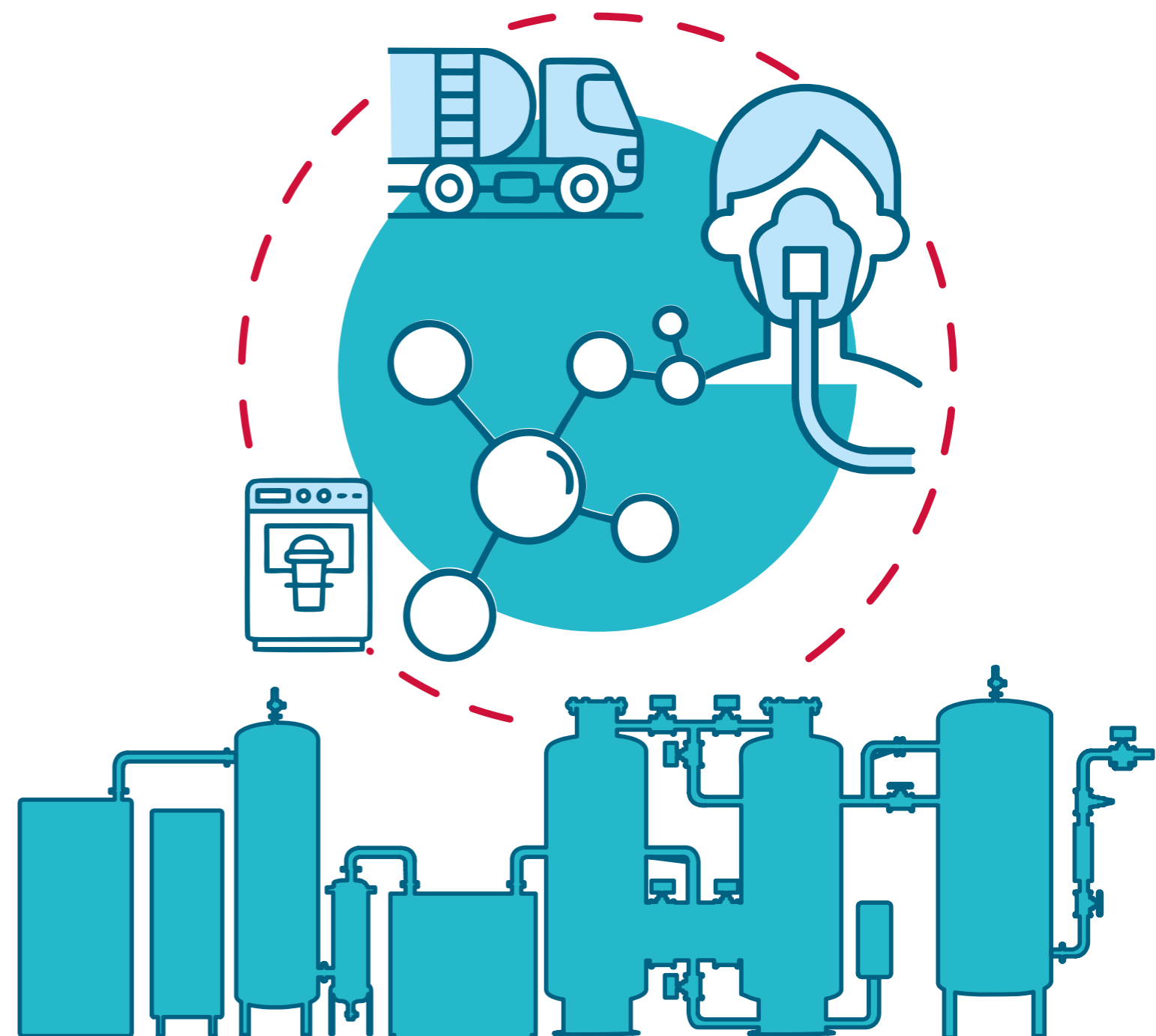




Manual on Conducting Oxygen Audits



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PREFACE



During the second wave of the COVID-19 pandemic, medical oxygen proved to be one of the most valuable resources. An analysis of the reports on the number of active cases, the number of patients on oxygen support, and the reported consumption of medical oxygen revealed variations in the calculated demand and the actual consumption. Guidelines on the rational use of oxygen were also released by the Ministry of Health and Family Welfare, Government of India, to address the variation in demand and consumption.

The Government of Rajasthan, with the support of USAID NISHTHA partner PATH, conducted a pilot oxygen audit from March to June 2022. This document is prepared based on the state's experience in conducting this pilot.

I take this opportunity to thank Dr. Prithvi, (Secretary, Medical & Health), Mr. Vaibhav Galriya (Ex-Secretary, Medical Education), Mr. Sudhir Kumar Sharma (MD NHM) and Mr. Jitendra Kumar Soni (ex-MD, NHM) for their guidance and approval to conduct the pilot. This pilot was conducted with support from Mr. Neeraj Jain (Country Director), Mr. Sudhir Maknikar (Director, Family Health), Mr. Jayendra Kasar (Program lead), Mr. Arun Nair (State lead) and all PATH Rajasthan team members. I extend my gratitude to all of them for their support.

This document can be considered a reference guide for other states to introduce regular oxygen audits in their systems. Regular and periodic facility-based audits by a dedicated oxygen audit team can ensure the rational use of oxygen in health facilities.

Dr. Prem Singh
State Nodal Officer
Inventory/Oxygen Management
Government of Rajasthan

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Disclaimer

"This report is made possible by the generous support of the American people through the United States Agency for International Development (USAID). The contents are the responsibility of Jhpiego and do not necessarily reflect the views of USAID or the United States Government."

ABBREVIATIONS

ABG	Arterial Blood Gas
ACO	Auto Change Over
AMC	Annual Maintenance Contract
BiPAP	Bilevel Positive Airway Pressure
CHC	Community Health Center
CMC	Comprehensive Maintenance Contract
CPAP	Continuous Positive Airway Pressure
DH	District Hospital
DQAC	District Quality Assurance Committee
HDU	High-dependency Care Unit
HFNC	High-flow Nasal Cannula
HMEF	Heat and Moisture Exchanging Filters
ICU	Intensive Care Unit
ISO	International Organization for Standardization
LMO	Liquid Medical Oxygen
LPM	Liters Per Minute
MC	Medical College
MGPS	Medical Gas Pipeline System
MoHFW	Ministry of Health and Family Welfare
NIV	Non-Invasive Ventilation
NRBM	Non-Rebreather Masks
O2	Oxygen
OC-MIS	Oxycare Management Information System
PESO	Petroleum and Explosives Safety Organization
PHC	Primary Health Care Center
PIP	Programme Implementation Planning
PSA	Pressure Swing Adsorption
SDH	Subdistrict Hospital
SMPV	Static and Mobile Pressure Vessels
USAID	United States Agency for International Development

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We would like to thank the **Government of Rajasthan** for its continued support to **USAID NISTHA** partner **PATH** in implementing oxygen audits in the state

CONTEXT SETTING

The onset of the COVID-19 pandemic in early 2020 severely impacted India's health-care system, resulting in a shortage of vital life-saving health-care resources. It became critical to keep an inventory of health care resources and use them judiciously to prevent surges of COVID-19 cases from overwhelming the health system during the various spikes of infection.

