

Annex 7: Number of embryos to transfer - Survey results

Patient experiences and preferences regarding embryo transfer- Report

INTRODUCTION

Even though ART treatment has been practised for more than 40 years, knowledge about patient wishes and preferences for children has been insufficiently studied. While the medical side of embryo transfer is well researched, there is still no reliable knowledge, for example, on the number of children that ART patients want to have. Existing publications have focused on different aspects of patient attitudes but the most commonly evaluated issue has been the preference for one singleton vs. one pair of twins (Blenborn et al., 2005, Højgaard et al., 2007, Mendoza et al., 2018, Okohue et al., 2010, Pinborg et al., 2003, Ryan et al., 2004, Twisk et al., 2007). These studies show that positive attitudes towards DET and twin pregnancies seem to be widespread in the ART patient population, even when patients are provided with information about the additional health risks involved. There have also been suggestions that a double embryo transfer is seen as a fast way to complete the family by having more than one child.

AIMS

The study was initiated in order to fill in the gaps of knowledge regarding patient wishes related to the number of embryos to transfer such as desired number of children and preference for singletons or twins.

METHODOLOGY

A questionnaire on patient experiences and preferences regarding the number of embryos to transfer was developed by Zdravka Veleva and Giuliana Baccino and with the collaboration of the members of this guideline development group (GDG). The aim of the questionnaire was to investigate knowledge, preferences, and experiences regarding the number of embryos to transfer during ART treatment of the female patient.

The questionnaire was translated to 29 different languages (see the list in **annex 7.1**) with the help of the GDG members, Fertility Europe (FE), several ESHRE national representatives, and volunteers (see the list in **annex 7.1**). The 30 versions of the web-based questionnaire via SurveyMonkey were launched the 7th of May 2021 with a post on ESHRE and FE respective websites and social media pages, in addition of several patient organizations' websites and social media pages (see **annex 7.2** for the complete list of contributors). A reminder post on ESHRE' s social media pages was posted each single week until October 15, 2021. Several emails and reminders were sent to the patient organizations in different European countries.

The survey, consisting of 21 questions, had a section on demographics and background information, a second section on wishes and beliefs on family building and pregnancy, a section on patient knowledge about the embryo transfer, and a last section on patient experience with the procedure. Details of replies to questions from the first two sections only will be presented in the present annex.

The English version of the questionnaire can be viewed in **annex 7.3**. The 29 other versions can be provided on demand.

The survey was closed on December 24, 2021, and 4507 replies were received.

SELECTION OF VALID REPLIES:

The selection of valid replies is outlined in **figure 1 and figure 2**. The resulting data set included 3911 replies representing the different European regions and some non-European countries.

Figure 1 Flowchart of the survey and an overview of replies per region

Survey period: April 2021- December 2021



Survey dissemination on ESHRE website, ESHRE social media pages, FE+ patient organisations website, FE+ patient organisations social media pages

