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## Psychology and counselling

# Permanently infertile couples and family building—a cross-sectional survey in Denmark

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### ABSTRACT

**STUDY QUESTION:** Which decision-making factors influence family building among permanently infertile couples?

**SUMMARY ANSWER:** Ethical, legal, and financial considerations outweigh genetic relatedness in decision-making, favouring domestic gestational surrogacy, if this were possible, over international options.

**WHAT IS KNOWN ALREADY:** Permanent infertility affects 4–5% of people in the fertile age. Their family-building options include adoption, surrogacy, uterus transplantation, foster care, and intentional multiple parenthood. However, in most countries, including Denmark, legal barriers constrain these methods due to surrogacy restrictions, suspended international adoptions, and the experimental status of uterus transplantation. Despite existing research on surrogacy, adoption, and specific causes of permanent infertility, a significant gap remains in our understanding of how couples with permanent infertility make family-building decisions within these limited frameworks.

**STUDY DESIGN, SIZE, DURATION:** This cross-sectional study with 150 permanently infertile Danish participants was conducted from June to November 2023 using an online questionnaire. Multiple strategies, such as online forums, fertility clinics, hospital departments, and snowballing, were used to recruit a diverse sample.

**PARTICIPANTS/MATERIALS, SETTING, METHODS:** The study included couples aged 26–50 years facing permanent infertility due to the following primary causes: women without a uterus (15%), women with a non-functional uterus (47%) or women for whom pregnancy would be life-threatening (9%), male couples (16%), transgender partner couples (2%), and other causes (11%). The survey collected data on demographics, reproductive history, family-building choices, and communication strategies. Closed questions were analysed using descriptive statistics.

**MAIN RESULTS AND THE ROLE OF CHANCE:** Among 150 respondents, 41% had used transnational surrogacy, 27% adoption, 14% chose to remain childless, and 19% were undecided. Critical factors on family-building decisions were ethical, legal, and financial concerns which ranked higher than genetic relatedness. Despite the complexity of family building, most participants were open about their child's origin and received social support. If all family-building methods were legal and available in Denmark, domestic gestational surrogacy would be the preferred method, with uterus transplantation and remaining childless being least popular.

**LIMITATIONS, REASONS FOR CAUTION:** The sample size is relatively small, despite the use of a variety of recruitment strategies. Nevertheless, this has ensured a diverse cohort representing the different reasons for infertility and family-building choices. It is important to note that the strategies may have favoured individuals achieving parenthood.

**WIDER IMPLICATIONS OF THE FINDINGS:** The finding of our study reveals a notable gap between available family-building options in Denmark and the preferences of couples facing permanent infertility. These insights could be instrumental for organizations reviewing and developing family-building frameworks. Furthermore, for healthcare professionals guiding couples experiencing infertility issues in their attempts to build a family, an understanding of these preferences is essential to facilitate informed decisions about their future family plans.

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**Keywords:** surrogacy / childlessness / adoption / uterus transplantation / intentional multiple-parenting / foster care / legislation / family building / national survey

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## Introduction

Infertility, a significant global health concern, affects millions of people aspiring to parenthood (Fauser et al., 2024). Denmark, notable for its extensive use of medically assisted reproduction (MAR), reported that MAR accounted for 12% of all births in 2022 (Danish Fertility Society, 2023). MAR services are available in the public and private sectors to infertile heterosexual and lesbian couples, as well as single women, and are reimbursed by the National Healthcare System. Yet, 4–5% remain childless due to permanent infertility (Schmidt et al., 1995; Lechner et al., 2007). In this article ‘permanent infertility’ is defined as the inability to conceive or carry a pregnancy due to biological impossibility or medical contraindications. It encompasses both primary and secondary infertility, which refers to the inability to conceive at all, or the loss of the ability to conceive following a previous pregnancy. Those experiencing permanent infertility may actively pursue parenthood through adoption, surrogacy, or other family-building options, or they may choose to stop pursuing parenthood (Tanderup et al., 2023). The term ‘permanent infertility’ is specifically used to distinguish from ‘involuntary definitive childlessness’, which only refers to the last-mentioned group who have stopped pursuing parenthood and additionally are primary infertile (Lechner et al., 2007; Ribeiro et al., 2024). The condition of permanent infertility affects a heterogeneous population, including women with absolute uterine factor infertility (AUI) in which the inability to conceive or maintain a pregnancy is a consequence of uterine absence or dysfunction (Jones et al., 2021). It also encompasses women for whom pregnancy is medically contraindicated, couples with poor gamete quality, male couples, people who identify as transgender without a uterus, and single men. The family-building options for these groups are often limited and inaccessible in most countries (Pennings, 2004; Horsey, 2023). As of January 2024, Denmark prohibits surrogacy aided by healthcare professionals, international adoption has been set on a halt, and uterus transplantation remains an experimental procedure not yet performed in Denmark (Ministry of Health, 2019; Ministry of Social Affairs, 2024a).

Many infertile individuals have a strong desire for children (Abbey et al., 1991; Schmidt et al., 2003; Colombo et al., 2023) and are willing to cross national borders, spend large amounts of money, and even face legal issues to achieve parenthood (Jadva et al., 2021; Kneebone et al., 2023). Different forms of family building apply to different individuals and their cultural background, with adoption offering a dual outcome of achieving parenthood and finding homes for parentless children (Scherman et al., 2016; Roach et al., 2023). However, international adoption has declined sharply, particularly in Denmark, from 418 children in 2010 to 23 in 2023 (Danish Adoption Board, 2024). There has been an increase in the number of adoptable children with significant health problems, who are older or part of a sibling group. As a result, the criteria for adoptive parents have increased. Due to concerns and reports about human trafficking, Denmark terminated international adoption in 2024 (Ministry of Social Affairs, 2024a). National non-familial adoption in Denmark remains stable, but low with approximately 20 children per year (Danish Adoption Board, 2022).

