



संगणक विज्ञान एवं अभियांत्रिकी विभाग
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IIT Bombay

To
Shri Rajesh Tope,
Hon. Health Minister
Government of Maharashtra,
Mantralaya, Mumbai 400032

23rd July, 2021

Dear Sir

This is concerning a report which appeared in *Loksatta* newspaper on 17th July, 2021 that (i) there were no deaths due to shortage of oxygen in the state, and that (ii) your department has submitted an affidavit on the same to the Mumbai High Court. It was also claimed that the deaths in Mulund and Nasik were due to accidents and not due to a shortage of oxygen.

This is to offer a few points for you to consider.

1. What exactly can be termed as death due to oxygen shortage or to establish a condition of shortage? Have such guidelines been formulated and issued by Govt. of Maharashtra or Government of India? Please provide a copy.
2. There can be two approaches here:

A. A death is a clinical matter. If a patient has died of a condition where oxygen would have been useful, and if it was not available at his/her bedside, for whatever reasons, then this death should be termed as death due to shortage of oxygen. This can be ascertained by (i) clinical cause of death as registered by the doctor and verified by a relative, (ii) record of unavailability of oxygen to the location of the patient.

Note that the claim of oxygen availability by an institution on a time and date needs verification.

B. Oxygen shortage is a "bulk" problem of inadequacy of supply to meet demand within a district or a city. For a shortage to be established, there need to be metrics for measuring supply and demand in the same terms, e.g., Metric Tonnes of LMO per day (MT/day). The supply side can be easily computed by the record of the MT/day supplied and the storage facilities in various institutions or households.

On the other hand, the clinical demand can be established by (i) noting the number of patients on any given day, and their severity profiles, and (ii) converting this into demand in terms of MT/day.

3. **Norms.** Are there any norms published by the Government of India or Government of Maharashtra on the LMO requirement based on the number of patients and the severity profile? Are there any guidelines on recording total hospital occupancy?
4. Can the Government of Maharashtra elaborate on the approach being followed in making the assertion that there were no deaths due to shortage of oxygen. Please provide a copy.
5. **Case of 2a.** If the approach was 2a above, then the 22 deaths in Nasik on 21st April, 2021, were certainly deaths due to the shortage of oxygen. The correct steps to check if more deaths have happened would be to (i) check the registered cause of death, (ii) check if the concerned institution has an oxygen supply facility, (iii) whether supply to that ward or bed was operational on the day of death, and (iv) record the statement of the relative of the deceased. In the interest of time, this may be done on a sample of cases selected appropriately.
6. **Case of 2b.** This raises two questions. Is there daily data at the city or district level on the number of cases needing oxygen? Please note that there have been many situations where beds in government hospitals were not available, private hospitals were out of reach, and patients were forced to administer oxygen at home.
7. Was such a supply-demand analysis done to establish that there were no shortages? Please provide such a supply-demand scenario for Nasik city and Ahmednagar district, for the period 15th April to 30th May, 2021 as an example.
8. Is there an analysis of Covid-positive deaths which have happened outside designated Covid institutions. How much is this number relative to institutional deaths?

I would also like a copy of the affidavit filed by your department in the High Court.

I must add that as an academician paid by public taxes, I consider it my duty to offer my services to improve the lives of our common people.

Let me know if I can help in any other way.

Regards,



Milind Sohoni
Professor.