STUDIA DEMOGRAFICZNE

1–2(185–186) 2024

Review article

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DOI: 10.33119/SD.2024.1-2.4

Reproductive difficulties in the context of declining fertility: The role of the Generations and Gender Survey

Abstract

This article addresses the significance of studying reproduction difficulties associated with infertility in the context of low fertility, alongside a review of the methodological approaches employed in research on reproductive health with special focus on the Generations and Gender Survey (GGS). According to the World Health Organization (WHO) estimates, approximately one in six people globally have experienced infertility at some stage in their lives. As childbearing postponement in Europe is progressing and ability to conceive declines with age, reproductive difficulties are increasingly recognised as a factor inhibiting realisation of people's childbearing aspirations. In the paper, we present main conceptualisations of reproductive difficulties and review different methodological approaches to this topic in reproductive health surveys, including various definitions and measurements of infertility. Finally, the article emphasises

the potential of the GGS, with its wide scope, panel design and international comparability, for future research into the causes and consequences of infertility. The article concludes by stressing the importance of interdisciplinary and internationally comparable research to inform policies supporting reproductive healthcare.

Keywords: fertility rates, Generations and Gender Survey (GGS), infertility, reproductive health

Introduction

Over the past decades, European fertility patterns have been shaped by two interconnected trends: persistently low birth rates and the steady postponement of childbearing. These shifts intensify the demographic relevance of reproductive health, as delayed attempts to conceive are related to rising age-related infertility and to a wider set of biological, behavioural and environmental factors affecting fecundity. At the same time, infertility is increasingly recognised as a broad social and public health issue, affecting an estimated one in six people worldwide and contributing to unmet reproductive intentions. This is of particular relevance in contexts where low fertility concurs with relatively high desire for children. These developments underscore the need for population-based, comparable data capable of capturing both the prevalence of reproductive difficulties and the social conditions in which they emerge.

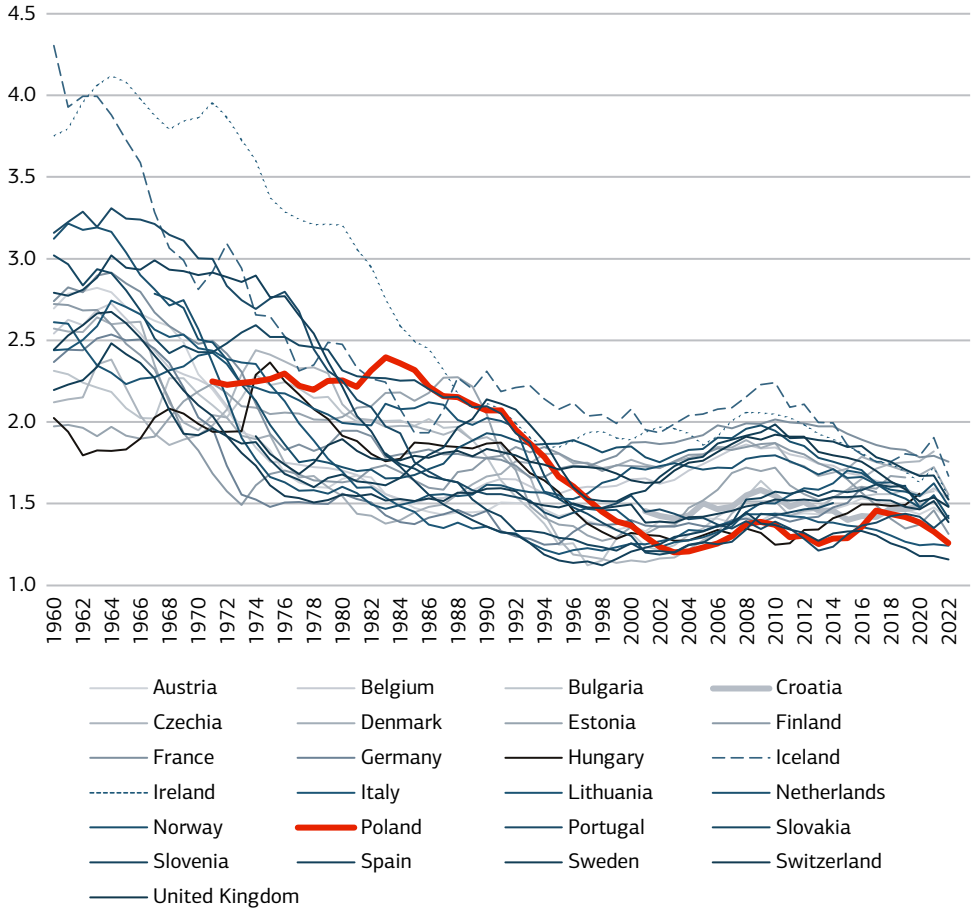
The aim of this article is to demonstrate how the Generations and Gender Survey (GGS) can serve as a valuable resource for studying reproductive health, with particular emphasis on infertility and difficulties in conceiving. To achieve this goal, the paper first outlines the demographic context of sustained low fertility and postponed parenthood, then discusses key aspects of reproductive health relevant to understanding contemporary fertility trends. The next section reviews major reproductive health surveys and their methodological approaches to identify emerging trends and still existing gaps in how we collect data on reproductive difficulties. Finally, the paper shows how reproductive difficulties are conceptualised and measured within the GGS, highlighting new opportunities for comparative and longitudinal research in this area.

Demographic context of low and late fertility

Europe has experienced significant changes in fertility, characterised by a declining number of children per women (the quantum effect) and an increase in the age at first and subsequent births (the tempo effect). In the early 1960s, European countries were

characterised by relatively high period total fertility rates and many countries had TFRs above 2.5 children per woman. In early 1970s, TFR fell to below replacement level in the Nordic and some Western countries, and remained at above replacement level in other regions. The 1980s saw the fertility decline to sub-replacement level in southern Europe, where the lower values of TFR were reached in a relatively short time. Fertility in Eastern Europe remained somewhat higher but also experienced a downward trend, which steepened in the 1990s (Figure 1).