The practice of transnational surrogacy, whereby an individual or couple, known as the intended parents, arranges for a surrogate to carry and give birth to a child in a different country, has become increasingly popular. This phenomenon offers infertile couples the opportunity to have a genetically related newborn (Perkins et al., 2016). The process is often quicker and more controlled than other options (Scherman et al., 2016). However, the

differing legislation concerning surrogacy worldwide means that infertile couples may seek countries with more favourable laws, affordable costs, shorter waiting times, or professional agencies (González, 2020; Horsey, 2023). Only a few countries allow commercial surrogacy, where the surrogate receives financial remuneration, such as states in the USA, Colombia, Mexico, Nigeria, and Ukraine (Sándor, 2018; Torres et al., 2019; Calhaz-Jorge et al., 2020). Infertile couples are, therefore, attracted to these countries, however, there are ethical and legal risks associated with this practice, such as differing reproductive norms, the potential exploitation of women, and legal uncertainty (Tanderup et al., 2015; Ragoné, 2019; Siegl, 2023). In Denmark, most couples opt for international surrogacy, as domestic surrogacy cannot be assisted by healthcare professionals (Ministry of Health, 2019) and a contract between the surrogate and the infertile couple is not legally binding (Ministry of Social Affairs, 2001). The exact number of couples going abroad for surrogacy is unknown but is estimated at 100–150 couples per year (Ministry of Social Affairs, 2024b). The legal situation regarding surrogacy in Denmark has recently changed. Previously, to prevent the commodification of children, the Danish Supreme Court ruled that if the (foreign) surrogate received payment, the intended mother could not proceed with stepchild adoption. However, the intended father would be the legal father if he was genetically related to the child. However, in 2022, the European Court of Human Rights overturned this decision, citing the children’s right to privacy and identity (European Court of Human Rights, 2022). Moreover, in 2024, the Danish Government plans to introduce new rules to protect the children born through surrogacy, both nationally and internationally. The rules enable transfer of the legal parenthood from the surrogate to both intended parents under certain conditions. The changes will also affect parental leave and inheritance rights for parents and children (Ministry of Social Affairs, 2024b).

For individuals who wish to carry a pregnancy and be genetically related to the child, uterus transplantation (UTx) is an option in countries such as Sweden, Czech Republic, and states in the USA. It is still considered an experimental treatment, mostly offered to women with Mayer–Rokitansky–Küster–Hauser Syndrome (MRKH) who were born without a uterus, resulting in more than 40 live births worldwide. However, this procedure carries ethical and medical risks for the donor, the recipient, and the child (Brännström et al., 2023; Mendilcioglu et al., 2023).

The need for transparency and support in the journey to parenthood from friends and family is underscored by the controversial nature of various family-building methods. The level of disclosure regarding the origins of families formed through surrogacy and adoption is high. This includes disclosure to the child (Blake et al., 2016; Scherman et al., 2016; Golombok et al., 2023) as well as to family and friends (Hammarberg et al., 2015; Blake et al., 2017). This is not surprising given the absence of pregnancy or male-only parentage, particularly in adoption situations involving transracial or older children. Surrogacy, legally recognized in nations like Australia, Canada, and the USA, gains familial support (Hammarberg et al., 2015; Blake et al., 2017; Carone et al., 2017; Fantus, 2021). Yet, the effect of restrictive laws on support in other countries remains to be explored. In Denmark and Sweden, the uncertain legal status of transnational surrogacy often results in stigma and official scrutiny for intended parents (Arvidsson et al., 2018; Tanderup et al., 2023).

Research into family-building priorities indicates divergence in perspectives of individuals going into fertility treatment. Women often express a desire to have a child within a year by any means. Conversely, men often prioritize a genetic relatedness

to their future child, suggesting differing priorities between partners (Duthie et al., 2017). Conversely, male couples exhibit a unified approach, equally valuing a controlled process and the genetic relatedness to their child, with financial concerns being secondary (Blake et al., 2017). Additionally, the decision-making process is significantly influenced by cultural, social, and religious context, with a notable emphasis on genetic relatedness in Middle Eastern societies (Inhorn et al., 2017; Behjati Ardakani et al., 2022). Despite these insights, no studies have examined the different reproductive choices regarding family building and experiences among the diverse group of individuals being permanently infertile. This study aimed to explore decision-making factors, preferences, and outcomes of family building among permanently infertile individuals, as well as the reactions to this decision from their confidants.

## Materials and methods

### Procedure

A cross-sectional online survey was conducted between June and November 2023 among permanently infertile couples across Denmark to assess their experiences in deciding between surrogacy, adoption, uterus transplantation, intentional multiple-parenting, foster care, or staying childless.

We invited Danish couples who were permanently unable to conceive and were between the ages of 20 and 50 years. This included women with AUF1, women with medical conditions that made carrying a pregnancy life-threatening, men in same-sex couples, and couples with a transgender partner where neither individual had a uterus. The survey used a convenience sampling method, inviting networks and NGOs to share a link to an online survey. Five fertility clinics, five gynaecological departments, an endocrinology department, and a clinical genetics department participated. The survey was also posted on seven online forums and three NGOs targeting various groups affected by gynaecological issues, childlessness, and alternative family forms.

The survey was exclusively for individuals in relationships, as the questionnaire was specifically designed for couples and to ensure a more uniform study population. Nevertheless, both individuals within a couple had the opportunity to participate in the survey to individually assess the impacts of infertility. Coupled respondents could not be identified within the survey. Participants were asked if they were aware of their partner's participation. Among the respondents, 10 couples had both partners participate. For parents with multiple children, the survey data focused on their firstborn child conceived through alternative reproduction.

### Ethical approval

Ethical approval for the study was granted by the Institutional Review Board at Aarhus University, Denmark (HE 2023-001) and the Danish Data Protection Agency (2016-051-000001, running number 2468). The study adhered to the Helsinki II Declaration.

### Data collection

The survey was designed using the national university database RedCap and gathered data on gender, age, socioeconomic status, reproductive history, psychosocial impact of infertility, opinions on choices of family building, and communication strategies. Questions were structured in a way to divide respondents based on their decision to engage in surrogacy, adoption, uterus transplantation, intentional multiple-parenting, foster care, or remain childless. Stratification was conducted based on the stage of the participants' journey to attain a child/children and their clinical

outcomes. The following section describes those variables used for the statistical analyses. A more comprehensive account of the full project questionnaire can be made available from the first author (M.T.).

### Socioeconomic and medical factors

The social-position was evaluated using standardized and validated items from the Danish Occupational Social Class (DOSC) questionnaire, using a combination of five items of school education, vocational training, and current job position. Individuals were classified into social class I (high) to V (low), VI (receiving social benefits), and VIII (students, maternity leave) (Christensen et al., 2014). In the analyses, social class was reduced to three levels: high (social class I + II), medium (social class III + IV), and low (social class V + VI + VIII). It should be noted that the DOSC does not include economic factors. However, in the context of alternative reproduction, which can be costly, two questions regarding the couple's income were included, although they were not part of the social classification. Medical background information was gathered through questions about years of infertility, diagnosis causing infertility, and whether they had children prior to infertility.

### Decision-making process of alternative reproduction

The decision-making process of family building was measured using items concerned with which factors that influenced a couple's selection of family-building methods (e.g. *how important was it for you to use own sperm?*). The items were developed from the Tanderup et al.'s (2023) qualitative interview study with Danish permanently infertile couples using surrogacy. The items evaluating factors used a three-point scale ranging from (1) important to (3) not important. The participants were also asked why they did not choose adoption, surrogacy, foster-care parenting, intentional multiple-parenting, or UTx on a multi-item scale with predefined responses. Finally, the couples should determine which alternative method of reproduction they would select as their first, second until last choice out of 11 options, under the pretence that all choices were permitted in Denmark. The first priority was analysed additionally to analysing the three highest priorities from a participant's response collapsed to 'top 3', and the three least prioritized to 'bottom 3'.

