MEETING TARGETS AND MAINTAINING EPIDEMIC CONTROL (EPIC) PROJECT

COOPERATIVE AGREEMENT NO. 7200AA19CA00002

Assessing the Medical Oxygen Ecosystem: Tools from National to Primary Health Care Levels

A COMPILATION OF RESOURCES

MARCH 2022

USAID FROM THE AMERICAN PEOPLE

EpiC Meeting Targets and Maintaining Epidemic Control

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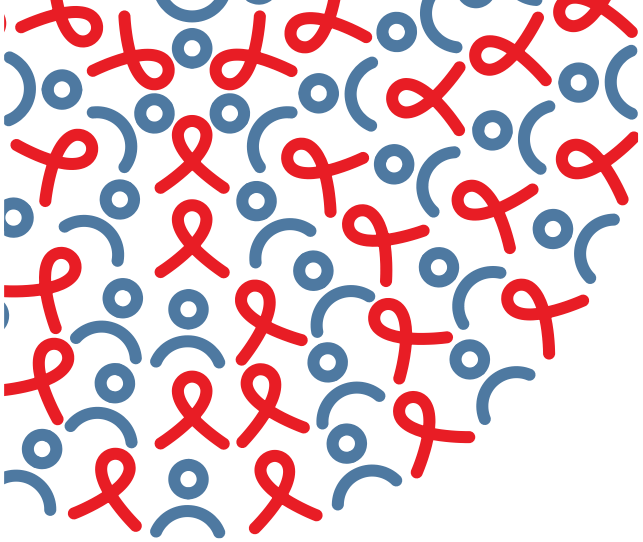
Introduction and How to Use This Resource

The global community has coalesced around the availability and effective delivery of medical oxygen in response to the COVID pandemic. Visions of patients and health care providers facing a limited supply of oxygen have motivated action to better understand the oxygen ecosystem and improve infrastructure and knowledge about medical oxygen supply, demand, and delivery. Many integrated factors allow medical oxygen to be safely and effectively delivered to the right patient at the right time. These factors range from engineering requirements and solutions to health care worker training in both knowledge and skills building. A comprehensive approach to better understand the existing systems and invest in capacity building will create sustainable outcomes for all patients requiring medical oxygen including, but not limited to, those infected with COVID-19.

This collection of tools is a resource to support meaningful assessments and better target effective interventions for those who are building the oxygen ecosystem. A key element of this work is partnership across sectors and groups to optimize opportunities for collaboration, and a recognition that oxygen by itself does not save lives, without knowledge and additional capacity. The tools collected here can be used individually for specific areas or together, as the first section focuses on liquid oxygen at the national level, then an assessment at the hospital level and, finally, the primary care level. By improving the understanding of the gaps and resources related to medical oxygen supply and effective delivery, the goal is for more patients to receive the treatment they need.



Section 1.
Liquid Oxygen Assessment Tools: USAID Mission Survey and National Stakeholders

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The two tools in this section—focused on liquid oxygen (LOX)—are designed to understand the LOX situation at the national level, and identify opportunities to expand supply and delivery. Assessment Tool A is designed to collect information for USAID to understand: (1) current donor investments in medical oxygen (specifically LOX); (2) contact information on key focal people within the government and donors; and (3) documents collected by the Mission pertaining to the LOX system. Assessment Tool B is designed to determine: (1) LOX infrastructure within the health care system and oxygen supply gaps at the country level, (2) governments commitment for investments in LOX, (3) availability of LOX suppliers in-country or in the region, and (4) complementarity to other LOX assistance activities.

These tools will be most useful to groups working to better understand the capacity for and landscape of liquid oxygen at the national level. A major focus is partnership within this sector, recognizing the importance of working together across organizations in this time of collective urgent response. Regulatory systems are also of high importance considering the urgency of building capacity but recognizing the risk of doing so without careful regulation.

Liquid Oxygen (LOX) Systems: Assessment Tool A – USAID Mission Survey

Assessment Tool A	
Target respondents	USAID Mission staff responsible for overseeing support for COVID-19, particularly for medical oxygen, if such a focal person(s) exists.
Duration to complete	1 week
Purpose	To collect information for USAID to understand: (1) current donor investments in medical oxygen (specifically LOX); (2) contact information on key focal people within the government and donors; and (3) documents collected by the Mission pertaining to these issues.
Key definitions	**Liquid oxygen (LOX)** is highly concentrated oxygen that is stored in a bulk tank, usually weighing over 55 kg (120 lbs.). Bulk liquid oxygen is generated off site, stored in a large tank, and supplied throughout a health facility pipeline system. Tanks require refilling by a liquid oxygen supplier. **Liquid oxygen system** is a system comprised of adequate infrastructure to deliver oxygen in a systematic manner. It includes liquid oxygen manufacturing, costing, supply, regulation, delivery logistics, distribution, a refill management system, other related infrastructure (tanks, piping), and training.

No.	Section I: General information				
GI1	**Country**		**Date/s**		
GI2	**Person(s) Completing the Tool (EpiC Staff or Consultants)**				
	Name	**Title**	**Organization**	**Phone**[1]	**Email**
GI3	**Person(s) Interviewed (USAID Mission staff)**				
	Name	**Title**	**Organization**	**Phone**	**Email**

[1] For phone numbers, include international code.

No.	Section 2: USAID and US Government support (E)	
US1	**Has USAID provided in the past, or does USAID currently provide, any support to improve access to medical oxygen, including liquid oxygen, in this country?**	❑ Yes ❑ No *If No or Don't know, skip to US5.*
US2	**Which option(s) best describe(s) past and/or current USAID support for improving access to medical oxygen, including liquid oxygen? If other, please explain.** *Check all that apply.*	❑ Donation of PSA/VSA[2] plants ❑ Financial support for the procurement of medical oxygen ❑ Support for oxygen storage equipment (cylinders, tanks, etc.) ❑ Support for transport of medical oxygen ❑ Support for basic infrastructure (e.g., hospital piping) ❑ Support for procurement of consumables for oxygen delivery to patients ❑ Concentrators ❑ Clinical training on medical oxygen ❑ Non-clinical training (maintenance, installation) ❑ Other _____
US3	**Where did/does USAID provide support to improve access to liquid oxygen?**	❑

Province	District	Facility Name

US4	Please provide points of contact (POC) of Implementing Partner (IPs) working with USAID on improving access to medical oxygen, including liquid oxygen, in country.				
	Name of the IP/Organization	**POC name**	**Title**	**Phone**	**Email**

[2] Pressure Swing Adsorption (PSA) and Vacuum Swing Adsorption (VSA) plants are alternatives to cryogenic plants that produce LOX

No.	Section 3: Additional information (E)			
US5	**Please provide information on various donors or non-USAID partners involved in providing support to improve access to liquid oxygen and PSA plants. Specify type of support they provide(d).**			
	Name of the Donor or International Partner	**Type of Work It Supports**	**Name/Email**	

US6	**Are any other USG agencies supporting access to medical oxygen, including liquid oxygen?** ***If yes, please name.***	**Name of the US Agency**	**POC's name**	**Email and Phone**

US7	**Can you share any in-country documents, tools, or resources related to medical oxygen, including liquid oxygen? Or can you direct us to where we can access these?** ***Please list and say where they can be accessed.*** *Note: this includes any documents that are developed in the country and or adapted from international sources (WHO, UN, etc.) for LOX in the country. You will use these documents to complete Tool B.*	**Name of the Document/Tool**	**Where Can We Access It (e.g., Website, POC)**

US8	**Can you direct us to which individual(s) in the government (MOH, Ministry of Industry, or other government agency) is/are working on medical oxygen, including liquid oxygen supply, import, and distribution?** *We will interview government and other partners to learn about government's commitment, assess the medical oxygen gap, and identify opportunities to expand access to liquid oxygen. Please name the agencies, contact persons, etc.*	**Name of the Ministry/ Department**	**POC's Name**	**Email and Phone**

US9	**Is there any other information you would like to share that may be useful for this assessment? (e.g., names and contact information of other donors or international organizations supporting medical oxygen ecosystem). *Please list.***	**Name of the US Agency**	**POC's Name**	**Email and Phone**
		Other information:		

Thank you for your time and for the information shared.

