THE LANCET Global Health

COMMISSION ON MEDICAL OXYGEN SECURITY

SPOTLIGHT BRIEF

20 Priority Areas for Oxygen Innovation

Introduction

***The Lancet Global Health* Commission on Medical Oxygen Security** highlights promising areas for oxygen innovation, many of which originated in low- and middle-income countries (LMICs), and recommends national governments, global health agencies, and their donors increase investment in high-impact models with the greatest likelihood of cost-effectively sustaining medical oxygen access over time.

The Commission supports calls for greater "localization" in the way global health agencies and donors invest in oxygen innovations and the need for greater investment in innovators - individuals and institutions - that emerge from low-resource settings.

For more information, see the Commission report: **Reducing global inequities in medical oxygen access: *The Lancet Global Health* Commission on medical oxygen security.**

What are the most promising areas for pulse oximetry and medical oxygen innovation...

#InvestinOxygen

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20 Priority Areas for Oxygen Innovation		
Domain	**Innovation**	**Example**
Pulse oximetry and oxygen use	Improve accuracy of pulse oximeters	***OpenOximetry.org***: *Online, free-to-access platform that reports pulse oximetry performance based on independent studies*
	Improve clinical and biomedical oxygen-related training	***The Oxygen Series***: *Extensive series of free, online training videos and resources in multiple language for clinicians in low-resource settings from Stanford Medicine, Assist International, and Lifebox*
	Better and more affordable oxygen delivery devices	***Polite CPAP***: *Low-cost neonatal CPAP (continuous positive airway pressure) device designed and built in Nigeria to replace the commonly-used 'improvised' CPAP devices**
	Strengthen professional associations	***African Women in Biomedical Engineering Alliance*** *(AWIBEA): First professional association for women working as biomedical engineers and technicians across Africa, to strengthen skills, networks, and opportunities for leadership, and close the wide gender gaps**
Oxygen supply systems	Develop more robust oxygen concentrators	***PulmO2***: *10LPM oxygen concentrator designed to UNICEF's Target Product Profile specifications**
	Reduce "graveyards" of broken equipment	***OpenO2***: *Mobile biomedical engineers who repair broken oxygen concentrators and related devices for a fraction of the cost of purchasing new equipment**
	Improve oxygen service management models	***Airbank***: *Social business delivering oxygen directly to hospitals in Nigeria and Kenya as part of the Oxygen Hub**
	More cost-effective methods of oxygen generation	***NASA Medical-Ceramic Oxygen Generator*** *(M-COG): New technology for generating medical oxygen in harsh operating environments from ceramic ion transport membrane technology*
	Improve access to spare parts	***PATH's Centralized Procurement Mechanism for Oxygen Compressor Spare Parts***: *for fast access to affordable compressor spare parts for oxygen plants*
	Power-outage proof oxygen technologies	***FREO2 Low-Pressure Oxygen System*** *(LPOS): Reserve that holds excess oxygen from a concentrator so that when the power cuts out, it is automatically released lasting eight to ten hours*
	Reduce energy costs of oxygen plants	***Africa Infrastructure Relief and Support*** *(AIRS): Solar powered oxygen plants and biomedical engineering training at three sites in West Africa*

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20 Priority Areas for Oxygen Innovation cont.		
Domain	**Innovation**	**Example**
Coordination	Strengthen national government leadership	*National medical oxygen plans (multiple governments): National government plan outlining how a country will ensure access to pulse oximetry and medical oxygen**
	Improve oxygen data generation and management	***India National Medical Oxygen Grid**: Online platform for hospitals to manage medical oxygen supply and for governments to minimize stockouts at local, regional, and national levels**
	Raise awareness about oxygen as an essential medicine	***World Oxygen Day**: Global effort to rally the world to advocate for access to medical oxygen held annually on 2 October*
	Connecting public and private oxygen sectors	***Oxygen Alliance**: Collaboration of public and private sector stakeholders for the repair and maintenance of biomedical devices, ensuring the delivery of high-quality healthcare**
	Better coordinate national oxygen system management	*Nigerian Oxygen Desks: Dedicated officer/team, based in National and States Ministries of Health, coordinating medical oxygen activities horizontally across national stakeholders and vertically with sub-national governments**
	Better support global oxygen support to LMICs	***Global Oxygen Alliance** (GO_2AL): Alliance of 20 global health agencies and donors providing oxygen support to LMICs*
Oxygen markets and regulation	Reduce anti-competitive practices in the oxygen industry	***WHO Pharmacopoeia**: Defines both oxygen 99% and 93% as safe for medical use and enables the mixing of oxygen from both sources reducing the risk that health facilities will be locked into one supplier*
	Increase LMIC manufacturing and supply chain management	***Hewatele East Africa Liquid Oxygen Plant:** First fully African-owned liquid oxygen facility with finance from donor governments, development finance institutions, and philanthropies**
	Increase corporate responsibility for oxygen access	***Air Liquide Access Oxygen™**: Corporate program involving company oxygen access target, regular reporting, and flagship programs in several low-resource settings to increase access to medical oxygen*

**LMIC innovation*

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ABOUT THE COMMISSION

Announced in September 2022, *The Lancet Global Health* Commission on Medical Oxygen Security provides a thorough exploration of medical oxygen coverage gaps, with recommendations to ensure that no patient dies for lack of access to this essential medicine, including during public health emergencies like COVID-19.

The Commission was led by 18 Commissioners - multi-disciplinary academics with clinical, economic, engineering, epidemiological, and public policy expertise - representing all regions of the world. Forty Advisors representing United Nations and global health agencies, donors, academic institutions, and non-governmental organizations provided guidance. A large global network of Oxygen Access Collaborators provided constant input to the Commission and included representatives from industry and Ministries of Health. Special consultations were conducted with patients, caregivers, and clinicians to ensure that their voices and experiences shaped the Commission's recommendations.

An Executive Committee coordinated the work of the Commission and included representatives from **Makerere University**, Uganda; **International Centre for Diarrheal Disease Research** (icddr,b), Bangladesh; **Murdoch Children's Research Institute** (MCRI), Australia; **Karolinska Institutet** Sweden; and **Every Breath Counts Coalition**, USA.

You can find the Commission report here and the advocacy package here, including:

- ***Report with Comments***
- ***Policy Brief (English, French, Spanish, Arabic, Chinese, and Russian)***
- ***Spotlight Brief: Access to Medical Oxygen Scorecard ($ATMO_2S$)***
- ***Spotlight Brief: Patient and Caregiver Testimonials***
- ***Spotlight Brief: 10 Oxygen Coverage Indicators***
- ***Spotlight Brief: 20 Priority Areas for Oxygen Innovation***
- ***Country Case Studies***