### Experiences with alternative reproductive methods

Items on number and health of the children through adoption and surrogacy were self-designed. Five items, derived from an American survey on MRKH women, were revised to evaluate the subgroups' experiences of using alternative reproduction (e.g. *My overall experience of adopting a child was good*) (Fischer et al., 2021). The response key for the five items was a 5-point Likert scale from (1) strongly disagree to (5) strongly agree. In the analysis the variable was collapsed into three groups: dissatisfied ('strongly disagree' and 'disagree'), neutral ('neither nor'), or satisfied ('agree' and 'strongly agree').

### Disclosure

#### Infertility-related communication strategies

The infertility-specific scale on Infertility-related Communication strategies (ICS) from the Copenhagen Multi-centre Psychosocial Infertility (COMPI) Research Programme was used (e.g. *Do you talk to other people about what kind of treatment you are trying?*) (Schmidt et al., 2005; Schmidt, 2006). The scale consists of four items of factual issues and two items of emotional issues related to infertility and the treatment process. The response key was (1) not to other people, (2) to people who are close to me, and (3) to most

acquaintances. The responses from the Infertility-related communication strategies were categorized into the following (i) a secrecy strategy when the infertility experience was not shared with others; i.e. when at least three out of four factual issues and at least one out of two emotional issues were not discussed with others, (ii) a formal strategy when only formal information was shared, i.e. when at least three of four factual issues were discussed with others and a maximum of one of two emotional issues was discussed only with close friends or family, and (iii) an open-minded strategy when both formal information and the feelings of the infertility experience were shared with others; i.e. when at least three out of four factual issues and both emotional issues were discussed with others (Schmidt, 2006; Rosholm et al., 2010). Same-sex couples and transgendered were excluded from the analysis as they were only asked two of the six items.

### Disclosure to the child

Two items from a British survey on surrogacy questioned the disclosure of the child's origin (Jadva et al., 2021). However, the items have been revised to encompass all forms of alternative reproduction, rather than solely surrogacy (*have you told or are you planning to tell your child/children how it/they came to be? Have you told or are you planning to tell your child that sperm or egg donation was used?*). The response key was (1) yes, have told already, (2) yes, vi have planned to tell, (3) have not decided yet, (4) no, we will not disclose later.

### Infertility-specific social relations

Questions regarding openness and negative reactions about infertility and methods of achieving parenthood from social relations used items from the baseline COMPI survey (Schmidt, 2006; Lund et al., 2009) (e.g. *do you get support and understanding from some people in relation to your childlessness?*), had four items specifying the support contrary negative reactions from (a) family, (b) family-in-law, (c) friends, and (d) colleagues. The response key was (1) have none, (2) always to (6) never. In the analyses the scale was reversed [(1) never, (5) always, and 'have none' were excluded from analysis]. The range was 4–20, where 20 indicated high support from others. In the two items on negative reactions (e.g. *do you find that some people react negatively to your way of having children?*) 20 indicated high level of negative reactions.

### Questionnaire pilot test and translation

The draft survey was reviewed and amended by all authors and three external experts in the field prior to finalization. Pilot testing of the survey was conducted with five distinct types of permanently infertile couples, resulting in a few amended items and removal of one item.

The items, initially written in English, were independently translated into Danish by two individuals. Subsequently, two other individuals conducted the back-translation. Most of the items were nearly identically translated and back-translated.

### Statistical analyses

Data from closed questions were analysed with descriptive statistics. All statistical analyses were completed using Stata version 18.0 (StataCorp, College Station, TX, USA). Respondents were not required to answer all survey questions. Where responses were missing, these are identified as 'missing'. Responses to the fixed choice questions are reported as percentages and number of respondents. Continuous data are reported as means when the data are symmetrically distributed and medians when they are skewed.

Comparisons between the different types of family building regarding socioeconomic characteristics, as well as infertility-related communication strategies, were made using Pearson's chi-square analyses. Differences between adoption and surrogacy in the reactions from others on their infertility and way of achieving a child were tested using Student's two-sample t-test. An Analysis of Variance (ANOVA) was employed to determine the significance of differences among group means. The threshold for statistical significance was set at a P-value <0.05.

## Results

### Participants

Of the 212 individuals who accessed the homepage, 188 initiated the survey. Of these, 150 met the eligibility criteria. Of the respondents, 76% identified as women, 23% as men, and 1% as transgender, as shown in Table 1. Their age ranged from 26 to 50 years with a median age of 39 years. Geographically, participants were from all regions of Denmark, with 18% residing in Copenhagen. The primary cause of permanent infertility was a non-functional uterus (47% of respondents), an absence of a uterus (15%), the risk of life-threatening complications during pregnancy (9%), men in same-sex couples and transgender individuals (18%), and other causes in 11%. In 16 cases, multiple causes of infertility were reported (Table 1) of which low sperm quality was the most common contributing factor. The nine respondents who identified low sperm quality as the primary cause reported using adoption (6), remaining childless (2), or other (1).

Among the respondents, 18 were secondary infertile (12%). However, in five cases, the child or children were stillborn or passed away. In all, 53% of the respondents had one to three children in the family, 14% of whom were from their own or their partners' previous relationships.

The groups were categorized according to the family-building method they had used. Among these groups, 41% planned or had used surrogacy, 27% planned or had used adoption, and 14% had not used a family-building method. However, this group is called 'remained childless' although three couples already had children before infertility. The remaining 19% is referred as 'others' and consists of 26 respondents who had not yet decided if they would use a family-building method and two who foster parented. Participants were limited to selecting only one family-building method. However, four participants indicated that they had been involved in both adoption and foster care. Despite selecting the category of adoption, they also noted their foster-care involvement in the provided text space. Consequently, they are only categorized in the adoption category in the article.

Of the respondents, 67% belonged to occupational social classes I and II, but participants from all social classes were represented in the study. The adoption group predominantly fell in the high social class (81%) but the childless group had the lowest representation (50%) in this class. The household's monthly income averaged 11 233 Euros, with the highest income observed among those who had utilized surrogacy and the lowest among those who had remained childless. None of these differences reached statistical significance, which is likely attributed to few observations.

