



COVID-19 information note 9

Every breath counts: utilizing the COVID-19 response to increase access to oxygen

Reversing health inequities affecting the most disadvantaged children

The world celebrates World Pneumonia Day on 12 November every year. This day draws attention to the considerable toll of pneumonia, especially in developing countries, much of which can be prevented. Last year the focus of the world was on coronavirus disease 2019 (COVID-19) which, by November, had caused about 1.3 million deaths. Against this setting, World Pneumonia Day 2020 served as an important reminder that pneumonia is still the single largest killer of children under 5 years.

Access to oxygen has been a long-overlooked element of health planning despite being an indispensable treatment for a range of diseases, including pneumonia. Data clearly show that medical oxygen (administered by face mask or nasal cannula prongs, not by mechanical ventilation) can reduce mortality from pneumonia by 35% in some high-burden settings¹. However, it is the COVID-19 pandemic that has put the spotlight on medical oxygen as it has been a life-saving therapy for COVID-19 patients struggling to breathe. As a result, the demand for oxygen has risen in health settings, and it continues to rise with COVID-19 cases still increasing.

In Somalia, the situation with regard to medical oxygen is alarming. None of the secondary health



care centres has medical oxygen available and the situation is even worse in the primary health care centres: as well as a lack medical oxygen, the health workers in primary care are not trained in its use. This state of affairs urgently needs to be rectified, not only to save the lives of people with COVID-19 but also the lives of people suffering from pneumonia and other medical conditions, especially children who needlessly die every day because of the lack of one of the most essential and affordable treatment tools. At the same time, poverty and inequity in Somalia concentrate pneumonia deaths among the poorest children who are most at risk because of high rates of malnutrition, poor housing and lack of access to basic health services and vaccinations for prevention and treatment of common childhood diseases. It is time to reverse this inequality and save children's lives.

Time to act: solutions are available and affordable

The lack of medical oxygen and training of health workers on the correct use of this life-saving therapy in many low- and middle-income

¹ Duke T, Wandt F, Jonathan M, Matai S, Kaupa M, Saavu M, et al. Improved oxygen systems for childhood pneumonia: a multihospital effectiveness study in Papua New Guinea. *Lancet*. 2008;372(9646):1328–33. [https://doi.org/10.1016/S0140-6736\(08\)61164-2](https://doi.org/10.1016/S0140-6736(08)61164-2)

countries, including in Somalia, means preventable deaths continue to occur every day. However, as health systems move forward within the COVID-19 environment, there is cause for optimism. Measures that have been put in place as part of COVID-19 case management can unlock the door to oxygen access and positively affect the health outcomes of both COVID-19 patients and children suffering from pneumonia. These measures include: distribution of pulse oximeters and oxygen equipment (oxygen concentrators and pressure swing absorption (PSA) plants); distribution of first-line antibiotics at the point of care; and training of the front-line health workforce, including community health workers, on the use of pulse oximeters and oxygen equipment. Pulse oximeters cost less than US\$ 2 each and their use by community health workers as a screening tool to identify signs and symptoms of pneumonia for referral offers an opportunity to increase access to oxygen for hypoxaemia, which is often associated with pneumonia deaths in children.

The usual way of supplying medical oxygen involves PSA plants with oxygen delivery using tanks or oxygen concentrators. The oxygen concentrators can cost US\$ 700 to 800 each while a large size PSA plant can cost US\$ 500 000 to 600 000 including long-term service agreement. However, barriers to access, including affordability, availability of a continuous supply of electricity and maintenance of PSA plants, may still exist. The current work of United Nations agencies and international partners on the COVID-19 response in Somalia provides an opportunity to explore innovative solutions to bridge the gap in access to medical oxygen and invest in training health care workers to operate and maintain the oxygen equipment and safely administer oxygen. The impact of these measures on child survival could be significant.



The evidence speaks for itself

- Pneumonia is the leading infectious disease cause of death in children globally.
- More than 800 000 children die from pneumonia every year in the world.²
- Pneumonia killed an estimated 15 165 children under-5 in Somalia in 2018 (about 21% of all child deaths) – about two children every hour.³
- The global target is to reduce pneumonia-related deaths in children under 5 years to 3 per 1000 live births; the current figure in Somalia is 24 pneumonia deaths per 1000 live births.
- Routine immunization coverage for three doses of the pentavalent vaccine is less than 40–50% in Somalia and the country is yet to introduce the pneumococcal conjugate vaccine nationwide.
- Globally, up to 35% of childhood deaths from pneumonia are preventable with the use of medical oxygen.
- As of February 2021, Somalia needs 588 cubic metres of oxygen a day⁴. Only 5–20% of this need is probably met every day. However, the secondary level health care centres in the country still do not have medical oxygen available.
- As there is no roadmap on provision of medical oxygen in the country, no community health worker is trained to use a pulse oximeter.