Liquid Oxygen (LOX) Systems: Assessment Tool B – National Stakeholders

Assessment Tool B	
Target respondents	**Key respondents:** Staff from government institutions, regulatory bodies, the industry, committees, and various other government stakeholders dealing with medical oxygen **Complementary respondents**: International organizations (e.g., WHO, UNICEF, CHAI, PATH, USAID implementing partners, others involved) and domestic organizations, major oxygen supplier in the country
Duration to complete	2 weeks
Purpose	To determine: (1) LOX infrastructure within the health care system and oxygen supply gaps at the country level, (2) government commitment for investments in liquid oxygen (LOX), (3) availability of LOX suppliers in-country or in the region, and (4) complementarity to other LOX assistance activities.
Key definitions	**Liquid oxygen (LOX)** is highly concentrated oxygen that is stored in a bulk tank, usually weighing over 55 kg (120 lbs.). Bulk liquid oxygen is generated off site, stored in a large tank, and supplied throughout a health facility pipeline system. Tanks require refilling by a liquid oxygen supplier. **Liquid oxygen system** is a system comprised of adequate infrastructure to deliver oxygen in a systematic manner. It includes liquid oxygen manufacturing, costing, supply, regulation, delivery logistics, distribution, a refill management system, other related infrastructure (tanks, piping), and training.

No.	Section I: General Information					
GI1	**Country:**					
GI2	**Person(s) Completing the Tool:**					
	Name	**Organization**	**Title**	**Email**	**Date**	
GI3	**Person(s) Interviewed:**					
	Name	**Organization**	**Title**	**Email**	**Phone**	**Date**

Respondent: Ministry of Health, Ministry of Industry, or other appropriate official

No.	Section 2: National Policy, Regulatory System, and Budget on Medical-Use Oxygen	
PU1	**Is there a national policy or standard on medical-use oxygen?** *Note: This implies policy/standard on source, distribution, safety, and use of medical oxygen and does not imply clinical guideline*	❑ Yes ❑ No ❑ Don't know *If No or Don't know, skip to PU3.*
PU2	**If there is a national policy or standard on medical-use oxygen, does it include the use of liquid oxygen?**	❑ Yes *If yes, provide the title and the site of the document*_____ ❑ No ❑ Don't know
PU3	**Is there a national technical working group on medical-use oxygen?** *If yes, please share contact details (email, phone).*	❑ Yes Email _____ Phone _____ ❑ No ❑ Don't know
PU4	**Are there any regulatory systems (agencies and processes) in place that govern various aspects of liquid oxygen (e.g., safety, transportation, storage, use, etc.)?** *Note: May be an agency similar to the U.S. Food and Drug Administration*	❑ Yes ❑ No ❑ Don't know *If No or Don't know, skip to PU6.*
PU5	**What are the regulatory systems (agencies and processes), and what are their specific roles in governing liquid oxygen?**	**Name of Agency** | **Agency's Role in Governing Liquid Oxygen** | **Agency Point of Contact (Name and Email)** | | | | | | | | | | | | | | |
PU6	**Is there an annual budget allocated for all forms of medical oxygen? Please check if the budget is distributed among central level, public health facilities, private health facilities, and/or private sector production.**	❑ Yes (*If yes, check all that apply)* ❑ Central level ❑ Public health facilities ❑ Private health facilities ❑ Private sector production ❑ No ❑ Don't know

PU7	**Has the government purchased or received a donation of liquid medical oxygen in the past 24 months?**	❑ Yes (*If yes, check all that apply)* ❑ Donation ❑ Central government purchase ❑ Facilities purchase oxygen themselves ❑ Other mode of purchase ❑ No ❑ Don't know *If No or Don't know, skip to PU9.*
PU8	**If medical oxygen is purchased, what does the cost include?** *Check all that apply.*	❑ Transportation ❑ Distribution ❑ Maintenance ❑ Other (specify)_____ ❑ No other services - just oxygen ❑ Not applicable

No.	Section 3: Information on Medical Oxygen Users and Infrastructure			
PU9	**Please provide the name and location of the health facilities currently using liquid medical oxygen (have a liquid oxygen tank available), along with the number of beds per facility.** *Note: you can provide this information also as an Annex*	**Name**	**Location (Province, District)**	**# of Piped Beds or Beds with Access to LOX**
PU10	**What is the number of health facilities that do not have a tank but have infrastructure to use liquid oxygen if it were available?** *Note: Health facilities that have following infrastructure: piping, tubing, and fittings in the facility suitable for oxygen service and for the pressures and temperatures involved.*	Number of health facilities_____		
PU11	**Please provide the name, location, and number of beds of these health facilities that have infrastructure to use liquid oxygen in the next 12 months.**	**Name**	**Location**	**# of beds**
PU12	**Are there any biomedical or mechanical engineers trained in managing medical oxygen infrastructure in-country? If so, how many are there? Estimate if you don't know exactly.**	☐ Yes: How many? _____ ☐ No ☐ Don't know		

No.	Section 4: Liquid Medical Oxygen Local Manufacturers	
PI1	**Are there any domestic liquid medical oxygen suppliers/manufacturers?**	☐ Yes ☐ No ☐ Don't know *If No or Don't know, skip to PI5.*
PI2	**What are the sources of liquid medical oxygen available domestically?** *Check all that apply.*	☐ Medical oxygen locally produced (This can also cover suppliers who may primarily provide industrial oxygen but are able to maintain the appropriate chain of custody for medical supply.) ☐ Compressed into cylinders at liquid-to-gas filling stations ☐ Liquid tanks (holding bulk liquid) and a vaporizer that can be immediately piped to bedside where piping is available. ☐ Other (Please specify): _____
PI3	**Are there local suppliers who manufacture, manage, or distribute other oxygen-related commodities (e.g., cylinders, PSA plants, patient delivery interfaces)? If so, who are they and what are their lines of business and capacities?** *Note: Count both facilities that will have infrastructure in the next 12 months, and those that already have infrastructure and are expected to use LOX in the next 12 months.*	**Supplier's Name** | **Supplier's Line of Business** | **Contact Info:** (Email and/or Phone) | | | | | | | | | | | |
PI4	**Who are the domestic industrial gas producers (includes liquid and non-liquid producers) in your country?** *Indicate their liquid medical oxygen production capacity if you know.*	**Name** | **Plant Type** | **Production Capacity** (Metric Ton/Hour) | | | | | | | | | | | |
PI5	**Are you aware of distributors who are importing oxygen internationally and then distributing domestically?**	☐ **Yes: Name of the Distribution Company** | **Contact Information** (Email and/or Phone) | | | | | | ☐ No ☐ Don't know

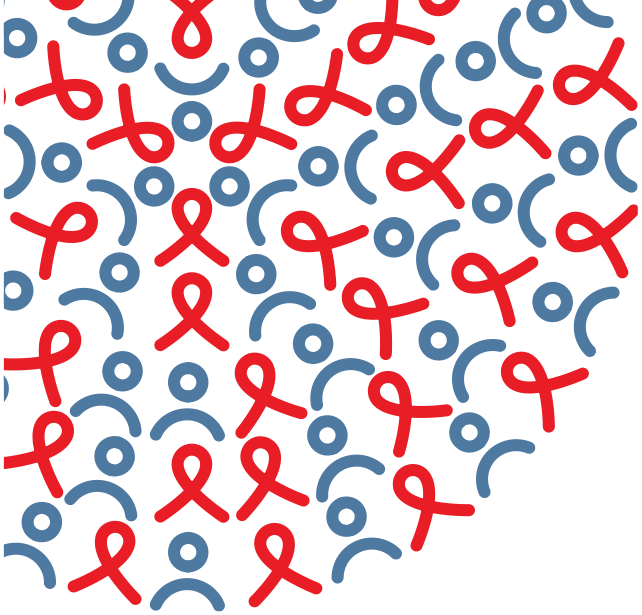
PI6	**What is the most prevalent source of oxygen for most of the health facilities currently in the country?** *Check all that apply and provide notes if there is a variation between national and subnational level facilities.*	☐ LOX ☐ On-site PSA plant ☐ Concentrators ☐ Cylinders Comments: _____
No.	**Section 5: Liquid Medical Oxygen Importation**	
PI7	**Does your country import liquid medical oxygen?**	☐ Yes ☐ No *If No, skip to SD1.*
PI8	**Which government agency governs the import of liquid oxygen from other countries?**	**Agency Name** | **Point of Contact** | **Email** | | | | | |
PI9	**What is the estimated total amount of liquid medical oxygen imported during the past 12 months?**	Amount in Metric Tons _____
PI10	**Which countries are you importing liquid medical oxygen from? Of these countries, from which do you receive the largest amount of imported liquid medical oxygen?** *List the countries with the largest amount first.*	Country 1: _____ Country 2: _____ Country 3: _____ Country 4: _____
PI11	**What are the names of major liquid medical oxygen producers/suppliers that you are importing from? Can you please share the contact information?** *List all producers/suppliers.*	**Name** | **Contact Information** (Phone, Email) | **Imported by Land or by Sea?** | | | | | | | | | | | |
PI12	**Have the companies you have been using to import liquid medical oxygen been able to allocate liquid oxygen within 2–4 weeks when the Ministry of Health or individual facilities have requested LOX?**	☐ Yes ☐ No ☐ Don't know
PI13	**What is the typical turnaround time between a request and having the liquid medical oxygen available in country?**	Number of weeks_____
PI14	**Which steps are subject to delays?** *Check all that apply.*	☐ Production ☐ Transport to border ☐ Customs ☐ Transport to central store/facilities