### Reproductive decision-making

Figure 1 illustrates the factors influencing participants' decisions regarding family building. The most important factor was ethical soundness from their own perspective, which was a factor considered by 91% of the participants. However, only 33% deemed it

**Table 1.** Medical and socioeconomic characteristics of study participants at survey time.

	Type of alternative reproduction used or planned.					P-value
	Total (n = 150)	Surrogacy (n = 61)	Adoption (n = 40)	Remain childless (n = 21)	Others <sup>a</sup> (n = 28)	
Age of participants (median years, IQR)	39 (34–45)	36 (33–44)	41 (39–45.5)	45 (41–48)	34 (29–37.5)	<0.0001 <sup>b</sup>
Age of eldest child through alternative reproduction (median years, IQR)		2 (1–3)	8 (1–11)			
Sex						0.001 <sup>c</sup>
Female	114 (76)	35 (59)	36 (90)	21 (100)	22 (79)	
Male	34 (23)	24 (41)	4 (10)	0 (0)	6 (21)	
Transgender	2 (1)	n/a	n/a	n/a	n/a	
Causes of infertility						
Born without a uterus	8 (5)	3 (5)	0 (0)	0 (0)	5 (15)	NA
Hysterectomized	14 (8)	10 (15)	1 (3)	1 (3)	2 (6)	NA
Non-functional uterus	72 (42)	17 (26)	29 (69)	13 (45)	13 (38)	NA
Life-threatening to carry a pregnancy	13 (8)	7 (11)	1 (2)	3 (10)	2 (6)	NA
Advanced age	10 (6)	3 (5)	0 (0)	6 (21)	1 (3)	NA
Low sperm quality	20 (12)	3 (5)	8 (19)	3 (10)	6 (18)	NA
Same-sex male couple	24 (14)	17 (26)	2 (5)	0 (0)	5 (15)	NA
Couple where one is transgender	3 (2)	3 (5)	0 (0)	0 (0)	0 (0)	NA
Other	6 (4)	2 (3)	1 (2)	3 (10)	0 (0)	NA
Duration of infertility (median years, IQR)	8 (4–13)	8.5 (3.5–13)	11.5 (8–15)	5 (3–8)	4 (1–7)	<0.001 <sup>b</sup>
Missing	8					
Current children in the family						<0.001 <sup>c</sup>
0	70 (47)	25 (41)	4 (10)	17 (81)	24 (86)	
1	46 (31)	21 (34)	20 (50)	3 (14)	2 (7)	
2	27 (18)	12 (20)	12 (30)	1 (5)	2 (7)	
3	7 (5)	3 (5)	4 (10)	0 (0)	0 (0)	
Given birth before infertility	18 (16) <sup>d</sup>	9 (24) <sup>d</sup>	4 (11) <sup>d</sup>	2 (10) <sup>d</sup>	3 (17) <sup>d</sup>	
Have lost a child before infertility	5 (4) <sup>d</sup>	3 (8) <sup>d</sup>	2 (5) <sup>d</sup>	0	0	
Relationship status						<0.001 <sup>c</sup>
Married/civil partnership	108 (72)	44 (72)	36 (90)	21 (100)	11 (39)	
Cohabitant	33 (22)	15 (25)	0 (0)	0 (0)	14 (50)	
Non-cohabiting	3 (2)	1 (2)	0 (0)	0 (0)	2 (7)	
Separated/divorced/widow	6 (4)	1 (2)	4 (10)	0 (0)	1 (4)	
Economy						
Total monthly household income before tax (mean ± SD, EURO)	11 233 ± 5199	12 180 ± 6222	11 071 ± 3814	9944 ± 4420	10 281 ± 4785	0.35 <sup>b</sup>
Quartile (lowest) (0–7372)	27 (23)	11 (23)	3 (10)	6 (38)	7 (33)	0.20 <sup>c</sup>
Quartile (7373–10 723)	29 (25)	12 (25)	11 (37)	2 (12)	4 (19)	
Quartile (10 724–12 404)	28 (24)	8 (17)	9 (30)	4 (25)	7 (33)	
Quartile (highest) (12 404–max)	31 (27)	17 (35)	7 (23)	4 (25)	3 (14)	
Missing	35					
Occupational social class						0.36 <sup>c</sup>
Low (V + VI + VII)	17 (14)	6 (12)	2 (6)	5 (28)	4 (16)	
Medium (III + IV)	24 (19)	11 (22)	4 (13)	4 (22)	5 (20)	
High (I + II)	83 (67)	33 (66)	25 (81)	9 (50)	16 (64)	
Highest education						0.21 <sup>c</sup>
Primary and high school	8 (7)	5 (10)	1 (3)	1 (6)	1 (4)	
Vocational school	19 (15)	6 (12)	2 (6)	6 (33)	5 (19)	
Short higher education	5 (4)	3 (6)	1 (3)	0 (0)	1 (4)	
Medium higher education	41 (33)	14 (28)	15 (48)	7 (39)	3 (12)	
Long higher education and research education	51 (41)	22 (44)	12 (39)	4 (22)	13 (50)	
Missing	26					

Unless stated otherwise values are n (%) percentages have been rounded to the nearest whole number so the totals may not always add to 100.

<sup>a</sup> Others: Two who have used foster care and 26 who have not decided yet on type of alternative reproduction.

<sup>b</sup> One-way ANOVA.

<sup>c</sup> Pearson's chi-squared test.

<sup>d</sup> Out of respondents who have been able to conceive before infertility (i.e. excluding same-sex, transgendered, and born without a uterus).

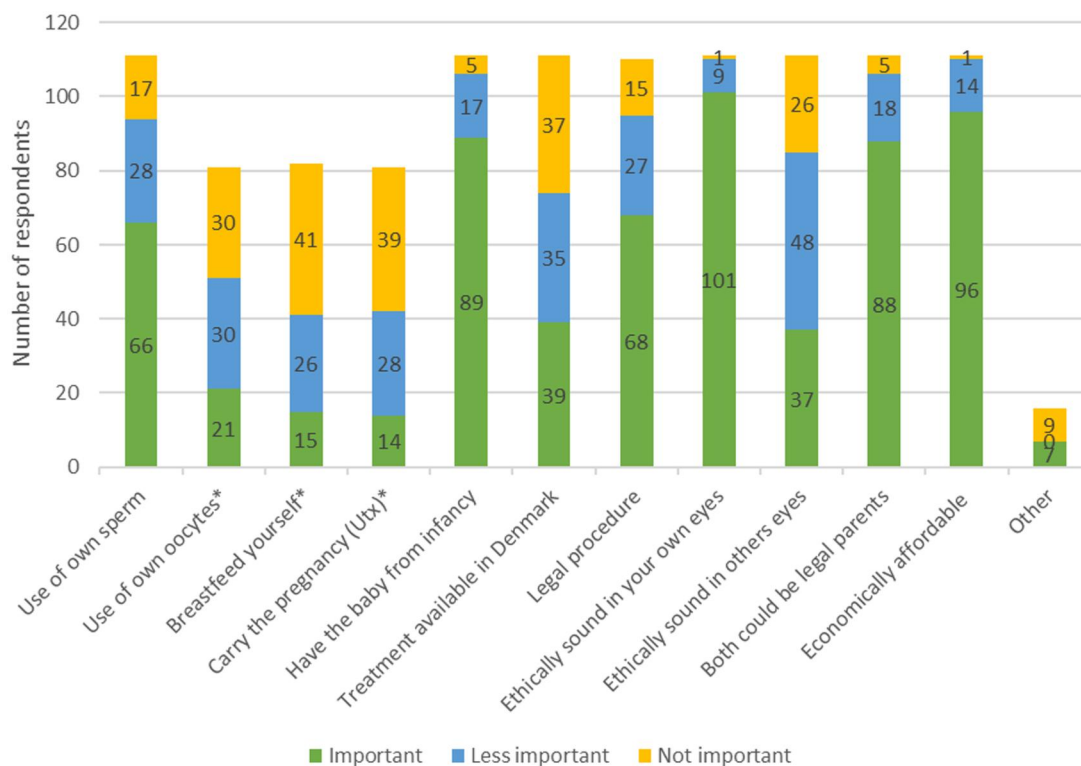
significant from the perspectives of others. Other crucial factors were economic affordability (86%), the ability to have the child from infancy (80%), and a secure legal framework for parental rights (79%). In contrast, factors such as using one's own oocytes, breastfeeding, and carrying the pregnancy (feasible through UTX) were considered less important.

