

# SUPPORT ON OXYGEN CONCENTRATORS

## Background

Data suggests that although the majority of people with COVID-19 have a mild illness (40%) or moderate illness (40%); about 15% of them have a severe illness requiring oxygen therapy, and 5% are critically ill requiring intensive care treatment. WHO recommends supplemental oxygen therapy immediately for patients with respiratory distress, hypoxemia, or shock. In the mild and moderate stages of the disease, medical oxygen supportive measures (facemask oxygen) will be useful. Medical Oxygen contains at least 82% pure oxygen, free from any contamination and generated by an oil-free compressor. Oxygen therapy or supplemental oxygen is the provision of medical oxygen as a healthcare intervention.



An oxygen concentrator is a self-contained, electrically powered medical device designed to concentrate oxygen from ambient air. It uses PSA technology to draw in air from the environment, removing the nitrogen to produce 90% concentrated oxygen. These machines are easily portable and can be moved in between clinical areas. It is a single concentrator that can service several beds with the use of a flowmeter stand to split output flow. Even after COVID-19, these machines can be used for treating asthma patients, surgeries, COPDs, or for post-operation support. In the long term, these concentrators are a one-time investment for the rural primary healthcare centers and community health centers.



## Need and Deployment:

When ACF reached out to public health departments in its core districts, most authorities were seeking help in owning oxygen concentrators as the best option to support critically ill patients. There were major challenges observed at health centers like a limited number of cylinders and logistics issues in the interior parts of the districts.

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ACF then carried out a rapid need assessment for each location to assess the distance of COVID-19 centers, isolation centers, and nearest block or district facilities where the critical patients were treated. Looking at addressing the challenges faced at these centers, ACF analyzed the number of beds, average cases required for oxygen therapy, the availability of oxygen cylinders and requirements, and also other resources like medical instruments, PPE kits, etc. It was then decided to provide concentrators as a routine supply which could reduce the dependency at the district level for refilling oxygen cylinders and most of the patients won't require referrals.

Sr.	Location	Cylinders	Concentrators	Provided At
1	Chandrapur-MH	5	3	Rajula, Jivati, Gadchandur
2	Darlaghat-HP	0	3	Bakhla Covid center & Civil
3	Nalagarh-HP	0	3	Isolation center
4	Roorkee-UK	0	2	Bhagwanpur center & Civil hospital
5	Ropar-PJ	0	1	Ropar isolation
6	Raigarh-CH	0	2	CHC and PHC
	<b>6 locations</b>	<b>5</b>	<b>14</b>	

All these concentrators were provided in September 2020 to respective locations and are being used continuously.

## COVID-19 scenario

### A. ACF Locations

According to a recent survey conducted by ACF, a comparison of the COVID-19 scenario was made between ACF villages and the district.

ACF villages COVID-19 data: (updated as of 25<sup>th</sup> April 2021 for 1900 villages at 22 locations)

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Geography	Locations	Districts	Villages	Population	COVID-19 cases	Active %	Recovered %	Deceased
<b>ACF</b>	22	23	2632	34.4 lakh	3266	27.4%	70.1%	2.5%
<b>District</b>	22	23	23740	3.04 cr	747027	22.2%	76.6%	1.2%

The active cases in ACF villages and districts were at only 10% in the earlier month of this year 2021. However, it has started to increase drastically. This month has recorded a 27.4% in active cases and a 2.5% in fatality; this also indicates the need for COVID-19 care and support in terms of beds and oxygen supply.

## B. Oxygen Therapy (Concentrators) data

Location	Active cases till April at COVID-19 center	Cases received oxygen therapy	Mortality reported (March 20 to April 21)
Chandrapur	715	187	8
Darlaghat	102	74	0
Raigarh	1171	130	0
Ropar	6922	59	1
Roorkee	5624	210	27
Nalagarh	362	95	2
<b>Total</b>	<b>14,896</b>	<b>755</b>	<b>38</b>

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A total of 14896 people have been treated with COVID-19 at the centres where our oxygen concentrators were provided. 755 people have received oxygen therapy in the last 8 months.