During the second wave of the COVID-19 pandemic, medical oxygen proved to be one of the most valuable resources, and monitoring of oxygen supply, consumption, logistics, and supply chain became one of the critical factors in combating COVID-19. Regular and periodic facility-based audits by a dedicated oxygen audit team were required to ensure rational use of oxygen in health facilities, streamline its supply from various sources, and ensure safety measures in the oxygen delivery system at the facility level.

To ensure monitoring of the oxygen stocks and their consumption during the second COVID-19 wave in India, Oxygen Monitoring and Audit Committees were formed by a few states in the country from March to June 2021. These committees were tasked with the daily monitoring of oxygen stock in terms of receipts, consumption, and balance stock, as well as ensuring that the use of oxygen for the management of COVID-19 patients was rational and as per prescribed treatment protocols.

RATIONALE FOR OXYGEN AUDIT

During the second wave of the COVID-19 outbreak, oxygen audits were conducted in health facilities by the governments of states and union territories in India. These audits resulted in considerable reduction of up to 20–25 per cent in oxygen consumption.^{1,2,3} Many factors may have contributed to the non-optimal use of medical oxygen as COVID-19-related respiratory distress case management was evolving and healthcare professionals had no prior experience of managing such cases. The audit reports bring up areas requiring attention, such as lack of captive oxygen generation in plants in hospitals; leakage of oxygen from the medical gas pipeline systems and other

wastage, the need for better management of high-flow and low-flow oxygen depending on the patients; and sensitization of healthcare workers and patients on the use of medical oxygen, among others. Medical oxygen audits should be a continuous process with regular follow-ups as these audits can scientifically map the projected future requirements and ensure optimal and rational use of oxygen during and beyond health emergencies.

AIM OF THIS DOCUMENT

This document aims to detail the process of how periodic and continuous oxygen audits should be conducted, as well as supportive supervision that should be provided to facility managers, oxygen device operators, and health service providers at different levels. It draws insights from the experience of conducting a pilot oxygen audit by the Government of Rajasthan with the support of USAID NISHTHA across 14 of the 33 districts of Rajasthan from March to June 2022. The districts covered for the oxygen audit pilot were Ajmer, Alwar, Barmer, Bharatpur, Bhilwara, Bikaner, Jhalawar, Jodhpur, Kota, Jaipur 2, Pali, Rajsamand, Sikar, and Udaipur. The districts were selected because, as per the state government records, they reported higher consumption of oxygen against the norms prescribed during the second COVID wave in India.

This document can be considered a reference guide for other districts and states to introduce regular oxygen audits in their systems. Its goal is to debunk the myths surrounding oxygen audits and present them as a problem-solving process. There is a need to integrate oxygen audits as a systematic component of improving the quality of care in facilities.

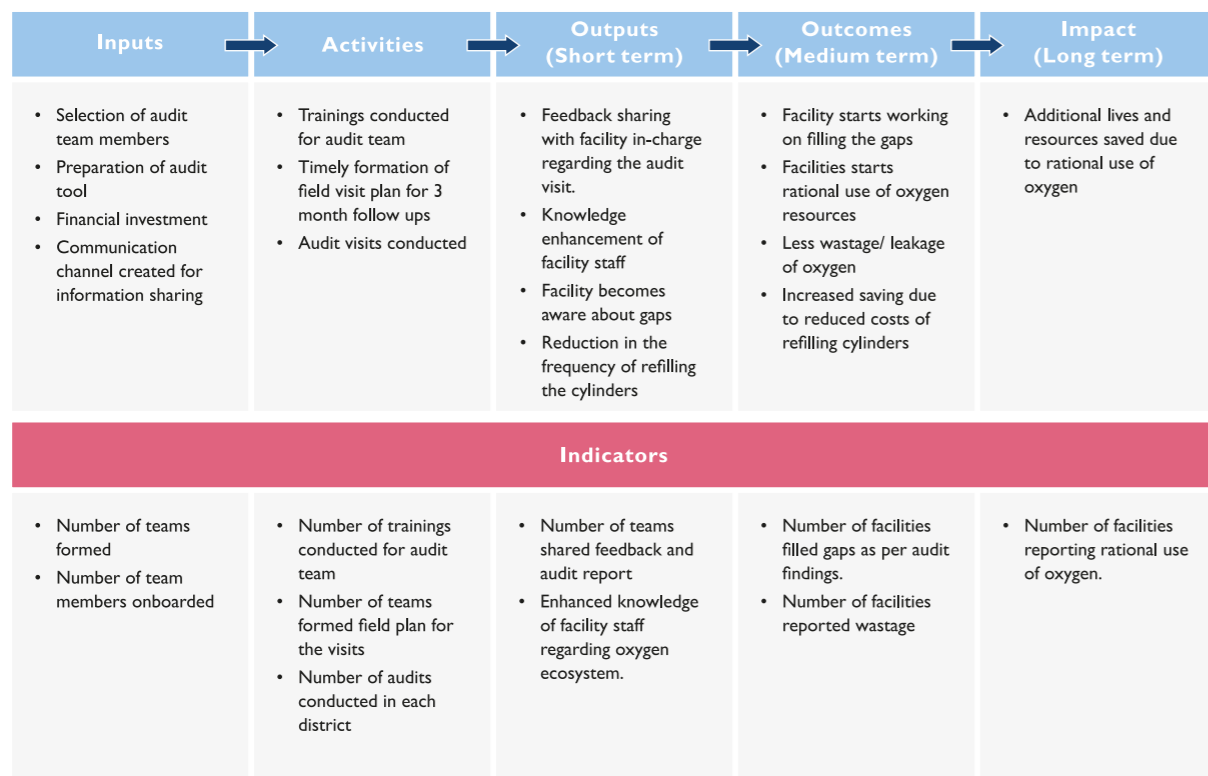
¹Chandigarh Administration. Oxygen Audit Report. May 2021. Link: <https://chbonline.in/wp-content/uploads/2021/05/Oxygen-Audit-Report-dated-31-05-2021.pdf>. Accessed on 17th Aug 2022.

²Oxygen audit ensures smooth supply of lifesaving gas: official. The Hindu. May 2021. Link: <https://www.thehindu.com/news/national/andhra-pradesh/oxygen-audit-ensures-smooth-supply-of-lifesaving-gas-official/article34653174.ece>. Accessed on 17th Aug 2022.