Figure 1. Period total fertility rates in Europe, 1960–2022

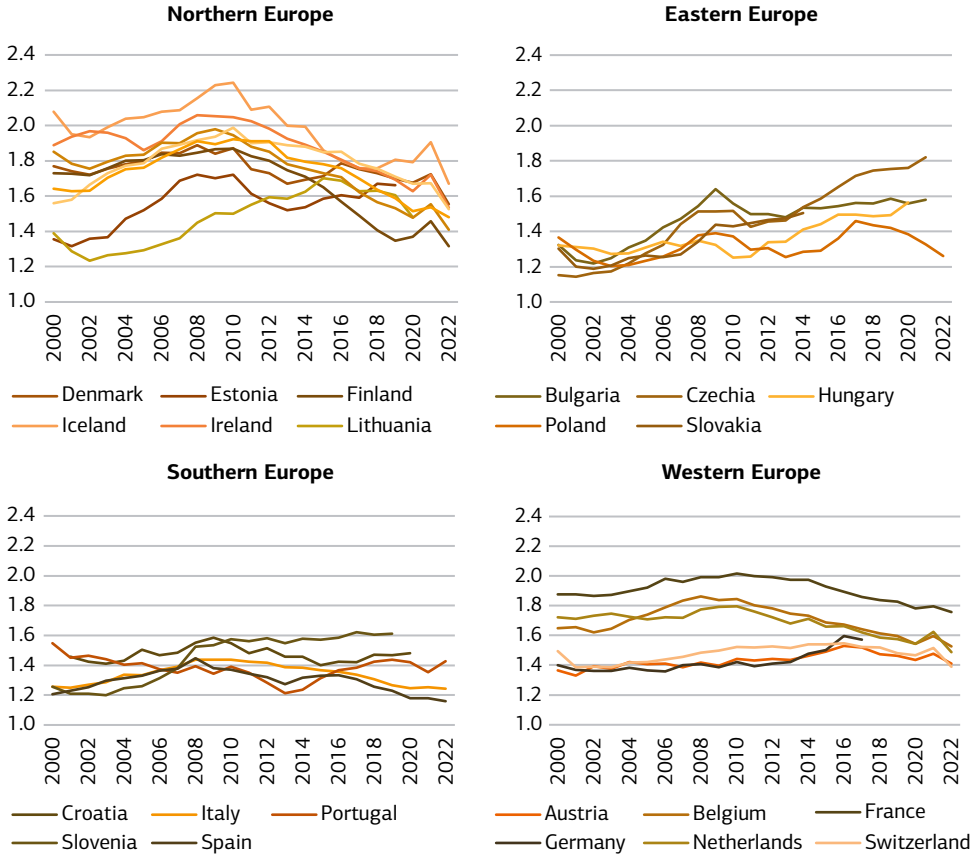


Source: Authors' own compilation based on data from the Human Fertility Database, https://www.humanfertility.org/ (accessed: 3.07.2025).

Although, after the year 2000, the total fertility rates in most European countries stabilised at below replacement level, the changes over time were not uniform. In

northern Europe the TFR noted a steady increase in the years 2000–2010, followed by a decrease to the initial level of about 1.6. Eastern Europe, on the other hand was characterised by very low TFRs, below 1.4, in the year 2000, followed by a gradual increase in most countries, however also stabilising below 1.6, with Czechia being an outlier and reaching TFR above 1.8 in 2022, while Poland noted a further decrease in its TFR after 2016 reaching the level of 1.26 in 2022. Southern Europe is characterised by a fairly stable low TFR, below 1.6, after the year 2000. Also countries in Western Europe show stable moderate TFRs, ranging from around 1.4 to 1.9 (Figure 2). These long-term trends show that, although some variety exists, the sub-replacement and low fertility in Europe has become prevalent.

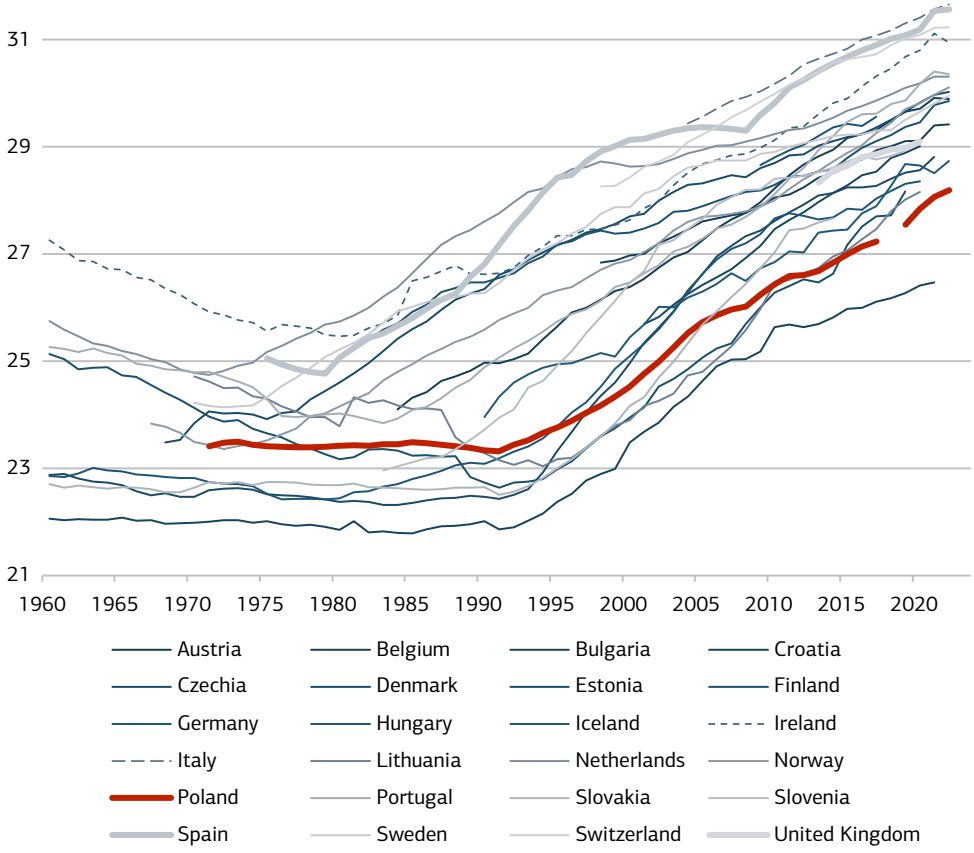
Figure 2. Period total fertility rates in Europe, 2000–2022



