EMT

World Health Organization

EMERGENCY MEDICAL TEAMS INITIATIVE

COMMUNITY FACILITIES

for preparedness and response to COVID-19

Isolation, treatment and step down of COVID-19 cases in community facilities

A scalable, modular and temporary solution based on the Emergency Medical Team methodology

content

The Emergency Medical Teams Secretariat of the World Health Organization (WHO) gratefully acknowledges the contributions that many individuals and organizations have made to the development of these guidelines.

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Foreword

The unprecedented spread of the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) overwhelmed health care systems across the globe. Countries were faced with the challenge to isolate and treat cases of coronavirus disease 2019 (COVID-19) while continuing to provide essential health care services, especially for acute and chronic illnesses. As the demand increased, capacities were stretched, prompting health ministries to seek new and efficient ways to manage the isolation and treatment of cases.

The Emergency Medical Teams Network works with countries to prepare their health care systems for outbreaks and through the years have worked closely with governments experiencing outbreaks such as the diphtheria outbreak in Cox's Bazar, Bangladesh, and in the recent Ebola outbreaks in the Democratic Republic of Congo and West Africa. Using the EMT methodology and by incorporating the latest guidance from this novel disease, the EMT Network has pooled its experience to fill an important gap in a country's response to managing COVID-19.

This document presents options to facilitate the immediate isolation and treatment of COVID-19 cases within existing or new community facilities. Readers will recognize that, to be effective, these facilities must be modular, scalable, and seamlessly integrated into a country's healthcare system at national or subnational levels. Aligning recommended practices with the local context is of paramount importance.

This publication is a product of collaboration between global experts from the World Health Organization (WHO) and throughout the EMT network. It should be considered a living document that continues to evolve as new information, evidence, and experiences from this pandemic response come to light. I would like to extend my sincere gratitude to all contributors for sharing their experience, expertise, and knowledge in seeing this publication realized. I would particularly like to thank Jorge Durand Zurdo and Veronica Sanchez Carrera for guiding this document from its inception to final publication; a significant achievement indeed.

With such resolve and innovation shown across the Network, I am confident that the EMT community will continue to play a crucial role in supporting the global response to this unprecedented emergency.

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COVID-19	coronavirus disease 2019
FTE	full-time equivalent
ICU	intensive care unit
IPC	infection prevention and control
IT	information technology
IV	intravenous
PCR	polymerase chain reaction
PPE	personal protective equipment
ppm	parts per million
SIPA	specific inpatient profile area
WASH	water, sanitation and hygiene
WHO	World Health Organization

1. Objective

This document assists countries in their planning and response efforts to isolate and treat suspected and confirmed cases of coronavirus disease 2019 (COVID-19) through the establishment of isolation and treatment centres in community facilities. It proposes a model for community facilities that is flexible, adaptable and easy to set up, through the use of a modular approach. It offers an alternative solution at the community level and complements the Severe Acute Respiratory Infections Treatment Centre guidance (*1*).

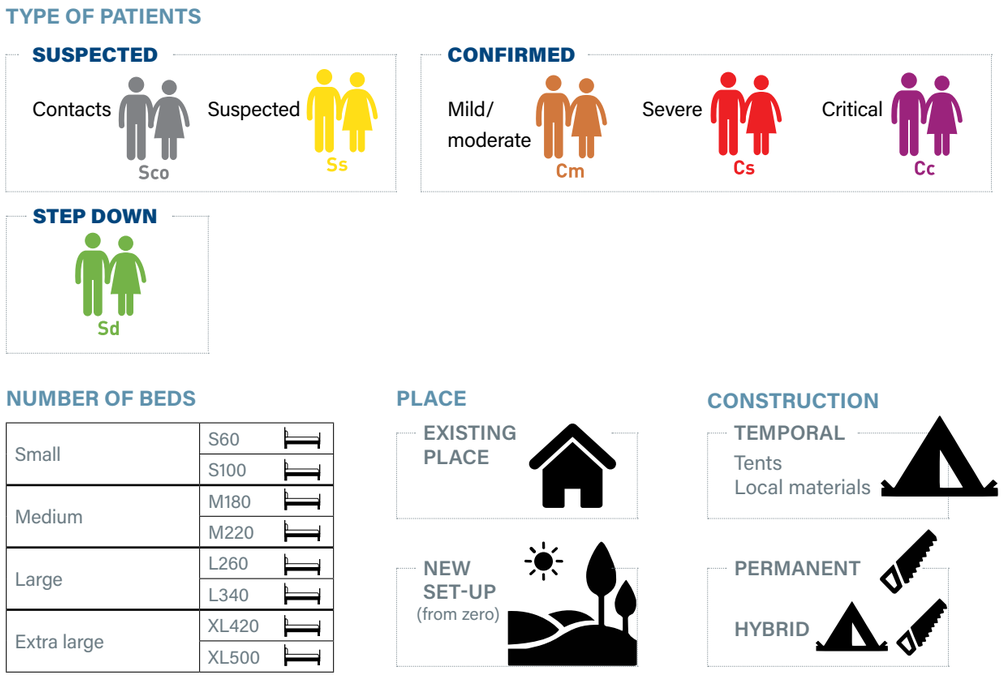
The scope of this document outlines the structure and flow of a COVID-19 community facility that is meant to increase the capacity of the health system to respond to this emergency. The proposed models can be situated within an existing community area, such as an open field, sports stadium, convention centre, event hall or warehouse. This model can be activated as part of the national/local surge plan, when health-care facilities anticipate that they will not have the capacity to serve COVID-19 patients, and should be part of a more comprehensive health system readaptation. If required and appropriate to the circumstances, community facilities can be scaled up and adapted to provide higher levels of care for severe and critical patients, taking into consideration the requirement of additional skilled staff, dedicated equipment and supplies.

In summary, this set-up can be used for the following purposes:

a. isolating contacts (i.e. quarantine);
b. treating patients with suspected COVID-19 (i.e. isolated individually);[1]
c. managing confirmed cases with mild or moderate disease severity without risk factors (i.e. cohorted care);
d. managing of confirmed cases with severe or critical disease severity (i.e. cohorted care); and
e. step-down care for recovering patients.

A community facility providing options a and e should have rapid access to health advice, for example, by an adjacent COVID-19 health post, via telemedicine, or using another modality. There are several variables that inform the final considerations for establishing community facilities (*see Fig. 1.1*); the proposed models are intended to cover all potential combinations of those variables, providing a wide set of likely configurations. For one example, see Fig. 1.2.

Fig. 1.1 *Variables that impact on design selection*



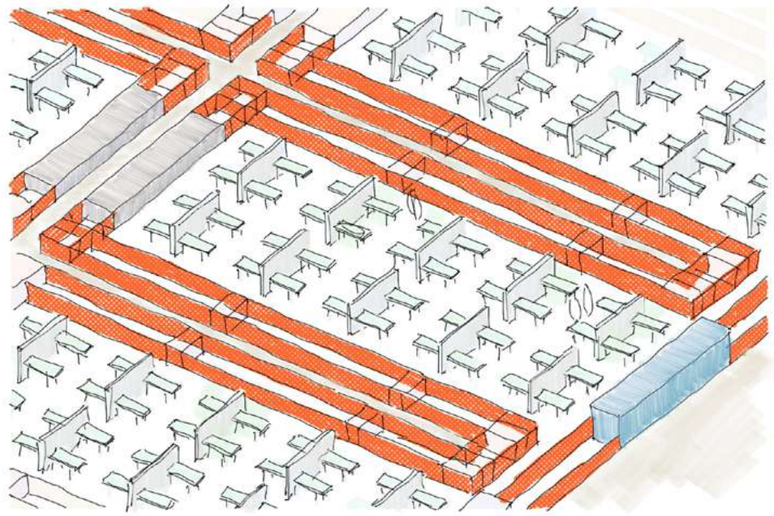
Considering the characteristics of the virus, strict and specific infection prevention and control (IPC) measures must be implemented at all times. Based on this assumption and on current knowledge, health facilities have to adapt their activities, taking into consideration that any person who enters the facility might pose a risk or be at risk.

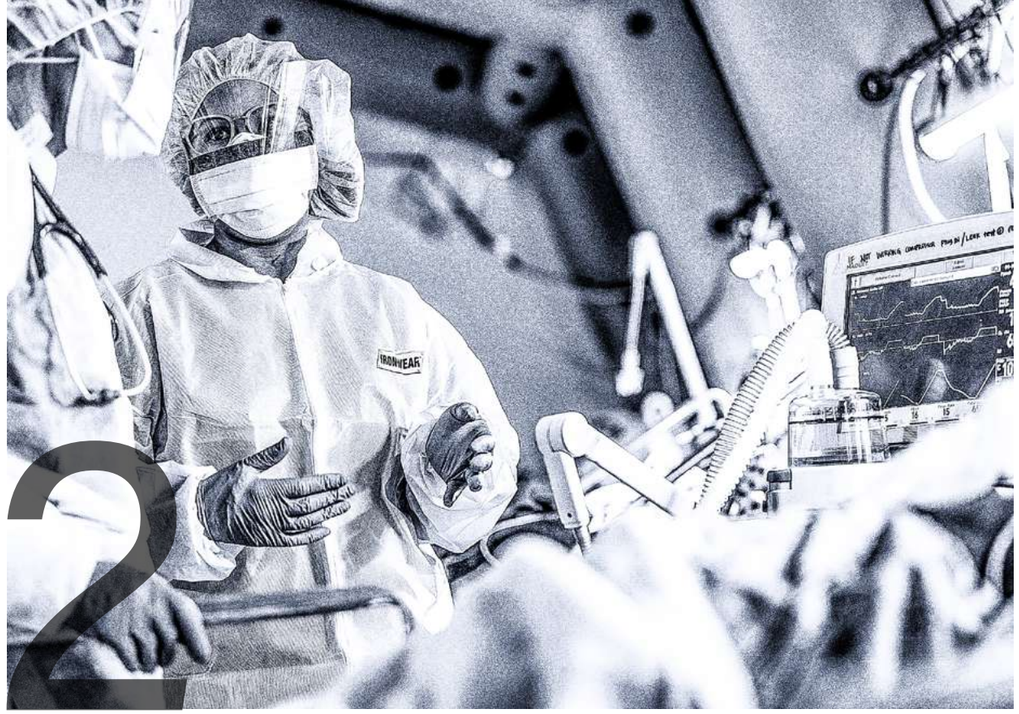
The World Health Organization (WHO) has recommended the actions shown in Table 1.1 for the different severities of COVID-19 (*2*).

Table 1.1 *Case management recommendation by case severity and risk factors*

Case severity, risk factors	Recommendations
Mild and moderate, with no risk factors	Patient should be instructed to self-isolate and contact COVID-19 information line for advice on testing and referral. Test suspected COVID-19 cases according to diagnostic strategy, with isolation/cohorting in: • health facilities, if resources allow; • community facilities (i.e. stadiums, gymnasiums, hotels) with access to rapid health advice (i.e. adjacent COVID-19-designated health post, telemedicine); or • self-isolation at home according to WHO guidance.
Moderate, with risk factors and all severe/critical cases	Patient should be instructed to self-isolate and call COVID-19 hotline for emergency referral as soon as possible. Test suspected COVID-19 cases according to diagnostic strategy. Patient should be hospitalized for isolation (or cohorting) and inpatient treatment.

Fig. 1.2 *Artistic representation of a 40-bed ward for confirmed COVID-19 patients*





2. Staff, supplies and equipment, structure and systems for a COVID-19 treatment centre in community facilities

This document is structured based on the main components of health-care system readiness or "surge capacity" (staff, supplies and equipment, structure and systems) needed to rapidly establish and operate community facilities.

2.1 Staff

Experience from China has demonstrated that, if possible, staff should limit working time in isolation areas to less than four consecutive hours (*1*). Staffing patterns should be pre-established to ensure effective coverage, and shifts should be monitored to ensure compliance. Insufficient staffing could impact the ability to effectively deliver services over time.[1] Staffing calculations in this document assume a standard average working week of 40 hours per person (1 full-time equivalent or FTE). Where available, minimum requirements are indicated as per Emergency Medical Team network minimum standards (*5*).