No.	Section 6: Liquid Medical Oxygen Storage and Distribution Capacity	
SD1	**What is the estimated total storage capacity of the Ministry of Health for liquid medical oxygen?** *Note: If another entity (may be private) is storing LOX for health facilities, state the name of the agency. If data are not immediately available, ask them to estimate.*	**Name of Agency** | **Capacity in Metric Tons** | **Cumulative Storage Capacity of All Hospitals** ☐ Don't know
SD2	**How many cryogenic tank containers are available in-country for transporting liquid medical oxygen?** *Note: Cryogenic (ISO) tanks are storage containers used for storing liquid medical oxygen at a very low temperature. Estimate if necessary.*	Number of ISO tank containers _____ ☐ Don't know *If Don't know, skip to SD5.*
SD3	**How many cryogenic tanks are owned by the Ministry of Health or another responsible government entity?** *Estimate if necessary.*	Number owned _____
SD4	**How many cryogenic tanks are rented by the Ministry of Health from a nongovernment source?** *Estimate if necessary.*	Number rented _____
SD5	**Does shortages of trucks or tanks limit the use of liquid medical oxygen in-country?**	☐ Yes (please explain): _____ _____ _____ ☐ No ☐ Don't know
SD6	**Does quality of the roads and/or ports affect the use of liquid medical oxygen in-country?** *Note: Road networks are important for overland transport of liquid oxygen between plants, storage tanks, and facilities. Seaports are important for overseas transport of liquid medical oxygen from other countries.*	☐ Yes (please explain): _____ _____ _____ ☐ No ☐ Don't know

No.	Section 7: Interest of the Government in Liquid Medical Oxygen System Capacity, Gaps, and Complementarity to Other Oxygen Assistance Activities	
SC1	**Is the Ministry of Health or other government agency interested in setting up or expanding their use of liquid medical oxygen?**	☐ Yes ☐ No ☐ Don't know Explain: _____ *If No or Don't know, skip to SC3.*
SC2	**How is the Ministry of Health or other government agency demonstrating its commitment to setting up or expanding its use of liquid medical oxygen?** *Check all that apply.*	☐ Increased Government Budget ☐ Supporting Domestic Suppliers ☐ Other: _____
SC3	**Has your country faced any shortages of medical oxygen in the past 24 months?** *If yes, please explain how long the country experienced a shortage. How many facilities were affected? What were the reasons?*	☐ Yes ☐ No ☐ Don't know If yes, please explain: _____ _____
SC4	**Has there been any increase in the price of medical oxygen in the past year? If yes, what was the start price and what was the end price?** *Please provide an estimated average or range.*	☒ Yes *If yes, what was the average start price?* _____ *What was the average end price?* _____ ☐ No ☐ Don't know
SC5	**What are the challenges faced by the Ministry of Health or other government agencies in setting up and maintaining a national liquid medical oxygen supply and distribution system?** *Please provide details for checked responses in the space below.*	☐ No liquid oxygen manufacturing ☐ Unsustainable supply ☐ Poor transport infrastructure to deliver ☐ Inadequate distribution to hospitals ☐ High cost to patient ☐ Inadequate refill management system by liquid oxygen supplier ☐ Poor or no infrastructure (bulk storage tanks, bedside piping outlets, ambient air vaporizer, backup cylinder supply) ☐ Safety concerns (risk of gas leakage from piping system) ☐ Lack of clinical and biomedical training Additional details for selected responses: _____

<table>
<tr><td>SC6</td><td>What support would be needed for the country to increase access, use, and maintenance of liquid medical oxygen?</td><td>Explain: _____
_____</td></tr>
<tr><td>SC7</td><td>Is the Ministry of Health receiving any assistance from donors, development banks, or international organizations to strengthen the medical oxygen ecosystem, especially liquid oxygen? If yes, please list the donors and describe the focus of their support.</td><td><table><tr><th>Assisting Organization's Name</th><th>Type of Support</th></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr></table></td></tr>
<tr><td>SC8</td><td>Are there any additional challenges or considerations related to strengthening access and use of liquid medical oxygen that you would like to share?</td><td>Explain: _____
_____</td></tr>
</table>

Thank you for your time and for the information shared.



Section 2.
Oxygen and COVID-19 Response Rapid Assessment Tool: Hospital Facilities

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Oxygen and COVID-19 Response Rapid Assessment Tool: Hospital Facilities

This tool, designed for hospital facility administrators to conduct a targeted yet thorough assessment of multiple facility-level components of COVID-19 preparedness, inquires about basic information related to COVID-19 clinical care with a focus on medical oxygen infrastructure and service delivery. Intended to be complementary rather than duplicative of other assessment tools, it incorporates some additional components (i.e., human resources) that impact clinical service delivery. The goal is to identify potential areas for investment and support in the face of the ongoing COVID-19 pandemic, recognizing the likelihood of recurrent surges, the shifting focus on appropriate—often decentralized—care for noncritically ill patients, and the need for resilient and sustainable health systems.

The historical time frames ask about the status of these indicators today, with some indicators asking about averages or numbers in the last four weeks, or the last six months. Some questions ask about indicators at the time of a facility's last "surge."

** "Surge" is defined as the day with the highest number of patient encounters or the last highest hospital census day (may be within period of days or weeks) directly related to a local surge of COVID-19 cases *within the last six months.* Please indicate the most recent "surge" and use that day or time frame to answer other questions about surge indicators.**

Finally, this tool is modular. The first five sections are required, with an appendix of optional sections. Users are encouraged to choose sections relevant to their own needs and customize adaptation for maximal impact.

Section 1: DEMOGRAPHICS (required)			
1.1	Name of the hospital		
1.2	Address (include district and region)		
1.3	Level of hospital		
1.4	Type of hospital:	❑ Private hospital ❑ Public (government hospital)	❑ Nongovernmental (NGO) ❑ Other _____
1.5	Is your facility designated as a COVID-19 referral facility?	❑ Yes ❑ No ❑ Don't know	
1.6	When was the last surge of COVID-19 at your facility? (DD/MM/YY) ** *See definition above; use this timepoint to answer future questions that inquire about "surge"*	_____/_____/_____ DD / MM /YY	
1.7	Catchment area population:		
1.8	If this assessment is completed by interview: - Name, title, and length of employment of interviewee		
1.9	- Name, title, organization of the interviewer		
1.10	If self-assessment, who completed self-assessment? - Name, title, length of employment		

Section 2: GENERAL FACILITY INFORMATION (required) **Completed by (name, title):**		
2.1	Total number of functional adult hospital beds	
2.2	Total number of functional adult beds with piped oxygen (wall-access)	
2.3	Total number of functional beds assigned for COVID-19 patients	
2.4	Total number of functional designated intensive care (ICU) beds	❑ None ❑ <5 ❑ 5-20 ❑ 21-50 ❑ > 50 (specify: _____)
2.5	Number of ICU beds currently allocated for COVID-19 patients	This week: _____ Week of last surge: _____
2.6	In the last six months, approximately how many critically ill patients (not with COVID-19) have not been able to be admitted to an ICU bed due to full units?	❑ 0-10 ❑ 11-50 ❑ 51-100 ❑ >100
The following section inquires about the average daily patient census within the last seven days, and the week of highest "surge" as defined in Question 1.6. These questions are asking about all patients, not only those presenting for suspected or confirmed COVID-19 care.		
2.7	Estimated emergency/casualty patients per day	Last 7 days: _____ Week of last surge: _____
2.8	Estimated outpatient department patients per day	Last 7 days: _____ Week of last surge: _____
2.11	Total # hospital patients admitted per day	Last 7 days: _____ Week of last surge: _____
2.12	Unplanned/new admissions	Last 7 days: _____ Week of last surge: _____
2.13	Planned surgeries/admissions	Last 7 days: _____ Week of last surge: _____
2.14	How many COVID-19 patients are admitted per day?	Last 7 days: _____ Week of last surge: _____