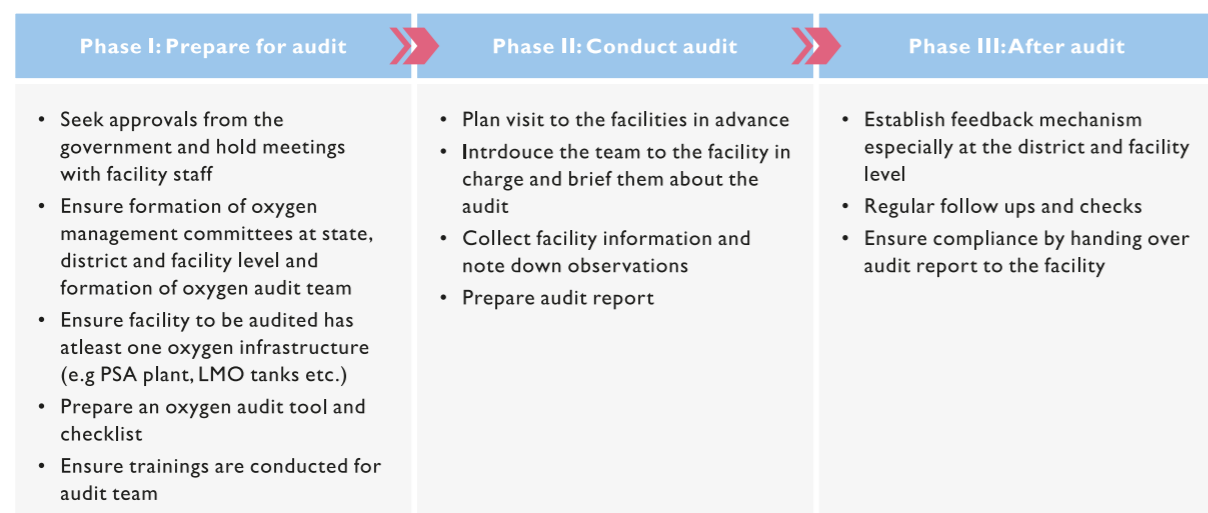
³Karnataka govt's audit finds some districts with less patients consume more oxygen. May 2021. Link: https://economictimes.indiatimes.com/news/india/karnataka-govts-audit-finds-some-districts-with-less-patients-consume-more-oxygen/articleshow/82569044.cms?utm_source=contentofinterest&utm_medium=text&utm_campaign=cppst. Accessed on 17th Aug 2022.

THEORY OF CHANGE

If oxygen audits are conducted regularly in facilities with the help of an audit team and an audit tool, along with follow ups and immediate follow up actions, it can ensure rational and optimum use of oxygen thereby reducing wastage and leakages.



PROCESS OF CONDUCTING OXYGEN AUDITS AND PROVIDING SUPPORTIVE SUPERVISION



⁴Oxygen crisis: IIM study flags wastage, asks hospitals to cut cylinder use. June 2021. Link: http://timesofindia.indiatimes.com/articles/how/83415595.cms?utm_source=contentofinterest&utm_medium=text&utm_campaign=cppst. Accessed on 17th Aug 2022. ⁵n I

Phase I: Prepare for audit

I. Approvals and meetings

- Meetings should be held at the facility level with the nodal officer and a trained oxygen auditor to advocate for oxygen audits. This includes, but is not limited to, details on the benefits of conducting an audit, the need for it, how and who will conduct it, and the resources and time needed from the facility.
- A proposal for oxygen audits should be submitted to the nodal officer, along with signed approval from the Mission Director, National Health Mission, after addressing all concerns.
- Nominated officials and staff should seek approval to attend the training on oxygen resources and audit checklist.
- Communication should be shared with all facilities in the respective districts, such as the Medical College (MC), District Hospital (DH), Sub District Hospitals (SDH), and Community Health Centers (CHCs), to provide necessary support during the team's visit to their institutes.

2. Committees at different levels and human resources

The guidelines for rational use of oxygen for management of COVID-19 by the Ministry of Health and Family Welfare (MoHFW) in 2020⁶ recommend the formation of oxygen monitoring committees at the state, district, and facility levels with a well-defined segregation of activities and responsibilities. Regular audits, review of audit reports by the hospital authority, and immediate follow-up actions ensure the medical oxygen supply service is smooth and hassle-free.

The team should include members with appropriate skills and knowledge combined with experience handling oxygen. The four-member team includes. The four-member team includes -

- Respiratory medicine specialist/ anesthetist or physician:** They will be required for analyzing consumption of oxygen for treatment purpose with regard to prescriptive standards.
- Biomedical engineer/technician:** These technicians will be inspecting oxygen equipment at the facility for leakages and functioning.
- Senior nurse:** S/he will be assessing nursing staff knowledge on use of

equipment and knowledge of prescriptive standards for use of oxygen.

- **Pharmacist/paramedical staff:** These staff will be evaluating utilization of oxygen in the facility against the clinical load of the facility.

3. Pre-requisite oxygen infrastructure

Audits should be performed in all facilities that have oxygen resources. The audits should be done as per the protocols and guidance of the state nodal officer.

4. Oxygen audit tool

An oxygen audit tool should be built by the department or organization conducting the oxygen audit. The audit tool developed by PATH in consultation with the Nodal Officer and experts from SMS Medical College, Jaipur, is available in the annexure for reference.

An approved audit tool should include the following:

- Facility profile, having details date of visit, state, district details, facility name, and staff details
- Basic infrastructure details related to the oxygen ecosystem
- Information on the number of oxygen concentrators
- Information on the number of oxygen cylinders
- Information regarding the Medical Gas Pipeline System (MGPS) installed in the facility as well as information on the number of functioning ventilators
- Information on Pressure Swing Adsorption (PSA) plants
- Information on Liquid Medical Oxygen (LMO) tanks
- Fire safety measures in the facility
- Availability of equipment for oxygen delivery and consumables
- Information on patients that visited the facility
- Areas of improvement in the facility

In addition, the state committee should develop a database of oxygen equipment suppliers for smooth procurement and ease of delivery.

⁶D.O letter/1830290/immunization/2020 dated 25'09'2020'

The Oxygen Audit Module – a digital tool for faster data collection and verification

Witnessing the huge demand for oxygen supplies during the second wave of the pandemic, it became pertinent that facilities undertake regular audits in an effective and accountable manner. This necessary intervention can be further empowered with a digital tool that can create avenues for improved tracking of oxygen supply and demand while ensuring accountability. Verified data gathered through this would also go a long way in helping to develop trends for improved decision-making for oxygen.

Moving away from manual pen-and-paper-based reporting for the oxygen audits, digitalizing components of the process could play an instrumental role in faster, easier, and improved processes for oxygen audits across the facilities. In a step towards this, USAID NISHTHA partner PATH developed an Oxygen Audit Module, a digital tool that helps in the aggregation and reporting of O₂ data from the facilities while measuring the wastage of oxygen in the facility using the available data.



MobileView of the Dashboard



Screenshot of the Analysis Dashboard

The oxygen audit module consists of four sections: O₂ storage, O₂ sources, patients on O₂, and consumption, requirement, and waste. The first three sections require the appropriate user to input the information and data, which, combined with the facility details that are pulled from a common database on the platform, give consumption, requirement, and wastage as the output of the audit activity.

5. Trainings

District-level teams tasked with conducting comprehensive oxygen audits in facilities should be trained by experts. A one-day orientation workshop may be organized once nominations for district-level teams are received. The training approach can be a mixed methodology, including instructor-led classroom learning, demonstrations, and mock audits.



A glimpse from Oxygen Auditors training from the pilot at Rajasthan

Training of Oxygen Auditors –sessions in a one-day module

A one-day training sessions for oxygen auditors can be conducted on the following topics -

- **Introduction:** The training commences with a brief on the purpose, need, and context of the pilot project.
- **Rational use of oxygen:** This session highlights the importance of oxygen audits, focusing on external as well as internal audits. In addition, it provides the participants with information on how to reduce oxygen waste.
- **Demystifying oxygen audit and supportive supervision:** This session thoroughly explains the oxygen audit and supportive supervision tools to participants. In addition, the session emphasizes ways of ensuring the trouble-free gathering of data on medical oxygen at healthcare facilities.
- **Visit to a medical college/district hospital:** After the completion of all the technical sessions, an in-person demonstration of medical oxygen sources will be provided in a medical college or district hospital having all the oxygen resources like PSA plants, LMO storage tank, Oxygen Concentrators, Cylinders, MGPS etc, and the know-how regarding the oxygen audit will be detailed.
- **Digital solution:** A session is conducted on the oxygen audit module. This module demonstrated a digital audit tool that was developed under the USAID NISHTHA project by its implementing partner, PATH. The module on Oxygen Audit has four sections: O₂ storage, O₂ sources, patients on O₂, and consumption, requirement, and waste.