Source: Authors' own compilation based on data from the Human Fertility Database, https://www.humanfertility.org/ (accessed: 3.07.2025).

Fertility decline is furthermore accompanied by a shift towards older childbearing ages. From the late 1980s onward, the mean age at first birth began to rise steadily across most European countries (Figure 3). After remaining relatively stable or even declining slightly through the 1960s and 1970s, many countries saw the turning point about 1985–1990. By the 2010s, many countries had surpassed an average age at first birth of 29 or even 30 years of age. In Poland, the mean age at first birth increased by almost five years from 23.3 in the 1980s to slightly over 28 in the 2020s (Figure 3).

Figure 3. Mean age at first birth in Europe, 1960–2022



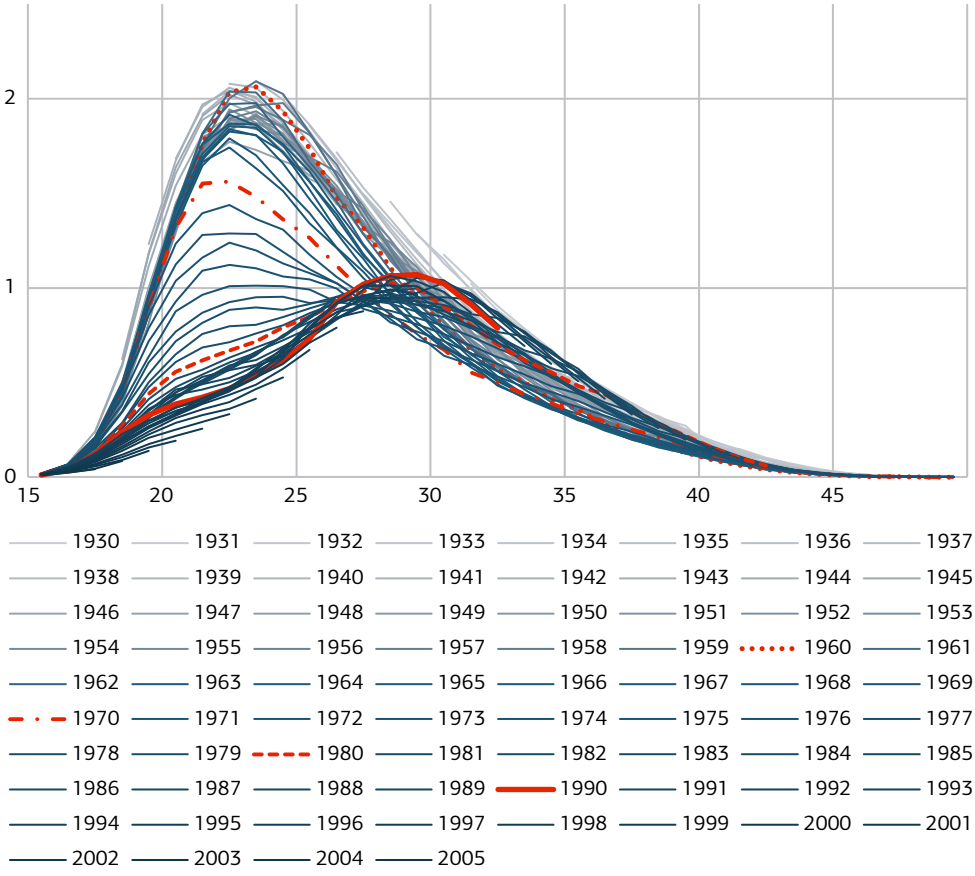
Source: Authors' own compilation based on data from the Human Fertility Database, https://www.humanfertility.org/ (accessed: 3.07.2025).

The shift towards older childbearing ages and overall fertility decline is clearly visible, when looking at cohort fertility rates. The example of Poland shows marked changes in the age-specific fertility pattern (Figure 4). In cohorts born prior to 1970, the highest fertility rates occurred predominantly among women aged 20–25.

However, for cohorts born after 1980, peak fertility shifted to the 26–32 age group. This postponement of childbearing is accompanied by a significant decline in fertility intensity. Women in the younger cohorts had, on average, one or fewer children between the ages of 26 and 32, whereas those in older cohorts typically had between 1.5 and 2 children in the 20–25 age range.

The decline in overall birth rates and an increasing shift toward delayed parenthood highlight the need to study reproductive health, specifically the incidence of reproductive difficulties and associated infertility (Beaujouan, 2023; Fauser et al. 2024). Low fertility in Europe cannot be understood solely as the result of voluntary postponement or changing family preferences. As childbearing is increasingly concentrated at later ages, reproductive difficulties have become a structural component of contemporary fertility regimes, operating alongside social, economic and normative factors.