2.15	What is the average length of stay (in days) for patients admitted for management of COVID-19?				
2.16	How far away is the nearest facility (in km) providing comparable levels of COVID-19 clinical care?				
2.17	During the last surge, did you run out of hospital beds for admitted COVID-19 patients?	❑ Yes	❑ No	❑ Don't know	
2.18	In the last six months, what happened to a patient who needed admission for COVID-19 care but there were no available beds for admission? ❑ Patients were held/boarded in a separate area until a bed became available ❑ Patients were directed to the nearest health facility with available beds ❑ Patients were transported to another health facility with available beds ❑ Patients were turned away ❑ Other_____				
2.19	Approximately what percentage of admitted COVID-19 patients never require supplemental oxygen, or only require supplemental oxygen for a few hours during their length of admission?	**None**	**1-25% (some)**	**26-75% (many)**	**>75% (most)**
2.20	Approximately what percentage of admitted COVID-19 patients require no more than 5L oxygen/min at any point in their admission?	**None**	**1-25% (some)**	**26-75% (many)**	**>75% (most)**
2.21	Approximately what percentage of admitted COVID-19 patients require more than 5L oxygen/min at any point in their admission (do not include patients who require invasive ventilation)?	**None**	**1-25% (some)**	**26-75% (many)**	**>75% (most)**
2.22	Do you have PCR COVID-19 testing laboratory in the hospital? If NO, how far is the nearest (in km) PCR testing laboratory?	❑ Yes ❑ No; distance _____ (km)			
2.23	What is the PCR turnaround time (for patients tested in hospital)?	❑ <24 hours	❑ 24-72 hours	❑ >72 hours	
2.24	Do you have rapid COVID-19 antigen diagnostic testing (RDT) available at your facility?	❑ Yes	❑ No	❑ Don't know	
	a. If YES, what departments utilize RDTs?	❑ Triage area ❑ Outpatient department ❑ Emergency department ❑ Wards/inpatient ❑ Others: _____			
2.25	Is there a designated triage station or separate screening tent at the facility entrance to identify patients with signs or symptoms of COVID-19?	❑ Yes	❑ No	❑ Unknown	
2.25	Is there a designated area for immediate isolation of patients presenting to the hospital with confirmed or suspected COVID-19?	❑ Yes	❑ No	❑ Unknown	
2.26	Does your facility have a triage protocol for confirmed or suspected COVID-19 patients?	❑ Yes	❑ No	❑ Unknown	
2.27	Does your facility have an admissions protocol (clinical criteria to admit confirmed/suspected COVID-19 patients)?	❑ Yes	❑ No	❑ Unknown	
2.28	Does your facility follow a standardized oxygen administration protocol (for COVID-19 and non-COVID-19 patients)?	❑ Yes	❑ No	❑ Unknown	
2.29	If YES, is it from a national guideline?	❑ Yes	❑ No	❑ Unknown	
2.30	If YES to question 2.28, is there a specific protocol for COVID-19 patients?	❑ Yes	❑ No	❑ Unknown	

2.31	Do you have equipment for tele-consultation or telehealth in the hospital? *This is defined as a dedicated set of equipment to virtually connect (audio and/or video) clinical staff with either patients or other clinical staff to render or coordinate care.*	❑ Yes *(If YES, proceed to a, b, c)* ❑ No		
	2.31a: Is this equipment functional?	❑ Yes	❑ No	❑ Unknown
	2.31b: Is this equipment in use?	❑ Yes	❑ No	❑ Unknown
	2.31c: Is it used for COVID-19 care?	❑ Yes	❑ No	❑ Unknown

Section 3A: HUMAN RESOURCES: STAFFING AND RATIOS (required)
This section inquires about ideal conventional staffing ratios, current staffing levels, as well as staffing ratios that occurred during the highest census count ("surge") the facility experienced as defined in Question 1.6

Completed by (name, title):

		Total Number (approx.)	Gender			Conventional Ratio Patient/Provider	Current Ratio Patient/Provider	Surge Ratio Patient/Provider
			M	F	Non-Binary			
3a1	Doctors							
3a2	Nurses							
3a3	Critical care doctors							
3a4	Critical care nurses							
3a5	Non-physician providers							
3a6	Respiratory therapists							
3a7	Anesthesiologists							
3a8	Anesthesia technicians							
3a9	Other clinical support staff							

Section 3B: HUMAN RESOURCES: TRAINING (required)

This section inquires about dedicated training events attended by the health care workforce of this facility within the last six months. This includes in-services, webinars, training from external organizations, etc. You may add or modify cadres to reflect your facility's designation.

Completed by (name, title):

		# Trained in clinical management of mild to moderate COVID-19	# Received training in IPC and PPE in the context of COVID-19	# Received training in clinical management of severe COVID-19 patients	# Received training in appropriate use of medical oxygen
3b1	Doctors				
3b2	Nurses				
3b3	Critical care doctors				
3b4	Critical care nurses				
3b5	Non-physician providers				
3b6	Respiratory therapists				
3b7	Anesthesia doctors				
3b8	Anesthesia technicians				
3b9	Other clinical support staff				

3b10	How many biomedical technicians does your hospital have?				
3b11	How many biomedical technicians does your facility need to meet the demand for repairs and maintenance?				
3b12	How many of the biomedical technicians have had dedicated training on medical oxygen equipment operation and maintenance within the last six months?				
3b13	In the last six months, approximately what percentage of the biomedical technicians have had dedicated training in the following:	**0 (none)**	**<25% (some)**	**26-75% (many)**	**>75% (most)**
	a. Medical oxygen equipment basic installation and operation				
	b. Medical oxygen equipment standard maintenance				
	c. Medical oxygen equipment malfunction diagnostics and repair				

Section 4. MEDICAL OXYGEN AVAILABILITY AND INFRASTRUCTURE (required)
This section aims to assess the supply of oxygen to the facility, delivery of oxygen around the facility, maintenance and repair considerations, and experiences with shortages, disrepair, or other challenges.

Completed by (name, title): _____

4.1	How many functional oxygen cylinders does this facility have?	# 5- to 39-liter cylinders: _____ # 40+ liter cylinders: _____
4.2	How many additional oxygen cylinders does your facility need for COVID-19 patients? *(based on last "surge" as defined in Q1.6)*	# 5- to 39-liter cylinders: _____ # 40 plus-liter cylinders: _____
4.3	How many oxygen concentrators do you have?	
4.4	How many of the oxygen concentrators are currently functional?	
4.5	How many concentrators produce 6-10 Liters oxygen/min?	Total: _____ Functional: _____
4.6	How many concentrators generate 1-5 Liters oxygen/min?	Total: _____ Functional: _____
4.7	How many more concentrators does the hospital need for COVID-19 patients (based on last surge)?	
4.8	Does this facility use a PSA plant?	❑ Yes ❑ No ❑ Unknown
4.9	Is the PSA plant fully functional?	❑ Yes ❑ No ❑ Unknown
4.10	If NO, what is the reason the PSA plant is not functional? ❑ In disrepair ❑ Lack of operations/maintenance staffing ❑ Power supply disruption ❑ Unknown ❑ Other: _____	
4.11	Do you have a resource to procure spare parts for the PSA plant?	❑ Yes, always ❑ Yes, sometimes ❑ No ❑ Unknown
4.12	Does the hospital use liquid oxygen (LOX) supply to a large tank?	❑ Yes ❑ No ❑ Unknown
4.13	What is the capacity of the LOX storage tank (volume)?	
4.14	How much liquid oxygen (LOX) is supplied to hospital per average week via a large storage tank? (volume)?	
4.15	How much liquid oxygen (LOX) is supplied in cylinders in an average week?	**a.** Total volume/week: _____ **b.** # of cylinders: _____ **c.** Size of cylinders: _____
4.16	Have you ever completely run out of oxygen in the last six months?	❑ Yes ❑ No ❑ Unknown
4.17	If YES, how many times in the last 6 months?	
4.18	If YES, please select a reason why you ran out of oxygen: *(Check all that apply)* ❑ Supplier did not have oxygen ❑ Disruption in transportation or delivery of oxygen ❑ Shortage of cylinders ❑ Malfunction of equipment for filling or transporting oxygen cylinders ❑ Malfunction of facility-level equipment (i.e., had oxygen, but could not deliver to patients due to-onsite malfunction) ❑ Unknown ❑ Other: _____	