Phase II: Conduct audit

1. Planning a visit to the facilities

- The audit team members should review the list of facilities in the district prior to auditing
- As per the number of facilities in the district, a visit plan should be prepared
- The team should brief the Nodal Officer on the purpose of the visit as well as inform the facility-in-charge about the visit.

2. Introduction to facility staff

- The team should have an introduction session with the facility in-charge and the oxygen nodal officer of the facility. The team should discuss the purpose of the visit and become acquainted with the facility's infrastructure.
- A staff member is appointed by the facility in-charge to accompany the team for the site visits.



3. Collection of information and observation

- The team should collect information about the oxygen infrastructure of the facility, such as the functioning of the LMO tank, PSA plant, manifold room, oxygen concentrators, MGPS pipelines, oxygen cylinders, etc.
- All the observations regarding the facility should be recorded in the digital audit tool. Other support provided, if any, should be recorded as well.

Based on the oxygen audit pilot conducted in Rajasthan by USAID NISHTHA partner PATH, it was observed that a complete facility audit requires close to 3 hours to complete. This is excluding the travel time to the facility. It is therefore advisable to schedule at the most two facility visits per day to assess the facilities and capture the data.

Audit report

The oxygen audit team prepares an audit report based on the information collected through the audit tool. Ideally, the report should be prepared immediately at the end of the visit or within a few days after the visit.

The audit reports may include-

- Facility-wise details of key audit findings along with immediate action taken to ensure compliance with recommended practices
- Details of facility resources should include information such as, the number of leakages identified in oxygen supply systems, any breakdown of oxygen sources, the proportion of admitted patients on High-Flow Nasal Cannula (HFNC), non-invasive ventilation, invasive ventilation, nasal cannula, simple face mask, Non-Rebreather Masks (NRBM), and other systems, and the utilization of oxygen in the facility against the clinical load of the facility.
- A gap analysis of the oxygen supply system should be undertaken to highlight any support requirements from the State Health Department.

A monthly audit report with details of the audit conducted should be sent to the state and district oxygen nodal officers by the district oxygen audit committees.

Phase III: After audit

1. Feedback

- After the audit, the team should have a debriefing meeting with the facility in-charge and staff to share their observations and suggest areas for improvement in the facility, ensuring immediate action.
- The oxygen audit findings should be discussed at District Quality Assurance Committee (DQAC) meetings.
- Feedback and support should be provided to all districts to strengthen the district medical oxygen supply system.

2. Follow-ups

Regular follow-ups and checks are required even after the audit is completed to ensure compliance and improvement in the facility resources.

3. Ensuring compliance

- The facility should be provided with a copy of the audit report to ensure compliance.
- A competent member of the audit team should present the audit findings at the District Quality Assurance Committee (DQAC) meeting.

A WhatsApp group was created comprising of the Rajasthan State team members, Government officials and USAID NISHTHA partner PATH team, to share reports, follow up on progress, discuss challenges and upcoming steps.



WAY FORWARD

Based on our experience in conducting oxygen audit in Rajasthan, we have come across a few potential challenges that can be mitigated with the following recommendations -

- The oxygen audit teams are usually formed at the state or district level, and these members are required to travel to health facilities at far-flung areas provisioned in order to conduct the audits. Currently there is no provision available in the government programs for the travel, accommodation, and field expenses for these auditors. It is recommended that the state governments allocate some budget while preparing the annual program implementation plan (PIP).

- It has been observed that some districts are under-resourced, and very few anesthetists, technicians, and other healthcare service providers are available. It is recommended that each district have a pool of trained auditors to conduct the oxygen audits at regular intervals. Knowledge and capacities of these auditors would also require strengthening at regular intervals. Nodal officer should conduct periodic reviews of the audits conducted.
- Oxygen audit and monitoring are currently not a part of any national or state level quality assurance guidelines for healthcare. It would be prudent to include oxygen audits in the mandate for District Quality Assurance Committees/units. This will ensure that the oxygen infrastructures in the country are objectively and systematically monitored and evaluated as per Government of India guidelines, resolve identified problems; and improve the overall quality of services.
- Developing a standardized digital tool to capture data will be helpful for conducting these audits. These tools can ease reporting for facilities and provide a broader picture of the O2 situation in the facility through quantitative assessment while also gathering specific information through qualitative assessment, thereby supporting future trend analysis, decision making, and tracking oxygen audits in the states.

ANNEXURE

Oxygen audit tool developed by PATH

An audit tool is a basic component for conducting the audit as it helps in time management

Every state must have an oxygen audit checklist which includes:

- **General information about the hospital**
 - Basic hospital details
 - Total number of beds and patients in the hospitals admitted in L2 and L3 wards
 - Details of oxygen use, sources of oxygen, and oxygen storage. Details of oxygen wastage.
- **General checklist for oxygen system**
 - (Observe) Check the ambient environment of oxygen source or plant and whether the surrounding material is fire retardant
 - (Observe) Tank safety measure and fire prevention measures taken
 - (Observe & Ask) Limited access to the storage area
- **Oxygen pipeline general inspection checklist**
 - (Observe) Check if leakages found at pipeline
 - (Observe) Oil/grease on pipeline
 - (Observe) Any explosive elements found near pipeline
- **General oxygen-weaning protocol**
 - (Ask & check record) Conduct staff training for Oxygen Weaning Protocol
 - (Observe) Display sign boards near the patient bed for oxygen weaning protocol
 - (Check records) Measure SPO₂ every 2 hours using a good quality oximeter
 - (Check records) An oxygen pipeline cylinder or cryogenic tank leakage
 - (Check records) Brief the patient about oxygen usage

- **Jumbo oxygen cylinder operation and maintenance checklist**
 - (Ask/ Observe) Inspect cylinders for damage, corrosion, pitting, cuts, gouges, digs etc.
 - (Ask/ Observe) Check the oxygen cylinder connections (pressure regulators, hoses, gauges etc.) for any integrity and tightness
 - (Ask/ Observe) Check if the cylinder valves are tightly closed when not in use
- **Precaution for effective utilization and storage of jumbo cylinders**
 - (Check records) Hospital administration should establish date-based weekly check with the help of flow meter and the percentage loss observed
 - (Check records) Check all humidifier bottles and gauges for leakages
 - (Check records) Check all spanners if they have lost grip because of wear and tear
 - (Observe) All jumbo cylinders should be marked with permanent paint, numbered, tagged and last refilling date should be mentioned
- **Dura oxygen cylinders**
 - (Observe) Check if all cylinders have safety valves; safety devices should be free of tampering
 - (Ask) Dura cylinders should only be handled by experienced and trained professionals
- **PSA plant**
 - (Observe) Check the functionality of PSA Plant. If nonfunctional mark the reason for non-functionality
 - Check the Pressure and Purity at PSA Plant
 - Ask for running time of PSA Plant (Verify Record)
 - Check for leakage from PSA Plant
 - Check for documents that have AMC/CMC details

