

# Impact of the COVID-19 Pandemic on the Sex Ratio at Birth Among Migrants in Italy

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## Introduction

### *Previous studies*

Many studies in different settings have suggested that migrants from countries with skewed sex ratios at birth tend to adjust the sex of their offspring to ensure the birth of at least one male child. In the Italian context, few studies have addressed the topic of sex ratio at birth (SRB) among migrants. All of them have reported an imbalance in SRB among births from immigrants of Indian and Chinese origin. The first study by Meldolesi (2012) was limited to the period of 2006-2009 and used data on birth records. Later, Ambrosetti et al. (2015) systematically analyzed births from mothers born in countries where sex selection at birth or son preference is widespread, considering Italy's most prominent immigrants' communities. They found a significant excess in male births at the national level from couples where both parents were Indian or Chinese during 2005-2013 and Albanian couples from 2008 to 2013. Their findings drew on cross-sectional data on all births without parity information. Furthermore, using Certificate of Birth Attendance data collected by the Ministry of Health registered in the Lombardy region in 2008/9, a positive association was found between excess male births and higher parity births to parents from countries with traditionally unbalanced SRBs. They also found a positive relation between previous abortions and the mothers' support for female discrimination using regional survey data. The study of Ambrosetti et al. (2022) has explored the phenomenon by studying the sex ratio at birth and sex selection at birth among migrants in Italy, focusing on birth order and the sex of the previous child. By performing a descriptive analysis of SRB by birth order (first, second and third), sex of the previous children, inter-birth interval and citizenship of the child using data of the Longitudinal register on reproductive histories from 1999 to 2017 (ISTAT), the authors found higher values of SRB for third births among Indian and Chinese communities when the first and second births are girls. They also found a skewed SRB among Indian babies born after a female firstborn. A more detailed analysis of SRBs for immigrants from China and India, by the sex of the previous children and inter-birth interval between second and third birth, did not indicate significant changes in SRB when the inter-birth interval is longer.

### *COVID-19, migrant women and sexual and reproductive health*

According to OECD, migrants were disproportionately affected by COVID-19 (OECD 2022). This was due to a range of factors such as poorer housing conditions with higher incidence of overcrowding; a higher dependency on public transport; overconcentration in areas with higher population density; fewer possibilities for teleworking and a higher incidence of frontline job; as well as language barriers and other structural obstacles to access health services and communications regarding prevention measures. Among migrants' populations, women were particularly vulnerable during the pandemic: indeed, several studies show that across

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every sphere, from health to the economy, security to social protection, the impact of COVID-19 was exacerbated for women and girls only due to their sex. Thus, being a woman and a migrant, could have exacerbated already existing inequalities during the pandemic.

According to UNFPA, the pandemic has significantly disrupted access to essential sexual and reproductive health services, exacerbating existing inequalities for women and girls while intensifying discrimination against other marginalized groups. Experts from the UN, academia, civil society, government ministries, and other partners reported widespread declines in access to sexual and reproductive health information and services, along with growing concerns about gender-based violence.

A study of Padmja and Behera (2023) analyzed the impact of COVID-19 restrictions on women's access to reproductive health facilities across 76 countries around the world, and confirmed that women, due to COVID-19 restrictions could not access reproductive health services at various times. Women seeking for abortion were particularly at risk during the pandemic. A systematic review of Qaderi et al. (2023) revealed that women had more request to access medical abortion than surgical during the COVID-19 pandemic. Women used telemedicine in order to get an abortion at earlier stage of their pregnancy compared to the pre-pandemic period. Studies realized in the Italian context on birth outcomes (e.g. Esposito et al. 2023) showed that the COVID-19 pandemic and the subsequent reorganization of health services affected birth management, leading to an increase in labor inductions, while having a relatively limited effect on maternal and neonatal outcomes. Other studies on childbearing in Italy during the pandemic (e.g. Mari et al. 2023) found that the COVID-19 pandemic negatively impacted the psychosocial well-being of Italian women during the perinatal period, with disruptions in intrapartum care creating uncertainty and emotional distress. Social support, whether from loved ones, healthcare professionals, or peer groups, emerged as a critical factor in mitigating these challenges. A lack of such support was associated with more stressful perinatal experiences, highlighting its importance during the pandemic. In particular, partner involvement not only provided emotional support but also offered an opportunity to share responsibilities, serving as a key protective factor against negative mental health outcomes.

As far as differences between Italian and migrants' women during the pandemic, the study of Vilca et al. (2024) showed that immigrants were more likely to state that COVID-19 pandemic was the main reason for non-compliance with antenatal-care visits.

Another important factor to stress during a period of crisis is that SRB may be altered by catastrophic events because of maternal stress. A systematic review of Fontanesi et al. (2023) examined the effects of natural catastrophes and epidemics on the sex ratio at birth (SRB). Most studies reported a decline in SRB after such events, supporting the Trivers-Willard hypothesis (TWH), which suggests that socio-ecological stressors, like natural disasters, can lead to a reduction in SRB. However, not all studies found the same results; some observed an increase or no change in SRB. The authors conclude that the variability in findings indicates the need for further research with more precise methodologies to better understand the mechanisms driving SRB changes during and after catastrophic events.

## **Aim of the study**

With the present study we aim to enlarge the study of Ambrosetti et al. (2022), analyzing SRB among migrants in Italy by birth order, sex of the previous child and inter-birth intervals, focusing on the period 2018-2023. More specifically, this study focuses on the sex ratio at birth (SRB) among children of Albanian, Indian, Chinese, Tunisian, Sri Lankan, and Pakistani immigrants in Italy, where son preference is prominent. Italian newborns serve as a control group. Additionally, the study examines induced abortion rates by parity and maternal citizenship to assess abortion ratios in migrant groups with elevated SRBs. By choosing the period 2018-2023 we aim to understand the possible effect of the COVID-19 pandemic on the SRB. As documented in the previous section, the pandemic may have an impact on SRB for different reasons: we could expect difficulties to access health care facilities, thus reduced abortion rates resulting in a decrease of SRB in population where it was higher than the biological constant. We may also expect a decrease of SRB for the whole population because of the Trivers-Willard hypothesis. Thus, we will need to compare the most recent data on births (2018-2023) with the previous periods, in order to assess if any changes have occurred. Overall, we expect to find a lower SRB both for Italian and migrants population.

## **Data and methods**

The data for this study on births at the national level was obtained from Italy's Longitudinal Register on Reproductive Histories, a dataset derived from Istat's Survey on Births (1999-2023). This register provides comprehensive demographic data on newborns and their parents, including sex, nationality, and birth order, along with household details. The register covers over 13 million births, including foreign-born children with siblings born in Italy.

The analysis focuses on SRB by birth order, sex of the previous child, and inter-birth interval for foreign newborns. The data, restricted to births from 1999 onward, ensures a more reliable dataset as migration to Italy from countries with skewed SRBs was minimal before this period, except for Albania. This exclusion avoids biases due to different inclusion criteria in earlier records.

Additionally, data on induced abortions, collected by Istat since 1979, is also analyzed. This administrative source captures details on women's social and demographic characteristics and reproductive behaviors during hospitalization. The analysis uses the citizenship of the newborn rather than the parents, as many immigrant parents may have acquired Italian citizenship over time. This approach provides a more accurate identification of foreign newborns, essential for assessing SRB trends in immigrant populations across Italy.

## **Preliminary results and further developments**

Results will be ready for IPC Conference.

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