

The Contribution of Medically Assisted Reproduction to Fertility in Italy

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Abstract

Medically Assisted Reproduction (MAR) is exerting a growing impact on childbirth in wealthy nations, especially on fertility at advanced reproductive ages. No study has yet analyzed the impact of MAR on total fertility in Italy, the country with the latest age at first birth in Europe. The present study addresses this oversight by analyzing the contribution of MAR to total and age-specific fertility rates by parity. To this end, we offer an estimate of the impact of MAR treatments on fertility in Italy by linking two different administrative data sources: the Birth Assistance Certificate dataset administered by the Ministry of Health and the register of live births administered by ISTAT, the National Statistical Office. This paper is timely as the significance of MAR on Italian fertility is expected to grow as a new law comes into effect: with the introduction of the Essential Levels of Care for MAR set to begin on January 1, 2024, the Italian Human Reproduction Society anticipates a notable rise in the number of couples seeking MAR treatments. It is projected that the proportion of children born via MAR will surpass 5% of all births in the general population in Italy, a substantial increase from the 3.7% observed in 2022.

Extended abstract

Background

The trend toward delayed parenthood is among the most significant demographic shifts observed in recent decades. The share of births to mothers aged 40 and above has considerably increased throughout Europe during the second half of the 20th century (Kocourkova et al., 2014; Sobotka 2010). The postponement of childbearing may eventually affect completed fertility because of the limited time interval left for second or higher order births. Furthermore, delaying entry into parenthood may, in some cases, also lead to involuntary childlessness (Tanturri et al., 2008; 2015). The rise in late fertility and sterility play a role to the rapid diffusion of various types of Medically Assisted Reproduction (MAR) techniques, and vice versa (Sobotka et al., 2009).

Parents who conceived via MAR tend to be older and more socio-economically advantaged compared to parents who conceived naturally (Goisis et al., 2020) – partly because higher-educated individuals may be more likely to postpone parenthood to later ages, but partly also because MAR treatments for women in advanced parental age (i.e., after age 35, De la Rochebrochard et al., 2003) tend to be considerably expensive, whereas treatment for younger women is generally state-subsidized.

Italy presents a unique –and so far unexplored– case-study in this respect. No study has yet analyzed the impact of MAR on total fertility in Italy, a country well-known on the international scene for its lowest-low fertility levels and latest-late age at first birth. In 2022, the mean age of women at the first child in Italy equals to 31.6 –the highest in Europe– while the total fertility rate was equal to 1.24 –among the lowest in Europe. After Spain, Italy is the European country with the highest incidence of births to mothers aged over 40 years of age (8.4%), 3 percentage points above the EU-27 average. Despite a restrictive legislation in Italy, MAR has allowed new opportunities for many

couples previously considered sterile or desiring to have children at later ages. The present study addresses this oversight by analyzing the contribution of MAR to total and age-specific fertility rates, separately for first births and subsequent births.

Such study is particularly timely given that, with the introduction of the Essential Levels of Care for ART set to begin on January 1, 2024, the Italian Human Reproduction Society anticipates a notable rise in the number of couples seeking ART treatments. The new law will considerably reduce and standardize the cost of accessing MAR for heterosexual couples throughout the country. At the time of writing, instead, the cost of MAR varies across regions, as well as the age criteria for accessing state-subsidized MAR treatments. It is projected that, after the introduction of the new law, the proportion of children born via MAR will surpass 5% of all births in the general population in Italy, a substantial increase from the 3.7% observed in 2022¹.

The use of ART in Italy: a description

The data provided by the Italian Ministry of Health indicates that, while the use of MAR techniques remains relatively rare in comparison to the potential demand, its utilization has significantly risen over time. There has been a 73% increase in MAR-related deliveries over the past decade, with the number climbing from 8,000 in 2012 to over 14,000 in 2022. On average, ART accounts for 3.7% of all deliveries in 2022, which is double the rate observed a decade ago (1.76% in 2012). Furthermore, the proportion of MAR-related deliveries increases with age: among women aged over 40 years old, nearly one in five deliveries are achieved through MAR. This share has notably expanded over the past 10 years, as in 2012, it was just under one-third².