- **Oxygen Concentrator**
 - Check the usage of concentrator at the time of visit
 - (Observe) Change of Water in Humidifier bottle
 - Ask the facility if they have power back up for Concentrator
 - Observe the correct placement of Concentrator in the facility (1-2 Feet away from the wall)
- **LMO oxygen system**
 - (Observe) Check availability of alternative manifold system if LMO supply fails or breaks down; oxygen cylinders with 4-8 hours backup per location
 - (Observe) If LMO and Manifold fails, then filled cylinders should be available in wards with regulators
 - (Observe) Inspection of ambient environment: ventilation, surrounding material, fire safety etc.
 - (Ask) Proper de-icing of vaporizer and pipeline from LMO to vaporizer



- **Dura oxygen system precaution for humidifier oxygen bottles and oxygen points**
 - (Ask) Check if clean distilled water/ boiled water used in humidifier bottles
 - (Ask) Humidifier bottles cleaned and made sterile every 3-4 days
- **Recycling of consumables**
 - (Ask) Check if NIV masks are being recycled by sterilization
 - (Ask) Nasal Prongs/ NRBM recycled at least 1-2 times by sterilization
 - (Ask) Safety goggles should be used by staff and not thrown away
- **Inventory report**
 - (Ask) Inventory of tools and spares required for each liquid tank
 - (Ask) Liquid tank valves, safety valves, internal valves, excess flow valves, SMPV regulators, Liquid tank gauges, nuts, Couplings, joints, Teflon tapes, toolbox etc.

Oxygen audit tool for visits

Rajasthan

Section A

This section has some basic details of visit. Fill after meeting with the nodal of the hospital.

S.No.	Facility Profile	Response
A.1	Date of Visit	
A.2	State	Rajasthan
A.3	District	
A.4	Name of Facility	
A.5	Type of Facility	MC/DH/SDH/CHC/SH/PHC
A.6	Name of Facility Incharge	
A.7	Mobile Number	
A.8	Email ID	
A.9	Name of Team Member 1	
A.10	Designation	
A.11	Mobile Number	
A.12	Name of Team Member 2	
A.13	Designation	
A.14	Mobile Number	
A.15	Name of Team Member 3	
A.16	Designation	
A.17	Mobile Number	
A.18	Name of Team Member 4	
A.19	Designation	
A.20	Mobile Number	

Section B: General Details

This section captures basic infrastructure details related to oxygen. Fill carefully after checking the records of hospitals and also check physically.

S.No.	Facility Infrastructure Related to Oxygen Ecosystem	Response
B.1	Total number of general beds available	
B.2	Total number of inpatient beds available	
B.3	Number of oxygen beds	
B.4	Number of ICU beds	
B.5	Number of HDU beds	
B.6	Total number of ventilators available	
B.7	Number of functional ventilators available	

Section C: Oxygen Concentrator

This section captures information regarding oxygen concentrators. Fill carefully by verifying records maintained by hospital and by verifying physically. Support and provide mentoring support if something is not practiced correctly.

S.No.	Oxygen Concentrator	5 LPM	10 LPM
C.1	Number of oxygen concentrators available		
C.2	Details of oxygen concentrators are updated on E-Upkaran	Yes/No	Yes/No
C.3	Number of oxygen concentrators in use (whether patients are on OCs)		
C.4	Number of oxygen concentrators in store which are not in use		
C.5	Number of non-functional oxygen c concentrators	Yes/No	Yes/No
C.6	Are the concentrators placed 1-2 feet away from the wall?	Yes/No/NA	
C.7	Are the concentrators being plugged directly in the wall power socket?	Yes/No/NA	Yes/No/NA
C.8	Spare filter available for oxygen concentrator	Yes/No	Yes/No
C.9	Power back up is available for oxygen concentrator	Yes/No	Yes/No
C.10	Are they providing oxygen purity of 93+/-3% (If no, mention in remarks)	Yes/No/NA	Yes/No/NA
C.11	Complaint being registered on E-Upkaran for non-functional concentrators?	Yes/No/NA	Yes/No/NA

S.No.	Oxygen Concentrator	5 LPM	10 LPM
C.12	Does the facility staff clean the filter of oxygen concentrator?	Yes/No/NA	Yes/No/NA
C.13	Humidifier bottle available with oxygen concentrator	Yes/No	Yes/No
C.14	Water in humidifier is changed or not?	Yes/No/NA	Yes/No/NA
C.15	Water is changed daily or not.	Yes/No/NA	Yes/No/NA
C.16	What is the frequency of cleaning the filter (in days)?		
C.17	Does the facility have some IEC displayed related to Oxygen Concentrator?	Yes/No	Yes/No

Section D: Oxygen Cylinder

This section captures information for oxygen cylinders. Fill carefully by verifying the records maintained by hospital and by verifying physically. Support and provide mentoring if something is not practiced correctly.

S.No.	Oxygen Cylinder	D Type	B Type
D.1	Number of cylinders available in facility		
D.2	Number of filled cylinders		
D.3	Number of empty cylinders		
D.4	Does the facility check the pressure of cylinders when it is received from the vendor?		
D.5	Is there any document available for routine maintenance of cylinders?	Yes/No	Yes/No
D.6	Are all oxygen cylinders subjected to periodic hydrostatic testing and interior inspection by suppliers?	Yes/No	Yes/No
D.7	Are all oxygen cylinders regularly inspected for corrosion, pitting, cuts, gouges, digs, bulges, neck defects and general distortion?	Yes/No	Yes/No
D.8	Are all oxygen cylinders regularly subjected to leak detection using an approved leak detecting liquid?	Yes/No	Yes/No
D.9	Are oxygen cylinders handled only by experienced and properly trained people?	Yes/No	Yes/No
D.10	Is the bottom of the cylinder protected from the ground to prevent rusting?	Yes/No	Yes/No
D.11	Are oxygen cylinders always moved, even short distances, by a suitable hand trolley?	Yes/No	Yes/No
D.12	Are cylinder valves always closed, except when the cylinder is in use?	Yes/No	Yes/No
D.13	Are cylinders stored in upright positions and immobilized by chains or other means to prevent them from falling?	Yes/No	Yes/No
D.14	Are full cylinders labelled and stored away from empty cylinders?	Yes/No	Yes/No

S.No.	Oxygen Cylinder	D Type	B Type
D.15	Are the markings for expiry visible on cylinders?	Yes/No	Yes/No
D.16	Are all oxygen cylinder valve covers/caps in place when cylinders are not in use?	Yes/No	Yes/No
D.17	Does the facility have PESO license for storing cylinders?	Yes/No	Yes/No
D.18	Does the facility have some iec displayed related to oxygen cylinders?	Yes/No	Yes/No

Section E: Medical Gas Pipeline System

This section captures the information regarding MGPS, mark the correct answer by asking the question to the service provider. Visit all places where oxygen is supplied by MGPS for detailed verification.