Figure 4. Cohort fertility rates in Poland (cohorts born 1930–2005)



Source: Authors' own compilation based on the Central Statistical Office data.

Reproductive difficulties and infertility

The World Health Organization defines infertility as "a disease of the reproductive system defined by the failure to achieve a clinical pregnancy after 12 months or more of regular unprotected sexual intercourse" (Zegers-Hochschild et al., 2009). According to the WHO estimates, one in six people globally have experienced infertility at some stage in their lives (WHO, 2023). The WHO estimates of infertility prevalence are similar across countries with different income levels. According to the European Parliamentary Forum for Sexual and Reproductive Rights and Fertility Europe (2024), 25 million citizens in the European Union face infertility.

Infertility can result from a range of factors related to physical, hormonal, lifestyle (including parenthood decisions) and environmental conditions (Fauser et al., 2024). Disorders of the reproductive system, such as polycystic ovary syndrome (PCOS), ovarian failure, endometriosis and blocked fallopian tubes are common causes in women, while men may experience infertility due to issues with semen quality, including low sperm count, poor motility or abnormal morphology (Khetarpal, Singh, 2012). Hormonal imbalances, including thyroid disorders and hyperprolactinemia, can disrupt menstrual cycles and overall reproductive function (Deyhoul et al., 2017). Age also plays a significant role, as both egg and sperm quality declines over time. Lifestyle choices such as smoking, alcohol consumption, poor diet and high stress levels can impair fertility by negatively affecting sperm and egg health. Environmental exposure to toxins and pollutants, as well as chronic health conditions like diabetes, hypertension, and obesity, further contribute to infertility (Segal, Giudice, 2019).

Literature frequently discusses the decline in fertility and contributing factors such as delayed childbirth, different aspects of reproductive health and access to fertility care, which includes infertility treatment (UNFPA 2025; Bignami et al, 2024; OECD 2024; Fauser et al. 2024). In recent decades, changes in education, career and lifestyle choices have led to a growing trend of fertility postponement, with more individuals and couples opting to delay starting families until later in life. While the reasons for this delay are varied, from personal and professional aspirations to financial stability and evolving cultural norms, the biological reality remains that fertility naturally declines with age (Leridon, Shapiro, 2017; Beaujouan, 2023).

A narrative review of the existing literature from the International Federation of Fertility Societies (IFFS) (Fauser et al., 2024) synthesises existing research to highlight an important shift: while family planning historically focused on limiting births, the current demographic landscape calls for a greater emphasis on family building for those who desire children. The authors explore various aspects, including the

prevalence and determinants of infertility, the often-overlooked importance of infertility awareness and prevention and a critical issue of equitable access to fertility care as a fundamental human right. Ultimately, the document advocates for integrated policies and increased awareness to address both declining birth rates and the unmet needs of individuals and couples striving to create families.

There is also a Polish handbook on public health (Jasieńska, 2024) addressing key aspects of reproductive health, from significant influence of early life conditions (foetal life and infancy) on future reproductive health to promoting healthy lifestyles also during the years surrounding the menopause. The authors conclude that infertility is a global issue, pointing out that in Poland it affects about 1.5 million couples and 186 million people worldwide, with many factors contributing to it, such as the rising age of first-time mothers, male reproductive health and environmental pollution. The key challenges related to reproductive health mentioned by the authors include raising awareness of early life conditions, promoting healthy lifestyles across the life course, addressing environmental impacts on fertility and ensuring equal access to reproductive health resources.

The increase in the prevalence of reproductive difficulties, attributed to factors such as delayed childbearing, health conditions, lifestyle choices and environmental exposures (Fauser et al., 2024) significantly influenced the evolution of medically assisted reproduction (MAR)[1] and heightened the demand for appropriate reproductive healthcare services. Innovations in reproductive medicine now provide a range of options for individuals and couples experiencing infertility, offering medically viable alternatives where natural conception is impaired. Importantly, assisted reproductive technologies (ART)[2] – as a key component of MAR – play a crucial role also for same-sex couples and single individuals who wish to start families. However, access to ART is uneven, as legal regulations and policy frameworks governing ART availability, affordability and eligibility criteria vary considerably across countries, often reflecting broader cultural, ethical and political attitudes toward family formation and reproductive autonomy (Fauser et al., 2024; Präg, Mills, 2017).

[1] Medically assisted reproduction (MAR): reproduction brought about through ovulation induction, controlled ovarian stimulation, ovulation triggering, ART procedures, and intrauterine, intracervical, and intravaginal insemination with semen of husband/partner or donor. Source: Zegers-Hochschild et al. (2009).

[2] Assisted reproductive technology (ART): all treatments or procedures that include the in vitro handling of both human oocytes and sperm or of embryos for the purpose of establishing a pregnancy. This includes, but is not limited to, in vitro fertilisation and embryo transfer, gamete intrafallopian transfer, zygote intrafallopian transfer, tubal embryo transfer, gamete and embryo cryopreservation, oocyte and embryo donation, and gestational surrogacy. ART does not include assisted insemination (artificial insemination) using sperm from either a woman's partner or a sperm donor. Source: Zegers-Hochschild et al. (2009).

There is growing evidence that MAR influences fertility trends in high-income countries (Lazzari et al, 2023; Smeenk et al. 2023; Chanfreau et al. 2025), however its effects at the population level vary across countries and are rather limited until now. For example, Burgio, Castagnaro, Vignoli and Vitali (2025), address the impact of MAR on fertility rates in Italy and show that MAR contributed 3.7% to the TFR in 2022 (for women aged 15–59 years), almost doubling from 2.1% in 2013. The authors state that without MAR, Italy's TFR in 2022 would have dropped from 1.24 to 1.20.

