

## Journey of Making a Community Health Center in a Hard-to-Reach Kuchai Self Sufficient in Oxygen Management

*This case study is a part of a compendium of case studies that capture the unique experience of the National Stock Exchange (NSE) Foundation as it mobilized the efforts of the Centre for Health and Research innovation (CHRI) through Project CAVACH, a respiratory care coordination project.*

*This case study aims to capture the collaborative efforts of NSE Foundation's Project CAVACH and CHRI to install an oxygen generation plant in one of the most remote and hard-to-reach areas of Kuchai block in Saraikela Kharsawan district of Jharkhand, parts of which are affected by Naxalism and covered with forests and hills. It captures how local the administration and other local stakeholders were roped in to ensure a seamless installation and commissioning of the plant to mitigate challenges posed due to the remoteness of the site. The case study also captures the learnings from such an intervention.*

### **Kuchai: A remote tribal block with limited healthcare facilities**

Kuchai is a community development block in the hilly areas of Saraikela Kharsawan district in Jharkhand. As per the Ministry of Tribal Affairs Annual Report of 2019-2020, the population of the block comprises 64,320 people, of which 78 per cent of the population are scheduled tribes (STs). Besides being a remote area, the block is partly covered by forest and riddled with extremist groups, which poses additional hurdles in connectivity and access to other parts of the country.

All the medical requirements of this population are provided by a 30-bed Community Health Center (CHC) that is based in Kuchai block. This CHC is also a recipient of the KayaKalp Award, which is given to health facilities by the Ministry of Health & Family Welfare, Government of India to those public health facilities that demonstrate high levels of cleanliness, hygiene, and infection control. Apart from the CHC in Kuchai, the closest referral centers for medical emergencies are Sadar Hospital, Saraikela, which is 27 kilometers away, and Sadar Hospital Chaibasa, which is 45 kilometers away.

### **Deluged by the pandemic, an overburdened public health system**

The surge in infections during COVID-19 had an overwhelming impact on the health systems of Saraikela Kharsawan district. Even as a Pressure Swing Adsorption (PSA) oxygen generation plant was sanctioned for installation under the Prime Minister's Citizen Assistance and Relief in Emergency Situations Fund (PM CARES Fund) in the Sadar District Hospital, it was not undertaken during the outbreak. Most of the health facilities in the district were managed using oxygen cylinders and oxygen concentrators. The government hospital in the nearby township of Jamshedpur also lacked self-sufficiency in generating oxygen and managed the crisis using liquid medical oxygen (LMO) and cylinders.

The situation in Kuchai block was far grimmer. The Kuchai CHC, that was recognized for its quality assurance earlier, was not well prepared as there were no designated oxygen beds available with a Medical Gas Pipeline System (MGPS) connection. It was managing a caseload of more than 100 patients affected by COVID-19 with 15 medical oxygen cylinders and just three oxygen concentrators.

For refilling the oxygen cylinders, the staff had to send cylinders from the health facility to nearby township areas of Jamshedpur, which was more than 60 km away. The remoteness of the area, broken roads and Naxalism further exacerbated the challenge. When the medical oxygen availability was severely affected due to lockdown measures, the health staff was compelled to also purchase medical oxygen from outside the formal market system to meet the crisis in the Kuchai CHC.

As the CHC was ill-equipped to handle oxygen management for patients, many of the COVID-19 cases had to be referred to nearby hospitals such as Sadar District Hospital (about 30 Km from Saraikela Kharsawan), Kanti Lal Hospital (a COVID-assigned health facility), Mahatma Gandhi Memorial Medical College and Hospital, and Tata Main Hospital in East Singhbhum.

*“Since the CHC was not equipped to manage the cases that were arriving on a daily basis, we were referring the COVID-19 cases to the nearby health facilities in the neighboring township. This was not an ideal situation, as we feared that referring patients meant them having to travel such long distances, increasing the risk of casualties during transportation.”*

- Nirmal Kumar Das, District Program Manager (DPM),

The crisis worsened further as there were limited government ambulances in Kuchai available for the transportation of the COVID-19 patients to the nearest health facilities. A large number of patients belonged to economically weaker communities and had to shell out huge amounts to hire a private vehicle at an inflated price during the lockdown that had imposed restrictions on mobility. The lockdown had affected the livelihoods of many people, particularly migrants from the state, and these added expenditures towards accessing critical medical care had only added to the burden of many.