2.2 Supplies and equipment

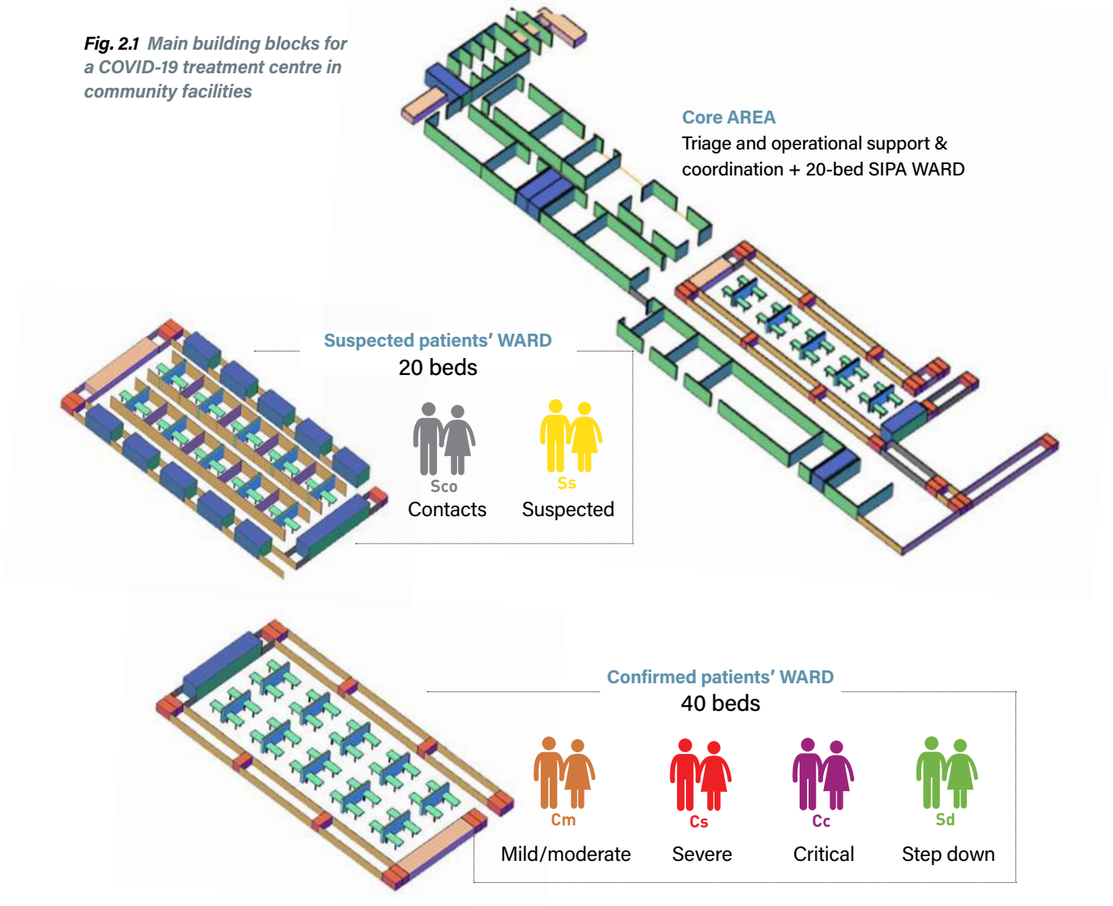
In terms of development and maintenance of medical and operational support services, supplies and equipment include medical equipment, pharmaceutical products and nonmedical supplies needed to provide clinical care in line with the services provided.[2]

2.3 Structure

The layouts presented are designed to be set up either within an existing building or in an open area. For selection of the location, some characteristics must be taken into consideration (i.e. site, physical characteristics, existing facilities, comfort conditions, etc.; *see Web Annex 1*; for criteria for the reuse of spaces, *see Web Annex 2*). Layouts have been designed for tented structures or for building in temporary or permanent settings if needed (*see Web Annex 3*). Any adaptation requires careful analysis of the pathways in the facility and crossover points. In addition, the flexibility of the design allows planning for the future, such as building a permanent health-care centre (60 beds) and/or planning for potential extensions up to 500 beds in case they are needed.

The main building blocks for the proposed facility layout are composed of core areas – operational support and coordination areas, screening and triage areas, variable 40- or 20-bed wards, plus one block of 20 beds that can be used for the specific inpatient profile area (SIPA) for children or people requiring specialized or intensive care unit (ICU) care (*see Fig. 2.1*). This also includes the separation of areas for patients with suspected and confirmed COVID-19, without any crossing of patient and staff flows (*see Fig. 2.2*). Detailed models and plans are available in Web Annex 3.

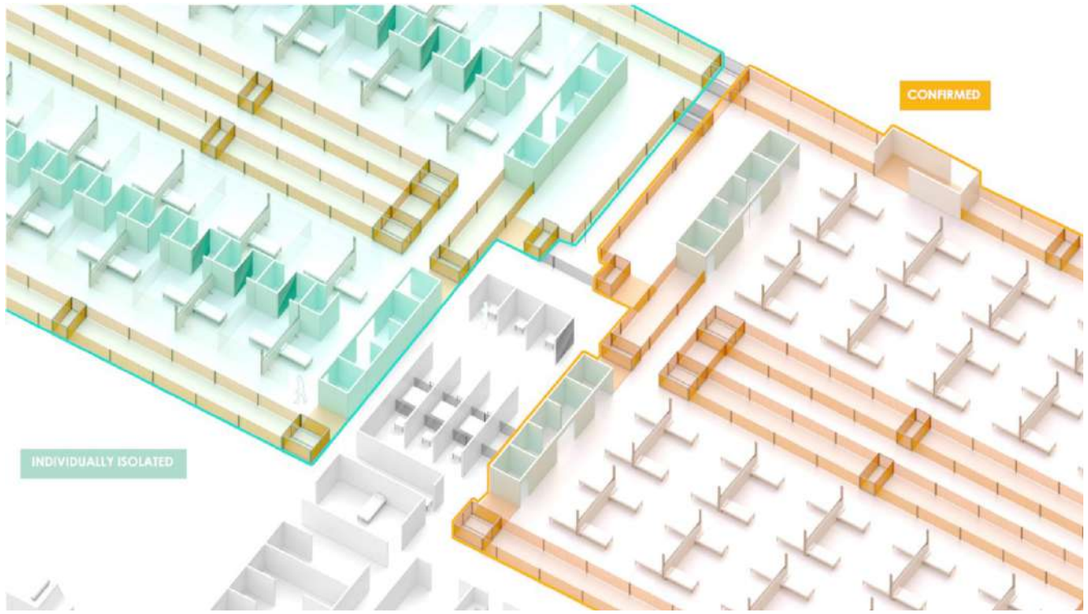
***Fig. 2.1** Main building blocks for a COVID-19 treatment centre in community facilities*



SIPA: specific inpatient profile area. *For description of patient types, see Fig. 1.1. (see page 10)*

Staff, supplies and equipment, structure and systems for a COVID-19 treatment centre in community facilities

Fig. 2.2 *Artistic representation of a community facility with wards for suspected (individually isolated – left) and confirmed (cohorted – right) cases*



2.4 Systems

Systems refer to the standard operating procedures and protocols that define the operating model of each community facility, including support systems to safeguard the quality of care.

3. Key considerations

3.1 Characteristics of the structural design

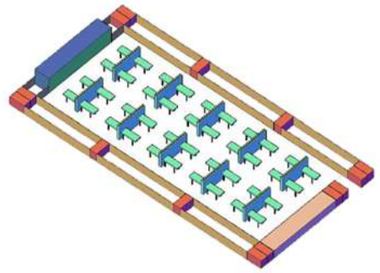
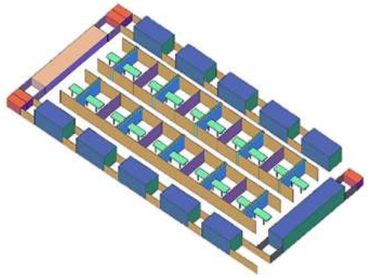
The COVID-19 community facilities have four major characteristics:

- **modularity** – the ability for areas to be expanded and/or repurposed;
- **separation** – clearly divided and dedicated areas:
  - high-risk area: every area where there are patients or items that are considered to be contaminated;
  - low-risk area: all areas where there are no patients or items that could be potentially contaminated;
- **line-of-sight** – the ability to view one area from another between low- and high-risk areas;
- **clear and efficient** patient pathways and staff flows.

3.2 Modularity

The modular approach enables the community facility to adapt to diverse needs and requirements, including space availability, number of patients and local conditions. Modules can also be adapted to function within and/or augment existing health facilities. Any module can be extended or stood down without impacting other modules while the facility is operational and accommodating patients (*see Table 3.1*).

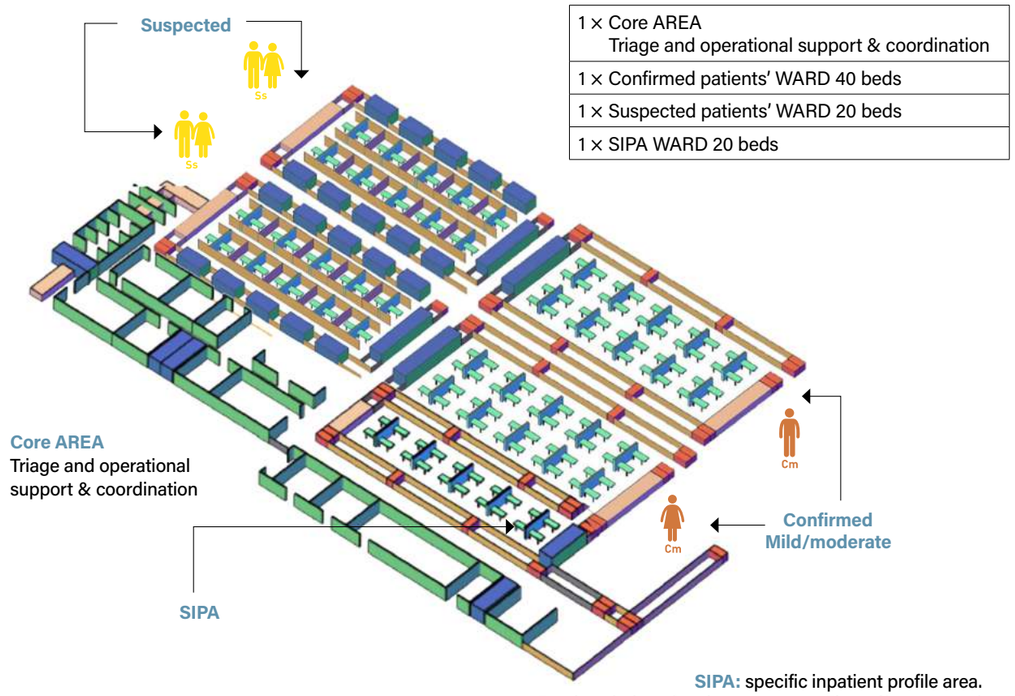
Table 3.1 *Suggested layout for 40-bed and 20-bed COVID-19 wards*

40-bed ward for confirmed cases	20-bed ward for suspected/probable cases
	
Description Module of 40-bed capacity in a cohorted structure for confirmed cases, with two toilets with handwashing basins,[1] two showers, power supply and lighting services. Storage space available at premises. This type of module can accommodate patients with confirmed COVID-19 of different degrees of severity: mild, moderate, severe and critical. Each module is conceived for one type of gender user.	**Description** Module of 20-bed capacity in an isolation room structure for separate case management. Independent toilets and shower for each patient, power supply and lighting services. This type of module can accommodate patients with suspected COVID-18 waiting for results, and contacts. Each module is conceived for one type of gender user.
If there is no dedicated ICU ward provided in the facility, a few beds could be adapted to provide critical care where referral to a higher level of care is not possible.	A few beds (e.g. 4 beds in the 20-bed unit) could be adapted to provide critical care.
	

ICU: intensive care unit. *For description of patient types, see Fig. 1.1. (see page 10)*

The high-risk area should comprise one or more modules, each with 40 beds (confirmed patients) or 20 beds (suspected patients). This area can be augmented by adding more modules for up to 80, 120 or more beds, for either suspected or confirmed cases. Modules can be divided by gender and/or dedicated space for children or people requiring specialized or intensive care, if required (*see Fig. 3.1*).

Fig. 3.1 *Model of 180-bed layout, with modularity showing different types of potential patient typology*



SIPA: specific inpatient profile area.
For description of patient types, see Fig. 1.1 (See page 10)

Scaling up the model from 60 to 500 beds (*see detailed plans in Web Annex 3*)

Modularity enables the establishment of new treatment areas while maintaining continuity of care. Fig. 3.2 demonstrates how to scale up a COVID-19 community facility so that previously established modules remain functional as bed capacity is increased progressively. Modularity enables expansion of the care facility to be planned in advance and established in phases. It is important to take into consideration that technical areas should be expanded as the facility grows.