While adoptive parents and intended parents in surrogacy shared prioritization regarding ethical soundness and economic affordability, statistically significant differences were observed in regard to other considerations. Intended parents in the surrogacy

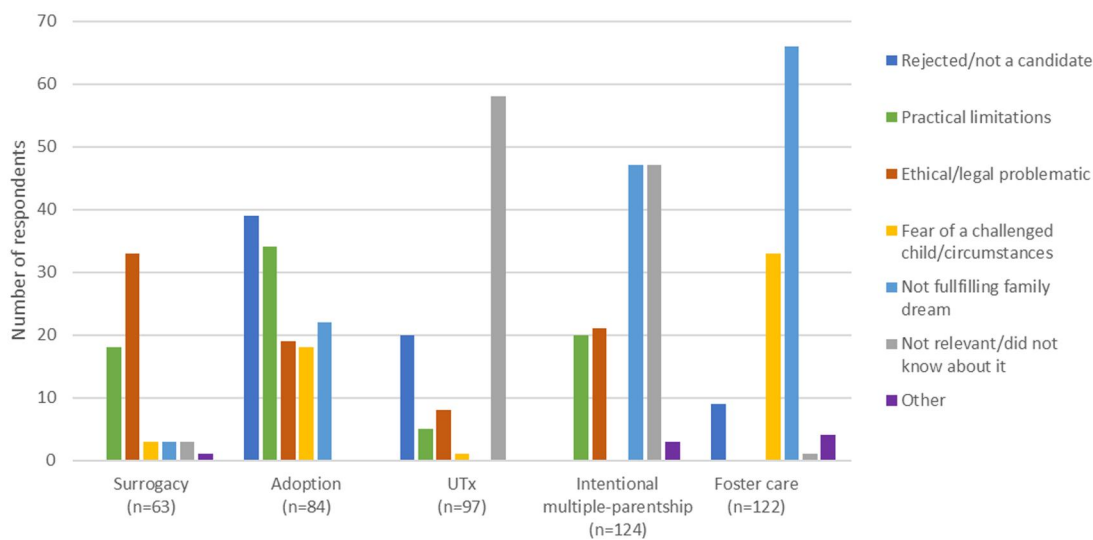
process placed greater importance on using their own sperm and having the child from infancy than did adoptive parents. Adoptive parents prioritized the legal framework.

### Reasons for not choosing a particular family-building method

The distribution of reasons for not selecting a particular method of family building among the participants is presented in Fig. 2. A reason for not selecting adoption was the perceived lack of eligibility as an adoptive parent due to factors such as being in a



**Figure 1. Factors influencing the permanently infertile couples' decision when choosing an alternative reproductive method.** \*Same-sex couples and transgendered were not asked these questions. Individuals who have not yet determined their preferred method of family building were not considered in this question (n = 26). Missing n = 13. Utx, uterus transplantation.



**Figure 2. Reasons for the respondents to deselect a particular method of family building.** Practical limitations: too expensive, not willing to go abroad, or did not have a donor/carrier/co-family. It was possible to choose more than one reason. Individuals who have not yet determined their preferred method of family building were not considered in this question (n = 26).

same-sex relationship, having cancer or other severe conditions or being of advanced age. Moreover, many participants were discouraged by the long and uncertain adoption process, and some had already waited unsuccessfully for more than five years. Surrogacy was mainly avoided in Denmark due to the insecure legal situation of this mode and the negative media coverage of gestational carriers being exploited abroad. Most of the participants were not aware of Utx as an option. Foster care and intentional multiple parenting were excluded as options because they

did not fulfil the desire for a traditional family structure. Additionally, some participants expressed concerns about the possibility of having a child with special needs or ending up in complex family relationships.

The prioritization of family-building methods among all the participants, pretending that all options were legal and available, revealed that 37% of participants preferred economically compensated surrogacy within the country as their primary choice. This was followed by 17% choosing domestic adoption 16%

opting for non-compensated surrogacy in Denmark. In contrast, only 7% favoured international surrogacy. Figure 3 presents the three most preferred and least preferred options for each participant. The least preferred option was to remain childless, followed by UTx. However, the group that had experience with adoption prioritized international and national adoption over surrogacy.

### Choosing surrogacy and adoption as a path to parenthood

The experiences of using adoption and surrogacy are shown in Table 2. More participants in the adoption category had already become parents through this method than those in the surrogacy category. The health outcomes of the children differed significantly: eight adoptive children had mental or physical issues, while all surrogacy children were healthy. Satisfaction with the alternative reproductive methods was high: 100% for surrogacy and 92% for adoption. Similarly, the willingness to recommend the methods to others was high: 93% for surrogacy and 85% for adoption.

The total cost of surrogacy typically exceeded that of adoption. This included payments to agencies, medical and legal assistance, travel expenses, and parental leave. In contrast to adoption, maternity leave was not reimbursed in the case of surrogacy.

### Disclosure and reactions to reproductive choices

Most heterosexual participants (62%) used an *open-minded* infertility-related communication strategy, disclosing their infertility and family-building choices to most of their acquaintances, while 25% used a *formal* strategy sharing only formal information. Notably, 13% used a *secrecy* strategy, telling almost no one about their situation. No significant differences in disclosure

patterns were observed between the surrogacy and the adoption groups. Regarding disclosure of this information to the child, 96% planned or had already disclosed the information. See Table 3.

The participants using surrogacy and adoption received considerable support and understanding regarding biological childlessness and family building. However, adoptive parents reported receiving significantly less support concerning their biological childlessness compared to those who used surrogacy. Beyond this, no notable differences in support or negative reactions were observed between the surrogacy and adoption groups, nor between heterosexual and same-sex couples. Further details can be found in Table 4.