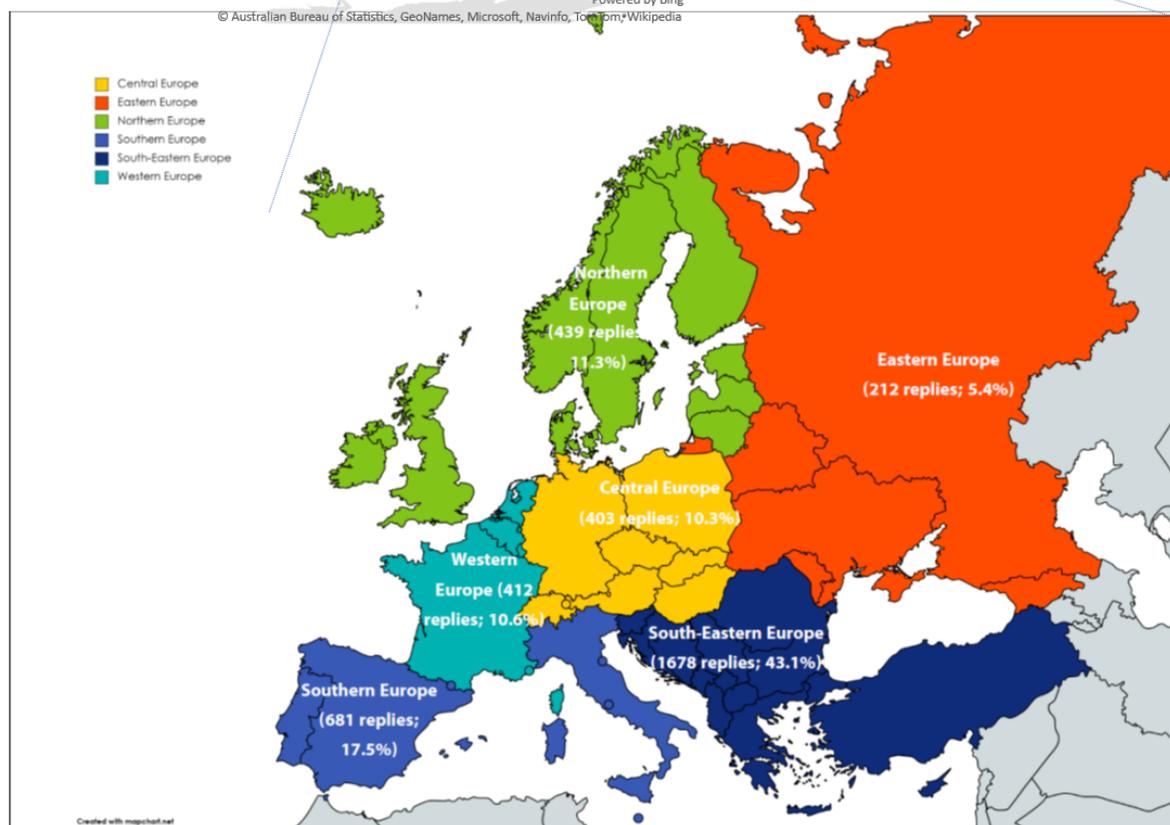
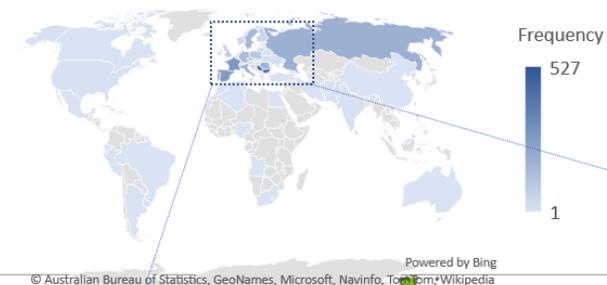
30 different languages, 4507 respondents



3911 respondent were included in the analysis, which was conducted per region (6 European regions and one non-European group of countries)

596 excluded for different reasons (GDPR not accepted, questionnaire not completed, irrelevant answers)