4.19	On average, how many days before oxygen supply was restored?	
4.20	Does your hospital have functioning oxygen piping system? (pipes from the source to patient bed)	❑ Yes, fully functional ❑ Yes, partially functional ❑ No ❑ Unknown
4.21	What problems do you have with the hospital medical oxygen piping system? *(Select all that apply)* *(You can expand or explain further at the end of this document if needed.)* ❑ National, regional, or supplier shortages of oxygen ❑ National, regional, or supplier shortages of equipment to deliver oxygen to facility ❑ National, regional, or supplier shortages for necessary equipment at your facility ❑ National, regional, or supplier shortages of spare parts for repairs ❑ Lack of trained personnel to install or repair equipment ❑ Unknown ❑ Other_____	
4.22	What is the average monthly cost of your facilities' oxygen system? **a.** If known, average monthly cost of oxygen: **b.** If known, average monthly cost of maintenance and repairs:	_____ _____ _____
4.23	Do you think your oxygen supply/system will be adequate if you have another surge of COVID-19 patients?	❑ Yes ❑ No
4.24	If NO, which best describes your main concern? ❑ We cannot procure oxygen from a supplier ❑ We cannot procure equipment to deliver the oxygen around the facility ❑ We cannot procure the equipment to get the oxygen to patients ❑ We have equipment in disrepair and cannot procure new or spare parts ❑ We have equipment in disrepair, but no technicians trained to service it ❑ We have regular power supply issues interrupting oxygen delivery ❑ Our clinicians are not trained appropriately in use of medical oxygen ❑ Other: _____	
4.25	What is the name of your primary oxygen supplier?	
4.26	Approximately how far is the oxygen supplier from the hospital? (km)	
4.27	How much oxygen does this company produce and supply every month? (cubic meters)	
4.28	What is the cost per cubic meter (estimate)?	
4.29	Who pays for the oxygen?	❑ Hospital/facility ❑ Ministry of Health ❑ Private sector ❑ NGO/grant funding ❑ Other: _____

Section 5. MEDICAL EQUIPMENT, SUPPLIES, AND CONSUMABLES (required)
This section inquires about medical equipment, supplies, and consumables required to safely deliver oxygen directly to patients.

Completed by (name, title): _____

5.1	How many ventilators does your facility have?				
5.2	How many ventilators are currently functional?				
5.3	If any of the ventilators are not functional, why not? ❑ Never functional/never been used ❑ Ventilator in disrepair, reason unknown ❑ Ventilator in disrepair, but no technician to repair ❑ Need spare parts but cannot procure ❑ Accessory issue: dysfunction or lack of accessories ❑ Unknown ❑ Other_____				
5.4	How many ventilators are currently in use at the time of this assessment?	**a.** Total #: _____ **b.** # for COVID-19 patients: _____			
The following questions ask about the availability of equipment in your facility. You can choose what percentage of time these items are available or answer "never, sometimes, most of the time, almost always." *(Mark with an X.)*		**Never**	**Sometimes (25-50%)**	**Most of the time (50-75%)**	**Almost always (>75%)**
5.5	What percentage of time is a pulse oximeter available for COVID-19 patients?				
5.6	What percentage of time is the appropriate patient circuit (tubing) available for COVID-19 patients requiring medical oxygen?				
5.7	What percentage of time is a basic nasal cannula available for COVID-19 patients requiring supplemental oxygen therapy?				
5.8	What percentage of time high-flow nasal cannula is available for COVID-19 patients who require high-flow medical oxygen?				
5.9	What percentage of time an oxygen delivery mask is available for a COVID-19 patient requiring medical oxygen?				
5.10	What percentage of time a multiparametric patient monitor is available for COVID-19 patients?				
5.11	What percentage of time are oxygen flowmeters available for COVID-19 patients?				
5.12	How many functional flowmeters does your facility currently have?				
5.13	Have you ever needed more flowmeters in the past six months?	❑ If Yes, specify how many: _____	❑ No	❑ Unknown	
5.14	How many oxygen pressure regulators (used for cylinders) do you have?				
5.15	Have you ever needed more pressure regulators in the past six months?	❑ If Yes, specify how many: _____	❑ No	❑ Unknown	
5.16	Do you have uninterrupted electricity to the hospital?	❑ Yes	❑ No	❑ Unknown	
5.17	If NO, what is the average frequency of interruption per month?				
5.18	What is the average length (in hours) of a typical interruption of electricity?				

5.19	Do you have a functioning back-up generator? **a.** If YES, how many hours can your generator support your facility's electricity needs?	❑ Yes **a.** _____		❑ No	❑ Unknown
5.20	How frequently, or what percentage of time is the following personal protective equipment (PPE) available for health facility staff in the last 4 weeks?	**Never, or very rarely**	**Sometimes (25-50%)**	**Most of the time (51-76%)**	**Almost always (>75%)**
	N95 respirator mask				
	Surgical mask				
	Face shield				
	Gown				
	Gloves				
	Overall				
	Water and soap				
	Hand sanitizer				
5.21	Do you have enough PPE to consistently protect all health care workers in the event of another surge of COVID-19? *(Use your highest surge census day as a benchmark)*	❑ Yes ❑ No. Please explain if desired: _____			

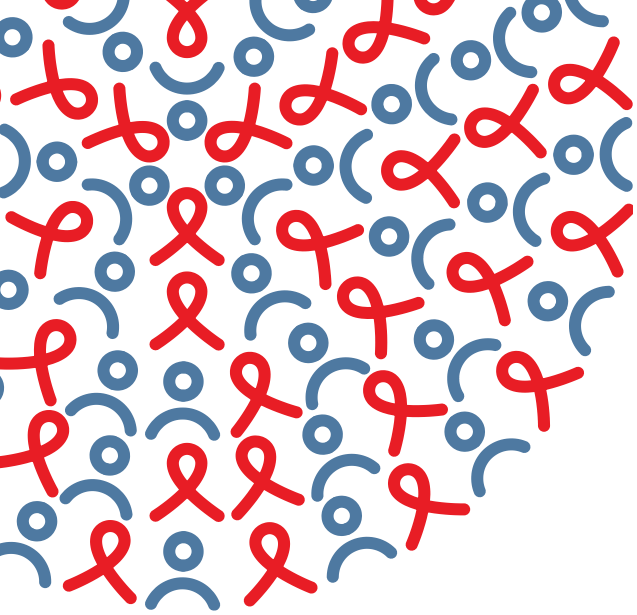
Thank you for your time and for the information shared.

Rapid Assessment Tools: Optional Appendices

The following assessments may be considered optional, but are encouraged. Please complete the Perinatal/Pediatrics section if your facility cares for these patient populations.