Fig. 3.2 *Scaling up: adapting to different sizes*

3.3 Separation: clearly divided and dedicated areas

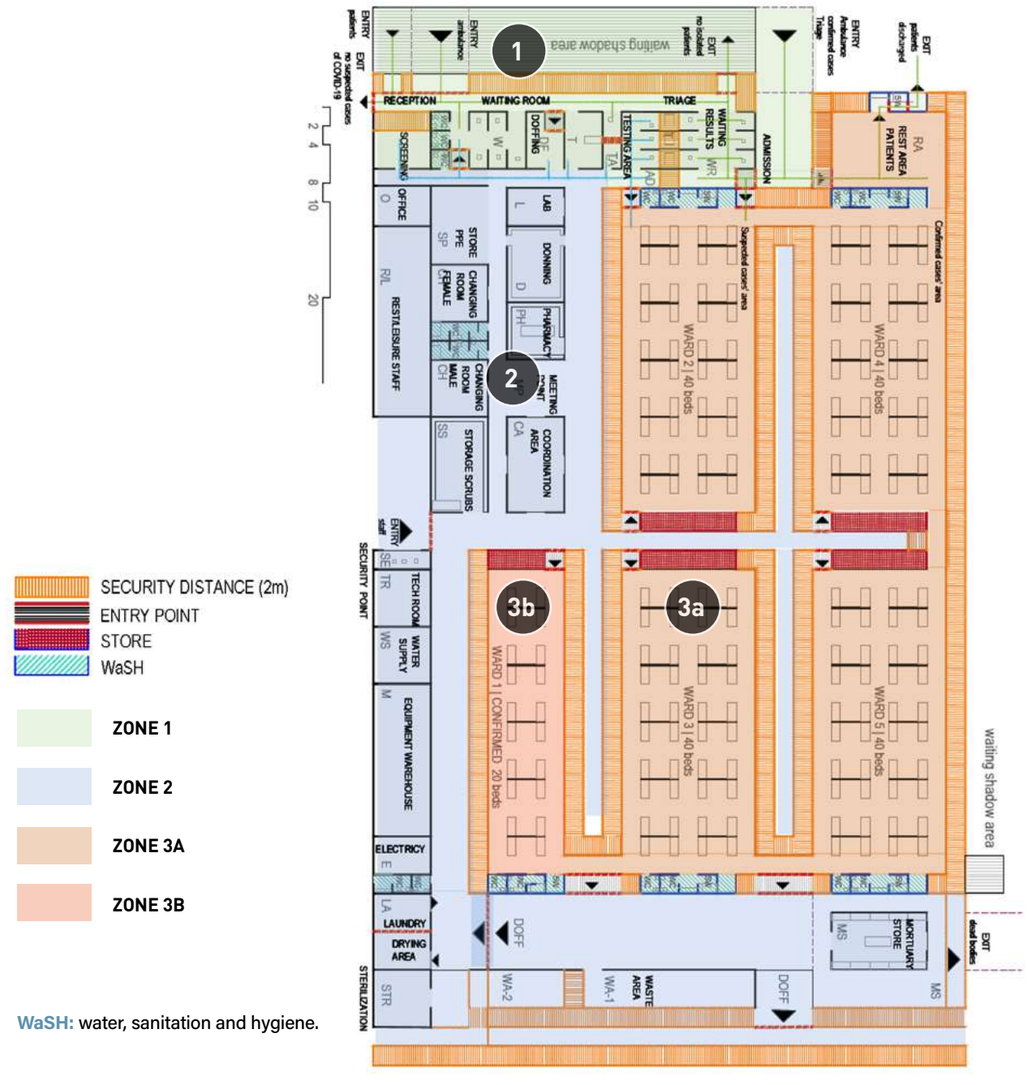
The care facility should be composed of four key areas, outlined in Table 3.1.

Table 3.1 *Key areas of the care facility*

Area	Description
1	Screening/triage/admission and registration area (high-risk area)
2	Technical (clinical and operational support) area (low-risk area)
3	Areas for treatment of confirmed or suspected cases (high-risk area): a. inpatient area b. specific inpatient profile area
4	Other complementary areas

There should be a safety zone of not less than 2 m (and/or with a physical barrier as appropriate) between modules. Fig. 3.3 illustrates a 180-bed model (100 × 80 m; Model M) with four clearly defined areas.

Fig. 3.3 *Model M: 180 beds (100 m × 80 m) with four areas*



WaSH: water, sanitation and hygiene.

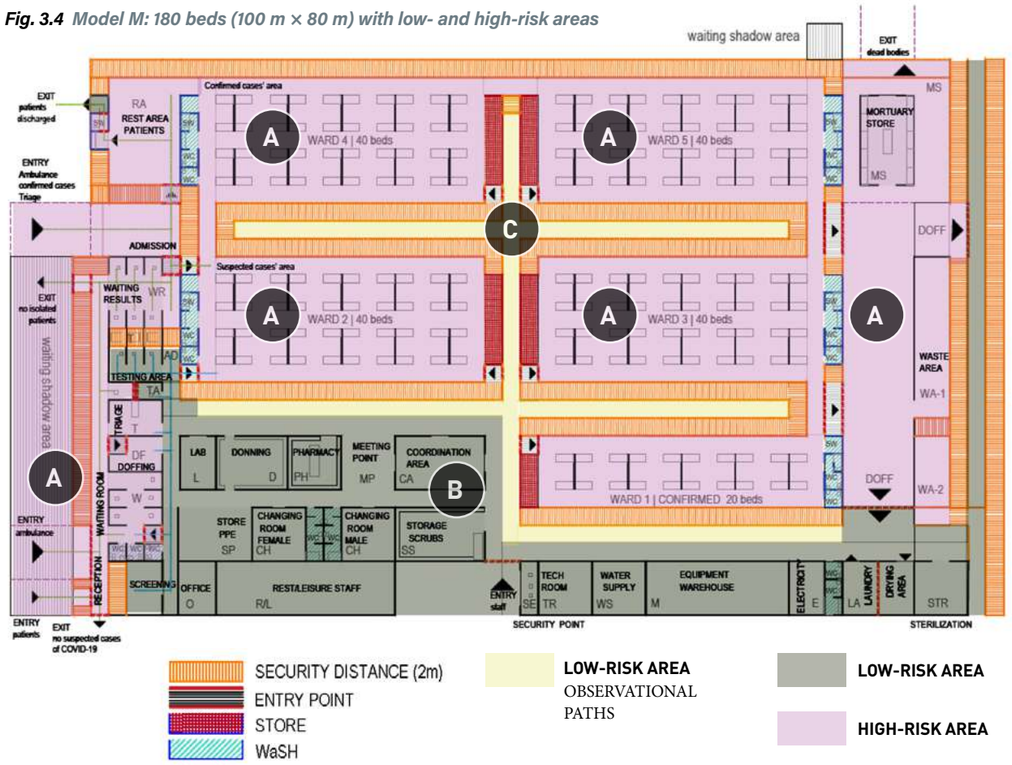
3.4 Lines of sight

A key characteristic of the design illustrated in Fig. 3.4 is the separation of high- and low-risk areas with both physical barriers and safety zones. Visual lines of sight between risk areas should be maintained if possible, to ensure that clinical staff can observe patients in other areas without donning or doffing additional personal protective equipment (PPE). Lines of sight between risk areas:

- **minimize** staff time required in higher-risk areas;
- **minimize** overuse of PPE and thus the impact on supply shortages (*1*); and
- **enable** more continuous patient monitoring.

PPE should be used based on the risk of exposure (e.g. type of activity) and the transmission dynamics of the pathogen (e.g. contact, droplet, or aerosol). For specific IPC recommendations for COVID-19, refer to the WHO COVID-19 website (*2*). The layout illustrated in Fig. 3.4 and described in Table 3.2 is designed to establish three main areas which divide the community facility.

***Fig. 3.4** Model M: 180 beds (100 m × 80 m) with low- and high-risk areas*



Area		Description
A	HIGH RISK	All staff entering this area should be wearing adequate PPE; the doffing area for PPE removal is located for staff exiting the high-risk zone.
B	LOW RISK	Clinical coordination and operational support staff area, donning/dressing area located at the high-risk zone entrances, a second donning/dressing area can be set up near a direct entrance into the ICU ward in case it needs to be set up.
C	OBSERVATION PATHS	Allow clear vision from the low-risk area to patient areas for clinical staff not wearing PPE to be able to observe patients.

ICU: Intensive care unit; **PPE:** personal protective equipment; **WaSH:** water, sanitation and hygiene.

3.5 Clear and efficient flows

Logical flows for patient, staff and visitors

This document describes the recommended flows for access to moving around the different areas; entering and exiting risk areas; and donning and doffing. For the facility to best function, it is necessary to have single-path order flows that avoid crossing paths, and a clear indication of the difference between patients, staff and visitors. It is also important to control the operational support flows, including a special consideration for waste-collection routes.

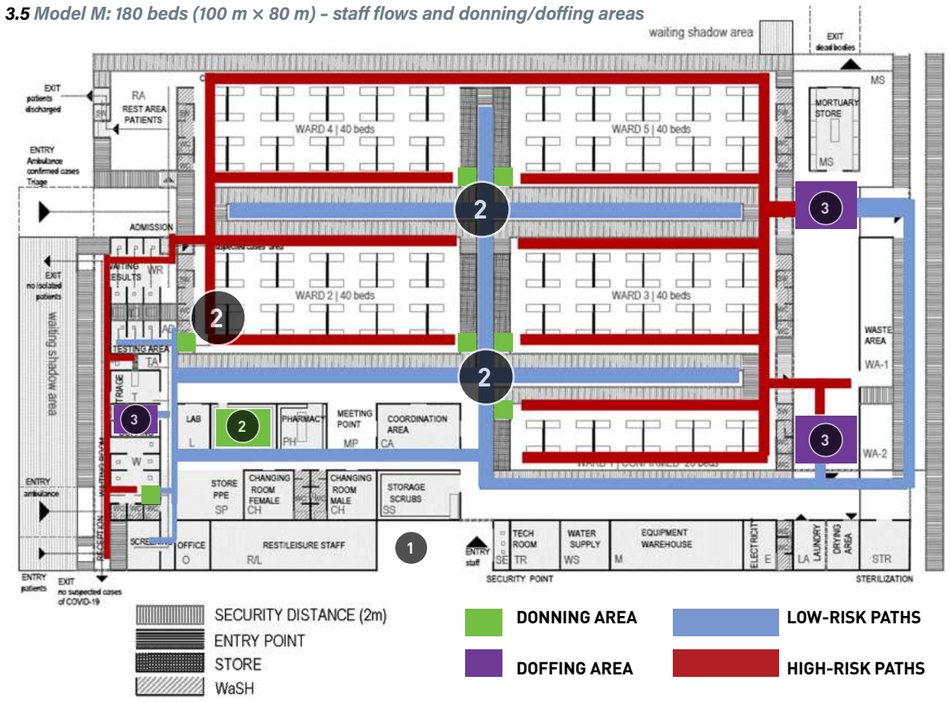
Staff flows

The following criteria ensure safe and efficient flow of staff:

1. access to low-risk area;
2. access to high-risk area, after changing room and donning; and
3. exit from high-risk area, through the doffing area.

A dedicated donning zone in each module is supported by a single large-capacity donning area at the main staff entrance and a single large-capacity doffing area at the exit of every two wards. This ensures unidirectional flow from high-risk to low-risk areas (*see Fig. 3.5*).

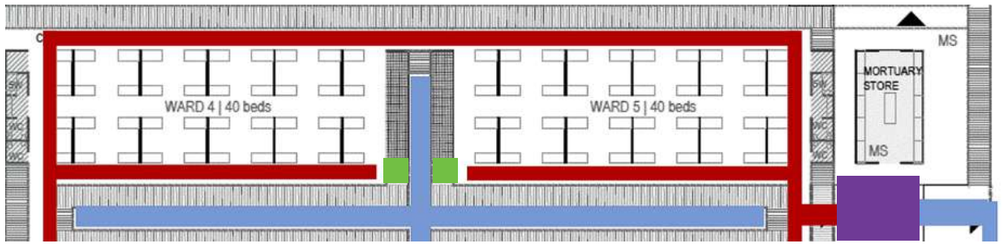
Fig. 3.5 *Model M: 180 beds (100 m × 80 m) – staff flows and donning/doffing areas*



WaSH: water, sanitation and hygiene.

Where possible, it is advisable to cohort staff, reducing the risk of cross-contamination. The configuration in Fig. 3.6 shows the compartmentalized area of two wards (80 beds) with the dedicated doffing area.