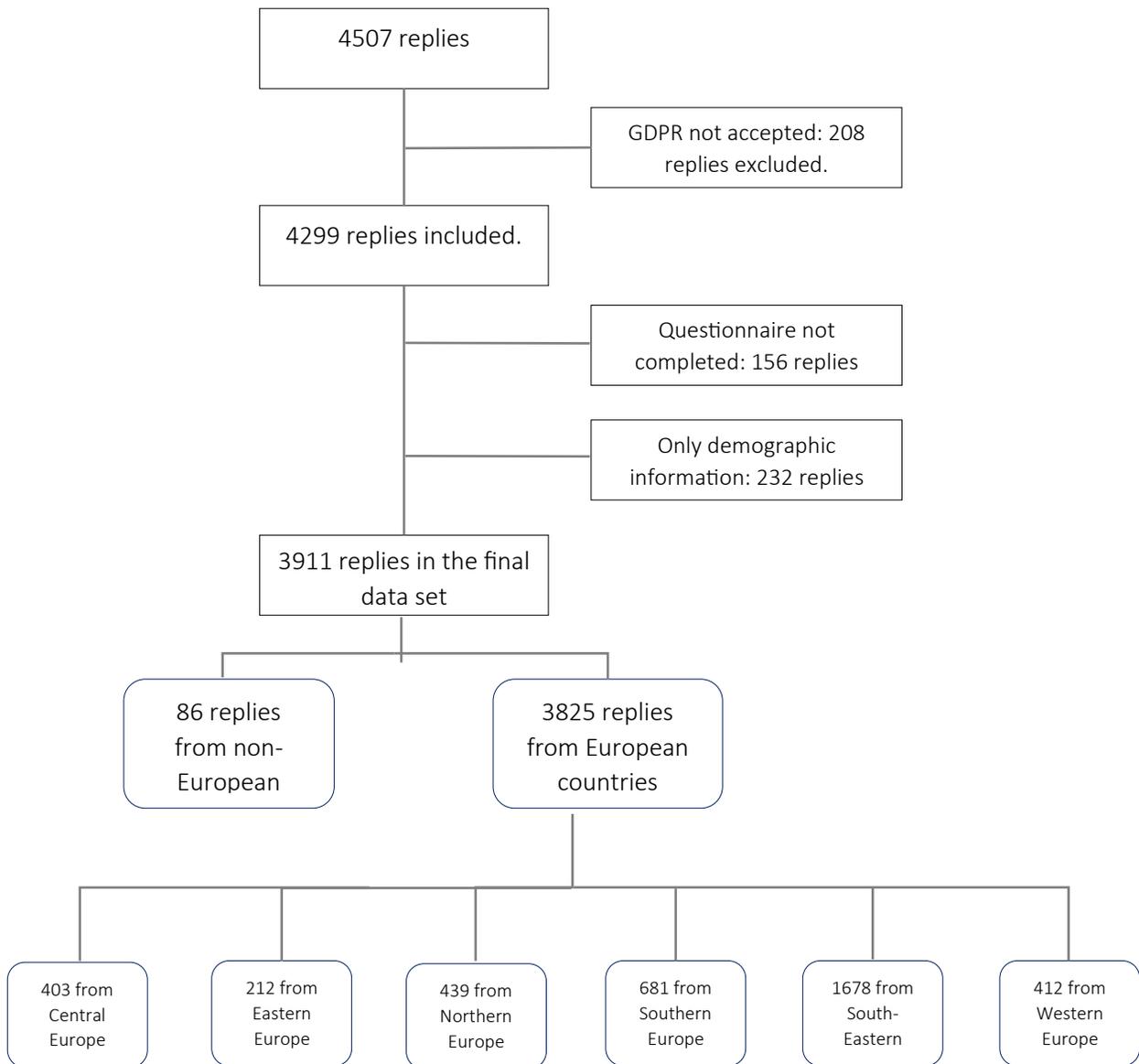
World map with indication of the number of valid replies per country



STATISTICAL ANALYSIS

It was calculated that for populations of infertile patients of >1 million persons, assuming 95% confidence level and 5% margin of error, the representative sample per country is 385 persons. Results were analysed by chi-square analysis whenever applicable, with $P < 0.05$ taken as level of significance.

Figure 2 Replies selection flowchart



RESULT ANALYSIS

I. Demographics- Overview of the number of replies received per region

European countries were grouped into six European Regions depending on geography and number of replies received. The non-European countries formed a separate non-European group. The composition of the European regions is as follows:

- Northern Europe: Denmark, Estonia, Finland, Iceland, Ireland, Latvia, Lithuania, Norway, Sweden, and the United Kingdom of Great Britain and Northern Ireland.
- Southern Europe: Andorra, Italy, Malta, Portugal, and Spain.
- Central Europe: Austria, Czech Republic, Germany, Hungary, Poland, Slovakia, and Switzerland.
- Western Europe: Belgium, France, and The Netherlands.
- South-Eastern Europe: Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus, Greece, Montenegro, Northern Macedonia, Romania, Serbia, Slovenia, and Turkey.
- Eastern Europe: Belarus, Moldova, Russian Federation, and Ukraine.

Several European countries were not included in the study groups either because no reply was received, or because all replies were incomplete or irrelevant.

The non-European group included valid replies (with GDPR permission) received from residents of the following countries: Afghanistan, Algeria, Angola, Anguilla, Antigua and Barbuda, Argentina, Australia, Brazil, Canada, China, Dominican Republic, Ecuador, Egypt, India, Iran, Israel, Japan, Kuwait, Lebanon, Malaysia, Mexico, Panama, Pakistan, Paraguay, Peru, Qatar, South Africa, Tunisia, United Arab Emirates, United States of America, and Uruguay. Replies from these countries were not analysed for the purpose of the Guideline.

