03 September 2021

WEBINAR 1

Policy for Sustainable Medical Oxygen Supply

Lessons from early experiences in various states

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Content Overview

- Agenda of the webinar
- Background of the webinar
- Key takeaways from each session
- Conclusion

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Agenda

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Building Sustainable Medical Oxygen Systems

South Asia Webinar Series

POLICY FOR SUSTAINABLE MEDICAL OXYGEN SUPPLY

Lessons from early experiences in various states

3 September, 2021

5:00 PM to 6:30 PM IST (GMT+5:30)

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DETAILED AGENDA

Welcome and Context Setting — 05:00 – 05:10 PM

Mr. Neeraj Jain
Country Director India and Director South Asia, PATH

Opening Remarks — 05:10 – 05:25 PM

World Bank's initiatives in accelerating medical oxygen availability

Dr. Trina Haque
Practice Manager for Health, Nutrition and Population, South Asia, the World Bank

Keynote Address — 05:25 – 05:35 PM

Sustainable medical oxygen supply policy: Experience and lessons from India

Ms. Sumita Dawra
Additional Secretary, Department for Promotion of Industry and Internal Trade, Ministry of Commerce and Industry, Government of India

Spotlight Address #1 — 05:35 – 05:45 PM

Public sector experience and lessons

Becoming Oxygen Surplus: Lessons from Kerala, the first Indian state to become oxygen self-sufficient

Mr. Balamurali D
Managing Director, Kerala Medical Services Corporation Limited, India

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Spotlight Address #2 — 05:45 – 05:55 PM

Private sector experience and lessons

Delivering oxygen to COVID-19 patients: Experience and lessons of an Indian healthcare corporate

Dr. Narayan Pendse
Vice President, Medical Strategy and Operations Group, Fortis Healthcare Limited

Global Perspectives — 05:55 – 06:05 PM

Sustainable access to oxygen: Global experience and lessons relevant for South Asia

Dr. Alex Rothkopf
Supply Chain Management and Data Science Advisor, PATH

Open House — 06:05 – 06:25 PM

Questions and answers from the audience

Summary and Closing Remarks — 06:25 – 06:30 PM

Mr. Neeraj Jain
Country Director India and Director South Asia, PATH

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Background

The World Bank, in collaboration with PATH, is conducting a five-part regional webinar series to share the challenges faced, best practices emerged, lessons learnt, and insights on India's evolving oxygen ecosystem in context of the COVID-19 pandemic.

The first of the five webinars was organized on Friday, September 3, 2021, on "Policy for Sustainable Medical Oxygen Supply: Lessons from Early Experiences in India".

The speakers during the inaugural webinar –

- Shared lessons on various approaches adopted to strengthen the oxygen ecosystem
- Discussed the way forward in making medical oxygen available and accessible across the country

472 subject matter experts, government officials, development partners, healthcare professionals, and private-sector representatives from India and countries in South Asia, North Africa, and Middle East.

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Accelerating Medical Oxygen Availability
World Bank's Initiatives

Dr. Trina Haque

Practice Manager for Health, Nutrition and Population, South Asia

World Bank

Key takeaways

The surge in COVID-19 infections across South Asia leading to unprecedented shortages in medical oxygen. The sudden surge in demand for medical oxygen during the second wave of the pandemic presented three challenges:

- Increasing oxygen production
- Improving oxygen storage
- Ensuring a smooth supply chain based on short- and medium-term requirements

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The World Bank in partnership with Government of India and several state governments facilitated rapid purchase and delivery of 22,600 high-quality oxygen concentrators in the country and aided in sourcing oxygen cylinders across the country by restructuring the existing World Bank projects across multiple sectors.

The Bank has been working with PATH in India to provide strategic as well as technical assistance on medium-term challenges with production, supply, and distribution of oxygen, to four states of India. The assistance from PATH encompasses support in planning and constructing new PSA plants, their operation and maintenance and ensuring adequate distribution of medical oxygen via reliable transport and storage facilities.

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Sustainable Medical Oxygen Policy
Experience and Lessons from India

Key takeaways

India immediately ramped up existing oxygen production, chiefly liquid oxygen (LOx) and making it available for use helped address the short-term demand.