S.No.	Medical Gas Pipeline System	Response
E.1	Does the facility have a centralized medical gas pipeline system (mgps) available?	Yes/No
E.2	Is an auto change over (acv) installed in the manifold room?	Yes/No
E.3	Manual changeover system available	Yes/No
E.4	Colour coding of MGPS done as per ISO standards?	Yes/No
E.5	Does the facility have a MGPS operator available?	Yes/No
E.6	Leakages found at pipeline, valve & joints	Yes/No
E.7	Any oil / grease found on pipeline?	Yes/No
E.8	Number of points where oxygen is supplied through MGPS	Yes/No
E.9	General O2 Beds	Yes/No
E.10	ICU beds (without ventilators)	
E.11	HDU beds (without ventilators)	
E.12	Ventilator supported beds	
E.13	Does the facility have any IEC displayed related to MGPS?	Yes/No

Section F: PSA Plant

Total number of PSA plant: _____

S.No.	PSA Plant	Plant 1	Plant 2	Plant 3	Plant 4	Plant 5
F.1	Is the plant commissioned?	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No
F.2	Supplied by (mention name of vendor)					
F.3	Name of contact person from plant supplier					

S.No.	PSA Plant	Plant 1	Plant 2	Plant 3	Plant 4	Plant 5
F.4	Capacity of PSA Plant (in LPM)					
F.5	Is the plant functional?	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No
F.6	If no, reasons for non-functionality (Remarks)					
F.7	Flow of the PSA plant (in LPM)					
F.8	Pressure at PSA Plant outlet (in bar)					
F.9	Oxygen purity level (percentage) at the time of visit?					
F.10	Average running hours per day (In hours)					
F.11	Plant operator available	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No
F.12	Whether the operator is trained in operations & maintenance of PSA plant?					
F.13	Record keeping of routine PSA data (Register)	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No
F.14	PSA plant installed close to diesel generators or Any other system which releases smoke or fire.	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No
F.15	Warranty period valid till (dd/mm/yy)					
F.16	AMC/CMC done	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No
F.17	Duration of AMC/CMC (in years)					
F.18	Is there any leakage from PSA Plant?	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No
F.19	Is the premise clean around the PSA Plant?	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No
F.20	Escalation matrix available at the site of PSA plant?	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No
F.21	Mock drill conducted for the plant	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No
F.22	Does the facility have any IEC displayed related to PSA Plants?	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No

Section G: Liquid Medical Oxygen

This section deals with information regarding LMO tanks. Fill the information carefully by checking the records and visiting LMO tank.

S.No.	LMO Tank	Response
G.1	LMO tank available in the facility	Yes/No
G.2	Total number of LMO tanks available in the facility	
G.3	Total capacity of LMO tanks (in kiloliter)	
G.4	Current stock available in tanks (in kiloliter)	
G.5	Supplier of LMO tank	
G.6	Contact details of supplier	
G.7	Are there separate entrances for operators and the LMO tankers?	

S.No.	LMO Tank	Response
G.8	Are the keys of LMO premise easily available with fire/ security / administration / operation staff?	
G.9	Is there a mechanism to de-ice the vaporizer by using water showers?	
G.10	Is the pipeline from LMO tank to vaporizer also getting de-iced?	
G.11	Is there any leakage found from LMO tank at the time of visit?	Yes/No
G.12	Is the flooring in the LMO decanting perfectly horizontal so that the LMO is decanted in the tank?	
G.13	What is the frequency of LMO tank refilling (in days)?	
G.14	SOP/IEC available for LMO tank	Yes/No
G.15	Dedicated staff available for operations and maintenance of LMO tanks	Yes/No
G.16	Is escalation matrix available at the site of LMO tank?	
G.17	Does the facility have any IEC displayed for LMO tanks?	Yes/No

Section H: Fire Safety

This section has information regarding fire safety, fill the checklist by asking the facility staff and by observation.

*Check Expiry of date of Fire Extinguishers

S.No.	Fire Safety	Fire Extinguishers	Fire Alarm	Smoke Detector
H.1	Fire safety equipment	Yes/No	Yes/No	Yes/No
H.2	Wards*			
H.3	ICU*			
H.4	HDU*			
H.5	Manifold room*			
H.6	PSA room*			
H.7	Other places*			
H.8	Is the Staff trained on fire safety measures	Yes/No		
H.9	When was the last fire safety audit done (Mention Date: dd/mm/yy)			
H.10	If fire safety audit not done, then mention the plan for next fire safety audit			
H.11	Does the facility have any IEC displayed for fire safety	Yes/No		

Section I: Equipment

S.No.	Availability of consumables and equipment for oxygen delivery	Response
I.1	Tubing (Ventilator, CPAP, BiPAP)	
I.2	Flowmeter	
I.3	Flow-splitter – 2 outlets	
I.4	Flow-splitter – 3 outlets	
I.5	Flow-splitter – 4 outlets	
I.6	Flow-splitter – 5 outlets	
I.7	Humidifier	
I.8	Nasal cannula	
I.9	Oxygen masks	
I.10	Nebulizer	
I.11	Oxygen hoods	
I.12	Ambu-bags	
I.13	Venturi-mask	
I.14	Nasal prong	
I.15	Nasal catheter	
I.16	NIV mask - adult	
I.17	NIV mask - pediatric	
I.18	Nebulizer mask	
I.19	HMEFs	
I.20	Breathing circuits - adult	
I.21	Breathing circuits - pediatric	
I.22	Breathing circuits - neonatal	
I.23	Suction-tubes	
I.24	BiPAP machine - adult	
I.25	BiPAP machine - pediatric	
I.26	BiPAP machine - neonatal	
I.27	CPAP machine - adult	
I.28	CPAP machine - pediatric	
I.29	CPAP machine - neonatal	
I.30	Multipara monitor	
I.31	ABG machine	
I.32	Oximeter - Fingertip	
I.33	Oximeter - tabletop	
I.34	Oximeter - pediatric	
I.35	High Flow Nasal Cannula	

Section J: Patient Survey

This section has information regarding patients where the team has to visit the patients admitted at the time of visit. Please fill the section carefully and mentor facility staff if something is not correctly followed. Focus on mentoring.

S.No.	Question	Response
J.1	Number of patients admitted and on oxygen therapy	Yes/No

Check random 3 patients

S.No.	Question	Patient I	Patient I	Patient I
J.2	Source of oxygen (OC/Cylinder/MGPS)			
J.3	Pressure			
J.4	Purity (if applicable)			
J.5	Flow recommended for patient in prescription chart			
J.6	Flow at the time of visit			
J.7	How oxygen is delivered (Face Mask/Nasal Prongs/Nasal Cannula/BiPAP/CPAP/Ventilator)			
J.8	Is there any leakage from oxygen delivery device	Yes/No	Yes/No	Yes/No
J.9	Whether the oxygen delivery device correctly fitted to patient.	Yes/No	Yes/No	Yes/No
J.10	Whether patient is aware about proning technique	Yes/No	Yes/No	Yes/No

Section K

(Please provide a summary of findings during your visit)

Name of hospital nodal officer

Signature of audit team members

Oxygen audit tool with facility assessment data-A Sample

OXYGEN AUDIT TOOL FOR VISITS RAJASTHAN

Section - A GENERAL DETAILS

This section has some basic details of visit. Fill after meeting with the nodal of the hospital

