



## Trends in maternal and child health in Brazil from 2000 to 2025

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### Introduction

The editors of the Brazilian Journal of Mother and Child Health (RBSMI) have taken an excellent initiative when celebrating the journal's 25th anniversary by inviting collaborators to reflect on health trends within these important population groups.

Over the last two and a half decades, maternal and child health has shown significant improvements. Thus, it is timely to analyze the primary indicators – specifically those related to mortality in both groups – as these data are systematically monitored and assessed.

Regarding maternal mortality, a significant reduction was observed between 2000 and the present day, with rates declining from 69 deaths per 100,000 live births to around 50 deaths per 100,000 in 2024.<sup>1</sup> However, beyond this downward trend, these average values mask marked regional and social inequalities within the country. They also reveal an even more concerning aspect: the relative stability of the maternal mortality profile. Hypertensive disorders of pregnancy, specifically preeclampsia and eclampsia remain as the leading

causes of deaths, followed by hemorrhages and infections related to childbirth and the puerperium.<sup>2</sup>

The persistence of this causal pattern suggests that, while improvements in the hospital management of severe complications have occurred, preventive strategies have yet to achieve their expected impact. Structural measures, such as family planning, the reduction of unplanned pregnancies, and the improvement of prenatal care quality – pillars of primary health care – remain central determinants.<sup>3</sup> Prioritizing high-complexity hospital services, while necessary, is no substitute for the effectiveness of timely interventions at the primary care level. This is underscored by the fact that most deaths occur in a hospital setting, yet they are associated with conditions already exacerbated by late diagnosis or inadequate management during early stages.

Significant advancements have been made in the management of these severe conditions, through the implementation of standardized protocols, the use of effective drugs – such as magnesium sulfate – and the enhancement of clinical monitoring in specialized care units.<sup>4</sup> Nevertheless, these causes continue to account for the majority of maternal



deaths, reflecting the limitations of interventions focused predominantly on high-complexity care.

Regarding infant mortality, in turn, significant positive shifts have been observed over the last two decades. Between 2000 and 2024, Brazil diminished its infant mortality rate from approximately 29 to 12.3 deaths per 1,000 live births – a decline of over 50%.<sup>5</sup> This reduction was driven primarily by the post-neonatal component, reflecting improvements in living conditions. This progress has been strongly associated with the organization of primary healthcare and the expansion of the Family Health Strategy. Key interventions at the primary care level included the promotion of breastfeeding, expanded vaccine coverage, and the systematic monitoring of growth and development, alongside the early detection of prevalent childhood diseases.<sup>6</sup>

One of the most emblematic situations is the management of diarrheal diseases, which, by the late 20th century, represented the leading cause of infant mortality in several vulnerable municipalities, particularly in Brazil's Northeast Region. The combination of improvements in basic sanitation, breastfeeding promotion, the introduction of specific vaccines – such as the rotavirus vaccine –, and the intensive use of oral rehydration salts contributed to a decline in hospitalizations and deaths within this group. This approach constitutes an exemplary model of a high-impact and highly cost-effective intervention at the primary care level.<sup>7</sup>

With the sharp decline in post-neonatal mortality, the neonatal component now accounts for the majority of infant deaths, becoming the leading contemporary challenge. Neonatal and perinatal deaths remain strongly associated with prematurity and its complications, low birth weight, intrapartum complications, perinatal asphyxia, and neonatal infections. Despite advancements in neonatology and the organization of perinatal networks, the prevention of prematurity and the quality of care during the first hours and days of life remain critical for further reductions in infant mortality. National studies indicate that social and reproductive factors, as well as those related to prenatal care access and quality, continue to be strongly associated with the occurrence of prematurity in the country.<sup>8</sup>

Alongside the improvement in mortality indicators during this period, there has been a notable increase in the prevalence of developmental disorders and other neurodivergent conditions in childhood, particularly Autism Spectrum Disorder (ASD). International estimates demonstrate a consistent rise in prevalence over the last decades, growing from approximately 1:150 children in the early 2000s to about 1:31 in more recent surveys in the United States.<sup>9</sup> Part of this increase stems from shifts in diagnostic criteria, greater public awareness, and expanded

access to specialized services. The hypothesis that environmental and social factors may contribute to this rise remains a subject of debate in the literature. In Brazil, although consolidated national population estimates are still lacking, the growing demand for diagnosis and follow-up within the Unified Health System (SUS) poses novel organizational and healthcare delivery challenges.

Finally, in the current landscape, the integration of artificial intelligence (AI) into healthcare emerges as a strategic opportunity to enhance both clinical and management processes. AI-based tools are already being employed for risk stratification in pregnancy, the early detection of complications, remote monitoring of maternal and neonatal conditions, and clinical decision support.<sup>10</sup>

In pediatrics, these technologies have the potential to assist in developmental screening, the early detection of disorders, the optimization of care workflows, and the personalization of care, among other measures currently being adopted.<sup>10</sup>

Nevertheless, the adoption of these innovations requires regulatory frameworks, data governance, and strict scientific validation criteria.<sup>11</sup> The primary challenge will be to integrate them ethically, equitably, and safely, ensuring that they narrow – rather than widen – historical inequalities in access and quality of maternal and infant care, strengthening the SUS in the coming decades.

### Author's contribution

The authors conceptualized the article and declare no conflicts of interest.

### Data availability

All datasets supporting the results of this study are included in the article.

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