

Current major event

COVID-19 strategies to overcome oxygen shortage in the Eastern Mediterranean Region

Medical oxygen is an essential treatment for a wide range of diseases, but it is often overlooked in health system planning because of complex infrastructure requirements, perceptions about cost and poor understanding of its health impact. Almost half of all hospitals in low- and middle-income countries have either an entire lack, or an inconsistent supply of medical oxygen. COVID-19 has made this pre-existing challenge even harder to overcome.

Editorial note

The COVID-19 pandemic has highlighted the role of medical oxygen as a lifesaving therapy for patients with severe and critical disease. The estimated daily oxygen requirement of severe and critical COVID-19 patients in some large countries during surge may reach higher than 1 million cubic meters of oxygen per day. Countries of all sizes may be unequipped to meet that level of demand. WHO recognizes the urgent need for a global effort to scale up the availability, accessibility and affordability of quality medical oxygen, and is working with Member States to accelerate oxygen scale-up activities.

There are three main configurations for the production of medical oxygen, with each option needing to be examined while considering access and distribution constraints:

- **Bedside concentrator** are portable, electrically-powered medical devices designed to concentrate oxygen from ambient air, using pressure swing absorption (PSA) technology.
- **PSA plants** generate oxygen using PSA technology (similar to concentrators) that can be located on-site at medical facilities.
- **Liquid oxygen plants** are large facilities that produce liquid oxygen in bulk and store the oxygen in tanks.

The medical oxygen requirements of a country, region or facility can be forecasted using tools such as the WHO COVID-19 Essential Supplies Forecasting Tool (ESFT). The ESFT can be used to forecast the necessary volumes of medical supplies, biomedical equipment and medical oxygen for supportive care and treatment of patients with COVID-19.

The WHO Regional Office has been assisting countries to develop sustainable oxygen supplies. One prominent example is Somalia, where some of its public hospitals lacked adequate medical oxygen supply before the pandemic began. This situation was exacerbated by COVID-19, with increased needs particularly in remote and rural facilities. To help overcome this challenge, WHO worked hand in hand with the Ministry of Health and other partners to procure medical oxygen in multiple configurations. There was investment in the procurement of PSA plants that were placed at health care facilities. This included the provision of innovative solar-powered oxygen concentrators across the country along with biomedical technical

Fig.1: Available methods for oxygen production



WHO ESFT projected oxygen needs during surge (SIR epidemiological model, medium attack rate)

Countries/areas	Estimated oxygen need per day (m3/day)
1. Afghanistan	173 325
2. Bahrain	32 833
3. Djibouti	13 056
4. Egypt	1 535 956
5. Iran	1 203 176
6. Iraq	557 575
7. Jordan	137 148
8. Kuwait	83 204
9. Lebanon	167 520
10. Libya	236 545
11. Morocco	380 273
12. Oman	79 666
13. Pakistan	1 165 839
14. Qatar	32 388
15. Saudi Arabia	906 061
16. Somalia	121 939
17. Sudan	275 594
18. Syrian Arab Republic	199 488
19. Tunisia	255 303
20. UAE	113 852
21. occupied Palestinian territory	59 562
22. Yemen	66 593

support. Oxygen cylinders and other oxygen accessories were also procured. In settings such as Somalia, a reliable and uninterrupted medical oxygen supply will be lifesaving for many people.

WHO recommends that Member States prioritize and invest in the availability, accessibility and affordability of quality medical oxygen at health care facilities to save lives.

Update on outbreaks

in the Eastern Mediterranean Region

COVID-19 in 22 EMR countries

Current public health events of concern [cumulative N° of cases (deaths), CFR %]

Coronavirus disease 2019 (COVID-19): 2019-2021

Afghanistan	[155 763 (7243), 4.7%]
Bahrain	[276 030 (1391), 0.5%]
Djibouti	[13 383 (179), 1.3%]
Egypt	[317 585 (17 926), 5.6%]
Iran (Islamic Republic of)	[5 773 419 (123 786), 2.1%]
Iraq	[2 033 737 (22 738), 1.1%]
Jordan	[840 117 (10 865), 1.3%]
Kuwait	[412 297 (2456), 0.6%]
Lebanon	[633 355 (8419), 1.3%]
Libya	[349 990 (4883), 1.4%]
Morocco	[941 863 (14 537), 1.5%]
occupied Palestinian territory (oPt)	[447 882 (4576), 1%]
Oman	[304 044 (4104), 1.3%]
Pakistan	[1 264 384 (28 269), 2.2%]
Qatar	[237 867 (608), 0.3%]
Saudi Arabia	[547 890 (8760), 1.6%]
Somalia	[210 269 (1180), 5.5%]
Sudan	[39 839 (2979), 7.5%]
Syrian Arab Republic	[38 705 (2391), 6.2%]
Tunisia	[710 906 (25 098), 3.5%]
United Arab Emirates	[738 487 (2118), 0.3%]
Yemen	[9512 (1802), 18.9%]