S.NO	Facility Profile	Response
A.1	Date of Visit	16-05-2022
A.2	State	RAJASTHAN
A.3	District	SIKAR
A.4	Name of Facility	S.K.HOSPITAL SIKAR
A.5	Type of Facility	MC/DH/SDH/CHC/SH/PHL
A.6	Name of Facility In charge	DR. mahinder KUMAR
A.7	Mobile Number	9828705526
A.8	Email- ID	pmo-sikar@yahoo.in
A.9	Name of Team Member 1	DR. V.P yadav
A.10	Designation	SMO(M.D), Anaesthesia
A.11	Mobile Number	902408280
A.12	Name of Team Member 2	Ravi mudgal
A.13	Designation	Bin medical engineer
A.14	Mobile Number	7413926493
A.15	Name of Team Member 3	Narsingh SHARMA
A.16	Designation	NURSE Grade II nd
A.17	Mobile Number	9680213420
A.18	Name of Team Member 4	Gautam SHARMA
A.19	Designation	Technician PSA PLANT
A.20	Mobile Number	6375152194

Sample of filled-out oxygen audit tool

S.No.	Areas of improvement/feedback provided at the facility
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	

Section - F PSA PLANT
Total Number of PSA Plant - 02 (By 02.04.22)

S.No.	Pressure Swing Absorption (PSA Plant)	Plant 1	Plant 2	Plant 3	Plant 4	Plant 5
F.1	Is the plant commissioned?	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No
F.2	Supplied by (manufacturer of vendor)	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No
F.3	Name of (Oxide) gases from plant supplier	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No
F.4	Capacity of PSA Plant (in LPM)	900	1000			
F.5	Is the plant (gas) used?	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No
F.6	If yes, reasons for non-commissioning (Mention in Remarks section of (F.1))					
F.7	Flow of the PSA plant (in LPM)	300	140			
F.8	Pressure of PSA Plant outlet (in bar)	4.8	4.8			
F.9	Oxygen purity level (percentage) at the time of visit?	93.4%	94%			
F.10	Average running hours per day (in hours)	12 hours	12 hours			
F.11	Plant operation guidelines	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No
F.12	Whether the operator is trained in operations & maintenance of PSA plant?	Yes	Yes			
F.13	Record keeping of routine PSA data (register)	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No
F.14	PSA plant installed close to District Laboratory or any other (public lab) reference centre	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No
F.15	Frequency of visit (in days/week)	2/week	2/week			
F.16	AMC/CMC Done	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No
F.17	Duration of AMC/CMC (in years)	2 years	2 years			
F.18	Is there any leakage from PSA plant?	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No
F.19	Is the alarm (alarm) about the PSA plant?	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No
F.20	Evacuation route available at the site of PSA plant?	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No
F.21	Stock level connected for the plant	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No
F.22	Does the facility have any O.C. involved related to PSA plant?	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No

SECTION - K
(Please provide Summary of findings during your visit)

S.No.	Areas of Improvement/ Feedback Provided at Facility
1	जॉइंट में Exhaust Tank की स्थिति परीक्षा कराई जाए
2	जॉइंट जॉइंट गर्म होकर बंद हो गई।
3	जॉइंट में SMOKE DETECTOR Fire Alarm की
4	क्षण बजने को Fire extinguisher की उपस्थिति
5	सजाई जाए।
6	जॉइंट के जॉइंट पर साफ सफाई और वेट्टे पीचे
7	भागाने के रूप में
8	जॉइंट जॉइंट सिगनेल की बचत के लिए
9	सोफ्ट जॉइंट भागाने पर बिचर को लॉक सिगनेल
10	की बचत हो गई।
11	D-S-A PLANT TECHNICIAN और निरीक्षण
12	के जॉइंट की Fire safety training प्रदान
13	कराई जाए।
14	D-S-A PLANT में O.C.P. के बारे में सुरक्षा की जांच कराई जाए


Name of Hospital Nodal Officer: _____
Signature: _____
Signature of Audit team members:
1- Dr. Vishnu Prakash Yadav
2- Narsingh Sharma
3- Ravi Mudgal
4- Gautam Sharma

Sample assessment of oxygen consumption

RAJASTHAN (Raj Oxy Sheet)	16.05.2021		Last 2 Days	
Total Active Cases	194,382	-6.9%	208,688	212,753
Total Patient on Oxygen Support	21,097	-1.7%	21,451	21,276
% of O2 patients against active cases (State)	11%		No change	
A. Actual Consumption of Oxygen (MT & D Type Cylinders)	404	43744 D Type Cylinders	397	
B. Oxygen Consumption (MT) that should be based on actual active cases and according to new Gol guideline (10 LPM for moderate patient and 24 LPM for severe patients)	571		Gap= 41.3%	
C. Oxygen Consumption (MT) that should be based on actual active cases and according to old Gol guideline (7.14 LPM for moderate patient and 11.9 LPM for severe patients)	350		Gap = (-13.3%)	
Average Oxygen consumption for per oxygen supported beds (State) in D type Cyl	2.1		Increased by 0.1 units	
Top 5 districts highest % of patients on Oxygen	30%	Judicious selection of patients for oxygen required on the base of guideline issued from State		
	27%			
	24%			
	23%			
	20%			
Top 5 districts highest Oxygen consumption for per O2 supported patients (Cylinders)	3.3	High use of Oxygen consumption. Audit of Oxygen consumption and training on rational use of Oxygen required.		
	3.2			
	2.8			
	2.7			
	2.4			
Oxygen Production & Lifting				
	Allocation	16-May	15-May	14-May
	120	130.79	121.36	87.75
	80		0	0
	100	107.05	108.39	111.50
	40		0	0
	80	77.66	76.49	41.14
	125	125	125	125
	0		45.5	0
	505	440.50	476.74	365.39
PSA plants functionality (State - 43 & Gol - 1)	SMS Hosp, Jaipur 1		S. Madhopur facility is not functional while other 2 PSA plants are functional but incharges complaint for flow and purity related issues so experts visit	
	DH Hanumangarh	S. Madhopur		
Date wise projection of Oxygen requirement (Date & Oxygen requirement in MT)	17/05/2021	18/05/2021	19/05/2021	20/05/2021
	667.77	676.84	685.92	694.99
	21/05/2021	22/05/2021	23/05/2021	24/05/2021
	704.06	713.13	722.20	731.28

Sample government letters and documents

Rajasthan Government approval letter



Government of Rajasthan
National Health Mission, Rajasthan
Directorate of Medical, Health and Family Welfare Swasthya Bhawan,
Tilak Marg, Jaipur. Phone No. 0141-2221463, Email ID: Oxyrajasthan@gmail.com

F.86()/Oxy control/2021/070 DATE:- 02/03/22

State lead
PATH, Rajasthan

Subject:- oxygen audit supportive supervision for rational use of oxygen

Ref:- Your letter dated 17th December 2021.


With reference to your proposal, we are accepting your proposal to support in oxygen audit and supportive supervision for rational use of oxygen.

PATH should implement this intervention for 3 months starting from February 2022. All expenses related to the intervention like training of district teams and their travel to facilities for oxygen audit will be borne by PATH as mentioned in the proposal.

List of 14 districts where the intervention must be rolled out is given as annexure.


You are required to submit progress update along with analysis of findings from the audit to the department on monthly basis.

Annexure:- as above.


