# Explaining the Recent Rise in Infant Mortality in France

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## Introduction

Since the early 2000s, and for the first time since the Second World War, the infant mortality rate (IMR) has ceased to decrease in France. While infant mortality has continued to improve in other European countries, the French IMR has remained above the European average since 2015. This trend is particularly concerning as infant mortality is inextricably linked to the quality of prenatal care as well as broader maternal health and social conditions (Esmaeilzadeh et al., 2021). To date, the factors driving this recent increase in infant mortality remain unclear.

Over the past two decades, a handful of studies have examined this phenomenon. Some interpreted this trend as a stagnation, given the random fluctuations expected from year to year (Papon, 2018; Branger and Picherot, 2019), while others documented a genuine increase (Breton et al., 2019). Trinh et al. (2022) demonstrated a significant rise in the French IMR between 2012 and 2019, that could not be explained by changes in clinical practices in perinatal period or registration artifacts. Their findings also showed that this increase is mainly driven by deaths within the first month of life, i.e., neonatal deaths.

More recently, research attention to this issue has intensified. Mullier et al. (2025) provided a comprehensive overview of neonatal mortality in France between 2001 and 2017, showing a substantial spatial heterogeneity across regions and calling for further investigation into France's divergence from other European countries. Shortly after, Blanpain (2025) showed that mortality rates slightly worsened among infants from multiple births, those born to non-native mothers and those born to mothers under 24 or over 38 years old. Sartorius et al. (2025) further showed that the rise in neonatal mortality has been most pronounced in socially deprived municipalities.

Despite these valuable contributions, no study to date has systematically identified the factors underlying this phenomenon. Two major challenges persist. First, standard birth and death certificates lack crucial medical and demographic information, such as gestational age, birth weight, and maternal health, making it difficult to conduct comprehensive analysis. A notable exception is the neonatal death certificate, which is mandatory for all infants who die within the first month. This certificate contains detailed information on the child, mother, and birth circumstances, making it possible to study neonatal mortality in depth. Second, perinatal and health data in France remain fragmented and rarely linked across sources.

To address these gaps, this study draws on multiple data sources to examine the recent rise in infant mortality in France. Specifically, it investigates whether this increase is due to a growing share of births at risk, reflecting changes in the characteristics of mothers and newborns, or to a higher risk of death at birth among specific groups. The main objective is to decompose neonatal mortality trends between 2010 and 2023 by key medical and demographic characteristics, including maternal age, nationality and infant's health status at birth.

## Data and methods

This study relies on three national data sources: the French civil register, the National Health Data System (SNDS), and the mandatory 8$^{th}$ day health certificates. Using multiple databases allows us to overcome the fragmentation of health information on infant deaths and births in France. In this paper, I focus on gestational age, birthweight, maternal age, maternal nationality and type of birth (single or multiple). These factors are well known to influence neonatal survival. Annual counts of live births by maternal age and nationality were obtained from the French civil register. Neonatal deaths by gestational age, birthweight, and type of birth were extracted from the SNDS. Finally, live births by gestational age, birthweight, and type of birth were obtained from the 8$^{th}$ day health certificates.

After analyzing the characteristics of infants who died within the first month and those of their mothers between 2010 and 2023, I will calculate specific neonatal mortality rates for each characteristic.

I will then apply decomposition techniques to separate the observed change in the neonatal mortality rate between 2010 and 2023 into two components. First, a structural effect, reflecting shifts in the composition of births according to the variables of interest mentioned above. Second, a rate effect, reflecting changes in mortality risks within these groups. This approach will allow us to assess whether the rise in neonatal mortality is primarily due to changes in the characteristics of mothers and newborns, or to increased risks of death among certain infants or mothers. Decomposition analyses will be conducted separately for each variable.

## Preliminary results and future steps

The data show that infants who die within the first month of life are typically born in poor health, with common risk factors including prematurity, multiple births, and advanced maternal age. Initial analyses reveal a notable deterioration in the health status at birth of these infants and their mothers between 2010 and 2023. For example, among neonatal deaths, the proportion of extremely preterm infants[1] increased from 45% to 50%, while the proportion of very low birthweight[2] infants rose from 57% to 62%. The share of mothers over 35 years old increased steadily from 23% to 31%.

For live births occurring in France during the same period, most characteristics changed little over time, except for maternal age. The proportion of extremely preterm infants increased slightly from 0,3% to 0,4% of total births, and the proportion of very low birthweight infants remained at 1 %. The proportion of mothers over 35 among live births increased noticeably from 19% to 25%.

The next step will involve calculating detailed neonatal mortality rates for each variable of interest. I will then examine whether mortality rates have increased more for specific groups of infants or mothers. Subsequently, I will apply decomposition methods to separate the observed change in neonatal mortality into the contributions of shifts in birth characteristics (structural effect) and changes in mortality risk within groups (rate effect). The study ultimately aims to determine whether the recent rise in neonatal

[1] Under 28 weeks.
[2] Under 1500 g.

mortality is driven by changes in the composition of births or by a genuine increase in mortality risks within particular groups. These findings will help to better understand the recent rise in overall infant mortality by examining how medical and demographic characteristics have shaped this trend, making it a possible tool to develop targeted interventions and to orient public health policies.

## References


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