Another research focuses on the effects of only ART on completed fertility. Simulations by Leridon and Shapiro, (2017) show that in France, ART increased the 1975 cohort TFR by approximately 0.02 (with an assumption that 33% of eligible women used ART). This estimated increase is significantly lower than the fertility decline related to delayed parenthood, which amounted to 0.2 children per woman over the same period. Also data from Czechia show that ART contributed 0.058 to the 2020 TFR, while in Australia in 2017, it was 0.88 (Kocourková, 2024). More recent data for Norway (Chanfreau et al., 2025) show that the overall ART contribution to the TFR increased from 0.6% in 1990 to nearly 5% of the TFR in 2018.

Although MAR enables individuals to overcome reproduction difficulties, it does not substantially mitigate the demographic consequences of declining birth rates. The extent of MAR usage varies widely across countries in Europe, due to differences in the governing laws, the affordability (reimbursement plans), and the norms surrounding childbearing and conception (Präg, Mills, 2017) and its use remains limited relative to the overall population of individuals at childbearing ages (Präg et al., 2017).

The growing prevalence of reproductive difficulties, combined with the limited (albeit slowly increasing) demographic impact of medically assisted reproduction, underscores the need for robust and comparable data on infertility and related health challenges. As infertility arises from a complex interplay of biological, behavioural and environmental factors – and as access to MAR remains unequal across populations – understanding its scale, determinants and consequences requires methodological approaches that go beyond clinical statistics. Population-based surveys play a crucial role: they capture experiences of trying to conceive, treatment-seeking behaviour and unmet needs among both women and men, and allow these patterns to be linked with broader socio-economic and life-course contexts. The following section reviews existing survey approaches in this area – their scope, measurement strategies and key limitations. This allows the Generations and Gender Survey to be situated within a wider methodological landscape.

Methodological approaches. Review of surveys on reproductive health

The issue of reproductive health has been, and still is, considered important by scientists all over the world, which is manifested in the prevalence of surveys on this topic. The first population-based social surveys in this area go back to the 1940s when the first Japanese National Fertility Survey was carried out and the second one in 1952. Since then, the survey has been carried out every 5 years (National Institute of Population and Social Security Research, 2023). In Europe, the first such surveys were conducted in the late 1960s and early 1970s (Kontula, Clifton, 2023) and some of these projects are still carried out today. As Matthiesen et al. (2017) indicate population based adult sexual health surveys have been conducted in more than 30 European countries.

The topics covered by these surveys changed over the years alongside the evolving concerns of societies steaming from significant social changes (de Graaf et al., 2023). The first studies focused more on sexual activity and attitudes and the use of modern contraceptives, as a contraceptive pill became popular and the sexual revolution dominated Western societies. The HIV/AIDS pandemic in the 1980s shifted the research focus to sexually transmitted infection, and sexual risk behaviour. With the internet prevalence and the recent popularity of sexual minority rights movement and #MeToo movement (de Graaf et al., 2023), the topics of most recent research centred more around sexual rights of minorities, sexual violence and the determinants of reproductive decisions and family planning.

Table 1 summarises selected large-scale studies on reproductive health conducted in developed countries across different time periods, showing their evolving scope and methodological approaches. These surveys are selected to illustrate the range of methodological strategies used internationally to measure reproductive health, including those directly relevant for analysing reproductive difficulties. While remaining diverse in age ranges, sample sizes and thematic depth all the surveys illustrate the global effort to understand and monitor reproductive health. Early initiatives such as the European Multicentre Study on Infertility and Subfecundity (1991–1993) focused on lifestyle factors – contraceptive use, smoking, caffeine and alcohol consumption – and their association with time to pregnancy (TTP). In contrast, long-running national surveys like the UK Natsal series (since 1990) and the U.S. National Survey of Family Growth (since 1973) provide repeated cross-sectional snapshots, enabling trend analysis over decades.

Table 1. Selected population-based social survey in the area of reproductive health

	GEOGRAPHIC LOCATION	YEAR	TYPE OF STUDY	SAMPLE SIZE	AGE RANGE	COVERED TOPICS
European Multicentre Study on Infertility and Subfecundity – population sample survey	Denmark, Germany, Italy, Poland, and Spain	1991–1993	Cross-sectional study	6630*	25–44	Contraceptive use, sexual activity, reproductive history, cigarette smoking, caffeinated beverages, alcohol consumption, health conditions, help-seeking behaviour, and time to pregnancy (TTP) for up to four pregnancies
European Multicentre Study on Infertility and Subfecundity – pregnancy-based survey	Denmark, Germany, Italy, France, and Sweeden	1992	Cross-sectional study	4035*	25–44	TTP, occupational and other exposures at the TTP starting date and help-seeking behaviour
The National Surveys of Sexual Attitudes and Lifestyles – Natsal	UK	Since 1990 up to now (every 10 years)	Cross-sectional study	Natsal-4: 8000	Natsal-1: 16–59; Natsal-2: 16–44; Natsal-3: 16–74; Natsal-4: 16–59 (oversample of 16–29)	Pregnancy experience and STI (sexually transmitted infection) prevalence
Canadian Sexual and Reproductive Health Survey	Canada	2024/2025	Cross-sectional study		18–49	Sexual activity, contraception, sexual health, pregnancy, reproductive health healthcare
Australian Study of Health and Relationships	Australia	ASHR1: 2001/2002 ASHR2: 2012/2013 ASHR3: 2023/2024	Cross-sectional study	ASHR1 19307 ASHR2 20094 ASHR3 over 14000	16–69	Demographics, sexual identity, history and practices, contraception and condom use, sex work, health, sexually transmitted infection (STI) diagnosis history, knowledge and attitudes related to sexuality, and blood-borne virus risk behaviours