Analysing the latest microdata available on Delivery Birth Certificates referred to 2021, live MAR-births represent 3.2% of the total live births. Data referred to 2021 are affected by the Covid-19 restriction during 2020 that lead to a sharp reduction of MAR treatments, because precautionary measures to treatments were temporarily suspended for couples who had not yet started pharmacological stimulation and who had no urgent indications for treatment due to age or health situation. Therefore, due to the pandemic restrictions in place in 2020, 1,500 fewer MAR-related deliveries occurred in 2021, 3.0% of the total.

In 2021, the average age at delivery was 38 years for women utilizing ART, in contrast to 32 years for deliveries not involving ART. Despite a significant stability in the mean age for deliveries without ART (remaining at 31.5 in 2012), the age at delivery with ART increased by nearly two years since 2012, reaching 36 years.

Data and methods

We focus on the outcomes of MAR-related pregnancies, utilizing a strategic combination of various administrative data sources. These sources include the Birth Assistance Certificate (CEDAP) dataset provided by the Italian Ministry of Health and the ISTAT register of live births. The CEDAP dataset has been consistently collected since 2002 and encompasses information gathered from hospital births departments. It includes information concerning the socio-demographic background of parents (such as age, residence, citizenship, marital status, education, and occupational status), the mother's reproductive history (including parity, live births, stillbirths, previous induced abortions, and previous miscarriages), pregnancy-related information (such as medical examinations, ultrasounds, gestational age, and more), assisted reproductive technology (categorized by type), details about delivery (including the place of birth, mode of delivery, date of birth, and plurality), characteristics of newborns (such as sex, external genitals, birth weight, length, vital status, neonatal presentation, and more), foetal mortality, and the presence of malformations. On the other hand, data on live births is

¹ “Pma: Con i Lea aumenteranno le coppie che accedono alle cure”, Panorama della Sanità 10/10/2023 <https://www.panoramasanita.it/2023/10/10/pma-con-i-lea-aumenteranno-le-coppie-che-accedono-alle-cure/>

² “Certificato di assistenza al parto. Analisi dell'evento nascita. Anno 2022”, Ministero della Salute, https://www.salute.gov.it/portale/documentazione/p6_2_2_1.jsp?lingua=italiano&id=3346

provided by ISTAT, the Italian National Statistical Office, and pertains to the resident population registered in Italian municipalities.

Using these data, age-specific MAR and non-MAR fertility rates are calculated. Differentials by mother's education, citizenship, and region of residence will be computed. We also aim to decompose the change in the TFR between 2012 and 2022 into MAR and non-MAR components. Finally, we will project future evolution of births in Italy based on diverse MAR-use scenarios.

Expected findings

This is the first study that will shed light on the contribution of MAR to total and age-specific fertility rates in Italy, highlighting the importance of MAR for the recovery of births at older reproductive ages. Assessing the contribution of MAR on fertility in Italy is especially crucial in light of the recent expansion in the use of MAR and the broader healthcare coverage offered by the National Health Service. This expansion will enhance the opportunity for couples to access healthcare services with only a minimal cost-sharing component (referred to as a 'ticket').

To be sure, the timing and quantity of fertility are closely interconnected. In conjunction with an increasingly pronounced ageing of fertility (2.2 million less women aged 15-49 in fifteen years), the country faces a dramatic loss of births. This is exemplified by the milestone in 2022, when the number of births reached its lowest ever recorded number, 392,598 births. This signifies a substantial 32% decrease compared to 2008, which represented the most recent peak in the number of births.

The final version of the paper will:

- Estimate the **contribution of MAR to total and age-specific fertility rates by parity** (parity 1 and 2+);
- Estimate the **potential contribution of MAR** to total fertility by considering all MAR-related pregnancies, i.e., those resulting in a live birth and those resulting in miscarriages/stillbirth;
- **Project** the proportion of children that will be born after MAR treatment in Italy in the coming years.

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