Table 1 shows demographic characteristics of respondents to the survey. Almost half (43.9%) of replies came from residents of South-Eastern Europe, with replies from Serbia (n=527) and Bulgaria (n=442) reaching representative sample sizes. Most women were 34-39-years old (33.8%), and most were present or former ART patients (93.9%). The majority of respondents who had ART treatment did this in their country of residence (85.5%).

Table 1 Demographic characteristics of European residents.

	Number of valid replies (%)
Area of residence	
Eastern Europe	212 (5.5)
Central Europe	403 (10.5)
Northern Europe	439 (11.5)
Southern Europe	681 (17.8)
South-Eastern Europe	1678 (43.9)
Western Europe	412 (10.7)
Age	
Younger than 20y	2 (0.1)
20-24 y	23 (0.6)
25-29y	329 (8.6)
30-34y	1125 (29.4)
35-39y	1291 (33.8)
40-44y	809 (21.2)
45-50y	210 (5.5)
Older than 50y	35 (0.9)
Treatment stage	
Treatment not started yet	232 (6.1)
Ongoing treatment with no ET	325 (8.5)
Ongoing treatment with at least 1 ET	1972 (51.6)
Finished treatment with no ET	38 (1.0)
Finished treatment with at least 1 ET	1248 (32.6)
Location of treatment	
Country of residence	3271 (85.5)
Another country	301 (7.9)
Unknown treatment country	21 (0.6)

II. Wishes and beliefs on family building and pregnancy

Infertility patients' wishes and beliefs on family building and pregnancy are summarised in **table 2**. Only a small proportion of women wanted to have only one child, while most women wanted to have two children. However, most women thought they would have only one child after treatment (35.5%). The proportion of women responding that they expected no children from ART treatment was very low (2.7%). Half of women indicated no preference towards twins or singletons, and among those with a preference, singletons were more preferred than twins.

Among those who desired singletons, the leading reason was an easier and less risky pregnancy. The other leading reason to prefer singletons was the lower perceived stress in raising singletons. Among those who desired twins, the leading reason was the desire to have several children as soon

as possible. Other reasons were being fond of twins and the desire not to undergo another stimulation. Interestingly, only 25.5% of patients wishing for twins thought their own health made it possible to have twins without problems, and an even smaller proportion of respondents thought that health risks for twins are small with modern medicine (11.6%).

Table 2 Patient preference regarding singletons and twins and reasons behind this preference

	Number of valid replies (%)
Number of desired children	
One	528/3825 (13.8)
Two	2340/3825 (61.2)
>2	933/3825 (24.4)
Number of children believed to have after treatment	
One	1358/3825 (35.5)
Two	897/3825 (23.5)
>2	139/3825 (3.6)
None	105/3825 (2.7)
Desire for singleton(s) or twins	
Singleton(s)	1245 (32.5)
Twins	588 (15.4)
No preference	1911 (50.0)
Reasons for preferring singleton(s)	
No desire for twins or triplets	211/1245 (16.9)
Healthier	192/1245 (15.4)
A more natural choice	100/1245 (8.0)
A singleton pregnancy is easier and less risky	1029/1245 (82.7)
Cheaper to raise	118/1245 (9.4)
Less stressful to raise	382/1245 (30.7)
Reasons for preferring twins	
I like twins	245/588 (41.7)
Desire to have several children as soon as possible	298/588 (49.5)
Twins as means to avoid embryo destruction	101/588 (17.2)
Health risks in twins are small with modern medicine	68/588 (11.6)
Own health allows to have twins without problems	150/588 (25.5)
Wish to avoid multiple hormonal stimulations	185/588 (31.5)
Cannot afford many infertility treatments	164/588 (27.9)
Embryo freezing not allowed in country of residence	9/588 (1.5)

III. What do you know about foetal reduction?

Foetal reduction was not acceptable to 40.7% of patients (**table 3**). Half of respondents were knowledgeable of the procedure before filling the questionnaire. However, only a very small

proportion of patients replied that foetal reduction has been offered to them or to an acquaintance (3.7%).

