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Perspectives on Neonatology in the context of global declining birth rates

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In recent years, neonatology has undergone substantial transformations in its scientific, clinical, and ethical scope. This year, a prestigious group of neonatologists published a comprehensive analysis in *The Lancet Child & Adolescent Health* journal on the impact of contemporary neonatology and the priorities that should guide its development in the coming years. Among their most relevant observations, they highlighted the persistence of high neonatal mortality rates, particularly in low- and middle-income countries, and the limited progress in high-impact research aimed at reducing morbidity associated with prematurity and critical neonatal care. The article emphasized that overly restrictive regulatory frameworks, coupled with limited financial resources, represent significant barriers to innovation and knowledge generation in this vulnerable population. These limitations threaten to slow the development of new drugs, medical devices, and care strategies that could substantially improve the survival and quality of life of the most critically ill newborns.[1]

Subsequently, another group of experts published a complementary analysis of these determining factors in neonatology. While they shared the concerns outlined above, they proposed creating a Global Alliance for Improving Neonatal Health (GAINH) as the most promising initiative. This body would coordinate international research and clinical care activities and monitor global progress in neonatal health. This proposal aims to emulate the advances made in pediatric oncology, where the systematic inclusion of each patient in clinical studies has led to remarkable progress. Beyond the technical component, the authors argue that reducing neonatal mortality does not depend exclusively on medical or technological progress, but mainly on political will and global commitment to protecting newborns.[2] However, we believe that objectives should be defined according to the specific realities of each country and region, considering the structural inequalities that condition perinatal outcomes.

Despite the relevance of these analyses, one crucial aspect has not been sufficiently addressed: the sustained decline in birth rates. This demographic phenomenon, particularly pronounced in developed countries and associated with apparently slower progress in those with fewer resources, has direct implications for the organization, priorities, and future sustainability of neonatal care. The reduction in the neonatal population forces a rethinking of the field's strategic objectives, including research, training, and infrastructure investment.

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Paradoxically, the regions with the greatest healthcare and scientific needs are often those facing the worst structural conditions: deficiencies in hospital infrastructure, insufficient access to prenatal services, a shortage of trained personnel, and limited opportunities for scientific development.[3] In such contexts, even the most advanced interventions can lose their effectiveness when implemented without adequate resources. A clear example is hypothermia therapy for perinatal asphyxia, whose benefits depend on a prepared healthcare environment and optimal neonatal resuscitation. This gap between high- and low-resource contexts threatens to widen further, considering the declining interest in neonatology training observed in several developed countries.[1]

Meanwhile, in low- and middle-income countries, the priority must be to reduce preventable neonatal deaths, in line with the 2030 Sustainable Development Goals (SDGs). Not all improvements require expensive technologies: strategies such as kangaroo mother care, essential newborn care, and basic resuscitation protocols continue to prove effective and low-cost. At the same time, it is essential to strengthen neonatal intensive care units through accessible technologies—such as continuous positive airway pressure (CPAP), noninvasive ventilation, and pulmonary surfactant therapy—complemented by policies to regionalize perinatal services. These strategies have shown promising results in reducing maternal and neonatal morbidity and mortality.[2]

The strengthening of essential services must be accompanied by active promotion of local science. Fostering neonatal research in resource-limited settings is not only an act of global justice but also a concrete opportunity to generate meaningful, sustainable, and regionally relevant knowledge.[4] Highly complex technological research can be conducted in countries with low- and middle-income countries, provided that there is equitable international collaboration, without relying exclusively on them to improve our results. A central challenge in this process lies in the ethical and operational design of neonatal research. More flexible and culturally sensitive consent models are needed to protect vulnerable populations without hindering scientific progress. Similarly, collaboration with the biomedical industry is essential for developing drugs and devices tailored to neonatal needs, always within transparent ethical frameworks.

Neonatal clinical practice also faces growing legal and bioethical challenges, such as controversies surrounding the use of formula in premature infants and its possible link to necrotizing enterocolitis.[5] These disputes, currently the subject of international legal controversies, have led to tighter regulations that, while intended to protect patients, may hinder the implementation of essential clinical studies. Even so, researchers must assume the ethical and scientific responsibility of generating robust evidence, while the industry should be involved from the initial stages of protocol design.[6] In this context, another determining factor is the inversion of the population pyramid, which could reduce the economic incentive for major technological developments in neonatology. However, this same demographic transformation offers an opportunity to redirect resources toward quality, equity, and translational research, rather than toward the quantitative expansion of services.

Despite advances, the scarcity of high-quality research persists. Cochrane reviews show that most studies on key neonatal outcomes have low or moderate levels of certainty.[7] It is urgent to strengthen human resources training and local research capacities, especially in countries where birth rates are declining more slowly, to ensure continued scientific progress and equitable access to neonatal health care.

In conclusion, the future of neonatology stands at a crossroads between scientific innovation, demographic changes, and political decisions. Achieving a sustained reduction in neonatal mortality will depend less on new technological discoveries and more on the global capacity to coordinate efforts, invest in science, and prioritize the lives of newborns as an unavoidable ethical and political commitment. ■

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