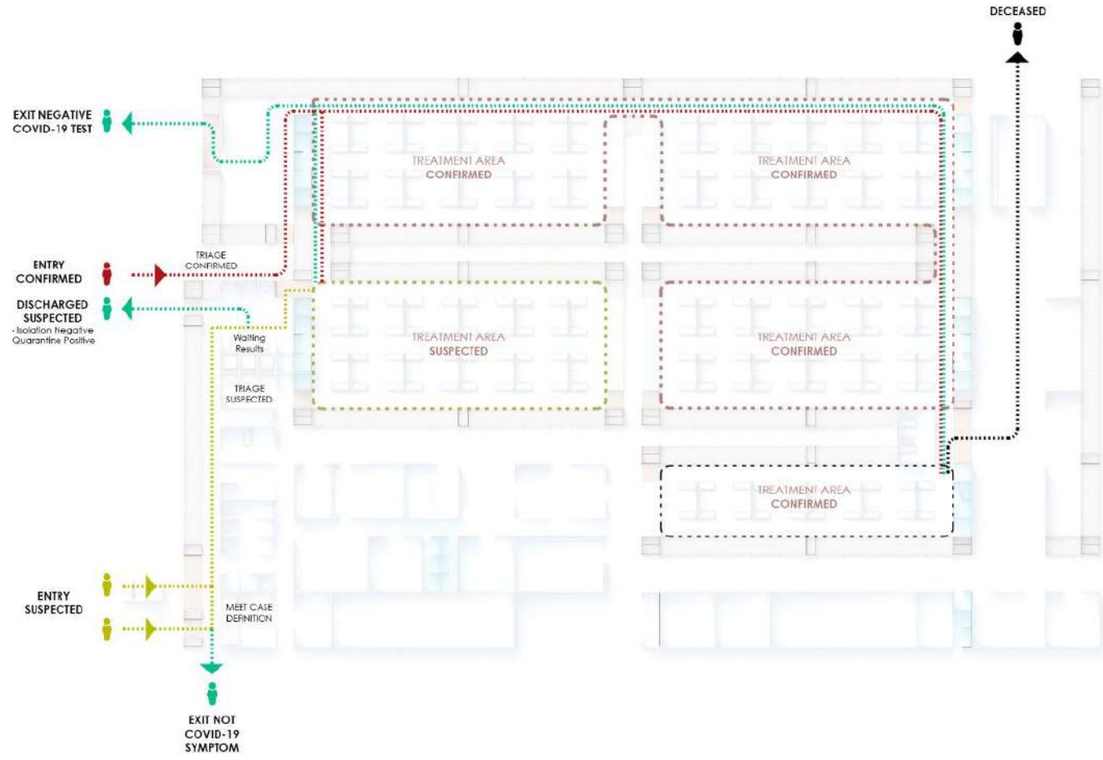
Fig. 3.6 *Model M: 180 beds (100 m × 80 m) – cohorting strategy donning/doffing areas*



Patient flows

Figs 3.7 and 3.8 present graphic and conceptual representations of safe and efficient patient flows through the community facilities.

Fig. 3.7 *Graphic representation of patient flows*



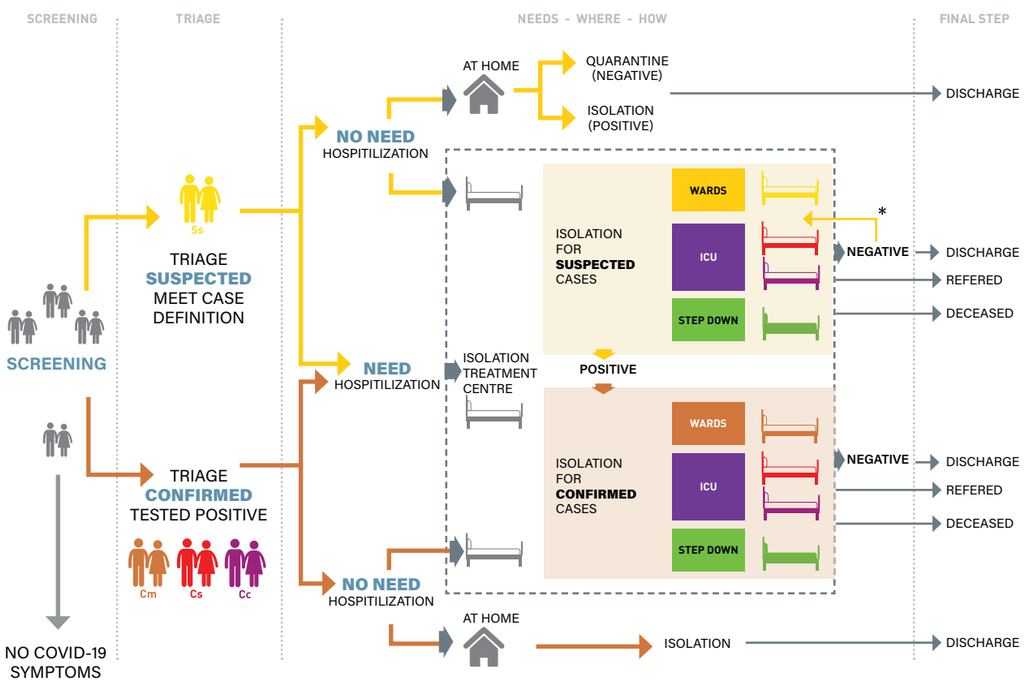


***Fig. 3.8** Conceptual representation of patient flows*

Remark: all discharges and referals are based on clinical decisions
For description of patient types, see Fig. 1.1. (see page 10)

Visitor flows

Fig. 3.9 shows the places where potential visitors can see and talk to patients (a). This option is only advised for confirmed COVID-19 patients, to reduce the risk of cross-contamination. It can also be used for interviews with contact-tracing teams or psychosocial support activities. Fig. 3.9 also indicates an area allocated for relatives of a deceased patient waiting for the dead body (b).

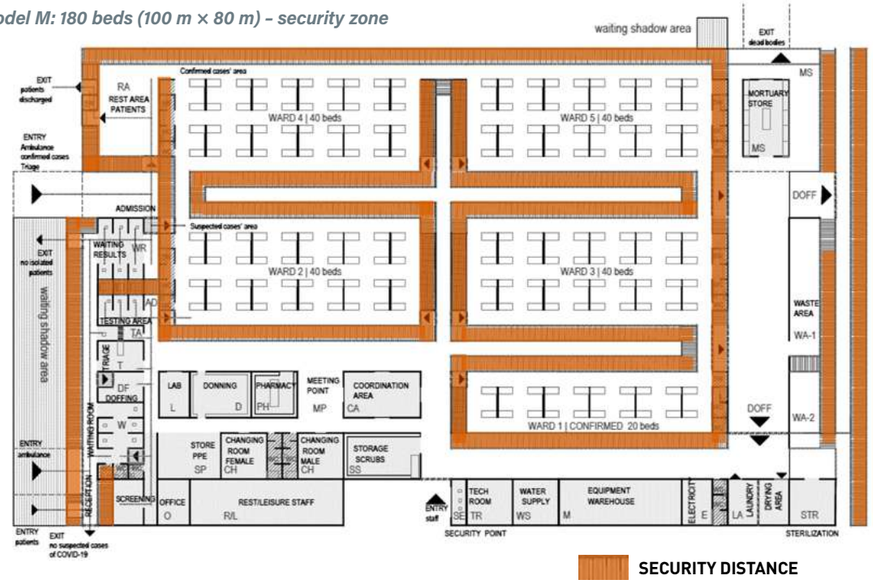
***Fig. 3.9** Model M: 180 beds (100 m × 80 m) – visitor flow*

WaSH: water, sanitation and hygiene.

Security zone

There is a security zone (2 m distance) between modules or, at some points, a physical barrier (*see Fig. 3.10*).

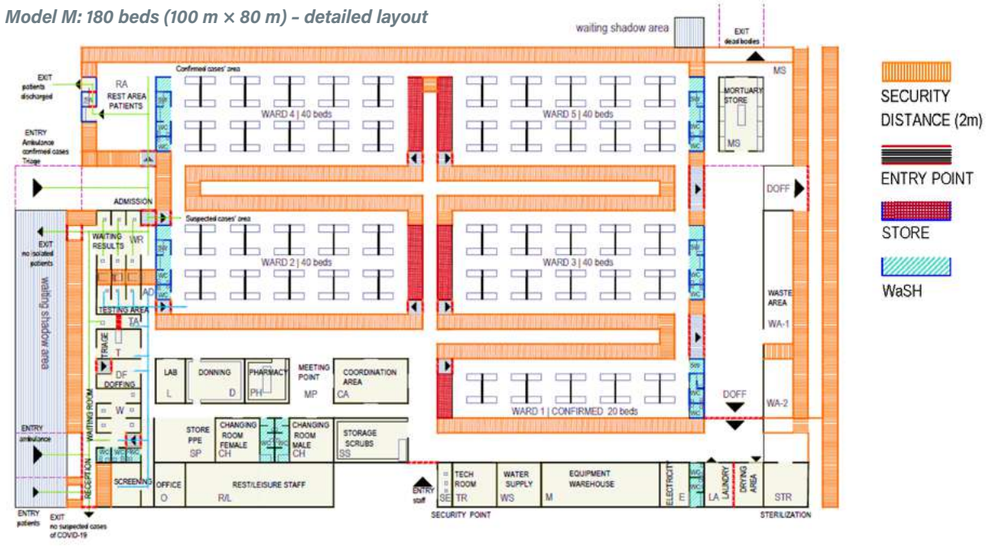
Fig. 3.10 *Model M: 180 beds (100 m × 80 m) – security zone*



3.6 Description of each area

Throughout this document, Model M 180 BEDS (100 × 80 m) is used as a reference point to help understand the proposed facility. It consists of four wards consisting of 40 beds each and a SIPA of 20 beds (*see Fig. 3.11*).

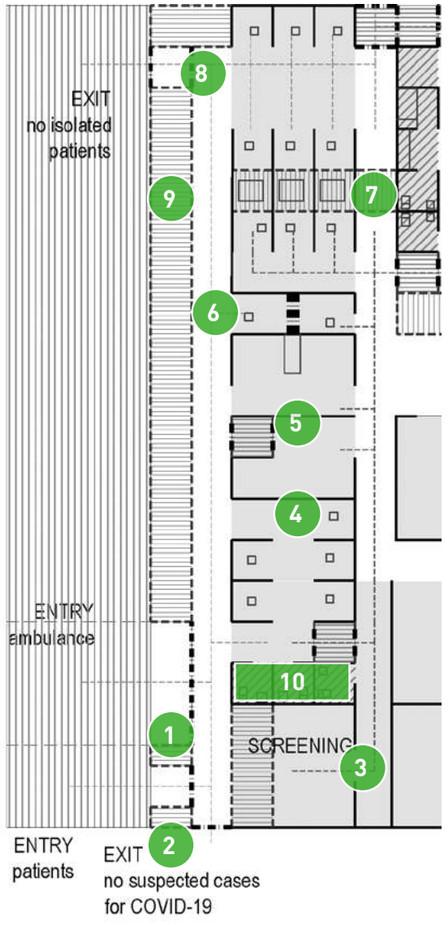
Fig. 3.11 *Model M: 180 beds (100 m × 80 m) – detailed layout*



Area 1: Reception, screening and triage areas

Area 1 is the reception, screening and triage station (*see Fig. 3.12*). The screening process involves evaluation of the patient using the standardized case definition for suspected cases of COVID-19 (*3*). The triage system will sort the patients based on the severity of their disease.

