

# COVID-19: Oxygen runs low in Maharashtra hospitals due to lack of infrastructure

CHAHAT RANA

23 September 2020

A medical worker stands next to an oxygen cylinder on 15 September 2020. ADNAN ABIDI/REUTERS

---

**COVID-19**



---

(/covid-19)

On 12 September, Dr Amit Thadhani, the medical director of Niramaya Hospitals in Panvel, spent 16 hours trying to find oxygen. Thadhani runs the 55-bed hospital that is now a COVID-19 facility and needs 70 oxygen cylinders a day for his patients. Thadhani had placed orders with various oxygen dealers to meet this requirement. By that afternoon, he received only 20 cylinders against one order for 50 cylinders. By the evening, he started to look for other hospitals where he could move his patients. “By the end of the day, after making many calls and making my staff run around town, we were able to source our daily requirement of oxygen, but by then we had already shifted two of our most critical patients to another facility,” Thadhani said.

Many medical facilities, especially smaller hospitals and nursing homes, repeatedly ran out of oxygen since late August, as the number of oxygen-requiring COVID-19 cases rose in Maharashtra. Oxygen manufacturers told me that demand for medical oxygen more than doubled since the epidemic started spreading. Oxygen dealers said there is a crippling lack of supply-chain infrastructure, which can result in oxygen not reaching hospitals.

Maharashtra had the highest burden of COVID-19 in India by mid-September, with close to three lakh (<https://www.covid19india.org/>) active cases. It also had the second-highest case-fatality ratio—the number of deaths as a proportion of the number of people reported infected. The pattern observed through this pandemic has been that most deaths occur after severe respiratory distress.

In the second week of September, 40 of the 55 beds in Thadhani's hospital were occupied. The doctor could not admit any new patients because he was unsure about whether he would be able to source enough oxygen if they needed it. "Thirty of my patients need oxygen, out of which six are on some form of non-invasive ventilation and constantly require high flow oxygen," Thadhani explained. The doctor spent at least 12 hours every day on the phone asking for oxygen. "I have to keep making calls and seeking different vendors and dealers every day, because no single vendor has enough to supply the 70 cylinders I require," he said. The hospital had needed not more than ten cylinders per day before the epidemic hit Panvel, when Thadhani hardly spared a thought for oxygen supply. "But now every day is a struggle," he said. "There is a moment every day where I feel like I have run out of options, and that is terrifying."

More than 170 kilometres from Panvel, Dr Sanjay Dhurjad, the director of Sudarshan Hospital in Nashik, went through the same daily ritual. He spent hours on phone calls trying to secure oxygen for his patients. "One day, my team went around the city for more than 24 hours, looking for oxygen cylinders, trying to source them from anywhere they could," Dhurjad said. Late one night, his staff found a tempo stocked with ten oxygen cylinders and no driver or caretaker in sight. Desperate to procure oxygen, they took the cylinders back to the hospital. The next day they returned to the spot where the tempo had been parked to find the people it belonged to and pay them. "I know how it sounds but it is now a matter of life and death," Dhurjad said. "This is just what we had to do to get by that night." He said that he raised the issue with the

district collector, the commissioner of the municipal corporation, the local MLA, the representative MP, and officials of the health department and state food and drug administration. They assured him that the supply chain would be restored by the end of September. “But until then, the same stressful cycle continues,” Dhurjad added.

Advertisement

The mode of supply of medical oxygen to a hospital depends on its size and location. Large manufacturers of medical oxygen—such as Inox Air Products Private Limited, Linde India Limited, Praxair and Vinayak Air Products Private Limited—primarily produce liquid oxygen. They supply this liquid oxygen directly to large government and corporate hospitals that have installed oxygen tanks. Compressors turn liquid oxygen to compressed gas, which is circulated through hospitals through designated pipelines. Large manufacturers also supply oxygen to dealers who compress oxygen gas into cylinders and deliver these to smaller hospitals and nursing homes. Such dealers supply most hospitals in tier-2 and tier-3 cities in India. Small-scale manufacturers also supply oxygen in cylinders directly to hospitals or dealers. Dealers, and often hospitals, refill empty cylinders at refilling stations.