cont. Table 1

	GEOGRAPHIC LOCATION	YEAR	TYPE OF STUDY	SAMPLE SIZE	AGE RANGE	COVERED TOPICS
Japanese National Fertility Survey	Japan	Ongoing since 1952; every 5 years; latest 2021	Cross-sectional study	(2021) Survey of Singles: 7826 Survey of Married Women: 6834	Unmarried men and women aged 18 to 54 and married women under the age of 55	Relationships, family formation, sexual activity, contraception, pregnancy, reasons for having children, intended and ideal number of children, concerns about infertility and treatment experience, views on marriage and family
National Survey of Family Growth	USA	From 1973 – ongoing	Cross-sectional study	1973: 9797 1976: 8611 1982: 7969 1988: 8450 1995: 10,847 2002: 12,571 (7643 F – 4928 M). 2006–2010 22,682 2011–2013 10,416 2013–2015 10,205 2015–2017 10,094 2017–2019 11,347 (6,141 F – 5206 M) 2022–2029 data collection will go through December 2029	1973–1981 ever-married women 15–44; 1982 women aged 15–44 regardless marital experience; 2002 independent sample of men aged 15–44; 2015 – women and men aged 15–49	Decisions people make about whether or when to have children How long marriages and other relationships last Family planning services received by women and men Risk for sexually transmitted infections, including HIV Difficulties people may experience in having children and their use of infertility services Preventive health services received by women and men
FINSEX	Finland	1971, 1992, 1999, 2007, 2015	Cross-sectional study	1971: 2152 1992: 2250, 1999: 1496, 2007: 2590, 2015: 2150	1971: 18–54, 1992: 18–74, 1999:18–81, 2007:18–74, 2015: 18–79	Relationships, sexual attitudes, sexual behaviour and sexual problems
Generations and Gender Survey	Round I – 19 countries Round II – 21 countries	Round I: between 2004 and 2015; round II since 2020	Round I – 3 waves -panel Round II – 3 waves – panel ongoing	Round I information collected from over 200,000 individuals Round II - ongoing	individuals aged 18 to 79 Round II – ongoing	Life course transitions (e.g. marriage, divorce, childbirth) Demographic behaviour (e.g. fertility intentions, family planning) Intergenerational relationships Economic conditions and employment Gender roles and equality

* analytical sample

Source: Authors' own work.

Some of the studies take innovative methodological approaches which include biosamples (e.g. urine and saliva sample in Natsal study in UK) or merging the survey data with administrative data (Canadian Sexual and Reproductive Health Survey).

Conceptual and methodological approaches of the reproductive health surveys differ across countries. As sexual health is a multidimensional concept it is difficult to measure it in a comprehensive way, and at the same time taking into account sociocultural differences. In the scientific community, a discussion continues on which sexual health dimensions should be prioritised (Dupont et al., 2022) and which sexual health indicators should be included in surveys (de Graaf et al., 2023).

Importantly, differences in approaches to reproductive difficulties and infertility are visible, too. In several surveys questions about self-perceived infertility or concerns about infertility are asked, for example: *Do you and your husband have any concerns or worries about infertility?* (the Japanese Fertility Survey). Others use the concept of time to pregnancy (TTP), defined as the period between the date at which the couples started having unprotected sexual relations and the conception expressed in months (European Multicentre Study on Infertility and Subfecundity). Another approach is to use questions based on the WHO definition of infertility, e.g. *Have you ever had a time, lasting 12 months or longer, when you and a partner were trying for a pregnancy but it didn't happen?* (Natsal). After this first question, the issue of infertility is further investigated by items relating to medical testing or treatment or other types of professional help.

As the above review shows, reproductive difficulties constitute an important and long-standing area of population research.. However, most projects are country-specific and differ substantially in how they define reproductive health problems, formulate their research focus, and operationalise key concepts. These discrepancies, combined with variation in survey methods, sampling procedures and the interview format limit the comparability of results across settings. In high-income settings characterised by sustained low fertility, internationally coordinated and methodologically standardised survey initiatives are largely absent.[3] Furthermore, most of the existing reproductive health surveys are cross-sectional. Although some are repeated periodically, only a few adopt a panel approach, and those typically cover only a single country. This lack of longitudinal data constrains our ability to analyse the dynamics of reproductive difficulties and to accurately identify their causes and consequences. Taken together, these limitations underscore the need for panel studies enabling longitudinal analyses in a comparative perspective, combining multidisciplinarity, and international comparability.

Generations and Gender Survey as a tool for studying reproductive difficulties

The Generations and Gender Survey (GGS) is a panel survey that collects data about families and life course trajectories of individuals across Europe and in a growing number of countries beyond. It seeks to determine what factors are important for family formation, having children and inter-generational relations. The survey is a part of the Generations and Gender Programme (GGP), which was launched in 2000 by the Population Unit of the United Nations Economic Commission for Europe (UNECE). The important characteristics of this international study include panel design, multidisciplinarity, cross-country comparability and its focus on inter-generational and gender relationships (Vikat et al., 2007; Gauthier et al., 2025). GGS allows for an integrated approach to the analysis of demographic changes because it provides information on their context, necessary for understanding the changes themselves and properly identifying their causes (Kotowska, 2017).

GGS is based on theoretical approaches from a number of social science disciplines, including demography, sociology, economics and social psychology, and the questionnaire reflects this complexity (Vikat et al. 2007; Gauthier et al. 2025). A large part of the GGS questionnaire is devoted to questions on the family situation and family formation, relationships history and the intentions of having children. The survey also covers a number of aspects relevant for people's intentions: socio-economic characteristics (e.g. economic activity, education level, income and assets), health, normative pressures from family, kin and social network, and an individual's own values, orientations and beliefs.