Section 6. WELLNESS/MENTAL HEALTH (optional) **These questions are intended for administrators to provide some information for how mental health and burnout among the health care work force has been addressed before and during the COVID-19 pandemic. Please enter N/A if not applicable, or your facility has not made specific changes.** **Completed by (name, title):**		
6.1	Has your facility or health care organization formally considered interventions to address mental health, wellness, and/or burnout among health care workers and staff?	❑ Yes, prior to the pandemic ❑ Yes, during the pandemic ❑ Yes, and we plan to continue after pandemic ❑ No, but we are considering such interventions ❑ No, not considering
6.2	Has your organization changed any of the following since the start of the COVID-19 pandemic?	❑ Work hours for health care workers ❑ Salary changes ❑ Staffing/ratio changes, or task shifting ❑ Security measures to protect health care workers ❑ Policy change, or other support for health care workers to miss work if they are feeling unwell ❑ Changes to physical environment (e.g., spacing to allow for physical distancing, or cohorting of patients)
6.3	Has your organization implemented any of the following interventions?	❑ Wellness initiatives (general) ❑ Specific initiatives to prevent burnout ❑ Peer support/clinician peer group development ❑ Access to formal mental health services (therapy, psychiatry) ❑ Specific interventions to support women (who compose 70% of the global health workforce)
6.4	In the last six months, has the organization screened health care staff for signs of poor mental health and/or burnout?	❑ Yes ❑ No ❑ I don't know
6.5	**If you answered "NO" to any of these questions:** **6.5a.** Do you feel that health care worker burnout is impacting patient care? **6.5b.** Are you interested in specific technical assistance for health care worker mental health, well-being, and burnout prevention?	 ❑ Yes ❑ No ❑ Yes ❑ No

Section 7: Special Populations: PERINATAL AND PEDIATRICS (optional) **This section is designed to assess the facilities' capacity for perinatal and/or pediatric care relevant to COVID-19 care and medical oxygen therapy. Please skip if your facility does not manage perinatal or pediatric cases.** **Completed by (name, title):**		
7.1	Does your facility have a perinatal unit (intrapartum, postpartum, and surgical obstetric services)?	❑ Yes ❑ No
7.2	How many beds?	
7.3	How many beds have medical oxygen delivery systems?	
7.4	How many live deliveries per year?	
7.5	How many perinatal patients had required surgical interventions (i.e., Cesarean section) in the last six months?	
7.6	How many postpartum hemorrhages in the last six months?	
7.7	How many maternal deaths in the last six months?	
7.8	How many doctors are currently assigned to perinatal ward?	
7.9	How many midwives are currently assigned to the perinatal ward?	
7.10	How many nurses are assigned to the perinatal ward?	
7.11	How many pregnant patients have been admitted with COVID-19 in the last six months?	
7.12	How many pregnant patients with COVID-19 have required medical oxygen therapy in the last six months?	
7.13	On average, what percentage of perinatal patients have needed oxygen but didn't receive it in the last six months? *(Select one)*	❑ <50% ❑ 50-75% ❑ 76-100%
7.14	What is the highest number of perinatal patients admitted at any point in the last six months?	
7.15	Does your facility have a pediatric unit?	❑ Yes ❑ No
7.16	How many beds?	
7.17	How many pediatric beds have piped (wall-access) medical oxygen delivery systems?	
7.18	How many patients under age 5 have required medical oxygen therapy in the last six months?	
7.19	How many patients under age 5 have been admitted with COVID-19 in the last six months?	
7.20	How many patients under age 12 admitted for COVID-19 have required medical oxygen therapy in the last six months?	
7.21	What is the highest number of patients under age 12 admitted during your last surge (defined in Q1.6)?	
7.22	On average, what percentage of pediatric patients have needed oxygen but didn't receive it in the last six months? *(Select one)*	❑ <50% ❑ 50-75% ❑ 76-100%



Section 3.
Oxygen and COVID-19 Response Rapid Assessment Tool: Primary Care Facilities

Section 3.
Oxygen and COVID-19 Response Rapid Assessment Tool: Primary Care Facilities

This tool, designed for primary care (defined as community-based or outpatient) facility administrators to conduct a targeted yet thorough assessment of multiple facility-level components of COVID-19 preparedness, inquires about basic information related to COVID-19 clinical care at the facility, with a specific focus on medical oxygen infrastructure and service delivery. Designed to be complementary rather than duplicative of other assessment tools, some additional components (i.e., human resources) that impact clinical service delivery have been included. The goal is to identify potential areas for investment and support in the face of the ongoing COVID-19 pandemic, recognizing the likelihood of recurrent surges, the shifting focus on appropriate—often decentralized—care for noncritically ill patients, and the need for resilient and sustainable health systems.

The historical time frames ask about the status of these indicators today, with some indicators asking about averages or numbers in the last week, or the last six months. Some questions ask about indicators at the time of the last "surge."

** "Surge" is defined as the day with the highest number of patient encounters, or the last highest hospital census day (may be within period of days or weeks) directly related to a local surge of COVID-19 cases within the last six months. Please indicate the most recent "surge" and use that day or time frame to answer other questions about surge indicators.**

Finally, this tool is modular. The first five sections are required, with an appendix of optional sections. Users are encouraged to choose sections relevant to their own needs and customize adaptation for maximal impact.

Section 1A: DEMOGRAPHICS (required)		
1.1	Name of the facility	
1.2	Address (include district and region)	
1.3	Level/designation of facility	
1.4	Type of facility	❑ Private ❑ Public (government facility) ❑ Nongovernmental (NGO) ❑ Other_____
1.5	Is your facility designated as a COVID-19 referral facility?	❑ Yes ❑ No ❑ Don't know
1.6	When was the last surge of COVID-19 at your facility? (DD/MM/YY) *** See definition above; use this timepoint to answer future questions that inquire about "surge"*	_____/_____/_____ DD / MM /YY
1.7	What is the total population of your catchment area?	
1.8	If this assessment is completed by interview: - Name, title, and length of employment of interviewee	Name: _____ Title: _____ Length of employment: _____
1.9	If this assessment is completed by interview: - Name, title, organization of the interviewer	Name: _____ Title: _____ Organization: _____
1.10	If self-assessment, who completed self-assessment? - Name, title, length of employment ** *Please designate who completed each section of this assessment.*	Name: _____ Title: _____ Length of employment: _____

Section 1B: PATIENT DEMOGRAPHICS (required)

Completed by (name, title):

How many patients are currently registered with your facility?												
Age	**0-5 years**			**6-17 years**			**18-50 years**			**>50 years**		
Gender	**Male**	**Female**	**Non-Binary**	**M**	**F**	**Non-Binary**	**M**	**F**	**Non-Binary**	**M**	**F**	**Non-Binary**
#												

Section 2: GENERAL FACILITY INFORMATION (required)			
Completed by (name, title):			
2.1	Please designate which clinical services are provided at this facility: *(Select all that apply.)* ❑ Child vaccination services, either at the facility or as outreach ❑ Child growth and development services, either at the facility or as outreach ❑ Curative care services for children less than age 5, either at the facility or as outreach ❑ Any family planning services ❑ STI screening, excluding HIV testing and counseling services ❑ STI screening, including HIV testing and counseling services ❑ Antenatal care Services ❑ Normal delivery ❑ Cesarean section ❑ Postnatal care Services ❑ Diagnosis or management of noncommunicable diseases, specifically diabetes cardiovascular diseases, and chronic respiratory conditions in adults ❑ Curative care for adults with acute conditions (i.e., "sick visits") ❑ Mental health, psychiatric care ❑ Telehealth, or virtual consultation services for patient care		
2.2	How far away is the nearest health facility of a similar tier to yours?	**a.** Distance (km): ❑ <20km ❑ 21-50km ❑ >50km	**b.** Average travel time (min): ❑ <60 min ❑ >60min (*specify:* _____)
2.3	How far away is the nearest regional or district hospital?	**a.** Distance (km): ❑ <20km ❑ 21-50km ❑ >50km	**b.** Average travel time (min): ❑ <60 min ❑ >60min (*specify:* _____)
2.4	How far away is the nearest tertiary care hospital with ICU services?	**a.** Distance (km): ❑ <20km ❑ 21-50km ❑ >50km	**b.** Average travel time (min): ❑ <60 min ❑ >60 min (*specify:* _____)
2.5	How many exam rooms does this facility have?	❑ None ❑ <5 ❑ 5-10	❑ 11-20 ❑ > 25 (*specify:* _____)
2.6	How many overnight observation beds are available in this facility?	❑ None ❑ <5 ❑ 5-10	❑ 11-20 ❑ > 25 (*specify:* _____)
2.7	**a.** Does this facility have a functional ambulance or other vehicle for emergency transportation for clients?	❑ Yes (*Specify how many:* _____) ❑ No ❑ Unknown	
2.7	**b.** Where is it stationed?	❑ At this facility ❑ At another facility ❑ Unknown	
2.7	**c.** Is fuel available today?	❑ Yes (*Specify how much:* _____) ❑ No ❑ Unknown	
2.8	**a.** If you answered NO to Q2.7 (a, b, or c), please describe the most common method of transportation for patients arriving for medical care at your facility.	❑ Walk ❑ Non-motorized vehicle ❑ Motorized personal vehicle ❑ Taxi service or non-personal vehicle ❑ Other: _____	

2.8	**b.** If you answered NO to Q2.7 (a, b, or c), please describe the most common method of transportation for patients at your health facility requiring transfer to a higher level of care (hospital) for urgent medical care.	❑ Walk ❑ Non-motorized vehicle ❑ Motorized personal vehicle ❑ Taxi service or non-personal vehicle ❑ Other: _____

The following section inquires about your average daily patient encounters within the last seven days, and the week of your highest "surge" as defined in Question 1.6. These questions are about all patients, not only those presenting for suspected or confirmed COVID-19 care.