Maharashtra faces an acute oxygen crisis but hospitals across India are also dealing with shortages. On 30 August, Assam’s health minister, Hemanta Biswa Sarma, said in a press conference that he is apprehending oxygen shortages in the state as COVID-19 continues to spread at an alarming rate. On 13 September,

(<https://thekashmirwalla.com/2020/09/in-jammu-gmch-suffers-from-acute-shortage-of-oxygen-as-covid-19-cases-rise/>) local news organisations in Jammu reported

(<https://www.dailyexcelsior.com/shortage-of-oxygen-creates-panic-in-gmch/>) oxygen shortages in the region’s Government Medical College.

On 14 September, the Punjab government reached out

(<https://www.ndtv.com/india-news/coronavirus-punjab-asks-neighbouring-states-to-increase-supply-of-liquid-oxygen-2294855>) to

neighboring states to help with supplies of liquid oxygen for fear that its hospitals would run out by the end of the month. Meanwhile, the union health secretary, Rajesh Bhushan, said that “at the national level, there is absolutely no shortage of medical oxygen” while answering questions at a press conference on 15 September.

In Maharashtra and in many parts of the country, the steep rise in cases led hospitals to admit only patients whose oxygen saturation levels were at critical levels. Thadhani and other doctors in Maharashtra who run COVID-19 hospitals told me that until July, less than ten percent of their patients required oxygen support. Now more than 90 percent require some form of oxygen therapy. Dr Sameer Chandratre, the head of the Indian Medical Association in Nashik, feared that if the state government did not take immediate steps to ramp up oxygen production and streamline the supply chain, hospitals would completely run out of oxygen by the end of the month. “Nashik has already exploded with cases,” he said. “I don’t know what is in store for our city in the next few weeks.”

As per data collated by the Maharashtra government, on 12 September hospitals across the state had a daily demand of 809.22 tonnes oxygen, while manufacturers and refillers supplied only 765.85 tonnes per day. COVID-19 hospitals across the state had a limited balance stock of 389.16 tonnes—less than half of the day’s requirement.

Advertisement

Representatives across the medical-oxygen industry said that myriad issues plague the sector. Some have been induced by the pandemic, others are old hurdles that the pandemic has made more difficult to overcome. The first of these problems is the sudden upsurge in demand since the outbreak in March. “I would estimate that the demand has more than doubled,” the sales head of a multinational company, who did not want to be identified, said. “While the market size for medical oxygen

on an average day was 900 to 1,000 tonnes in India”—before the pandemic—“it is now at least 2,500 tonnes per day now.”

Deepak Baheti is an oxygen supplier for government hospitals in Aurangabad. The district administration also employs him to act as an oxygen-supply mediator to make sure that crucial elements of the supply chain, such as infrastructure and transportation are robust. He said that the monopoly of large, private players over liquid oxygen is partly responsible for the disruption of the oxygen supply chain in India. “Unless liquid oxygen suppliers step up to meet demand, there is nothing much we can do to amp up production,” he said. “They are the ones in control of most of the production.”

However, according to the sales head of the multinational company, India has the production capacity. “We have the capacity to produce 8,000 tonnes of oxygen per day,” he said. “Our company alone is now producing almost a 1,000 tonnes.” He pointed to the second, and possibly bigger problem, which is a weak supply chain. “Ensuring that oxygen reaches all patients requires a certain degree of infrastructure, not only in bigger cities but across small towns and villages. You need tankers, cylinders, oxygen pipelines in hospitals and we simply don’t have enough infrastructure to carry this oxygen to all cities.”

A small manufacturer and supplier of oxygen in Nashik agreed that lack of infrastructure was the biggest obstacle. “Oxygen is not really the problem for me, it is the lack of cylinders,” the director of the company, who also spoke on condition of anonymity, said. “When I manufacture oxygen for hospitals, I deliver more steel in the form of cylinders rather than the oxygen content itself, and hence those cylinders are a big investment I have to make in order to increase production.” According to him, cylinder manufacturing has not caught up with the scale at which medical oxygen is being produced. Oxygen cylinders can be recycled and hospitals often get them refilled. But with the demand for oxygen increasing every day, hospitals have been searching for extra cylinders to

refill as well. The small manufacturer in Nashik is reluctant to invest in cylinders that may be superfluous after the epidemic ends in India. “I have to think practically before I make a large investment by buying such cylinders, because three to four months down the line, when the pandemic subsides, what will be my return on these investments?” he said.

