

# Oxygen therapy for newborn, child, and maternal health

Increasing access to oxygen through normative policy change

## HEALTH NEED

Pneumonia remains the leading infectious cause of child mortality worldwide, responsible for an estimated 16 percent of all deaths of children younger than five years. Pneumonia, preterm birth complications, and intrapartum-related complications collectively contribute to more than 40 percent of global under-five mortality, with the vast majority of these deaths occurring in areas with limited access to lifesaving treatment and prevention.<sup>1</sup>

Notable progress has been made in fighting childhood pneumonia, with mortality falling by 58 percent between 1990 and 2013. However, gains remain uneven across countries, with much of the progress occurring outside of the high-burden areas that account for more than half of all child pneumonia deaths.<sup>2</sup>

Hypoxemia, or low levels of oxygen in the blood, is a life-threatening condition that contributes to morbidity and mortality associated with newborn and pediatric respiratory diseases. Hypoxemia is a fatal complication of pneumonia that increases the risk of mortality five-fold in sick children in low- and middle-income countries (LMICs).<sup>3</sup>

## IMPACT OF OXYGEN

Oxygen is an essential treatment for hypoxemia, which requires early detection and monitoring with pulse oximetry for safe provision. Hypoxemia often goes undiagnosed, and many deaths occur when monitoring is infrequent or absent.<sup>4</sup> Improving access to oxygen and pulse oximetry has been shown to reduce the risk of death from childhood pneumonia by 35 percent in certain high-burden settings.<sup>5</sup>

Adequate tools and regular training are essential to providing safe oxygen. Such tools include:



- **Pulse oximetry**, which is critical for diagnosing hypoxemia and monitoring oxygen saturation to prevent toxicity.
- **Safe sources of oxygen**, including concentrators, cylinders, or pipelines, which provide the most consistent and cost-effective supply of oxygen in health facilities.
- **Devices for respiratory support**, including continuous positive airway pressure, mechanical ventilators, and self-inflating bags, which are recommended for newborns and children with severe respiratory conditions.
- **Delivery methods**, including airway interfaces, tubing, flow meters, humidifiers, and blenders, which are used to deliver oxygen to the patient.

For many years, oxygen has been included in the World Health Organization (WHO) Model List of Essential Medicines (EML), but only for use as an inhalational medicine in general anesthesia, with no specification for use as a treatment for hypoxemia. Lack of such global endorsement and normative guidance limited the use of oxygen therapy, which remains inaccessible to a large proportion of patients admitted to health facilities in LMICs.

Furthermore, when oxygen technologies are available, their use is often complicated by inadequate maintenance, missing equipment, or lack of proper staff training on safe use and/or treatment guidelines. As a result, newborns, children, and pregnant women in need of oxygen often do not receive it or receive it unsafely, creating a serious barrier to improving health outcomes, and putting particularly vulnerable patients at risk.

**PATH'S POLICY AND ADVOCACY APPROACH**

**Additional listing for oxygen on the WHO EML**

PATH reviewed the national essential medicines lists of 105 countries and found that approximately a third (31 percent) did not include oxygen and roughly half (48 percent) listed oxygen only by anesthetic indication.<sup>6</sup> In collaboration with partners and expert advisers, PATH petitioned the WHO EML secretariat to include an additional listing of oxygen as a medical gas, extending its use for the management of hypoxemia.

On June 7, 2017, PATH hailed WHO's landmark decision to include a new indication for oxygen in its EML and EMLC for children, identifying oxygen as a medicine essential for the management of hypoxemia.

**Updated WHO Essential Medicines List (March 2017)**

1. Anesthetics, Preoperative Medicines, and Medical Gases	
1.4 Medical Gases	
Oxygen*	<p><b>Inhalation</b></p> <p>For use in the management of hypoxaemia.</p> <p><small>*No more than 30% oxygen should be used to initiate resuscitation of neonates less than or equal to 32 weeks of gestation.</small></p>

This change clarifies oxygen's importance as a medical treatment that should be widely available in health facilities everywhere. Ensuring such global endorsement and normative guidance for the broader applications of oxygen may foster a more enabling environment for oxygen delivery at the national level.

**Evidence-based advocacy**

PATH produced a policy and advocacy primer—a suite of evidence-based resources to enable country-based

advocates to engage national decision-makers, policy influencers, and champions and stimulate their support for increased access to lifesaving oxygen delivery systems. The primer includes materials intended to help advocates and decision-makers understand the planning, policies, and technologies involved in oxygen delivery scale-up. It showcases a successful example of oxygen policy planning from Ethiopia, and provides guiding questions for decision-makers considering a national or subnational scale-up effort of their own. A messaging map, including a compilation of key messages, provides the most effective talking points about the need for oxygen and how to increase access to this essential treatment.

This resource aims to stimulate discussion among advocates and decision-makers, generating commitment to identify barriers to access and ensure inclusion of oxygen and pulse oximetry in local normative policies, treatment guidelines, health budgeting, and system infrastructure (e.g., maintenance and supply chain management).

**RESOURCES**

Additional technical and advocacy resources, including Oxygen is Essential: A Policy and Advocacy Primer, global guidelines for oxygen use, and the HO2PE Campaign social media toolkit, are available on our website: [sites.path.org/oxygen-therapy-resources/](https://sites.path.org/oxygen-therapy-resources/).

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