Priority actions to improve access to medical oxygen

The COVID-19 pandemic has exposed and magnified a critical gap in access to medical oxygen and the barriers that prevent oxygen from reaching patients in under-resourced communities. To reduce this gap, the following actions need to be considered.

1. Developing a roadmap for provision of medical oxygen.

Estimation of the demand for medical oxygen equipment at point of care and strategies for its distribution are needed.

² Bassat Q, Watkins K, Peterson S, Bijlleveld P, Detjen A, Winn J, et al. The first Global Pneumonia Forum: recommendations in the time of coronavirus. *Lancet Glob Health*. 2020;8(6):e762–3. [https://doi.org/10.1016/S2214-109X\(20\)30125-X](https://doi.org/10.1016/S2214-109X(20)30125-X) and WHO Maternal and Child Epidemiology Estimation (unpublished)

³ Fighting for breath in Somalia. A call to action to stop children dying from pneumonia. Save the Children UK, UNICEF and Every Breath Counts Coalition; 2020 (https://resourcecentre.savethechildren.net/node/17993/pdf/FightingforBreath_SOMALIA%202020.pdf, accessed 7 February 2021).

⁴ Access to oxygen. Scotts Valley, CA: Assist International; 2020 (<https://assistinternational.org/global-health/access-to-oxygen/>, accessed 7 February 2021).

2. Training the health workforce. Data show that providing clinical training significantly increases oxygen use and demand.

3. Supporting innovation in provision of medical oxygen. Solar-powered medical oxygen equipment can be an innovative and cost-effective solution to provide access to oxygen in places where access to electricity and the power grid is not consistent or guaranteed.

4. Promoting sustainability and local control. Ensuring oxygen availability in the long term will require promoting local entrepreneurship and public-private partnerships for a business model that can be sustained over time.

5. Measuring impact. Implementation research needs to be conducted to assess the effectiveness of the delivery and use of medical oxygen as it is introduced.

Moving forward: accelerating innovations and partnerships

The importance of medical oxygen and the need to scale up its availability are increasingly acknowledged. Therefore, on Universal Health Coverage Day on 12 December 2020, WHO, UNICEF and UNFPA committed to work collaboratively to scale up the availability of medical oxygen in Somalia. Partnering with innovation funders such as Grand Challenges Canada, and the Global Action Plan for Healthy Lives and Well-being for All, the WHO Somalia country office identified several innovations that could help overcome barriers to access of medical oxygen, such as solar-powered oxygen concentrators, free oxygen and PSA plants. As part of this process, the country office has established three solar-powered medical oxygen stations in the paediatric ward of Hanano referral hospital in Dhushamareb, Galmudug state. The activities include on-the-job training as well as maintenance of the equipment. This activity will be coupled with implementation research supported by the

UNICEF/UNDP/World Bank/WHO Special Programme for Research and Training in Tropical Diseases. This research will gather evidence on the feasibility, use, cost-effectiveness and impact on survival of the solar-powered medical oxygen systems in a complex and fragile context. Recent studies have shown that solar-powered oxygen can reduce child deaths among paediatric admissions in general and child deaths from pneumonia and is substantially cheaper than standard oxygen cylinders.^{5,6} Thus, the current research seeks to provide further evidence of the benefits of solar-powered medical oxygen systems.

WHO has, so far, delivered 64 oxygen concentrators to different health centres in the country and plans to procure three PSA plants. The work of WHO in Somalia with other principal agencies and partners to reduce gaps in oxygen access is linked to the overall priority of the government to strengthen primary health care services to accelerate progress on the health-related Sustainable Development Goals and attain health system preparedness and readiness towards achieving universal health coverage.

Moving forward, WHO aims to utilize COVID-19 response operations to improve access to oxygen in Somalia. A focused effort by all, accelerating innovations in fragile health settings and tracking progress with transparency and accountability can protect the most vulnerable children and fulfil the promise – every breath counts.

⁵ Mian Q, Huang Y, Conroy A, Opoka R, Namasopo S, Hawkes M. Solar-powered oxygen delivery to treat childhood pneumonia in low-resource settings: a randomized controlled non-inferiority trial and cost-effectiveness study. *Lancet Glob Health*. 2019;7(special issue):S10. [https://doi.org/10.1016/S2214-109X\(19\)30095-6](https://doi.org/10.1016/S2214-109X(19)30095-6)

⁶ Duke T, Pulsan F, Panauwe D, Hwaihwanje I, Sa'avu M, Kaupa M, et al. Solar-powered oxygen, quality improvement and child pneumonia deaths: a large-scale effectiveness study. *Arch Dis Child*. 2020;0:1–7. <https://doi.org/10.1136/archdischild-2020-320107>



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