Fig. 3.12 *Model M: 180 beds (100 m × 80 m) – Area 1, Reception area*



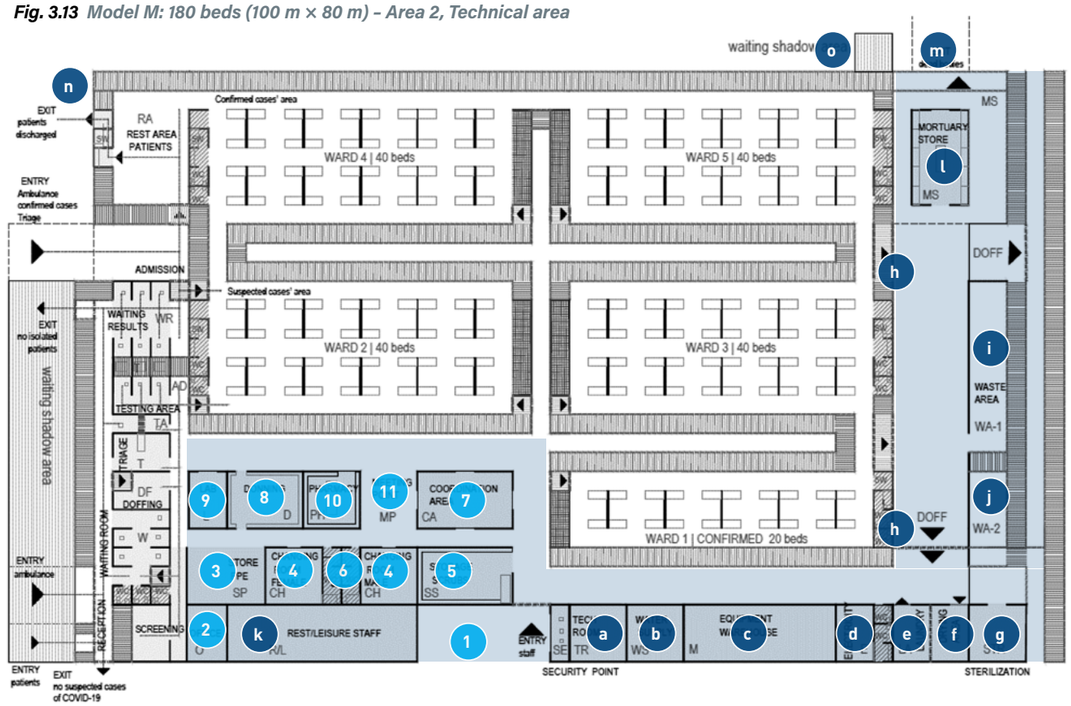
1	**ENTRY** Patients and ambulance
2	**RECEPTION** Patients'/companions' orientation
3	**SCREENING** The place where the health personnel screen each patient entering the facility, using the standardized case definition (keep >1 m distance)
4	**WAITING ROOM** The place where patients with symptoms wait to be taken care of by the health personnel – 7 independent cabins (2 m × 2 m)
5	**SAMPLE AREA** To collect testing samples from the patients
6	**TRIAGE** 3 separate cubicles where the health personnel determine the acuity level of patients, using a standardized, validated tool, and health workers will direct the patient to the appropriate section of the facility
7	**ADMISSION** Registration and entrance for admitted patients
8	**RESULTS WAITING ROOM** 6 independent cabins (2 m × 2 m) with separated positions
9	**EXIT** For patients who are not admitted
10	**WC** (toilet) Two bathrooms (male and female) for the use of patients during waiting and being attended to

WaSH: water, sanitation and hygiene.

Area 2: Technical (clinical and operational support) area

Area 2 is the main component of the core area of the facility and includes staff entry and spaces for coordination, clinical and operational support services (*see Fig. 3.13*). This area should be expandable in case the facility grows in size.

Fig. 3.13 *Model M: 180 beds (100 m × 80 m) – Area 2, Technical area*



SECURITY DISTANCE (2m) ENTRY POINT STORE WaSH

WaSH: water, sanitation and hygiene.

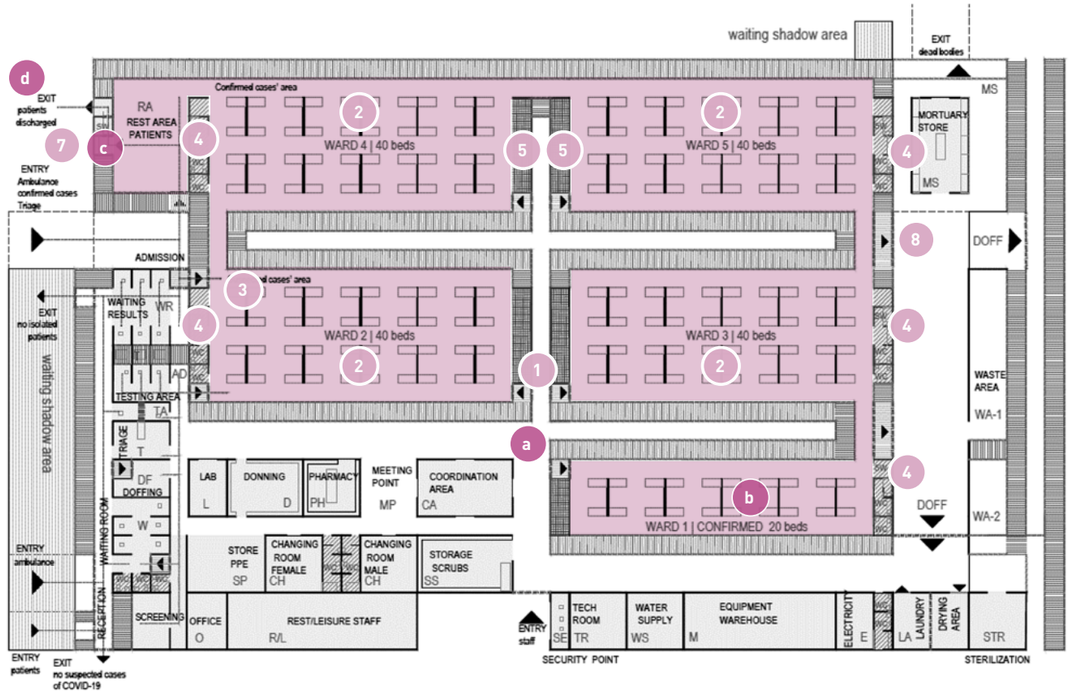
OPERATIONAL SUPPORT	
a	**TECH ROOM** Reserved for the storage and control of technical systems and equipment. Technical personnel only
b	**WATER SUPPLY** Control point for water storage, treatment and distribution
c	**EQUIPMENT WAREHOUSE** Storage of spare parts, tools and machinery for technical areas
d	**ELECTRICITY AREA** For main electrical control panels and spare parts
e	**LAUNDRY** Sorting, washing, extracting, drying, ironing, folding and delivery of linen facility material and disinfection of PPE and scrubs
f	**DRYING AREA** For clothing and equipment
g	**STERILIZATION** Disinfection of reusable medical instruments and equipment
h	**DOFFING AREA** Where PPE is removed after leaving the high-risk area
i	**WASTE AREA 1** For storage and treatment of infected waste
j	**WASTE AREA 2** For storage and treatment of waste from the low-risk area
k	**REST/LEISURE STAFF** Break/on-call room for resting during shift
l	**MORTUARY STORE** Temporary location for deceased prior to removal from the community facilities
m	**EXIT DEAD BODIES** For removal of dead bodies
n	**VISITORS' AREA** Area where visitors and relatives could establish visual and verbal contact with patients
o	**RELATIVES' AREA** The place where relatives wait for identification or for burial

CLINICAL	
1	**STAFF ENTRY** Entrance for clinical and operational staff, including security control point. Staff wear a mask from entry to the facility
2	**OFFICE** Administrative workspace for personnel
3	**PPE STORE** Storage location for personal protective equipment (PPE) – gloves, masks, goggles, aprons and other PPE
4	**CHANGING ROOM** Area where staff change from street clothes into scrubs and mask
5	**SCRUB STORAGE** Storage and distribution of work clothing to staff
6	**BATHROOMS** Male and female toilet, showers
7	**COORDINATION AREA** Dedicated space for office activities
8	**DONNING ROOM** The place where the PPE is put on before entering the high-risk area
9	**LABORATORY** It is recommended this space be reserved even if it is not initially required/available
10	**PHARMACY** Storage and dispensing of medicine
11	**MEETING POINT** Dedicated space for organization of daily activities

Area 3: Wards

The wards are set up for the provision of care for suspected COVID-19 patients in individual spaces or for confirmed COVID-19 patients in cohorts (*see Fig. 3.14*). They are expandable and can accommodate from 20 to 40 beds.

Fig. 3.14 *Model M: 180 beds (100 m x 80 m) – Area 3, Wards*



WaSH: water, sanitation and hygiene.

INPATIENT AREA (MODULE OF 40 BEDS OR 20 BEDS)	
1	**ENTRY POINTS** For staff wearing personal protective equipment (PPE)
2	**WARDS** 40 beds or 20 beds each with gender separation
3	**ICU** inside suspected case-treatment area or in confirmed patients' ward when there is no dedicated intensive care unit (ICU) ward in the facility: beds designated for patients who arrive in need of immediate invasive intervention i.e. such as central lines, intubation, catheters. Positive (already confirmed) patients are directly moved to ICU from triage
4	**WASH MODULES** (toilet, handwashing basin, shower)
5	**STORAGE MODULES** For consumables and other items
6	**REST AREA FOR PATIENTS** Area of relaxation for admitted ambulatory patients
7	**EXIT** For recovered patients
8	**STAFF EXIT** Exit for staff with PPE

SPECIFIC INPATIENT PROFILE AREA (MODULE OF 20 BEDS)	
a	**STAFF ENTRANCE** Staff with PPE
b	**WARDS** 20-bed module
c	**DISCHARGE SHOWER** Wash and disinfection point for recovered patients before they go outside
d	**EXIT** For recovered patients

Area 4: **Other complementary areas**

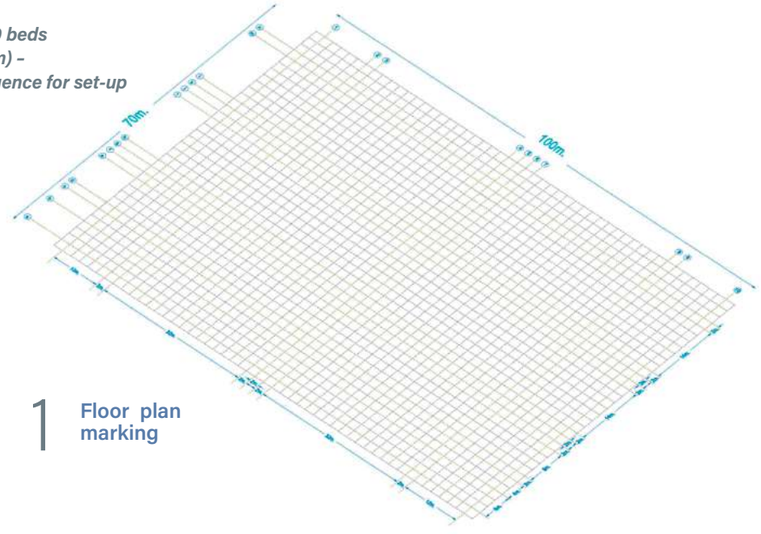
The following additional areas should be established or expanded to support the community facilities:

- control and security points;
- resting areas for staff;
- kitchen;
- living room;
- power generation;
- fuel farm;
- parking;
- visitors' area;
- warehouse external; and
- shadow for external waiting area.

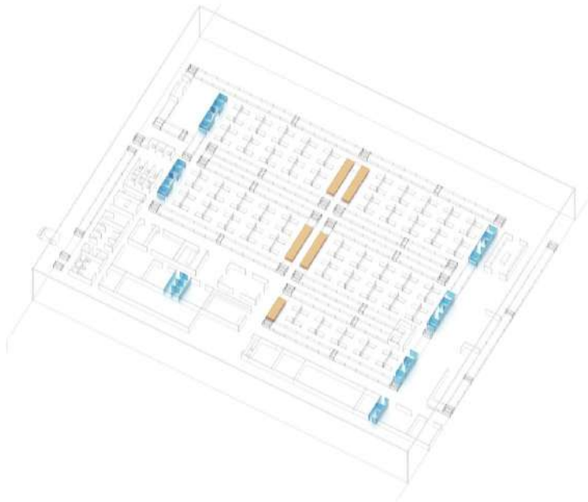
3.7 Building sequence for set-up

Fig. 3.15 illustrates the recommended building sequence, constructive elements, and scaled gridded plans that detail module construction. Measurement tools such as surveyors' tape and/or laser measurement tools can be utilized to adapt the illustrated layouts to identified locations and facilitate site clearing and levelling if required in outdoor settings. Preparation of land will facilitate the subsequent phases of the work, such as water drainage and assembly of tents and structures, etc.