Small-scale dealers and refillers said that only multinational companies can make large investments to streamline oxygen supply at this moment. “We are already working at full capacity, trying to meet all demands but we simply do not get enough oxygen from the liquid-oxygen manufacturers,” Amin Dhamani, the director of a small dealership called Nagpur Gases, said. “There are now more than 35 dedicated COVID-19 hospitals in Nagpur. If five more such hospitals come up in the future, there will be no oxygen available to run them,” he said. Patients have approached dealers like Dhamani directly for oxygen cylinders after failing to find hospital beds with oxygen supply. Some have even asked for ventilators. “At least five people today asked me if I can place a whole ventilation set up at their home, because every hospital in Nagpur has refused to admit them,” Dhamani said.

Advertisement

The sales head said that even as liquid-oxygen production increased, manufacturers have not been able to supply it to dealers because the dealers do not have enough compressors to convert larger quantities into gas. Doctors such as Thadhani resorted to buying their own compressors as a backup for oxygen cylinders. “We have rented two such machines ourselves and that is another cost we had to bear due to a shortage of oxygen cylinders,” Thadhani said.

The director of the oxygen-manufacturing company pointed to another factor that went against local dealers—most leading manufacturers have contracts with big hospitals where they have installed liquid-oxygen tanks. “So of course they prioritise their commitments to the hospitals

than to the dealers, who they really don't have commitment towards," he said. "As a result, dealers are not getting enough oxygen to supply to the hospitals with whom they in turn have a contract with."

A third cause of oxygen-supply disruption is the reaction by states themselves. The national lockdown and various state-level lockdowns brought down production capacity earlier in the year. The lockdowns eased but normal oxygen-supply routes were not restored as each state tried to keep as much oxygen as it could within its borders. "States like Maharashtra are not letting our tankers move across state borders to deliver to hospitals in Gujarat," the sales head said. In response to reports that state governments were disrupting interstate oxygen transportation, the health ministry issued a statement on 11 September urging all "states/UTs to ensure that no restriction is imposed on movement of Medical oxygen between states."

A fourth problem is a hike in the cost of oxygen cylinders as reported by doctors across Maharashtra. Chandratre, the president of the IMA's Nashik chapter, claimed that a jumbo oxygen cylinder with a capacity of about seven thousand litres, or about seven tonnes, used to cost Rs 150 per cylinder, and now costs Rs 500. Thadhani said he paid between Rs 400 and Rs 650 for a similar cylinder. This price rise occurred even though the National Pharmaceutical Pricing Authority fixed the price of inhaled medical oxygen, which is considered an essential drug and commodity, at Rs 17.49 (<http://www.nppaindia.nic.in/wp-content/uploads/2020/07/1-856.pdf>) per cubic metre—1,000 litres. This translates to about Rs 122 for 7,000 litres.

On 18 September, the NPPA wrote to the drug controllers of all states and unions territories about news reports of "shortage, black marketing and hoarding" of medical oxygen. In its letter, the NPPA directed states to "ensure a strict vigil on the situation" and take action under the Drugs and Cosmetics Acts as well as the Essential Commodities Act to prevent black marketing and hoarding.

According to Ayush Prasad, the CEO of the Pune zilla parishad, who also heads a committee working to ensure oxygen supply for patients, said that these costs have risen due to additional investments in infrastructure and transport. “The cost of oxygen is regulated as an essential commodity, but there are many overhead charges now which might be spiking up the costs.” Baheti said that if the government regulated prices of large manufacturers better, then suppliers and dealers lower down the hierarchy will be able to bear the costs of investing in additional infrastructure, thereby decreasing the cost at which cylinders are sold to hospitals, doctors and patients.