Table 3 Patient knowledge about the risks associated with foetal reduction

	Frequency (%)
Is foetal reduction acceptable	
Yes	981/3825 (25.6)
No	1558/3825 (40.7)
Don't know	1108/3825 (29.0)
Have you heard of foetal reduction before	
No	1603/3825 (41.9)
Yes	1899/3825 (49.6)
Yes, the procedure has been offered to me or to someone I know	141/3825 (3.7)

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Annex 7.1: Translation

The English questionnaire was translated to 29 different languages:

	Language	Responsible for translation
1	Arabic	Saria Mcheik
2	Croatian	Dinka Baldani, Klaudija Kordic
3	Bulgarian	Martina Koleva
4	Danish	Fertility Europe
5	Dutch/Flemish	Nathalie Vermeulen
6	Finnish	Zdravka Veleva, Satu Rautakallio-Hokkanen
7	French	Saria Mcheik
8	German	Thomas Ebner
9	Greek	Athanasios Clementides
10	Hebrew	Zdravka Veleva, approval Ofra Balaban
11	Icelandic	Fertility Europe
12	Italian	Alessandra Alteri
13	Macedonian	Fertility Europe
14	Norwegian	Aleksej Stefanovic
15	Spanish	Giuliana Baccino
16	Polish	Grazyna Zeranska-Gebert
17	Portuguese	Samuel Santos-Ribeiro
18	Romanian	Laurentiu Craciunas
19	Russian	Zdravka Veleva, Vitali Reif
20	Swedish	Kenny A. Rodriguez-Wallberg
21	Turkish	Fertility Europe
22	Lithuanian	Brigita Vaigauskaite, Raminta Basuyte
23	Slovakian	Pavel Svitok
24	Hungarian	Attila Vereczkey
25	Ukrainian	Birol Aydin
26	Czech	Zuzana Holubcova
27	Bosnian	Fertility Europe

28	Serbian	Fertility Europe
29	Slovenian	Martin Stimpfel, Milan Reljic

Annex 7.2: Contributors to the survey dissemination

Fertility Europe through the member organizations as well as other patient organizations, ESHRE SIG nursing and midwifery and patient representatives helped the GDG disseminate the survey through their websites and/or social media pages. All contributors are listed in the table above.

Patient organisations
Fertility Europe
FE member organisations and associate members: <ul style="list-style-type: none"> - CHEN- Patient Fertility Association - Child Support Association - Iskambebe - Do bebe po patot na IVF - До бебе по патот на ИВФ - Kiveli - Nasz Bocian - Ønskebarn - Red Infertiles - Sdruzhenie Zachatie - Simpukka - You are not alone
Patient representatives (Not members of the GDG)
Cat Strawbridge
Monika Bulmanska
Professional organizations
The German reproductive medicine centre association- Germany
ESHRE SIG nursing and midwifery

Annex 7.3: Questionnaire

Patient experiences and preferences regarding embryo transfer

Introduction

Embryo transfer is an essential step in in vitro fertilisation treatment (IVF/ICSI). There are differences in practices between countries and doctors regarding the transfer of one or more embryos at the same time during the procedure. Currently, there is very little information on what patients prefer.

With this questionnaire, we would like to collect the opinion and experiences of women with regard to embryo transfer. The questionnaire is aimed at women that are undergoing fertility treatment, or that had fertility treatments in the past.

The questionnaire comprises 4 sections, focusing on background information, wishes and beliefs on family building and pregnancy, knowledge about embryo transfer, and experience with the procedure.

Replies will be treated as part of ESHRE's work on a Guideline on the number of embryos to transfer in IVF/ICSI. By completing this survey, you have a chance to help infertility specialists perform better treatments!

By completing this survey, you agree that ESHRE shall process your personal data in accordance with our privacy declaration (<https://www.eshre.eu/Privacy-Declaration-ESHRE>)

I agree

I disagree

Section 1 - Background information

1. Which country do you live in?

2. How old are you?

- Younger than 20 years.
- 20-24 years old.
- 25-29 years old.
- 30-34 years old.
- 35-39 years old.
- 40-44 years old.
- 45-49 years old.
- Older than 50 years old.