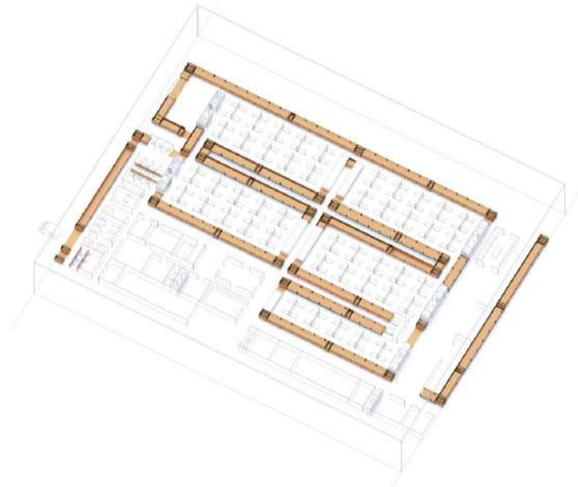
Fig. 3.15 *Model M: 180 beds (100 m × 80 m) – building sequence for set-up*



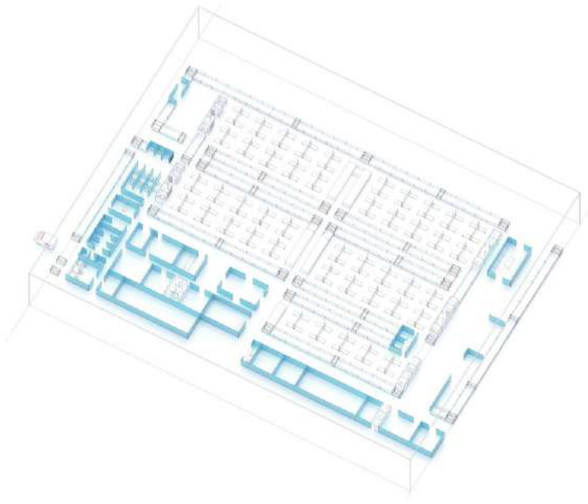
1 Floor plan marking



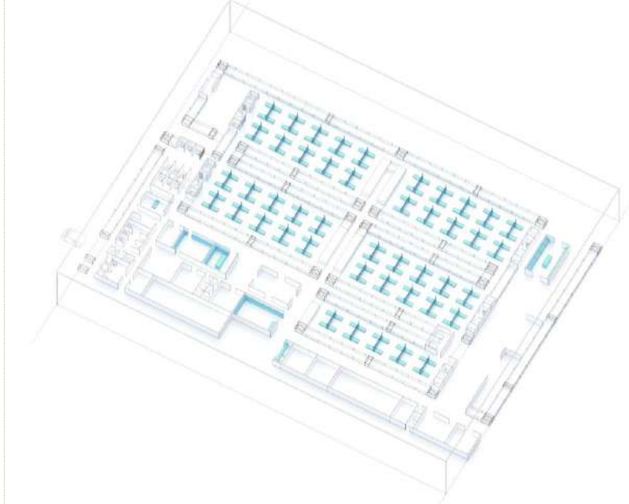
2 Corner modules set-up



3 WC and storage modules set-up



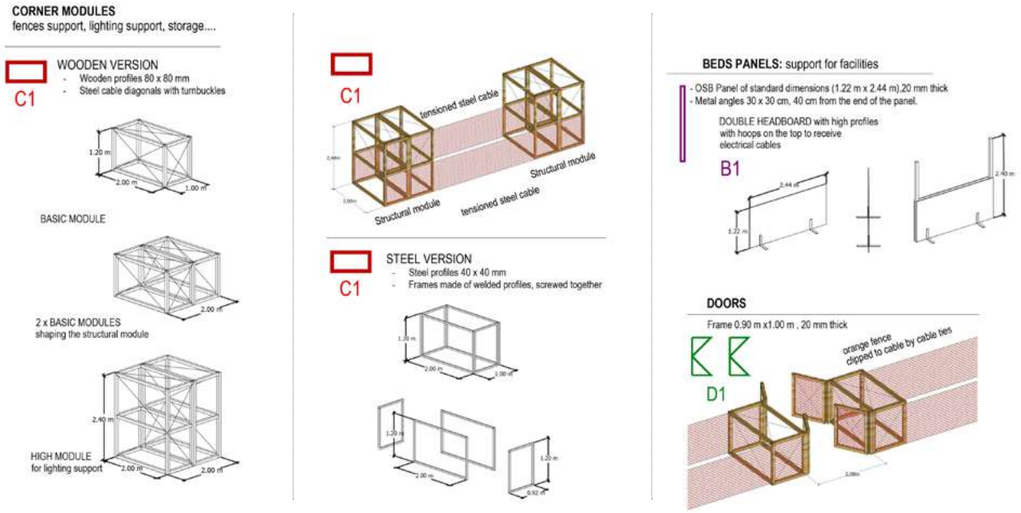
4 Fence separations set-up



5 Technical area modules set-up

Modular structures

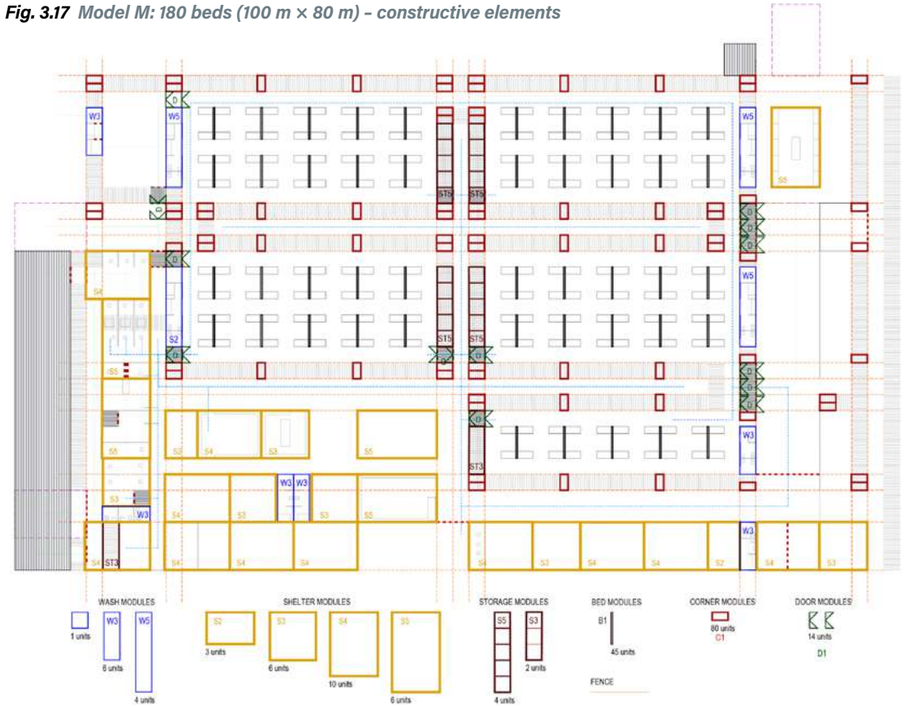
The conceptual design allows building of a temporary facility by using different types of available materials (for a detailed bill of quantities see Web Annex 4). To simplify the set-up of the centre, a structured order is proposed (*see Figs 3.16 and 3.17* and detailed plans on Web Annex 3).



OSB: oriented standard board.

- **Corner modules** are key in establishing the community facility's footprint and circumscribe the required area. They can be made of wood or welded metal.
- **Storage modules** can provide a space to house equipment, consumables, cleaning materials and other supplies. If not already constructed, they can be fabricated from plastered wood or other building materials.
- **Bed modules** can be constructed of oriented standard board (OSB, or plywood) of standard dimensions, which serve as a separation between zones. They will hold the power and lighting support systems if needed.
- **Shelter modules** should be 6 m wide, to enable set-up using commercially available tents or locally available materials
- **Water, sanitation and hygiene (WASH) modules** contain all WC/toilet and WASH infrastructure and can be constructed or developed on site, ideally with prefabricated superstructures and established sanitation technologies.
- **Separation modules** should be linked to corner modules, establishing the safe distances required to maintain effective IPC, including contact and droplet precautions. Modules can be constructed from orange plastic mesh initially or in low-resource settings and, as time permits, be replaced with panels with translucent openings to enable line of sight between areas.
- **Fence elements** or other physical barriers should be utilized to designate different areas and zones.

Fig. 3.17 *Model M: 180 beds (100 m × 80 m) – constructive elements*



3.8 Support systems with no interference

The community facility has different modules and areas that should be integrated within the structure (*see Section 8 and Figs 8.1, 8.3 and 8.7 for details*):

- water;
- sanitation;
- electricity and illumination;
- waste management;
- fire safety;
- telecommunication;
- ventilation; and
- oxygen.

All support systems, including but not limited to power supply, water supply, sewage and greywater systems and waste management can be established, maintained and scaled up without interrupting the operations of the community facility.

4. STAFF

Table 4.1 outlines the core staffing requirements for all proposed set-ups of wards in a COVID-19 community facility. It shows the suggested staff for each clinical module, based on a 40-bed module (mild/moderate and severe) or for a 20-bed isolation and ICU module. For clarity, the full-time equivalent (FTE) has been used for those functions that are suggested to be available in shifts. One FTE equals a staff member working 40 hours per week in shifts of 8 hours.

***Table 4.1** Suggested staffing numbers for the different proposed ward set-ups*

	NUMBER **PER BEDS**				
	20 beds isolation of contacts	**40 beds** mild and moderate patients	**40 beds** severe patients	**20 beds** ICU patients	**20 beds** step-down patients
Head nurse	1	1	1	1	1
Nurses	n/a	8.5 FTE	21 FTE	42 FTE	8.5 FTE
Nurse assistants	n/a	8.5 FTE	17 FTE	8.5 FTE	8.5 FTE
Medical doctors	n/a	n/a	4 FTE	n/a	n/a
Intensivists/anaesthesiologists	n/a	n/a	n/a	8.5 FTE	n/a
Respiratory physiotherapists (or national equivalent)	n/a	n/a	8.5 FTE	8.5 FTE	n/a
Physiotherapists (or national equivalent)	n/a	n/a	n/a	n/a	3 FTE
ICU speech and language therapists (or national equivalent)	n/a	n/a	n/a	1 FTE	1 FTE
Intensivists/anaesthesiologists	n/a	n/a	n/a	8.5 FTE	n/a
Occupational therapists (or national equivalent)	n/a	n/a	1.5 FTE	n/a	3 FTE
Psychologists (or national equivalent)	n/a	n/a	n/a	n/a	1 FTE
WASH /IPC officers	4.25 FTE	4.25 FTE	4.25 FTE	4.25 FTE	4.25 FTE
Cleaners and helpers	4.25 FTE	4.25 FTE	4.25 FTE	4.25 FTE	4.25 FTE

FTE: full-time equivalent; **ICU:** intensive care unit; **IPC:** infection prevention and control; n/a: not applicable; **WaSH:** water, sanitation and hygiene

Table 4.2 clarifies the suggested FTEs for screening and triage. The suggestion is to have two staff available for screening and two more for triage at any given time. Every shift should also have two WASH/IPC officers and two cleaners, to ensure IPC standards are met and patients appropriately instructed. It also includes a rapid response team that can provide 24/7 medical supervision for those facilities with mild cases or quarantined contacts, or provide emergency assistance in wards with moderately or severely ill patients. For those facilities that only accommodate contacts or mild cases, the implementing organization may choose to have a doctor on call rather than 24/7 medical presence in the facility. It is advised to have a nurse present at all times.

***Table 4.2** Full-time equivalents (FTE) for screening and triage*

Staff members	**Screening and triage rapid response team**
Screening and triage nurses	17 FTE
Rapid response team doctors	4 FTE
Rapid response team nurses	4 FTE
WASH/IPC officers	8 FTE
Cleaners and helpers	8 FTE

Depending on the size and focus of the facility, additional functions should be considered: hospital manager, senior medical doctor, nursing manager, operational support lead, IPC/WASH-lead, rehabilitation lead, supply chain manager, data manager, epidemiologist, psychosocial support, pharmacist, staff health doctor, X-ray technician, laboratory technician, kitchen staff, cleaners and helpers, security guards, warehouse staff, technical staff, biomedical engineer, and laundry. These functions could be combined or expanded, based on the system implemented and staff availability.