- The Drug Controller General of India advised the industrial oxygen manufacturers, like steel and petroleum refineries, in April 2020 to produce medical-grade oxygen.
- Prioritizing and promoting LMO over producing gaseous oxygen.
- Increasing the storage capacity for LMO across all major health facilities.
- Releasing excess stocks of (LOx). For example, safety stock in storage tanks of the steel plants was brought down to 2.5 days from about 3.5 days, thereby, increasing the availability of (LOx) from the stocks for medical use.

Oxygen burden is always not the same across the states. It is important to (a) classify them oxygen demand geographically as high burden, moderate burden, and low burden areas, (b) scientifically assess oxygen demand-supply gap, and (c) plan and allocate oxygen using a dynamic framework.

- Used a standardized formula to calculate demand-supply gap and future oxygen requirement
- Developed a nationwide supply plan, matching with the production centers, and sharing the oxygen sources between states
- Created web portals such as oxygen demand aggregation system to capture oxygen shortage data

Ms. Sumita Dawra

Additional Secretary, Department for Promotion of Industry and Internal Trade, Ministry of Commerce and Industry

Government of India

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Key takeaways

India enhanced the elasticity of the oxygen supply chain by leveraging non-traditional modes for transportation of medical oxygen.

- Other sectors such as the Indian Railways and Indian Airforce were additionally engaged to transport medical oxygen. The Indian Airforce helped in lifting containers from overseas - ISO, empty, tankers to the source of production.
- Nitrogen and argon tankers were converted to oxygen tankers for transportation, bringing in hundreds of ISO containers into the country, each with 20 tons of oxygen capacity.
- To track the daily movement of oxygen tankers, an oxygen digital tracking system was established, along with geotagging of cylinders.

India expanded the storage capacity at facilities along with reducing wastage of oxygen is important to ensure seamless availability of medical oxygen.

- Augmented the number of medical oxygen cylinders from 450,000 cylinders in March 2020 to 1.27 million cylinders by August 2021.
- The number of cryogenic storage tanks was also increased.
- Oxygen management committees were set up to monitor the rational use of oxygen through oxygen audits and ensured the protocols for home care and triage system were being followed.

Becoming Oxygen Surplus

Lessons from Kerala, the first Indian state to become oxygen self-sufficient

Mr. Balamurali D

Managing Director, Kerala Medical Services Corporation Limited

Government of Kerala, India

Key takeaways

Despite of the high disease burden and a seropositivity of 43%, Kerala saw a case fatality rate of only 0.5%. Mr. Balamurali D. provided insights on the measures taken by Government of Kerala to address the surge in the demand met with limited resources in a short span.

Kerala adopted the oxygen wastage reduction strategy

The state government equipped 56 major hospitals, which otherwise used cylinders, with MGPS

Patients are triaged depending on severity and categorized into A, B and C categories

Hospitals are categorized as COVID-19 hospitals, first line and second line treatment centers.

Committees of anesthetists and biomedical engineers did oxygen audits before the second wave, which helped in identifying and correcting wastage at the local level.

Regulation of oxygen production and storage by the government

The Government of India regulated the industrial oxygen producing units for production of liquid medical oxygen. As a result, one one major LMO producer in Kerala ramped up production from 50-60 MT to 180 MT by the first week of June.

National Disaster Management Authority also issued directive of diverting industrial oxygen cylinders for storage of medical oxygen.

Improving oxygen storage capacity across the state

Three buffer storages were created at strategic locations based on the distance between production and supply units in the state.

Other than government hospitals, major private medical colleges were identified and equipped with increased storage capacity.

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Key takeaways

Strengthened supply chain management of oxygen.