### Discussion

This study is the first nationwide survey to explore the decision-making factors and outcomes of family building among permanently infertile couples in Denmark. The results suggest that permanently infertile couples would like their family-building process to be ethical to oneself, having a baby from infancy, to be legally parental and to be financially feasible. Notably, the genetic connection to the child emerged as a secondary consideration, diverging from prior research that emphasized genetic ties as a primary concern in family-building decisions especially among men (Blake et al., 2017; Duthie et al., 2017; Behjati Ardakani et al., 2022). This divergence may be attributed to the distinctive demographic profile of the study population, comprising couples who have experienced infertility for an average of eight years. Such a duration of infertility is likely to subject individuals to extensive decision-making processes, during which the initial desire for a genetic relatedness may diminish in the face of legal, financial, and ethical challenges associated with various family-building methods. When prioritizing the

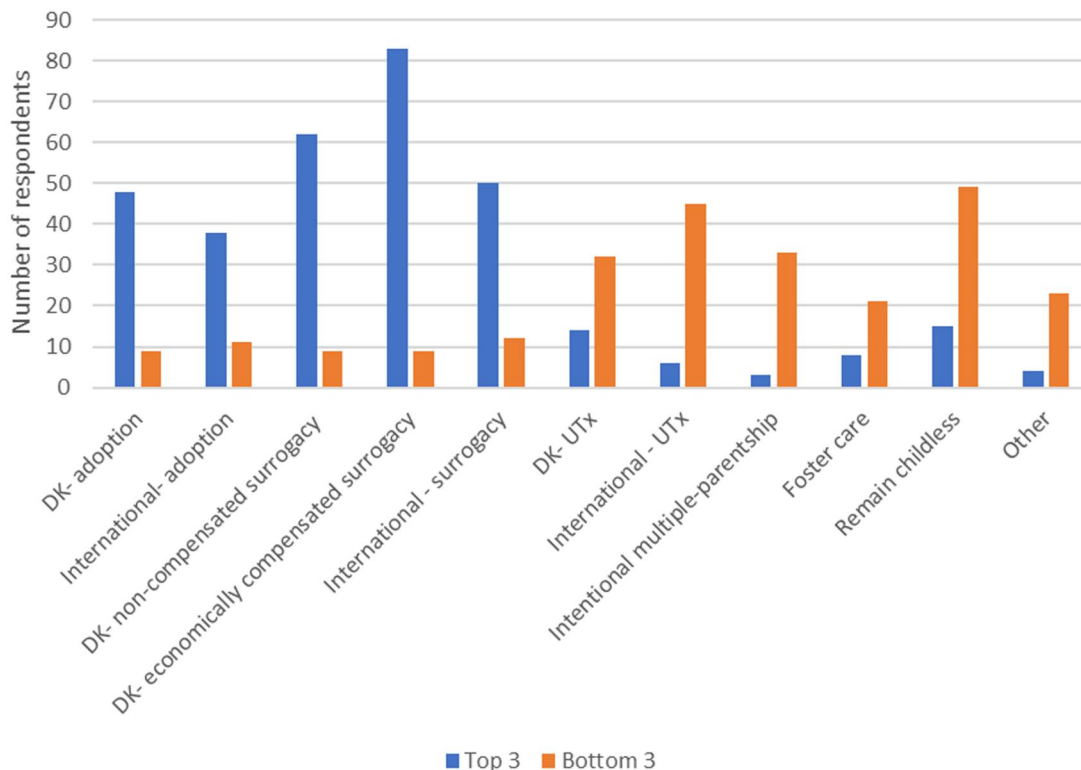


Figure 3. Participants' priorities for future alternative reproductive methods in Denmark if all 11 options were available. DK, Denmark; UTx, uterus transplantation. Total responses = 116, missing n = 34.



**Table 2.** The respondents' experiences using surrogacy (n = 61) and adoption (n = 40).

	Surrogacy n (%)	Adoption n (%)
Stage of the process of alternative reproduction		
	n = 61	n = 40
Initial stage	14 (23)	1 (3)
In process	12 (20)	4 (10)
Achieved one or more children	35 (57)	35 (87)
Length from initiating the process until a child was achieved (years)*		
	n = 35	n = 35*
1 year	4 (11)	1 (3)
2 years	10 (29)	4 (12)
3 years	9 (26)	13 (38)
4 years	4 (11)	6 (18)
More than 4 years	8 (23)	10 (29)
Number of children through alternative reproduction		
1	22 (63)	24 (69)
2	11 (31) <sup>a</sup>	9 (26)
3	2 (6) <sup>b</sup>	2 (6)
Geographic of alternative reproduction		
National	0	7 (21)
International	35 (100)	26 (79)
Missing	0	2
Health of the children		
All children are healthy	35 (100)	26 (77)
Physical or mental complications	0 (0)	8 (23)
Missing	0	1
Estimated expenses of the complete process including travel expenses, fees, leave from work (DKK)*		
Less than 100 000	0	6 (17)*
100 000–299 999	0	8 (24)
300 000–499 999	8 (24)	14 (41)
500 000–1 000 000	15 (45)	6 (18)
More than 1 000 000	10 (30)	0
Missing	2	1

\* Data were significantly different between adoption and surrogacy, Pearson Chi<sup>2</sup> test, P-value ≤ 0.02.

DKK, Danish kroner; 100 DKK = 13.4 Euro, on 13 March 2024.

<sup>a</sup> Two sets of twins.

<sup>b</sup> One set of twins.

**Table 3.** Disclosure to the child of its origin.

Disclosure to the child how she/he came to be	Couples who have adopted, used surrogacy or foster care (n = 103) <sup>a</sup>	Couples who have used egg donors through surrogacy (n = 39) <sup>b</sup>
Have told already	45 (52)	5 (15)
Have planned to tell	38 (44)	28 (82)
Have not decided yet	3 (3)	1 (3)
Will not disclose later	1 (1)	0

Values are n (%). The average age of the child through surrogacy is 2 years old. Missing:

<sup>a</sup> n = 16.

<sup>b</sup> n = 5.

family-building method the couples would prefer domestic gestational surrogacy to transnational alternatives. However, recent developments have deviated from this preference, with the government announcing the end of international adoption and maintaining restrictions on domestic surrogacy, banning the use of assisted reproductive technology in surrogacy. However, a law is due to be introduced in 2024 that will allow both intended parents to become legal parents through surrogacy. These developments raise concerns about the potential increase in transnational surrogacy arrangements, and it is important to consider the perspectives of permanently infertile individuals, as they will be directly affected by any legislative changes.