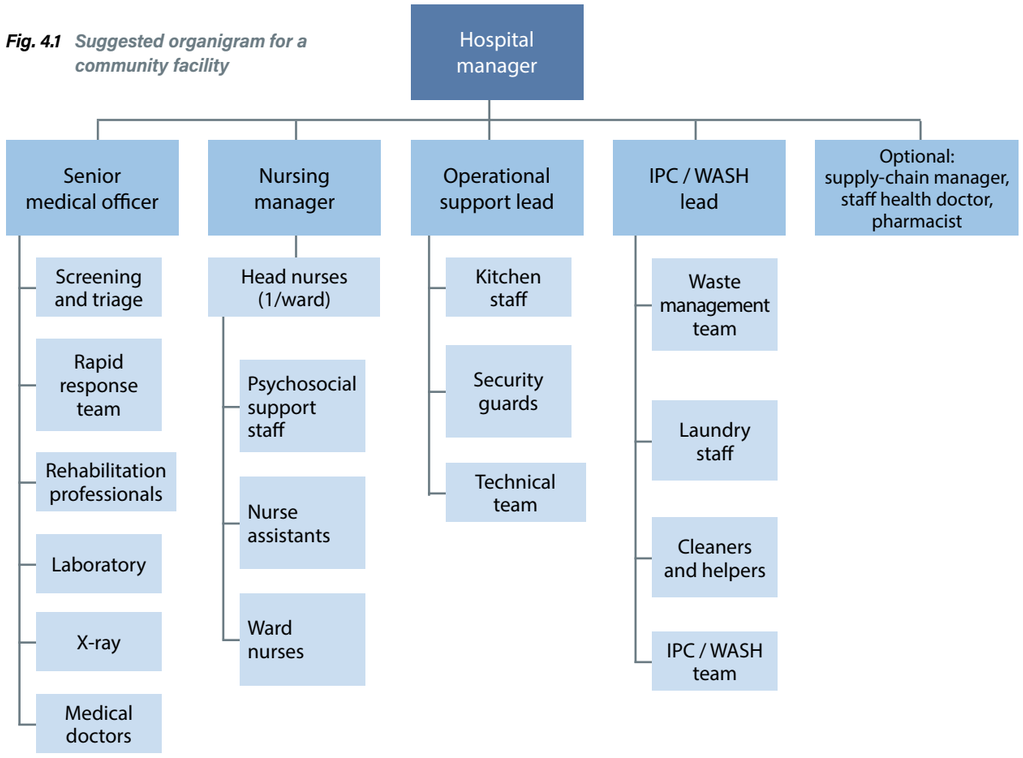
4.1 Management

Clear lines of command and control are critical to the effective operation of any facility. Fig. 4.1 illustrates suggested roles and responsibilities of the community facility management team

Each member of the management team is responsible for following up on safe staffing levels and rostering of their respective teams. Some organizations advise to have staff work in fixed teams with minimal contact with the other teams. The objective of this strategy is to minimize the danger of deactivation of a large percentage of the department staff in case of exposure.

A sample organigram is proposed in Fig. 4.1.

Fig. 4.1 *Suggested organigram for a community facility*



4.2 Screening and triage personnel

Screening and triage areas should be expected to have a high throughput. Bottlenecks should be avoided as much as possible, as they bring people close together, which can accommodate cross-contamination.

The staff at the screening area should be trained and updated regularly on changes in the case definition. Two nurses at the screening station at any moment should be considered the minimum, and this number should be increased on demand; 8.5 FTE nurses should therefore be considered. The implementing agency can, of course, choose to assign other trained professionals to perform screening functions.

It is recommended to have at least two nurses assigned to the triage area, with the ability to surge staffing as needed; 8.5 FTE nurses are required to ensure two nurses are always present. Organizations may choose to add other health professionals to the triage staff as required (e.g. medical doctors). IPC officers and cleaners/helpers should be available 24/7 here as well.

The triage personnel should have specific training in application of a standardized, validated triage tool, such as the Interagency Integrated Triage Tool (*1*).

4.3 Nurses

International guidelines indicate that no fewer than one nurse should be assigned for every eight beds (*2*). Accordingly, five nurses should be assigned to each ward for severely ill patients. This means 21 FTE nurses are required for each severe ward module (plus one head nurse). It should be recognized that use of full PPE for extended periods of time challenges staff members' ability to work effectively. Adherence to minimum staffing requirements ensures that patient deterioration is identified early, and necessary interventions are being undertaken to prevent patient decompensation. One head nurse per ward should be responsible for shift planning, liaison with the nursing manager, interdisciplinary communication, facilitation of admissions, discharges and referrals. When the head nurse for a ward is not on duty, another nurse should be assigned as a shift-responsible professional, assuming all head-nurse activities and giving reports to the head nurse on their return to duty at the next shift handover.

If the ward is used to isolate contacts, it is suggested that there is no need for additional nursing staffing. Access to health-care service can be ensured through the rapid response team (one nurse and one doctor 24/7). One head nurse could be included to supervise the planning (e.g. admissions and discharges) for the ward.

In areas for patients with mild or moderate disease, or as step-down ward, no fewer than two nurses are required for every 40-bed module (20 beds for step-down ward). Patients in these areas should be capable of some self-care and tolerance to oral medication regimens that can be distributed by nurses, potentially for several days at a time. This calculates into 8.5 FTE nurses per ward and one head nurse.

A 20-bed ward for suspected cases should include, for example, four beds that can safely accommodate ICU-level care for those patients who are not confirmed COVID-19-patients but require a higher level of care. This should reflect in the staffing for this ward by adding two (1 per 2 beds) ICU-trained nurses per shift (8.5 FTE). The nursing staffing for the remaining 16 patients should be adapted to the disease severity (one nurse per eight beds in each shift for severely ill patients; one nurse per shift for all patients if all are mildly or moderately ill)

In the event that a 20-bed SIPA module is used for ICU beds, the international standard indicates that no fewer than one nurse be assigned to every two patients. For a 20-bed ICU module, this equates to 42 FTE nurses.

4.4 Nurse assistants

For mildly or moderately sick patients or for step-down ward modules, no fewer than 8.5 FTE nurse assistants per 40-bed ward (20 beds for step-down ward) are required. No fewer than 17 FTE nurse assistants are required for every ward for 40 severely sick patients.

Large proportions of severely sick patients will be bed-bound and require a continuous supply of oxygen and continuous care for all basic needs. These needs include, but are not limited to, hygiene, feeding and provision of drinking water. The community facility should be designed so that equipment and supplies are brought in from the "low-risk areas". The suggestion is to add one nurse assistant for every nurse during the day and two nurse assistants for every ward during the night.

For situations where the SIPA is utilized as an ICU, two nurse assistants per shift are required, adding another 8.5 FTE for a 20-bed ICU module.

4.5 Medical doctors

For wards only accommodating isolation of contacts or mild- or moderate-severity patients, the rapid response team doctor can supervise, as these patients should not need too much medical care. The rapid response team doctor can also care for the (for example) four ICU beds in the ward for suspected cases.

Each 40-patient ward module for severely ill patients should be staffed by no fewer than one medical doctor during each shift, including overnight periods.

Depending on staff availability, shift patterns, and differing ways of working, the required number of doctors may vary across health systems and should be carefully considered and reassessed periodically, in advance of opening one or more ward modules. At the minimum, one doctor per shift working 40 hours per week equates to 4 FTE doctors per ward module.

In an ICU ward module, no fewer than one doctor for every 10 patients should be considered. A doctor from the rapid response team can support this ward module indirectly, as may be necessary for emergency procedures and/or referrals. For a 20-bed ICU, no fewer than 8.5 FTE intensivists/anaesthesiologists should be considered.

4.6 Rapid response team

A roving emergency team with skills, experience and required equipment should be included for every 5 × 40-bed ward module. This team should consist of no fewer than one specialized nurse and one doctor. The rapid response team should have a technological or a resilient notification system that enables immediate notification when a ward identifies a decompensating patient who requires acute intervention and/or resuscitation. When not required, the team should be assigned to support in the triage area, to deliver acute stabilizing interventions and/or to work in an ICU ward module when not called upon to respond to an emergency elsewhere in the COVID-19 community facility. The rapid response team and other clinicians should be mindful of the criticality of the rapid response team's resilience and provide for adequate breaks and, if appropriate, critical incident stress debriefing following extended or challenging interventions, particularly with paediatric patients.

The rapid response team should be available to all wards on all shifts. It also ensures medical supervision in those facilities where only contacts or mildly sick patients are accommodated. This equates to no fewer than 4 FTE doctors and 4 FTE nurses for up to five ward modules of 40 beds.

4.7 Physiotherapists (or national equivalent)

Physiotherapists (or national equivalents) working in a COVID-19 community facility require competencies to maintain/optimize patient mobility and function and deliver specialist respiratory interventions that aim to improve oxygenation and manage hypersecretions.

Each 40-bed ward module for severely ill patients should be staffed by no fewer than two respiratory physiotherapists (or respiratory therapists or other national equivalent) during each shift, with no fewer than one during overnight periods. This requires 8.5 FTE. Each 20-bed ICU ward should have no fewer than two respiratory specialist therapists at any time (8.5 FTE). For each 20-bed step-down ward that is established, there should be two physiotherapists during each shift, but overnight cover is not required (3 FTE).

4.8 Speech and language therapists (or national equivalent)

When the community facility includes ICU capacity and is using mechanical ventilation, no fewer than one speech and language therapist, or national equivalent, should be available per shift (1 FTE; overnight cover is not required). They will work across wards to assess patients for swallowing and speech impairments that may occur as the result of mechanical ventilation and sedation, and provide interventions that facilitate oral intake of nutrition and prevent aspiration pneumonia.

4.9 Occupational therapists (or national equivalent)

Each 40-bed ward for severe cases requires one FTE occupational therapist or national equivalent. Each 20-bed step-down ward should be staffed by no fewer than two occupational therapists each shift (no overnight cover required). Occupational therapists working in a community facility require competencies to conduct cognitive assessment and rehabilitation, as well as graded activity and functional retraining.

4.10 Psychologists, psychosocial support staff

The community facility should have easy access to psychosocial support personnel for both patients and staff. This can vary from providing entertainment up to professional support according to local custom. Where step-down wards are included, at least one qualified psychologist or national equivalent (1 FTE), is advised, to provide psychological strategies and trauma counselling as needed.

4.11 Pharmacist

Most of the patients can be expected to require continued treatment for pre-existing conditions and may require medication to treat chronic illness. The size, staffing, and resource requirements of the pharmacy module will vary depending on the size and resources available to the community facility. The clinical team, in consultation with the supply-chain manager and pharmacist, should establish the requisite formulary and supply-chain management system, to ensure that an efficient system of decentralized stores with provision for restocking of medication is implemented in advance.

4.12 Staff health and safety lead

A staff health and safety lead should be designated before the commencement of any treatment activities. The lead will ensure that all staff remain aware of and report any signs of illness and/or absenteeism immediately. The lead will meet regularly with the community facility management team and liaise closely with the IPC lead. The staff health and safety lead will ensure administrative controls are in place, in order to guarantee provision of adequate training for health workers, ensuring an adequate patient-to-staff ratio and establishing a surveillance process for acute respiratory infections potentially caused by COVID-19 among health workers; ensuring that health workers and the public understand the importance of promptly seeking medical care; monitoring health workers' compliance with standard precautions; and providing mechanisms for improvement as needed.

The lead will ensure operations of the community facility prioritize protection for frontline health workers and non-clinical staff. The staff health and safety lead may be responsible for testing and tracking isolation for staff, reporting this information regularly to the community facility management team. No fewer than 2 FTE experienced clinicians should be assigned to this function for a facility.

Staff members who show signs or symptoms of COVID-19 should be tested and isolated promptly, to ensure that effective IPC for both staff and patients is maintained as soon as possible and prevent spreading of the disease to colleagues.

4.13 Cleaners and helpers/WASH/IPC officers (IPC team)

For every ward module, no fewer than two environmental staff should be assigned. An additional six staff members should be assigned to the triage area, staff areas and waste management. Staff should be available for both day and night shifts. One or two experienced environmental leads, ideally with both IPC and staff management experience should be appointed before the commencement of patient care activities. In total, 26 FTE should be utilized for triage, staff areas and waste management, plus 8.5 FTE for each 40-bed ward module (or 20 beds for ICU or step-down ward).

4.14 Other

Additional functions might be required:

- nutritionist;
- kitchen staff (kitchen and food delivery);
- security;
- warehouse;
- biomedical engineers;
- information technology (IT) professionals;
- laboratory;
- laundry;
- water supply;
- waste management;
- electrician;
- mortuary;
- patient transport;
- administration and finance;
- social services; and
- clergy.

5. Supplies and equipment

WHO has developed kit lists for treatment of patients with COVID-19. The lists provided in Web Annex 4 should be considered, and will drive procurement planning scaled to the number of patients to be treated. Specifications for critical medical equipment can be found on the WHO website (*1*). Therefore, details and numbers are not mentioned in this section.

5.1 Emergency equipment

Equipment for the acute management of decompensating patients (equivalent to a "crash cart") should be available in every ward module. Equipment includes a self-inflating ambu-bag with the ability to connect to high-flow oxygen; a resuscitation board for cardiopulmonary resuscitation (CPR); a suction unit; a kit with the materials for oxygen delivery; intravenous (IV) catheters/cannulas;, drip sets; and fluids (*2*).

Equipment that is not assigned to an individual patient must be thoroughly cleaned following every use. While using the emergency equipment, or during any other aerosol-generating procedure, staff should wear appropriate PPE, including N95/FFP3 masks.

A cart or backpack with specialized emergency equipment for the rapid response team must be placed in a strategic location in the facility. This contains (additional to the kit in the wards) medication, intubation equipment, a suction unit and a defibrillator. Suspected and confirmed areas in the facility have separate sets of emergency equipment to avoid cross-contamination. In the ICU area, several of these kits should be present.