The GGS core questionnaire has undergone revisions in its approach to fertility between the first round (years 2003–2015) and the current round of data collection. These revisions are particularly visible in relation to topics of childbearing, reproductive health and infertility. The GGS round I questions primarily focused on past fertility behaviour such as the number and timing of births, they also covered fertility intentions, conceptualised within the Theory of Planned Behaviour framework (Liefbroer et al. 2015; Klobas, Ajzen, 2015). The GGS round II, which started in 2020, expands on this by incorporating questions about infertility experiences, including the duration of attempts to conceive, medical consultations, and treatments undertaken (Gauthier et al. 2024, 2025).

Specifically, the GGS round II module on fertility includes numerous questions, crucial for capturing reproductive difficulties. The respondents are asked about contraception, sexual activity, problems with conceiving, infertility, infertility treatment,

and reproductive autonomy (in line with UN indicators for Sustainable Developmental Goal 5.6.1. – informed decisions regarding sexual relations, contraception and reproductive health, https://unstats.un.org/sdgs/metadata/). Additionally, childbearing intentions remain in the heart of GGS with questions on intentions to have (more) children and (personal and general) ideal number of children. Importantly, the questionnaire covers all information necessary for estimating the unmet need for family planning in countries, where the survey is conducted (Koops, 2023).

Given the strong focus on fertility within the GGS, some countries have also opted for country-specific questions related to this topic, such as a block of questions on the views on childbearing based on the Miller's Childbearing Questionnaire (Miller 1995, Mynarska & Raybould 2020) and/or questions based on the Intensive Parenting Attitudes Questionnaire (Liss et al. 2013). The first set of questions was administrated in Austria, Argentina, Finland, Denmark, Norway and Poland, whereas the later version was included – in the baseline (first wave) questionnaire in Croatia and Sweden.[3] Items related to intensive parenting will be included in all countries, where GGS-II wave 2 will be conducted (Billingsley et al. 2025).

As mentioned above, various approaches have been adopted in different reproductive health surveys to ask about infertility or problems with conceiving a child. The core GGS questionnaire of round I and round II approached this by including a question on the respondent's and respondent partner's self-perceived infertility with a four-point response scale from *definitely no*t to *definitely yes*:

> *Some people are not physically able to have children. As far as you know, is it physically possible for you, yourself, to have a/another baby?*
>
> *As far as you know, is it physically possible for your current partner to have a child of his/her own if he/she wanted to?*

Respondents who answer *definitely not* and *probably not* to the above question are then probed with further questions about the possible diagnosed causes of infertility:

> *Have you been sterilised or have you had an operation that makes it impossible for you to have a child/ more children?*

Furthermore, in GGS round II, an additional question is asked, when the respondent provides a negative answer to the question on sterilisation/operation:

> *Have you been diagnosed with anything that might explain why you might not be able to have (more) children? Please choose all that apply to you.*

[3] https://www.ggp-i.org/wp-content/uploads/2024/02/GGP-country-specific-questions.xlsx (accessed: 12.03.2025).

- *Endometriosis,*
- *Adhesions,*
- *Blocked tubes,*
- *Polycystic ovary syndrome (PCOS),*
- *Pelvic inflammatory disease,*
- *No/irregular ovulation,*
- *Poor sperm count/quality,*
- *Uterine fibroids,*
- *No cause was found,*
- *None of the above*

Both the GGS round I and II questionnaires include a question on whether respondents received any medical assistance in conceiving – infertility treatment:

Have you or your partner ever done any of these things to help you get pregnant? Please select all of the things you have been doing.

- *Receiving medication*
- *Methods for ascertaining timing of ovulation*
- *In vitro fertilisation (IVF) or micro-fertilisation (ICSI)*
- *Surgery Artificial insemination*
- *Consulted a physician*
- *Other medical treatment*

Moreover, the current GGS round II questionnaire, has adopted some new questions that are especially interesting in the context of postponed parenthood such as problems of conceiving within at least 12 months, reasons for infertility, and the fertility window (defined by standard markers of the fertile period: start of the period, menopause and voice deepening).

The most significant addition to the GGS core questionnaire in the area of infertility is the inclusion of the question related to conceiving problems:

Was there ever a time when you and a partner were trying to get pregnant but did not conceive within at least 12 months?

This item allows to capture self-reported experiences of infertility as it aligns with the standard definition of infertility. Its inclusion enables cross-national comparisons of the awareness of self-reported infertility within the population.

These updated questions reflect growing recognition of infertility as a significant demographic and public health concern, aligning the GGS with evolving research needs and societal awareness. Importantly, the multidisciplinary nature of the survey allows for the analysis of reproductive problems against the background of other

social phenomena and processes, e.g. well-being, relationship, health or financial situations as well as renewed geopolitical tension such as war conflict.[4]

Although reproductive health was not a primary focus until the second, ongoing GGS edition, data from the GGS I round has already yielded several important findings in this area.

A French study on fertility problems (Mazuy, Rochebrochard, 2008) measured the perception of fertility problems and use of medical treatment for infertility among a representative country sample of men and women with at least one child. One-third of mothers from the analyse sample reported encountering fertility problems in their reproductive lives. In comparison, 21% of fathers declare that they have encountered such difficulties. Nevertheless, medical intervention remained low in the French society: 3.6% according to mothers and 2.6% according to fathers. The perception of fertility problems is more homogeneous among fathers than among mothers – the fathers' declarations of fertility problem do not vary according to their sociodemographic characteristics. Fertility problems estimates are higher among mothers who have more children, especially those living in areas of historically high fertility levels. The article authors indicate that this might be the result of a social pressure to conceive, especially among women.