*“As we all have witnessed the crisis of COVID-19 and the gaps in medical oxygen, preparing ourselves with better infrastructure and augmentation of oxygen needs is very important to tackle any such emergencies and be better prepared for the future crisis. The support of NSE Foundation’s Project CAVACH in collaboration with CHRI will strengthen our fight against COVID-19 and future preparedness.”*

-Dr. Bijay Kumar, Civil Surgeon, Saraikela Kharsawan

### **Project CAVACH: Fast-tracking provision of critical oxygen care**

CHRI is an affiliate of PATH which was already collaborating with Jharkhand state National Health Mission (NHM) in strengthening the medical oxygen ecosystem in the state. The initiation of NSE Foundation’s project CAVACH, in collaboration of CHRI, enabled the state to fast-track the availability of critical oxygen care in Kuchai. This, in turn, enabled a smooth and timely commissioning and installation of the plant.

*It was the timely partnership with Project CAVACH that enabled us to reach out to hardest-to-reach areas of Jharkhand. We introduced the NHM team to NSE Foundation’s Project CAVACH and requested the CHRI team to simultaneously apprise NHM on the PSA sites requirements of Kuchai, Deoghar and Chakulia.”*

- Jayendra Kasar, Senior Program Officer, PATH

CHRI, in collaboration with CAVACH suggested installing 200 LPM PSA plant. Based on the capacity suggested by the NHM Jharkhand, the NSE Foundation’s Project CAVACH, in collaboration with the CHRI team, provided

the technical and operational support required for the installation of the PSA plant.

*“As a leading partner in the Oxygen/PSA cell, we have relentlessly supported NHM in fast-tracking, commissioning of 38 PM CARES and 30 state-funded and CSR-funded PSA plants till date. The NSE Foundation’s Project CAVACH donation of three plants for augmenting oxygen beds in remote and underserved rural and primary health facilities such as CHC Kuchai and CHC Chakulia will cater to oxygen demand at the primary health care level. It will definitely reduce the time to treat hypoxia cases at the CHC level and thus will reduce the burden on tertiary health care facilities.”*

-Abhijeet Sinha, State Lead, PATH

It also provided coordination support for civil and electrical work for the PSA plant to be commissioned in the facility. The funds for the civil work were provided by the NSE Foundation.

*“Though many CSRs provided support for PSA plants across India, but NSE Foundation’s Project CAVACH grant is unique as it also provided financial support for civil work. For a health facility getting the budgetary grant, approval can be a time taking process. Moreover, the approximate cost for civil work is usually high. Therefore, looking in retrospect of the support, we felt that this kind of model is more beneficial for the health facilities with limited resources.”*

-Kushal Mazumdar, Director of Finance & Operations



PSA plant of 200 LPM commissioned in CHC Kuchai

### **A unique public-private collaboration to augment oxygen supply**

In September 2021, the installation and commissioning of PSA plant in the state received a further boost when the Tribal Affairs Minister, Shri Arjun Munda offered a sum of Rs 25 lakh from the Member of Parliament Local Area Development (MPLAD) fund to undertake civil work in these sites of oxygen generation plants.



Shi Arjun Munda with ex MLAs

This unique partnership also augmented existing resources to overcome challenges of manpower and transport that emerged due to the remote location of Kuchai.

### Training sessions on oxygen ecosystem: building a resilient future

As the technical lead for the provision of medical oxygen in the state, CHRI has been supporting the technical capacity-building initiatives across all facilities in Jharkhand. It has been instrumental in providing a series of virtual capacity building trainings on the oxygen ecosystem, use of oxygen concentrators, rational usage of oxygen in COVID-19, ICU management, PSA operation and maintenance, fire safety for PSA plant, as well as a live demo on resolving challenges related to the functioning of the PSA plant. It has built the capacity of around 1,300 people ranging from civil surgeons, nurses, PSA nodal officials, engineers, and technicians from various districts across Jharkhand, including Kuchai and Chakuli (for strengthening the health delivery system). The capacity-building initiatives enabled a holistic and incisive understanding of oxygen management at the facility level.