A fifth problem is an overall reluctance to invest in the medical oxygen-supply chain. This is because, until the COVID-19 outbreak, oxygen suppliers were sending the bulk (<https://economictimes.indiatimes.com/industry/healthcare/biotech/pharmaceutical-companies-can-make-medical-oxygen/articleshow/75171714.cms?from=mdr>) of their product to industries and not to medical facilities. Since March, however, the Maharashtra government has redirected most of the oxygen manufactured to hospitals. Maharashtra’s chief minister, Uddhav Thackeray, said ([https://www.business-standard.com/article/current-affairs/covid-19-hospitals-to-get-80-oxygen-cylinders-says-uddhav-thackeray-120091100317\\_1.html](https://www.business-standard.com/article/current-affairs/covid-19-hospitals-to-get-80-oxygen-cylinders-says-uddhav-thackeray-120091100317_1.html)) that the state would reserve 80 percent of its oxygen for medical use, while inaugurating a COVID-19 facility in Navi Mumbai on 11 September.

“Industries have already taken a hit due to the lockdown, with labourers going back home and manufacturing stalled, so it was easy to redirect oxygen supply towards medical use,” Prasad said. However, manufacturers and dealers have incurred high costs while making that change. “The same amount of infrastructure, which would have allowed us to transport 100 cylinders to one company or business for industrial use, is now used to transport ten cylinders to one hospital,” Dhamani said. Another problem for him was that he supplied to COVID-19



hospitals dispersed across the city, as compared to an industrial facility where he could send a bulk order. This raised transportation costs.

“Our business has indeed taken a hit because we are no longer supplying oxygen to industries,” Vikas Pratihast, the sales manager for Tripti Gases—a small dealer that supplies oxygen cylinders to hospitals across Mumbai and Navi Mumbai—said. “The need of the hour is medical oxygen, and so most of our production is for medical use, but costs have increased because we have to invest in infrastructure and transport much more.

Advertisement

Prasad acknowledged that Maharashtra lacked access to large resources of oxygen, but insisted that many measures have been taken by the government to ensure that the supply chain remains uninterrupted in the future. “Apart from redirecting oxygen for medical use, we are constantly in touch with large manufacturers across India and distributors,” he said. “We have mapped out the whole supply chain as well as the demand and our suppliers have ensured us that these demands will be met in the future.”

He also claimed that despite the shortage in oxygen supply, each patient currently hospitalised has constant access to oxygen. “Not a single bed is without the oxygen supply stipulated for it. There were times when we were close to it, but the crisis was always averted and the situation is only going to improve,” he said hopefully. “I can assure this, if not of the whole of Maharashtra, then at least Pune and its surrounding districts in western Maharashtra.”

Not everyone shared Prasad’s optimism. “How can we admit more patients when we are already working at full capacity?” Chandratre of the IMA asked. He said that his colleagues across the state were struggling to treat existing patients. “This war will now be fought with oxygen, and

unless the government intervenes to maintain the supply chain, I don't know how long we can go on like this.”

*This reporting was supported by a grant from the Thakur Family Foundation. Thakur Family Foundation has not exercised any editorial control over the contents of this reportage.*

---

**CHAHAT RANA (/AUTHOR/37386)** is a reporting fellow at *The Caravan*.

---

KEYWORDS:

### COMMENT

You are logged in as [Haripriya K M](#)

SUBMIT

## MORE FROM THE CARAVAN

---

POLITICS

LABOUR

HEALTH

**COMMENTARY**

**Why India needs transparency about the health of Amit**

BHARAT BHUSHAN

---

HEALTH

**NEWS**

**From Delhi to Bihar and back: The relentless cycle of**

AKHILESH PANDEY

---

HEALTH

**NEWS**

**UP adds ivermectin to its COVID-19 protocols without evidence that**

CHAHAT RANA

---

HEALTH

**NEWS**

**Villages in Punjab boycott COVID-19 tests and hospital**

JATINDER KAUR TUR

---

**COMMENTARY**

**How India exploits health workers**

KARUNA DIETRICH WIELENGA

---

**NEWS**

**Collateral damage of COVID-19: People whose cancer, TB and**

AKHILESH PANDEY

---

---

[About Us](#)

[Masthead](#)

[Careers](#)

[Contact Us](#)

[Submit to Us](#)

[Syndication](#)

[Subscribe](#)

[Advertising](#)

[Privacy Policy](#)

[Terms and Conditions](#)