Using the longitudinal data from the GGS, Köksal and Goisis (2023) estimated the changes in emotional and social loneliness among pregnancy seekers by the mode of conception – spontaneous conception or medically assisted reproduction (MAR). They found that, contrary to emotional and overall loneliness, the social loneliness increased more among individuals who underwent MAR than among individuals who were trying to conceive spontaneously. Moreover, the association between undergoing MAR and the experienced levels of social loneliness was mainly driven by the respondents who did not have a live birth in the analysed period. The authors suggest that the increased social loneliness of the respondents who had undergone MAR treatment might be attributable to infertility-related stress and stigma surrounding infertility and childlessness. As no gender differences were found, it can be assumed that undergoing fertility treatment has similar emotional and social consequences for both partners and is therefore a couple experience.

GGS has also been employed to show how general health of future parents is important for childbearing postponement. Mynarska and Wróblewska (2017) found that in Poland, self-rated general health was important for women's childbearing

[4] One of the modules in the GGS II questionnaire, Global Uncertainty and Institutional Trust, provides a set of items capturing subjective concerns about many global threats such as terrorism, climate change, economic and democratic crises and military conflicts.

plans. Their subjective evaluation of health was found to overweigh any objective indicators, such as disability status, limitations in everyday activities, or diagnosis of a chronic illness. Such findings locate reproductive difficulties in a wider context of health-related concerns.

Noteworthy, some countries opted to incorporate additional items into the GGS-I questionnaire to more thoroughly address topics related to reproductive difficulties. In Poland, for example, the inclusion of a question on time to pregnancy (TTP) enabled further analysis of factors important for reproductive outcomes. For instance, Tymicki (2017) analysed how the waiting time to pregnancy (TTP) is related to age. He found that about 70% of couples conceived a child within the first 3 months of unprotected intercourse, while 9% needed more than a year to conceive a child. At the same time, nearly 25% of the women who gave birth to their first child at the age of 35 or older had to wait to become pregnant for a year or longer, whereas the corresponding proportion among younger women, aged 25–29, was only 4–5%. Women who began trying for a child after their 30th birthday can experience considerably longer waiting time to pregnancy, and as a consequence decreased possibility of fulfilling their reproductive intentions. The article also explores how the TTP is affected by different birth control methods. Although previous studies suggested that hormonal contraception can result in prolonged waiting time to pregnancy, Tymicki's (2017) analysis of the Polish GGS data does not support this conclusion.

Conclusions

The sustained sub-replacement fertility across Europe, in particular low fertility persisting in some countries, is accompanied by delayed childbearing, which is increasingly common due to social, educational, and economic factors. As women and couples postpone parenthood, the associated rise in age-related infertility emerges as a critical contributor to unmet reproductive intentions. Infertility is not only a medical but also a social problem as it prohibits individuals from meeting one of the most prominent social roles – the role of a parent. An experience of infertility is often described as a "crisis of infertility" consisting of multiple stressors such as physical, psychological, financial and social factors (Gibson, Myers, 2002; United Nations Population Fund, 2025; Fauser et al., 2024). Therefore, it should be analysed on an ongoing basis and in a wider context to show the possible causes and consequences of infertility in the broadest possible socio-economic perspective.

Reproductive health and infertility surveys have long been recognised as essential to studying reproductive difficulties, yet most existing studies are country-specific,

vary in definitions, focus and methodology, and are therefore difficult to compare. Differences in sampling and interview formats further limit harmonisation, while the predominance of cross-sectional designs restricts longitudinal insights. The Generations and Gender Survey (GGS) addresses these gaps by offering a unique panel design that combines multidisciplinarity and international comparability, marking a significant advancement in reproductive health research in low-fertility settings.

The GGS is an important source of data on fertility behaviour embedded in a broad socio-economic context. Its panel character allows for tracking determinants and the long-term effects of reproductive difficulties on an individual as well as a social level. Through its longitudinal design, the GGS makes it possible to distinguish between postponement that reflects respondents' preferences and trajectories in which delayed childbearing is followed by reproductive difficulties and unmet fertility intentions. The GGS data can also help to investigate factors important for infertility treatment decisions, including economic situation, partnership and family context, as well as personal attitudes. The very wide thematic scope of the GGS data facilitates formulation of new hypotheses and searching for theories in the area of reproductive health.

The research potential of the GGS is further strengthened with its large country-level representative samples and international comparability. Large samples enable testing more in-depth hypotheses and detect real effects that would remain invisible in smaller studies. The international comparability of GGS data gives a unique opportunity for identification of transnational trends and patterns in reproductive health. Equally important, the GGS enables examination of how institutional, social and cultural contexts shape the extent and nature of these patterns, thereby revealing both the universal and context-specific dimensions of reproductive difficulties. This facilitates the formulation of effective strategies and policies for reproductive health on national and supra-national level.

The openness and accessibility of the GGS – both its survey data and detailed metadata – facilitate high-quality and reliable research. Open access allows researchers to analyse the collected information, replicate findings, compare results across studies and apply new analytical approaches as the field evolves. Additionally, the availability of these data enhances the transparency of the research process, increasing trust in the obtained results and enabling their further use in future studies on reproductive health and fertility dynamics.

There is a pressing need for more interdisciplinary research and internationally comparable demographic surveys which can capture the underlying causes and long-term effects of contemporary fertility trends. Such evidence is essential to inform fact-based, targeted policies that support reproductive autonomy, improve access to fertility care, and create conditions favourable to family formation. The GGS, with

its longitudinal design, broad thematic scope and cross-country comparability, is well positioned to meet these needs and to advance research on reproductive difficulties in low-fertility settings.

Acknowledgments

This article was prepared as part of the project "GGP-PL: Generations and Families. A panel study on the transformation of intergenerational relations, family dynamics and gender relations," co-financed through the Ministry of Science programme "Support for the participation of Polish research teams in international research infrastructure projects."

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