2.9	Estimated patient encounters per day	Last 7 days: _____ Week of last surge: _____
2.10	Estimated scheduled patient encounters per day (with appointments)	Last 7 days: _____ Week of last surge: _____ ❑ There are no scheduled appointments at my facility
2.11	Estimated walk-in/same-day patient encounters per day	Last 7 days: _____ Week of last surge: _____
2.12	Average encounters per day of patients presenting with confirmed or suspected COVID-19	Last 7 days: _____ Week of last surge: _____
2.13	Do you render direct clinical care to patients with COVID-19 symptoms at your facility?	❑ Yes, always ❑ No ❑ Sometimes ❑ Unknown
2.14	If you answered NO to Q2.13, what do you do when a patient with signs or symptoms of COVID-19 presents to your facility for care? *Check all that apply.*	❑ Send home with no care rendered ❑ Send home with basic information about testing and supportive care at home ❑ Send home with option for telehealth, or a virtual visit with a health care worker ❑ Refer to a facility for testing only ❑ Refer to the nearest hospital (higher level of care than your facility)

If you answered YES or SOMETIMES to Q2.13, please answer the following questions:

2.15	What is the average number of patient encounters per week for signs or symptoms of COVID-19?	This week: _____ Week of last surge: _____	
2.16	**2.16a.** Do you administer PCR COVID-19 testing at your facility?	❑ Yes ❑ No	
	2.16b. If NO, how far away is the nearest COVID-19 testing facility?	**a.** Distance (km): ❑ <20km ❑ 21-50km ❑ >50km	**b.** Average travel time (min): ❑ <60 min ❑ >60min (specify: _____)
2.17	For clinicians: In the last six months, how frequently have you empirically diagnosed a patient with COVID-19 without obtaining a diagnostic test?	❑ Never, I always confirm with a test ❑ Rarely, I usually confirm with a test ❑ Sometimes, depending on the patient situation ❑ I usually diagnose COVID-19 without a test ❑ I always diagnose without a test; testing is not available for my patients	
2.18	What is the PCR turnaround time for patients you test, or refer for testing?	❑ <24 hours ❑ 24-72 hours ❑ >72 hours	
2.19	Do you have rapid COVID-19 antigen diagnostic testing (RDT) available at your facility?	❑ Yes ❑ No ❑ Don't know	
2.20	Is there a designated triage station or separate screening area at the facility entrance to identify patients with signs or symptoms of COVID-19?	❑ Yes ❑ No ❑ Don't know	

2.21	Is there a designated area for immediate isolation of patients presenting to the facility with confirmed or suspected COVID-19?	❑ Yes	❑ No	❑ Don't know
2.22	Does your facility have a triage protocol for confirmed or suspected COVID-19 patients?	❑ Yes	❑ No	❑ Don't know
2.23	Does your facility have an emergency transfer protocol (clinical criteria to transfer patients exhibiting signs of complications of COVID-19 to a higher level of care)?	❑ Yes	❑ No	❑ Don't know
2.24	Do you have equipment for tele-consultation or telehealth in the hospital? *This is defined as a dedicated set of equipment to virtually connect (audio and/or video) clinical staff with either patients or other clinical staff to render or coordinate care.*	❑ Yes *(If YES, proceed to a, b, c)* ❑ No		
	2.24a: Is this equipment functional?	❑ Yes	❑ No	❑ Don't know
	2.24b: Is this equipment in use?	❑ Yes	❑ No	❑ Don't know
	2.24c: Is it used for COVID-19 care?	❑ Yes	❑ No	❑ Don't know

Section 3A: HUMAN RESOURCES: STAFFING AND RATIOS (required)

This section inquires about your ideal conventional staffing ratios, your current staffing levels, as well as staffing ratios that occurred during the highest census count ("surge") your facility experienced as defined in Question 1.6. You may add or modify the listed cadres to best reflect your facility's staffing structures.

Completed by (name, title):

		Total Number (approx.)	**Gender**			**Conventional Ratio Patient/ Provider**	**Current Ratio Patient/ Provider**	**Surge Ratio Patient/Provider**
			M	**F**	**Non-Binary**			
3a1	Doctors (general)							
3a2	Nurses							
3a3	Doctors (specialists)							
3a4	Midwives							
3a5	Non-physician providers							
3a6	Other clinical support staff (i.e., nursing assistants)							

Section 3B: HUMAN RESOURCES: TRAINING (required)
This section inquires about dedicated training events attended by the health care workforce of this facility within the last 6 months. This includes in-services, webinars, training from external organizations, etc. You may add or modify cadres to reflect your facility's staffing structures.

Completed by (name, title):

		# Trained in clinical management of mild to moderate COVID-19 (including home-based care and referral pathways for severe COVID-19)	# Received training in triage, IPC, and PPE in the context of COVID-19	# Received training in clinical management of post-COVID-19 conditions	# Received training in appropriate use of medical oxygen therapy
3b1	Doctors				
3b2	Nurses				
3b3	Critical care doctors				
3b4	Critical care nurses				
3b5	Non-physician providers				
3b6	Respiratory therapists				
3b7	Anesthesia doctors				
3b8	Anesthesia technicians				
3b9	Other clinical support staff				

Section 4. MEDICAL EQUIPMENT, SUPPLIES ,AND CONSUMABLES (required)
This section inquires about medical equipment, supplies, and consumables.

Completed by (name, title):

The following questions ask about the availability of equipment in your facility. You can choose what percentage of time these items are available, or answer "never, sometimes, most of the time, almost always." *(Mark with an X.)*		**Never**	**Sometimes (25-50%)**	**Most of the time (50-75%)**	**Almost always (>75%)**
4.1	How frequently is a pulse oximeter available for patients?				
4.2	How frequently is a thermometer available for patients?				
4.3	How frequently is a blood pressure cuff available for adult patients?				
4.4	How frequently is a blood pressure cuff available for pediatric patients?				
4.5	How frequently is an infant scale available for infants?				
4.6	Do you have uninterrupted electricity to the facility?	❑ Yes	❑ No	❑ Don't know	
4.7	If NO, what is the average frequency of interruption per month?	Number of times per month: _____			
4.8	What is the average length (in hours) of a typical interruption of electricity?	Number of hours: _____			
4.9	Do you have a functioning back-up generator? **a.** If YES, how many hours can your generator support your facility's electricity needs? _____ hours	❑ Yes	❑ No	❑ Don't know	

4.10	Do you have internet services at your facility?	❑ Never	❑ Sometimes	❑ Always	
4.11	Do you have cellular phone service at your facility? (i.e., can staff and/or clients reliably use a mobile phone at the facility?)	❑ Never	❑ Sometimes	❑ Always	
4.12	**How frequently, or what percentage of time, has the following personal protective equipment (PPE) been available for health facility staff in the last 4 weeks?** *(Mark with an X.)*	**Never, or very rarely**	**Sometimes (25-50%)**	**Most of the time (51-76%)**	**Almost always (>75%)**
	N95 respirator mask				
	Surgical mask				
	Face shield				
	Gown				
	Gloves				
	Overall				
	Water and soap				
	Hand sanitizer				
4.13	Do you have enough PPE to consistently protect all health care workers in the event of another surge of COVID-19? *(Use your highest surge census day as a benchmark.)*	❑ Yes ❑ No. Please explain if desired: _____			
4.14	In the last 6 months, have clinical staff ever decided to render care without PPE?	❑ Yes ❑ No. Please explain if desired: _____			
4.15	In the last 6 months, have clinical staff ever decided to NOT render care, or to withhold care, because they didn't have PPE?	❑ Yes. Please explain if desired: _____ ❑ No			
4.16	Do you provide medical oxygen to patients at your facility?	❑ Yes *(If YES, complete Section 5.)* ❑ No *(If NO, skip to Section 6.)*			

Section 5. MEDICAL OXYGEN AVAILABILITY AND INFRASTRUCTURE *(If YES to Q4.16)*

This section aims to assess the supply of oxygen to the facility, delivery of the oxygen around the facility, maintenance and repair considerations, and your experiences with shortages, disrepair, or other challenges.