Section 2 - Wishes and beliefs on family building and pregnancy

3. Are you/have you been in infertility treatment?

- Not yet.
- Yes, I am undergoing infertility treatment and I have already had at least 1 embryo transfer.
- Yes, I am undergoing infertility treatment, but I have not yet undergone embryo transfer.
- Yes, my infertility treatment has finished, and I am not planning any more treatments. I have had embryo transfer.
- Yes, my infertility treatment has finished, and I am not planning any more treatments. I did not have embryo transfer.

4. In which country have you had infertility treatment?

5. How many children would you ideally like to have?

- One.
- Two.

- More than two.

6. How many children do you think you will have after treatment?

- One.
- Two.
- More than two.
- None.

7. I want to have:

- Singleton(s), i.e. 1-baby pregnancy (pregnancies).
- Twins.
- I have no preference whether to have singleton(s) or twins.

8. Why do you want one baby at a time? (Check all that applies)

- I don't want twins or triplets.
- Singletons are healthier.
- Singletons are a more natural choice.
- A singleton pregnancy is easier and less risky.
- It is cheaper to raise singleton(s).
- It is less stressful to raise singleton(s).
- Any other reason? Please explain:

9. Why do you want twins? (Check all that applies)

- I like twins.
- I want to have several children as soon as possible.
- I don't want my embryos to be destroyed after a single embryo transfer, I would rather raise twins.
- Health risks in twins are small with modern medicine.
- I am healthy and can have twins without problems.
- I do not want to undergo another hormonal stimulation.
- I cannot afford many infertility treatments.
- My country does not allow the freezing of embryos.
- Any other reason? Please explain:

Section 3 - What do you know about embryo transfer?

10. What do you think about the following statements (True, False, I don't know):

- The more embryos are transferred, the higher the chance of a pregnancy.
- If embryos are transferred one at a time, the woman will never get pregnant.
- A twin pregnancy has more complications and is less safe than a singleton pregnancy.
- Raising a pair of twin children costs as much as raising two singletons.
- There are more divorces in parents of twins compared to parents without twins.

11. In a procedure called “foetal reduction”, if a pregnancy has two or more foetuses, one or more foetuses can be aborted. Is this acceptable?

- Yes.
- No.
- I don't know.

12. Have you heard of foetal reduction before?

- No.
- Yes.
- Yes, the procedure has been offered to me or to someone I know.

13. Is it important for you to know the advantages and the risks related to the transfer of 1, 2, or more embryos?

- Yes.
- No.
- I don't know.

Section 4 - Experience with the procedure

14. Please mark which information was provided by your treatment practitioner about the number of embryos to transfer in IVF:

- The legal restrictions with regards to embryo transfer in your country.
- Pregnancy and live birth rates with the transfer of 1 or 2 embryos.
- Pregnancy and baby health risks depending on the number of embryos transferred. Risk of premature birth.
- Risk of miscarriage.
- Risk of hypertension.
- Risk of diabetes.
- Financial issues with singleton/twin pregnancies and children.
- Family coping issues related to pregnancy, birth, and raising singletons/twins.
- No information was given, just had to follow instructions.

15. How did you receive this information?

- I received written information
- I received oral information
- I received both, oral and written information

16. What information do you receive from the internet, support groups, friends?

- Information I find on the internet does not apply to my situation.
- I discuss this information with friends and other infertility patients.
- I discuss this information with my care provider.

- My care provider has recommended an internet site, book, or article on the number of embryos to transfer and pregnancy-related issues.
- I cannot find enough information in my language.
- I don't read or discuss anything regarding embryo transfer or pregnancy.

17. How many embryos have you had transferred? If you have undergone several embryo transfers, please state the highest number of embryos you have had replaced into the uterus.

18. Was this number higher or lower than what you would have desired?

- I agreed with this number.
- It was higher than I would have wanted.
- It was lower than I would have wanted.
- I had no opinion at the time.

19. Is there anything else you would like to tell us regarding your views or experiences with embryo transfer?

Thank you

20. Finally: We would appreciate it if you give us your email so that we could contact you in relation to this or future studies.

Email Address