 (Dr. Jitendra Kumar Soni)
 Mission Director NHM and
 Joint Secretary- MH & FW
 Rajasthan

Copy to:

- PS to Secretary Medical Health and Family Welfare, Rajasthan
- PS to Secretary Medical Education.
- PA to Mission Director, NHM & Special Secretary, MH&FW, Rajasthan
- PA to Director, PH.
- Additional Director, HA/RH.
- CO/IT.
- Guard file.


 Additional Director-HA
 MH&FW, Rajasthan

Training letter

राजस्थान सरकार
राष्ट्रीय स्वास्थ्य मिशन, राजस्थान
चिकित्सा, स्वास्थ्य एवं परिवार कल्याण विभाग, स्वास्थ्य भवन, तिलक मार्ग, राजस्थान,
जयपुर, फोन न. 0141-2221463, Email ID: oxyrajasthan@gmail.com
क्रमांक: ऑक्सीजन कंट्रोल/2022/099 दिनांक: 22/03/2022

संयुक्त निदेशक,
समस्त संभाग, राजस्थान।
मुख्य चिकित्सा एवं स्वास्थ्य अधिकारी।
प्रमुख चिकित्सा एवं स्वास्थ्य अधिकारी।
अजमेर, अलवर, बाड़मेर, भरतपुर, भीलवाड़ा, बीकानेर, झालावाड़, जोधपुर, कोटा, जयपुर द्वितीय,
पाली, राजसमंद, सीकर, उदयपुर, राजस्थान।

विषय :- ऑक्सीजन ऑडिट एवं सपोर्टिव सुपरविजन कार्यक्रम के तहत एक दिवसीय प्रशिक्षण में दिनांक 22 मार्च 2022 को उपस्थिति होने बाबत।

उपरोक्त विषयान्तर्गत लेख है कि कोविड-19 महामारी के संक्रमण को रोकने में ऑक्सीजन एक महत्वपूर्ण घटक साबित हुआ है तथा यह दिन प्रतिदिन OT/ICU एवं भविष्य में होने वाली संभावित महामारियों में भी उपयोगी है। ऑक्सीजन से संबंधित उपकरणों की नियमित ऑडिट एवं ऑडिट समीक्षा द्वारा ऑक्सीजन की सुचारु एवं निर्बाध आपूर्ति बनाये रखते हुए, ऑक्सीजन का सुरक्षित उपयोग सुनिश्चित किया जाना आवश्यक है।

इसे ध्यान में रखते हुए राज्य के 14 जिले ऑडिट के लिए चयनित किए गए हैं। इन जिलों में 4-4 सदस्यों की टीम का गठन किया गया है जिनमें एक एनेस्थेतिस्ट, एक बायोमेडिकल इंजिनियर, एक नर्स और एक PSA ऑपरेटर/टेक्नीशियन है।

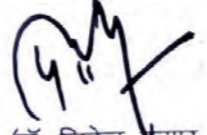
उक्त टीम द्वारा अपने जिले में सप्ताह में एक चिकित्सा संस्थान का ऑक्सीजन से संबंधित उपकरणों की ऑडिट एवं सपोर्टिव सुपरविजन विजिट की जायेगी जिससे कि ऑक्सीजन का सुरक्षित अनुकूलतम उपयोग सुनिश्चित किया जा सके।

इस हेतु PATH संस्था के सहयोग से एक दिवसीय प्रशिक्षण दिनांक 24 मार्च 2022 को प्रातः 9 बजे से होटल लेमन ट्री प्रीमियर, आईनोक्स सिनेमा के पीछे, सिंधी कॉलोनी, बनीपार्क, जयपुर में निश्चित किया गया है। उक्त प्रशिक्षण में सहभागियों का परिवहन (अधिकतम डीलक्स बस/थर्ड एसी ट्रेन का किराया) एवं अन्य लॉजिस्टिक्स का भुगतान PATH के द्वारा वहन किया जायेगा।

अतः आपको निर्देशित किया जाता है कि आपके अधीन मनोनीत सदस्यों को उक्त प्रशिक्षण में उपस्थित होने के लिए पाबंद करें। इस संबंध में किसी भी सूचना/समन्वय हेतु श्रीमती सोनिका शर्मा, पाथ (9929555454) से सम्पर्क कर सकते हैं।

संलग्न -1. प्रतिभागियों की सूची।

2. प्रशिक्षण एजेंडा।


(डॉ. जितेन्द्र कुमार सोनी)
मिशन निदेशक, एनएचएम एवं
संयुक्त सचिव चिकित्सा
स्वास्थ्य एवं प0क0

THE OXYGEN AUDIT IN RAJASTHAN - A PILOT ASSIGNMENT OF GOVERNMENT OF RAJASTHAN AND USAID NISHTHA PARTNER PATH

Key findings

Problems with human resources, trainings

- Due to the challenge of shortage of technicians for operating the PSA plants, it was found that nursing staff at the facility were managing operations of the plant. Need for trained plant technician and training of the staff at the facility for maintenance of the plant was identified.
- Awareness of fire safety measures was not found within the staff handling the oxygen. Fire safety training of all operator and staff should be provided.

Infrastructure challenges

- Equipment like oxygen analyzers for measuring oxygen purity and cylinder transport trolley was needed.
- Display of sign boards and dangerous zone, colour coding of pipeline as per ISO guidelines was required.
- The team also identified the technical issue of oxygen pipeline installation.

Facility visit status

- A total of 117 visits out of 147 expected visits were conducted from 25th March to 30th June 2022. All districts except District #1, District #2 and District #10 completed their assigned number of facility visits.

District	Expected no. of visits	No. of visits done	District	Expected no. of visits	No. of visits done
District #1	15	7	District #8	9	9
District #2	23	7	District #9	12	12
District #3	7	7	District #10	10	4
District #4	9	9	District #11	10	10
District #5	15	15	District #12	6	6
District #6	8	8	District #13	10	10
District #7	5	5	District #14	8	8

Low use of oxygen concentrators

- A total of 2625 oxygen concentrators of 5 LPM were available in these 117 facilities. Out of this only 643 (24%) were found to be in use at the time of visit.
- Similarly 22625 oxygen concentrators of 10 LPM were available and out of this 464 (18%) were in use.

Empty oxygen cylinders

- A total of 4822 D-Type cylinders were available in these facilities and out of these 2042 (42%) were found to be empty at the time of visit.
- A total of 1892 B-Type cylinders were found in these facilities and 693 (36%) were found to empty as per hospital reports.

PSA Plants

- In these 117 visits, 152 PSA plant sites were observed and visited. Of those, 127 plants were found to be commissioned and 25 were non-commissioned. Out of these 127 commissioned plants 107 (84%) were found to be functional and 16% of commissioned plants were found to be non functional at the time of visit.



- Only 4 facilities had LMO tanks available at the time of visits. LMO tanks are to be installed at DH level facilities.
- A total of 92 facilities had fire safety equipment installed in their premises. Out of 117 facilities visited, only 85 PSA sites had fire safety equipment.
- It was found that only 27% facilities had plant operators.
- Less than 30% of facilities had IEC display regarding oxygen ecosystem (OC's, Oxygen Cylinders, MGPS, PSA Plants, Fire safety).

Achievements of the pilot conducted

- Formation of audit team at the district level
- Training of audit team members on oxygen audit and rational use of oxygen.
- Provided handhold support to facility staff on oxygen resource management.
- The trained audit team members can be used to conduct audits in other districts or can even be used as trainers.
- 117 out of planned 147 facilities visited.