Completed by (name, title): _____

5.1	How many functional oxygen cylinders does this facility have?	# 5- to 39-liter cylinders: _____ # 40 plus-liter cylinders: _____
5.2	How many additional oxygen cylinders does your facility need for COVID-19 patients? *(based on last "surge" as defined in Q1.6)*	# 5- to 39-liter cylinders: _____ # 40 plus-liter cylinders:_____

The following questions ask about the availability of equipment in your facility. You can choose what percentage of time these items are available, or answer "never, sometimes, most of the time, almost always." *(Mark with an X.)*		**Never**	**Sometimes (25-50%)**	**Most of the time (50-75%)**	**Almost always (>75%)**
5.3	What percentage of time is the appropriate patient circuit (tubing) available for COVID-19 patients requiring medical oxygen?				
5.4	What percentage of time is a basic nasal cannula available for COVID-19 patients requiring supplemental oxygen therapy?				
5.5	What percentage of time high-flow nasal cannula is available for COVID-19 patients who require high-flow medical oxygen?				
5.6	What percentage of time an oxygen delivery mask is available for a COVID-19 patient requiring medical oxygen?				
5.7	What percentage of time oxygen flowmeters are available for COVID-19 patients?				

5.8	How many functional flowmeters does your facility currently have?			
5.9	Have you ever needed more flowmeters in the past six months?	❑ Yes *(Specify how many):* _____	❑ No	❑ Unknown
5.10	How many oxygen pressure regulators (used for cylinders) do you have?			
5.11	Have you ever needed more pressure regulators in the past six months?	❑ Yes *(Specify how many):* _____	❑ No	❑ Unknown
5.12	How many oxygen concentrators do you have?			
5.13	How many of the oxygen concentrators are currently functional?			
5.14	How many concentrators produce 6-10 liters oxygen/min?	Total: _____	Functional: _____	
5.15	How many concentrators generate 1-5 liters oxygen/min?	Total: _____	Functional: _____	
5.16	How many more concentrators does the facility need for COVID-19 patients (based on last surge)?			
5.17	Does this facility use a liquid oxygen (LOX) system? *(If yes, answer 5.18. If no or unknown, proceed to 5.19)*	❑ Yes	❑ No	❑ Unknown
5.18	Is the liquid oxygen (LOX) system fully functional?	❑ Yes	❑ No	❑ Unknown
5.19	Does this facility use a PSA plant?	❑ Yes	❑ No	❑ Unknown
5.20	Is the PSA plant fully functional?	❑ Yes	❑ No	❑ Unknown

5.21	What is the reason the PSA plant or liquid oxygen system is not functional?	❑ In disrepair ❑ Lack of operations/maintenance staffing ❑ Power supply disruption	❑ Unknown ❑ Other: _____
5.22	Do you have a resource to procure spare parts for the PSA plant?	❑ Yes, always	❑ Yes, sometimes ❑ No ❑ Unknown
5.23	Have you ever completely run out of oxygen in the last 6 months?	❑ Yes	❑ No ❑ Unknown
5.24	If YES to Q5.23, how many times in the last 6 months?		
5.25	If YES to Q5.23, please select a reason why you ran out of oxygen *(Check all that apply.)*	❑ Supplier did not have oxygen ❑ Disruption in transportation or delivery of oxygen ❑ Shortage of cylinders ❑ Malfunction of equipment for filling or transporting oxygen cylinders	❑ Malfunction of facility-level equipment (i.e., had oxygen, but could not deliver to patients due to on-site malfunction) ❑ Unknown ❑ Other: _____
5.26	On average, how many days before oxygen supply was restored?		
5.27	What is the average monthly cost of your facilities' oxygen system?	**a.** If known, average monthly cost of oxygen: _____ **b.** If known, average monthly cost of maintenance and repairs: _____	
5.28	Do you think your oxygen supply/system will be adequate if you have another surge of COVID-19 patients?		❑ Yes ❑ No
5.29	If NO to Q5.28, which best describes your main concern?		❑ We cannot procure oxygen from a supplier ❑ We cannot procure the equipment to get the oxygen to patients ❑ We have equipment in disrepair and cannot procure new or spare parts ❑ We have equipment in disrepair, but no technicians trained to service it ❑ We have regular power supply issues interrupting oxygen delivery ❑ Our clinicians are not trained appropriately in use of medical oxygen ❑ Other: _____
5.30	What is the name of your primary oxygen supplier?		
5.31	Approximately how far is the oxygen supplier from the facility?		km: _____
5.32	How much oxygen does this company produce and supply every month? (cubic meters)		Total cubic meters: _____
5.33	What is the cost per cubic meter (estimate)?		
5.34	Who pays for the oxygen?	❑ Hospital/facility ❑ Ministry of Health ❑ Private sector	❑ NGO/grant funding ❑ Other: _____

Thank you for your time and for the information shared.

Rapid Assessment Tools: Optional Appendices

The following assessments may be considered optional, but are encouraged. Please complete the Perinatal/Pediatrics section if your facility cares for these patient populations.

Section 6. WELLNESS/MENTAL HEALTH (optional) **These questions are intended for administrators to provide some information for how mental health and burnout among the health care work force has been addressed before and during the COVID-19 pandemic. Please enter N/A if not applicable, or your facility has not made specific changes.** **Completed by (name, title):**		
6.1	Has your facility or health care organization formally considered interventions to address mental health, wellness, and/or burnout among health care workers and staff?	❑ Yes, prior to the pandemic ❑ Yes, during the pandemic ❑ Yes, and we plan to continue after pandemic ❑ No, but we are considering such interventions ❑ No, not considering
6.2	Has your facility changed any of the following since the start of the COVID-19 pandemic?	❑ Work hours for health care workers ❑ Salary changes ❑ Staffing/ratio changes, or task shifting ❑ Security measures to protect health care workers ❑ Policy change, or other support for health care workers to miss work if they are feeling unwell ❑ Changes to physical environment (e.g., spacing to allow for physical distancing, or cohorting of patients)
6.3	Has your facility implemented any of the following interventions?	❑ Wellness initiatives (general) ❑ Specific initiatives to prevent burnout ❑ Peer support/clinician peer group development ❑ Access to formal mental health services (therapy, psychiatry) ❑ Specific interventions to support women (who compose 70% of the global health workforce)
6.4	In the last 6 months, has your facility screened health care staff for signs of poor mental health and/or burnout?	❑ Yes ❑ No ❑ Don't know
6.5	**6.5a.** Do you feel that health care worker burnout is impacting patient care? **6.5b.** Are you interested in specific technical assistance for health care worker mental health, well-being, and burnout prevention?	❑ Yes ❑ No ❑ Yes ❑ No

Section 7: Special Populations—PERINATAL AND PEDIATRICS (optional) **This section is designed to assess the facilities' capacity for perinatal and/or pediatric care relevant to COVID-19 care and medical oxygen therapy. Please skip if your facility does not manage perinatal or pediatric cases.** **Completed by (name, title):**		
7.1	Does your facility have a perinatal unit for deliveries in the facility?	❑ Yes ❑ No
7.2	Does your facility perform surgical obstetrical services (C-section)?	❑ Yes ❑ No
7.3	How many beds for labor, birth, and immediate postpartum care?	
7.4	How many live births per year?	
7.5	How many perinatal patients have required surgical interventions (i.e., Cesarean section) in the last six months?	
7.6	How many postpartum hemorrhages in the last six months?	
7.7	How many maternal deaths in the last six months?	
7.8	How many doctors at your facility manage perinatal patients?	
7.9	How many midwives at your facility manage perinatal patients?	
7.10	How many nurses at your facility manage perinatal patients?	
7.11	How many pregnant patients have presented to your facility with COVID-19 in the last six months?	
7.12	How many pregnant patients with COVID-19 have required medical oxygen therapy in the last six months?	
7.13	On average, what percentage of perinatal patients have needed oxygen but didn't receive it in the last six months? *(Select one)*	❑ <50% ❑ 50-75% ❑ 76-100%
7.14	Does your facility offer curative services for pediatric patients (i.e., children with acute illnesses)?	❑ Yes ❑ No
7.15	How many patients under age 5 have required medical oxygen therapy in the last six months?	
7.16	How many patients under age 5 have presented with COVID-19 in the last six months?	
7.17	On average, what percentage of pediatric patients have needed oxygen but didn't receive it in the last six months? *(Select one)*	❑ <50% ❑ 50-75% ❑ 76-100%