**Table 4.** Reactions from others on the couples' childlessness and way of achieving parenthood.

Variables	Surrogacy (n = 45)		Adoption (n = 33)		t-diff	P-value*
	Mean	SD	Mean	SD		
Support from others in relation to your						
Biological childlessness	17.11	3.40	15.45	3.30	2.2	0.03
Way of achieving parenthood	17.95	2.92	17.56	3.31	0.55	0.58
Others react negative to your						
Biological childlessness	5.44	2.55	6.12	3.52	-0.99	0.33
Way of achieving parenthood	5.83	2.55	5.34	1.72	0.91	0.36

The scale ranges from 4 to 20. In the two first variables higher scores indicating greater support. In the two last variables a lower score indicating less-negative reactions from others.

\* Calculated with Student's t-test.

### Reproductive decision-making

In our study, 70% preferred domestic family-building options. However, due to the stringent regulations governing surrogacy, adoption and UTx in Denmark, 87% of the permanently infertile individuals chose transnational surrogacy and international adoption instead. These international options entail a range of ethical, legal, regulatory, and financial complexities (Scherman et al., 2016; Arvidsson et al., 2018; Kneebone et al., 2022; Siegl, 2023). A similar phenomenon is observed in an Australian study examining couples utilizing surrogacy wherein stringent national regulations, characterized by too long and complicated processes, led 63% of participants to opt for surrogacy overseas. Nonetheless, an overwhelming 92% of couples expressed a preference for domestic surrogacy (Kneebone et al., 2023). Enhanced legal frameworks, increased availability of surrogates, and reduced waiting times serve as key motivators for surrogacy abroad (Jadva et al., 2021). However, the absence of internationally agreed-upon ethical and reimbursement standards heightens the risk of unethical practices, underscoring the need of each country to regulate domestic surrogacy so it can be undertaken safely and ethically to protect the best interest of the children, surrogates, intended parents, and families (Fenton-Glynn, 2016; Horsey, 2023).

The motivation for couples who choose adoption or foster parenting is often dual: to fulfil their dream of having a child and to provide a home for a parentless child. While some couples intentionally adopt a disabled child out of a desire to provide care, not all the 23% who ended up with a child with disabilities had set out with that specific intention. The increased risk of adopted children having disabilities reflects a global trend of increasing numbers of adopted children with complex health conditions or disabilities (Roach et al., 2023). For the permanently infertile couples the risk of adopting a disabled child was one of the major reasons not to proceed with adoption alongside the long waiting time and not being eligible as adoptive parents. Two studies including couples seeking surrogacy showed that approximately 60% considered adoption before deciding on surrogacy (Hammarberg et al., 2015; Blake et al., 2017). However, adoption was seen as less desirable compared to surrogacy by 66%, and a genetic relatedness to the child was important (Blake et al., 2017). In January 2024, Danish permanently infertile individuals faced additional challenges as international adoption was no longer an option due to difficulties in ensuring legal completion in relation

to biological parents (Ministry of Social Affairs, 2024a). Norway and Sweden also appear to be following this policy (Euronews, 2024).

In the context of surrogacy, participants rated the genetic relatedness to the father as significantly more important than the link to the mother. However, this prioritization does not necessarily reflect a paternalistic perspective, but rather a practical consideration. Under the current Danish legislation, establishing a genetic link to the father is crucial for a newborn baby conceived through surrogacy to obtain a Danish passport and to be repatriated to Denmark. This legal requirement stems from the principle that legal fatherhood can be established through a genetic connection, while the woman who gives birth (in this case, the foreign surrogate) is always recognized as the legal mother. However, recent government announcements signal a future change, requiring only one of the intended parents to establish a genetic relation to the child in surrogacy arrangements (Ministry of Social Affairs, 2024b).

Previous studies have shown a high preference for UTX among women with MRKH women (Kisu *et al.*, 2016; Peters *et al.*, 2020; Fischer *et al.*, 2021; Jones *et al.*, 2023). The participants in those studies expressed a strong desire for the ability to carry a pregnancy with genetic relatedness. However, our study does not support these findings as carrying a pregnancy was one of the least prioritized factors, influencing the form of family building, and none of the participants in our study had undergone UTX. The difference may be explained by the fact that previous studies recruited participants from online groups solely for women with MRKH, which are the most relevant candidates for UTX. For the Danish infertile couples, the knowledge of UTX was limited as this treatment is not offered nationally, and undergoing UTX abroad is challenging, expensive, and carries considerable risks (Peters *et al.*, 2020; Mendilcioglu *et al.*, 2023).

### Economically inequality

The participants, particularly those couples engaging in adoption and surrogacy, were notably more educated and affluent than their peers. Within the 25 to 50 age bracket, 41% of the participants had completed an advanced education compared to 20% of the broader Danish population, and 33% had a medium-level higher education versus 24% of the population (Statistics Denmark, 2022). The average income was €11 233, exceeding the national average of €9138 for the same age group (Statistics Denmark, 2022). This pattern is consistent with prior research on adoption and surrogacy, which may be explained by the high cost involved in both the process and the complexities of the process (Scherman *et al.*, 2016; Kneebone *et al.*, 2023). Nonetheless, the socioeconomic privilege of the surveyed couples underscores a disparity in access to family building, disproportionately affecting those from lower socioeconomic strata.

### Satisfaction with the decision

The present study compared the experiences and levels of satisfaction of individuals who opted for surrogacy or adoption as alternative paths to parenthood. The results indicated high satisfaction and recommendation rates for both methods, aligning with the findings of an American study on that reported similar positive outcomes for domestic and international adoption (Hanlon, 2022) and an American study on surrogacy (Blake *et al.*, 2017). However, Blake *et al.* also observed that 10% of parents through surrogacy reported feeling neutral or dissatisfied. This was attributed to the demanding nature of the surrogacy process, which can lead to anxiety and concern (Blake *et al.*, 2017).

## Communication about infertility and family building

In every family, parents must decide on whether, when, and how to disclose to their child how it came into the world. Our study shows that most parents who used adoption or surrogacy plan to disclose their child's origin to them, either now or later. Only one respondent indicated that this would not be the case. This is consistent with previous research, reporting high rates of disclosure among surrogacy (Carone *et al.*, 2018; Golombok *et al.*, 2023) and adoption families (Siegel, 2013). In contrast to previous studies, which showed a higher tendency to disclose the use of a gestational carrier compared to oocyte and especially sperm donors (Blake *et al.*, 2016; Tallandini *et al.*, 2016; Golombok *et al.*, 2023), almost all in our study utilizing oocyte donation also expressed a desire to disclose the use of donation. However, it should be noted that intentions may not always translate into action, and further studies are needed to confirm the actual disclosure rates.

Interestingly, our study also shows that infertile couples commonly disclose their infertility and family-building plans, aligning with prior Danish findings on communication strategies among infertile couples (Rosholm *et al.*, 2010). Most couples receive support regardless of their family-building method or sexual orientation, though some face negative feedback. The acceptance of surrogacy by friends and family, especially where legally permitted (Hammarberg *et al.*, 2015; Blake *et al.*, 2017; Carone *et al.*, 2017; Fantus, 2021), is corroborated by our study, which also indicates that support persists in countries with legal limitations on surrogacy and adoption.