**An average of 94** beneficiaries were provided with oxygen therapy per month from September 2020 to April 2021.

## Chandrapur

- Chandrapur is one of the districts in Maharashtra where ACF reaches out to a large number of villages (644) as ACF works with farmer groups through the Better Cotton Initiative project
- 639 cases were identified so far in ACF villages (active-66%, recovered-22%, death-12%)
- 437,877 cases in the entire district. (Active-24%, recovered-74%, death-2%)
- 187 COVID-19 patients received oxygen therapy from ACF. The Mortality of 8 patients was reported

## Roorkee:

- ACF has 2 locations in Roorkee reaching out to 35 villages in the Haridwar District of Uttarakhand
- 215 cases were identified so far in the villages (active-17%, recovered-80%, death-2%)
- 27,229 cases identified in the entire district. (Active-38%, recovered-61%, death-1%)
- In the present scenario, COVID-19 patients are increasing for which the hospital has oxygen availability. 210 people have received oxygen therapy so far

## Nalagarh

- Nalagarh is in Solan district, Himachal Pradesh where ACF reaches out to 12 villages
- 34 cases were identified so far in the villages (active-6%, recovered-88%, death-6%)
- 11,354 cases in Solan district (active-21%, recovered-78%, and death-1%)
- Nalagarh is highly prone to the virus in the current scenario and COVID-19 care centers in Katha and Bakhalag are going to be operationalized due to the increase in numbers of COVID-19 positive cases. 95 patients received oxygen therapy

## Darlaghat

- Darlaghat is in Solan district, Himachal Pradesh where ACF reaches out to 12 villages
- 163 cases were identified so far in the villages (active-26%, recovered-74%, death-1%)
- 11,354 cases in Solan district (active-21%, recovered-78%, and death-1%)
- COVID-19 positive cases are on a surge since the last week of March 2021. Most of the cases started increasing due to overcrowding during the vaccination drive. 74 patients were treated with oxygen therapy

## Raigarh

- At Raigarh, Chhattisgarh, ACF has a presence in 6 villages
- 23 cases identified so far in ACF villages (active-30%, recovered-66%, death-4%)
- 37,147 cases in the entire district. (Active-22%, recovered-77%, death-1%)
- There was a rise in cases after the Holi festival. Due to the unavailability of facilities at the Community health centres (CHC), patients were referred to the district COVID-19 centres. Tamnar CHC caters to large villages and has seen 130 patients receive oxygen therapy

## Ropar

- Ropar is in Rupnagar, Punjab where ACF reaches out to 37 villages
- 72 cases were identified so far in ACF villages (active-38%, recovered-51%, death-11%)
- 7562 cases in Rupnagar district (active-14%, recovered-61%, and death-4%)
- 59 cases received oxygen therapy

## C. Changes in COVID-19 situation after concentrators support

**Chandrapur:** As reported by the Medical superintendent at Rural Hospital Gadchandur, they have used oxygen concentrators for the respiratory problem cases but haven't used for COVID-19 cases regularly. It was used as per need-based and only for 25 cases in a month. Oxygen resources were mobilized for COVID-19 care center at Rajura which was centrally placed and found very useful in COVID-19 and COPD cases as well.

**Roorkee:** The concentrators are very useful for treating COVID-19 cases. Before the concentrators were provided, the team had to refer the cases to other private hospitals. These concentrators have helped in saving money for oxygen cylinder refilling & transportation.

**Nalagarh & Darlaghat:** The scenario changed after receiving the oxygen concentrators as it proved to be an additional support for the respiratory patients as well as to control the COVID-19 situation. It helped as an advanced treatment to restore the breathing speed before admitting to the ICU center. Most of the referrals were made to Chandigarh which is quite a long distance so the concentrators turned out to be very useful.

**Raigarh:** After receiving the concentrators the scenario changed as people started to rely on the hospitals due to better facilities. People residing in remote areas benefited and received quality treatment. Oxygen was provided to only those patients who were in critical condition or were unable to arrange transportation for district hospitals.

**Ropar:** Ambuja donated 1 oxygen concentrator to the community healthcare centre in Bharatgarh. Now in this area, there are three COVID-19 isolation centers and so far oxygen supply is sufficient. The government also provided oxygen concentrators to CHC Bhartgarh after receiving Ambuja 's concentrators. As per the health officials, these concentrators are more beneficial than the cylinder and are easy to operate.

## **D. Benefits of the Concentrators (logistics, refiling, cost, and referral management)**

**Chandrapur:** ACF had provided two Oxygen concentrators at a dedicated COVID-19 healthcare center, Rajura & one at Rural Hospital Gadchandur. Recently, there has been a daily admission of 35 high-risk cases with oxygen saturation falling at a very low level. This center covers Korpana, Rajura, Jiwati, and Gondpipari blocks, the district hospital Chandrapur is already full, so all cases are mobilized to this center. The concentrators have helped the medical staff with supporting such a large number of cases. This is an advantage of the concentrator where cylinders are used as a backup.