- Kerala set up a command system called state war room and district-level war room for management of all the oxygen-related demands
- IT platforms were created to map oxygen demand for government & private health institutions, including oxygen production & major oxygen suppliers
- The collected data was analyzed for daily usage pattern, weekly usage history etc. to evaluate allocation, storage and wastage
- Oxygen transportation was subsidized for tankers running at full capacity with no idling time for any tanker
- Hub and Spoke model was created that mapped the nearest suppliers to the institution to optimized oxygen supplies

Upgradation of oxygen production

- Non-functional air separation units (ASU) were identified and made functional by adding capacity for gaseous oxygen production
- Bed capacity at facilities near oxygen generation units were increased

Incentives to private sector for oxygen supply and management

- Economic incentive was provided such as subsidized transportation charges for private sector and government funded oxygen transporters
- Legal clearance relaxed for speeding up installation of new oxygen production units

Preparation for subsequent waves of the pandemic

- The Kerala government aims to achieve 85 MT of capacity per day, to meet peak requirements during the predicted surges
- The government is focusing on investing in PSA plants to balance the time consumed in setting up liquid oxygen production units
- The government is purchasing more cylinders to further improve the storage capacity
- The state government is also increasing the storage capacity for LMO

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Delivering oxygen to COVID-19 patients

Experience and lessons of an Indian healthcare corporate

Key takeaways

Determining a target oxygen saturation level

The target oxygen saturation level was brought down to 94%-95% from 98%-99%. For those with chronic obstructive pulmonary disease were acclimatized to lower oxygen concentrations, hence, their target saturation could be lowered to a greater extent

Adopting efficient ways to deliver oxygen

The private-sector hospitals segregated patients into moderate and severe COVID-19 cases. Non-rebreather masks were used for moderate cases and helmet masks/ face masks for severe cases as a method to reduce oxygen wastage

Improving oxygen supply & minimizing wastage

Liquid oxygen tanks were installed in most of the hospital premises along with gas manifold systems including B and D type cylinders. Focus was to provide uninterrupted supply of oxygen to the demand site and minimize wastage through proactive monitoring. Oxygen nurses were deployed to continuously monitor, educate, and train the nurses and other colleagues on efficient usage of oxygen

Information sharing with healthcare professionals

Private hospitals organized focus group sessions including biomedical engineers and senior professionals with prior experiences to share knowledge among themselves about oxygen management and best modes of oxygen delivery

Dr. Narayan Pendse

Vice President, Medical Strategy and Operations Group

Fortis Healthcare

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Sustainable access to oxygen

Global experience and lessons relevant for South Asia

Dr. Alexander Rothkopf

Supply Chain Management and Data Science Advisor

PATH

Key takeaways

Dr. Alex Rothkopf from PATH Seattle highlighted that sustainability could be achieved in oxygen use through five major components –

- Maintenance and servicing of oxygen supply equipment either by recruiting a team of biomedical engineers or by contacting a service provider in order to help oxygen infrastructure function efficiently
- Robust and effective supply chain management is important in ensuring availability of equipment and accessories such spare parts
- Training and capacity building is important to diagnose and categorize patients based on their criticality, as to determine who needs oxygen therapy, and on appropriate use of oxygen equipment
- Financing is crucial to converge pivotal investments in oxygen management, and sustainability in oxygen supply and access
- Data analysis and management through rigorous systematic data collection and its effective utilization in assessment and formulation of new policies and practices is essential

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Conclusion

Increasing investment in oxygen production and storage capacity	Need to channelize resources to improve production and storage capacities of oxygen across geographies for sustainability and catering to all future demand surges
Improving oxygen supply and transport	Efficient supply chain management can be supported by setting up war rooms with technology platforms for mapping demands, capacity and transportation of oxygen
Enhancing data collection, analysis and knowledge sharing	Timely data collection on oxygen supply and consumption to identify areas of improvement, and sharing knowledge to encourage learning from the experiences from other settings
Training health workers providing respiratory care services	Oxygen wastage can be prevented by providing appropriate training to medical professionals on categorizing patients by triaging, timely audits and effective oxygen equipment usage
Improving service & maintenance of oxygen production units	It is essential to continuously support sourcing equipment, maintenance service provision, and capacity-building for oxygen production, storage and maintenance so that they can function effectively
Collaboratively working and innovating	All the stakeholders including public, private and civil society must engage and work synergistically to accomplish the set goals, and build on lessons learnt from previous experiences

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