### Strengths and limitations

To our knowledge, this is the first study to examine the reproductive decision-making and view on future forms of family building in a diverse group of permanently infertile couples in Denmark. It is not possible to know if participants in this study were representative of all couples facing permanent infertility. Furthermore, the sample size was limited, despite the invitation of all established networks and NGOs to distribute a participant information. The sensitive nature of the topics raised has likely influenced the willingness to participate, and although family building is often a decision process within couples, we focused on all available responses on an individual level for these analyses. Nevertheless, the causes of infertility and types of family forms were widely represented, as well as the geographic location of the couples, suggesting that a diverse range of people participated in the survey.

Most of the participants were satisfied with having chosen to have a child through adoption or surrogacy. However, owing to the use of a volunteer sample in this study, the possibility that those couples who had a particularly positive experience were more likely to participate in the study cannot be ruled out. Looking ahead to future research, a longitudinal approach would offer valuable insights into the long-term outcomes and experiences of individuals utilizing alternative reproductive methods. However, the absence of a surrogacy registry in Denmark has hindered such endeavours thus far. Nevertheless, the anticipated legislative changes may pave the way for future research in this domain.

The present study also has several strengths. A thorough conceptualization, leading to the use of validated items in the questionnaire, used in previous research, such as DOSC and COMPI-Infertility-specific items or based on previous research on permanent infertility conducted by the author group. Importantly, the instruments were pilot-tested in the target group beforehand.

## Conclusion

This study contributes to the small yet growing literature that explores the choice of family building among permanently infertile couples. Our findings indicate that factors such as ethical considerations, legal regulations, and financial feasibility play pivotal roles in the family-building process. Our research has identified a significant disparity between the family-building solutions currently accessible in Denmark and the actual desires of couples confronting permanent infertility. These insights can serve as foundational academic knowledge for policymakers who are crafting legislation that affects couples unable to conceive. The understanding of couple's preferences is crucial for informed legislative processes that aim to support and address the challenges faced by these individuals in their family-building journeys and balancing this with the ethical implications of the different forms of family building. Furthermore, it is important for healthcare professionals assisting permanent infertility individuals to comprehend their preferences, as this knowledge is key to helping them make informed decisions about their family-building options.

## Data availability

The data underlying this study cannot be shared publicly due to protection of the privacy of individuals participating in the study. Anonymized data will be shared upon reasonable request to the corresponding author.

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## Authors' roles

M.T. and L.S. were responsible for developing the questionnaire. M.T. was responsible for data collection and drafted the article. M.T., D.V., and L.S. analysed the data. All authors participated in the concept and design of the study, as well as interpretation of data, draft versions, and approval of manuscript submission.

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## Conflict of interest

No conflicts were declared for all authors.

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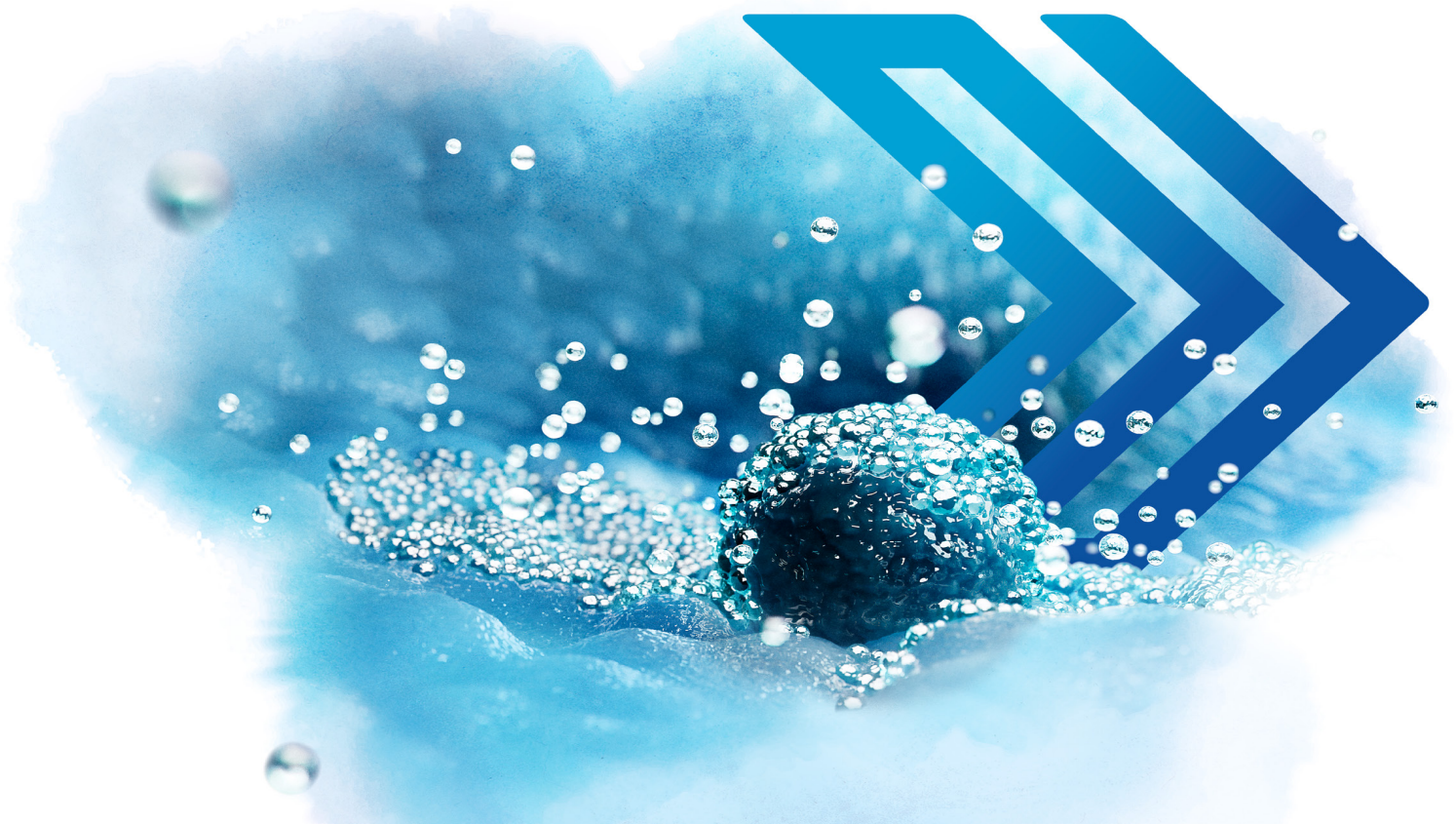
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