**Roorkee:** Provision of Concentrators proved to be a cost-saving benefit as compared to oxygen cylinder refilling & transportation.

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**Ropar:** As per the health officials of Ropar, the concentrator is more beneficial than the cylinder and easy to operate. After receiving the concentrator from ACF, instead of providing new cylinders, the local government procured 2 new concentrators for COVID-19 centers with a total of 3 concentrators in service.

## E. Feedbacks from Doctor/MO In charge

**Chandrapur:** Dr. Kulmethe, medical superintendent at the dedicated COVID-19 healthcare Center said the concentrators were very useful for him. Every day 35 to 40 positive cases are received with an oxygen saturation rate of 40-45. At such crucial times, oxygen is required and hence, two oxygen concentrators are provided by ACF which were used by the hospital. There is a requirement for more oxygen concentrators



**Roorkee:** Sri Ramkesh Gupta Hospital Manager, Civil Hospital, Roorkee said that in the past they were in shortage of oxygen but after receiving oxygen concentrations from Ambuja Cement Foundation, they are able to not only treat COVID-19 cases but also those seeking oxygen treatment.

**Bhagwanpur:** Dr. Sirohi, In charge of Community Health Centre Bhagwanpur said that the oxygen concentrators will not only help them with COVID-19 cases but also treating patients suffering from Asthma and pregnant women.

**Nalagarh:** Dr. Rupesh Kumar, MO In charge said that the Oxygen concentrators are very useful at COVID-19 care center at Katha and a requirement of 5 more to be installed at the other primary centers is requested.

**Darlaghat:** Dr. Radha Sharma, BMO Civil Hospital Arki said that the concentrators are very useful in terms of respiratory support to the patients. These Oxygen concentrators helped those suffering from COVID-19 and respiratory complications. There is also a request for ACF to support more as there is a rise in COVID-19 cases and have been rising on a daily basis. By the end of April,

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COVID-19 care center is to be operated at Bhakalag and there is a requirement of at least 5 more such oxygen concentrators.

**Raigarh:** Dr. D. S. Paikra, MO Incharge said that the Oxygen concentrators provided by ACF are very helpful for COVID-19 care center at Tamnar. There is a plan to start a new COVID-19 center and have requested ACF to provide 5 more oxygen concentrators to the new COVID-19 center and other primary centers.

**Ropar:** Dr. Bhupinder Singh SMO Bharatgarh said that the concentrator is helpful because the refilling issue of oxygen cylinders is only done at the government hospital which loses time and cost. Thus the concentrator is a very good option to replace the cylinder and easy to use and is preferred in all government hospitals.

## F. COVID-19 scenario in ACF villages across locations

There was a drop in active cases in the initial months in 2021 with a downward trend. Sudden increase in March 2021 shows 211 cases and 28 deceased in ACF villages. Which changed 896 active cases with 82 deaths recorded in villages by April. Unfortunately, the number of deceased has increased almost 3 times with 82.



## G. Requirement for concentrators

All the healthcare facilities have seen a high increase in cases and support is required in various ways. The recent mapping with regard to the need for oxygen concentrators is compiled in the table below:

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ACF Locations	Concentrators Requirement	Total requirement
<b>State</b>	<b>Locations</b>	<b>ACF</b>
<b>Maharashtra</b>	Chandrapur, jivati, rajura, korpana, hingna, Nagpur, bhadrawati, warora, brahmpuri	78
<b>Gujarat</b>	Amreli, Junagadh, Gir Somnath, Gandhinagar, Morbi	45
<b>Rajasthan</b>	Rabriyawas, Mundwa, Chirawa	17
<b>Chattisgarh</b>	Bhatapara, Tamnar, Ambikapur	110
<b>West Bengal</b>	Farakka, Sankrial	51
<b>Punjab</b>	Bhatinda, Rajpura, Hanumnagarh, Ropar	19
<b>Uttarakhand</b>	Roorkee Haridwar, Bhagwanpur	15
<b>Himachal Pradesh</b>	Darlaghat, Nalagarh	16
<b>Uttar Pradesh</b>	Dadri, Agra, Mathura, Lucknow	8
<b>MP</b>	Chhindwara	5
<b>AP</b>	Nadikudi	16
<b>Orissa</b>	Durg	25
<b>Updated on 6<sup>th</sup> May'21</b>		<b>405</b>