*“It was only due to the support of NSE Foundation’s Project CAVACH in collaboration with PATH and CHRI many of healthcare staff got trained on oxygen management in Kuchai CHC. Training sessions were crucial as none of our health staff had prior knowledge of using the ventilator or MGPS pipeline etc.”*

-Nirmal Kumar Das, District Program Manager, Saraikela Kharsawan district.

### Lessons learnt

- **Reducing the burden on the tertiary facilities:** Strengthening oxygen capacity (infrastructure, skills to manage oxygen devices and deliver oxygen), at the sub-district facilities reduces the burden on tertiary facilities.

- **Reaching hard-to-reach areas:** There is a need to strengthen oxygen infrastructure in hard-to-reach areas, identifying sub-district facilities that cater to marginalized communities. Corporate Social Responsibility (CSR) funds have the potential to strengthening such facilities.
- **Public-private partnership:** Legislative funds such as MPLADS can be utilized for rapid response and/or augmenting existing resources. District health officials should explore these options.
- **Support is needed for civil works in addition to procurement and installation of oxygen systems:** The NSE Foundation’s Project CAVACH model of installing the PSA plant with support for civil work was appreciated by the district officials and health staff in all three locations as it reduced the time taken for budgetary approvals, procurement and also meant less expenditure by the health facilities.
- **Capacity building of the staff and plant operators after the installation is critical:** For sustained oxygen support to any state, it will also be important to go beyond only installing a PSA plant and focus on strengthening the various stakeholders in the oxygen ecosystem through training and capacity building initiatives.

### Way Forward

The COVID-19 pandemic has highlighted the need for ensuring better preparedness in the management of oxygen supplies. NSE Foundation’s Project CAVACH has offered crucial support in ensuring that health facilities with limited critical care in Jharkhand became self-sufficient in oxygen management, particular in remotely located districts. Depending merely on oxygen concentrators and cylinders is not a sustainable approach for any health facility. The PSA plant ensured that health facilities, such as the CHC in Kuchai, is able to manage patients in need of critical oxygen care and reduce the burden on the tertiary health facilities.

### References

1. Amitabh Srivastava, What’s behind the rising Covid wave in Jharkhand. India Today; 2021 May 12; Available from: <https://www.indiatoday.in/india-today-insight/story/what-s-behind-the-rising-covid-wave-in-jharkhand-1801861-2021-05-12>.
2. News Deck, Arjun Munda lays the foundation for oxygen generation plants at CHC Kuchai. Avenue Mail; 2021, September 12; Available from <https://avenuemail.in/arjun-munda-lays-foundation-for-oxygen-generation-plant-at-chc-kuchai/>

### **About NSE Foundation's Project CAVACH**

Project CAVACH is an initiative of the National Stock Exchange (NSE) Foundation, which was implemented by mobilizing the efforts of the Centre for Health and Research innovation (CHRI), an affiliate of PATH. Launched on 15th July 2021, Project CAVACH (COVID-19 and Vaccination Awareness Campaign for Health) aimed at strengthening systems related to the access of oxygen and the supply of other essential equipment in hospitals in remote regions.

NSE Foundation facilitated the establishment of five pressure swing adsorption (PSA) oxygen generation plants with capacities ranging from 250 LPM to 1000 LPM in Jharkhand and Maharashtra, where CHRI was engaged to provide on-ground support in procuring, installing and commissioning of these plants. In addition to this, the project supported the provision of small oxygen delivery equipment to 18 facilities in Rajasthan, Tamil Nadu, Assam, Maharashtra, Delhi, Jammu & Kashmir, and Nagaland.



PATH is a global nonprofit dedicated to achieving health equity. With more than 40 years of experience forging multisector partnerships, and with expertise in science, economics, technology, advocacy, and dozens of other specialties, PATH develops and scales up innovative solutions to the world's most pressing health challenges.

[path.org](http://path.org)

**Address**

15th Floor, Gopal Das Building  
New Barakhamba Road, Barakhamba  
New Delhi 110001 INDIA

**Date Published**

December 2021