5.2 Personal protective equipment

A table with estimated PPE usage for different patient numbers is provided in Web Annex 4. Refer to existing WHO guidance, such as *Modes of transmission of virus causing COVID-19: implications for IPC precaution recommendations* (*3*), *Infection prevention and control during health care when COVID-19 is suspected* (*4*) and *Rational use of personal protective equipment for coronavirus disease (COVID-19)* (*5*), for more detailed information.

5.3 Patient observation

COVID-19 patients need to be monitored closely, mainly for development of complications of COVID-19 such as sepsis, septic shock, respiratory failure or acute respiratory distress syndrome. Therefore, nurses in wards for moderately or severely sick patients need to monitor vital signs on a regular basis. Oxygen therapy is guided by oxygen saturation. Infection is a complex disease process that can affect all vital systems. Following temperature, urine output, pulse rate, respiratory rate, oxygen saturation, blood pressure and mental status are hence all equally important. Staff should have access to sufficient equipment to monitor patients in an efficient way.

In the area for suspected cases, equipment should be assigned to each individual patient and cleaned and disinfected after discharge, or thoroughly cleaned and disinfected in between usage.

An early warning score system can be put in place to identify deteriorating patients.

5.4 Administrative equipment and furniture

Furniture should be assigned to specific zones. Staff and patients need sufficient chairs and tables to sit and work efficiently. In the zone for confirmed cases, nurses can use trolleys to move from patient to patient with their equipment. In the areas for suspected cases, this should be avoided as it can initiate cross-infections.

Beds should be adapted to the disease severity of the patient. Patients in critical care areas should have pressure-relief mattresses if available.

The recommended characteristics for finishes and furniture are:

- leanable (material easy cleanable and resistant to repeated cleaning);
- easy to maintain and repair (select materials that are durable and/or easy to repair);
- resistant to microbial growth (select metals and hard plastics);
- nonporous (avoid porous plastics, such as polypropylene, in patient care area); and
- seamless (avoid upholstered furniture in patient care areas).

5.5 Imaging

Chest X-rays have limited sensitivity in the early stages of COVID-19 pneumonia. A computerized tomography (CT) scan is more sensitive but raises logistical problems and exposes patients to significant amounts of radiation. If ultrasound competencies are available, lung ultrasound can be used (*6*).

When these are used in the facility, there must be significant attention to IPC, as this equipment is used for larger numbers of patients and can possibly be a cause of cross-infection. In case the SIPA is adapted for ICU, mobile bedside X-ray should be available.

5.6 Medication and consumables

Detailed lists of medications and medical consumables are included in Web Annex 4.

5.7 Other medical equipment

Web Annex 4 includes detailed equipment for each ward module, and other clinical areas.

6. Systems

6.1 Screening

All health facilities should introduce a screening station at the entrance of the facility. The screening process involves evaluation of the patient using the standardized case definition for COVID-19 (*1*). If the patient fulfils the case definition, the triage system will define the acuity level of the patient (see later). Suspected and probable cases will be treated similarly in this proposed set-up.

Suspected case

A. A patient with acute respiratory illness (fever and at least one sign/symptom of respiratory disease [e.g. cough, shortness of breath]) AND a history of travel to or residence in a location reporting community transmission of COVID-19 during the 14 days prior to symptom onset

or

B. A patient with any acute respiratory illness AND having been in contact[1] with a confirmed or probable COVID-19 case in the last 14 days prior to onset of symptoms

or

C. A patient with severe acute respiratory infection (fever and at least one sign/symptom of respiratory disease (e.g. cough, shortness breath) AND requiring hospitalization AND in the absence of an alternative diagnosis that fully explains the clinical presentation

Probable case

A. A suspected case for whom testing for COVID-19 is inconclusive (inconclusive being the result of the test reported by the laboratory)

or

B. A suspected case for whom testing could not be performed for any reason

Confirmed case

A person with laboratory confirmation of COVID-19 infection, irrespective of clinical signs and symptoms

The case definition should be reviewed regularly on the WHO website (*2*).

Patients who do not fulfil the definition of a suspected case should be referred to regular health-care services. They do not need to wear a mask any longer. Patients clearly requiring intensive care are referred to ICU immediately. For patients defined as a suspected or probable case, laboratory sampling should be undertaken as soon as resources allow. People who were in contact with a confirmed case, but do not (yet) show symptoms (*see also reference* (*3*)) should be quarantined for 14 days. This can be done either at home, in a dedicated ward or facility for quarantining of contacts, or even in a ward for suspected patients (*3*).

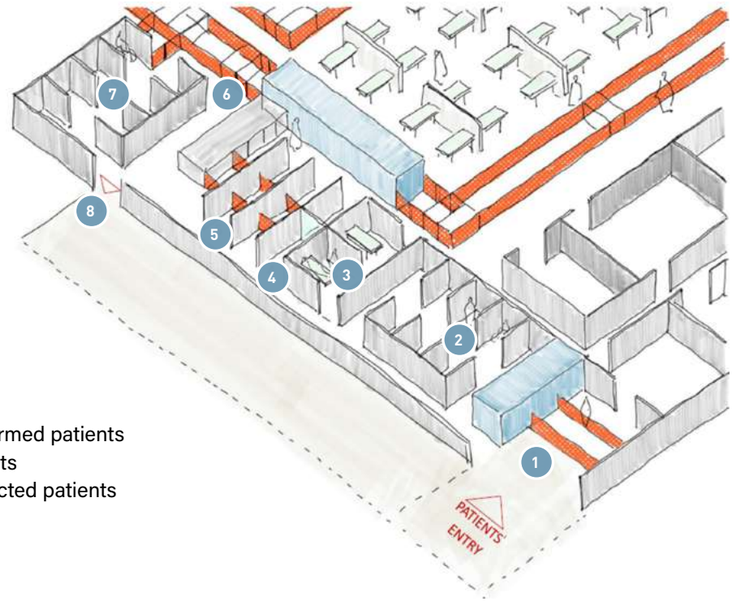
Informing

Everyone entering the facility should be informed about the signs and symptoms of COVID-19 and measures to be put in place (e.g. handwashing, respiratory hygiene, limiting visitors). Those without symptoms should not enter the facility, in order not to put themselves at risk.

Waiting areas

Waiting areas should be designed to allow those patients waiting to be pre-screened to see and speak with relatives separated by a safe distance (*see Fig. 6.1*). Regarding dimensions, sufficient space is recommended, as the number of people waiting can be very variable. Waiting areas should be spacious enough to allow distancing between those waiting or using screens in between patients, to reduce the area needed.

Fig. 6.1 *Artistic representation of waiting area and entrance*



1 Reception
2 Waiting area
3 Crash room
4 Test sample
5 Triage
6 Access for confirmed patients
7 Waiting for results
8 Exit for non-infected patients

Entrance screening points

At a screening point, all patients suspected of having COVID-19 (*1*) are directed to the triage point. Guidance on building and managing the screening points can be found in the earlier published document on building centres for treatment of severe acute respiratory disease (*4*). Checkpoints should be properly equipped with the correct PPE for patients and staff. Patients referred from other facilities can pass immediately through a separate entrance.

The following items should be provided at the entrance screening point:

- guidance posters for staff (e.g. to guide the process) and non-staff (e.g. to self-report, respiratory hygiene, etc.);
- masks for staff (if there is no physical contact with a patient, PPE does not have to be changed by the health worker);
- gloves for staff (if there is no physical contact with a patient, PPE does not have to be changed by the health worker);
- masks for patients: patients who are referred to the triage point are given a mask and an explanation that they should wear it until instructed otherwise at or after the triage;
- thermometers (infrared);
- facilities for hand hygiene (handwashing and alcohol-based hand rub) in staff and non-staff areas (i.e. for public/patient use as well); and
- waste bins for safe disposal of PPE.

Design considerations for screening and triage points

- The entry and exit points of the screening areas must be clear and signposted following a unidirectional flow.
- All patients should be able to perform hand hygiene (handwashing with soap and running water or alcohol-based hand rub/sanitizer) at entry and exit points.
- A fence between the staff and patients' area should be set up in, for example, a tent in front of the entrance. The distance between the areas must be a minimum of 1 m.
  - The more ventilation that is possible the better (e.g. a tent with open sides oriented in the same direction as the dominant wind direction).
- The routes and walkways must be wide enough to prevent overcrowding, as sometimes these can be points of contact of several people with different degrees of contamination or protection.
- The whole area must have good visibility, so that the guard can control it all from his or her position. A dedicated staff member should evaluate whether the presenting person fulfills the case definition for COVID-19.
- Triage staff only need to move to the patient area when absolutely needed; on indication from the triage office, two dedicated staff members should accompany patients to a dedicated ward. Documents should stay in the staff area at all times. One nurse should stand behind a desk in a secure area, while two health staff work between the entrance, triage and suspected cases' area, moving patients in need and helping the triage officer.

Referral and transport

For acutely ill patients who do NOT meet the COVID-19 case definition, measures must be taken to ensure rapid referral to an appropriate level of care (*2*). It is advised to contact beforehand to ensure there is capacity available to accept the patient and to avoid additional transport needs.[1] A staging area could be put in place where patients can wait until the appropriate facility is identified and transport is arranged. No special transport considerations need to be in place to move these patients. However, if an ambulance is used it is essential to ensure that appropriate cleaning and disinfection is performed between patients.

For transport of suspected, probable or confirmed COVID-19 patients, ambulance staff should have access to appropriate PPE. It is not recommended to transport several patients in one vehicle if they are not all confirmed COVID-19 cases.

The ambulance needs to be disinfected after each use. Therefore, it is useful to reduce the equipment in the patient compartment to the essentials. Currently, WHO recommends using 70% ethyl alcohol to disinfect small areas between uses, such as reusable dedicated equipment (e.g. thermometers) and sodium hypochlorite at 0.1% (equivalent to 1000 parts per million [ppm]) for disinfecting surfaces; however, disinfection with a minimum concentration of 0.5% (5000 ppm) sodium hypochlorite (bleach) is strongly recommended. Disinfection should preferably be done near the triage area, so the ambulance is immediately available. Waste should be handled as infectious medical waste and can be handed over at the triage area after handing over the patient.

Facilities with particular capacities (such as critical care, obstetrics, etc.) should be identified during initiation of coordination, and clear referral criteria should be delineated for all staff. Referral of a patient is always a medical decision.

After screening

Patients meeting the case definition of COVID-19 proceed to the triage area.

6.2 Triage point

Triage is an acuity-based sorting of patients best done with a standardized, validated triage tool, such as the Integrated Interagency Triage Tool (*7*).

Triage set-up

The triage area (*see example in Fig. 6.2*) should be properly equipped with correct distancing measures and PPE for staff; no patient should enter the triage area without a mask, received at the entrance. The figure shows two entrances, where one is used for patients that have already received their laboratory result confirming infection. They do not need to go through the screening station.

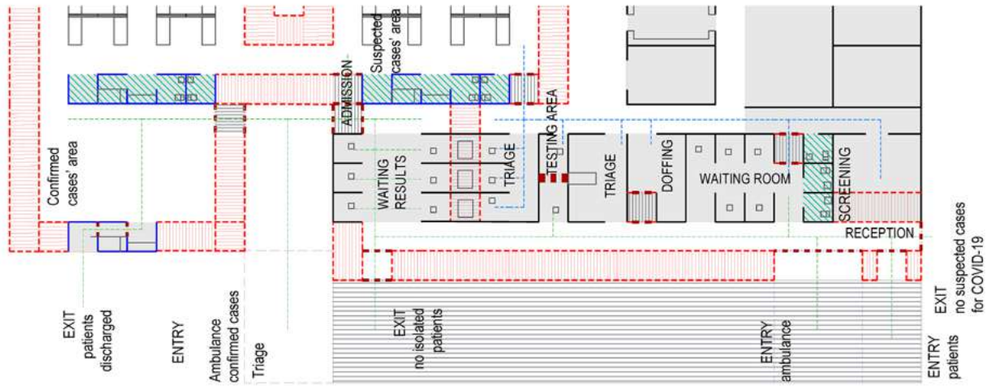
After triage, patients can be categorized by disease severity and clinical syndromes and admitted to the appropriate modular area.

Patient identification/administration

Upon arrival in the facility, every patient should be identified with a unique identifier and full name, which should both be written on a bracelet and follow the patient throughout their journey in the facility. The identifier and the patient's name should be on each document, sample and item allocated to the patient.

A whiteboard (physical or electronic) should be provided in every section of the facility and in a central place, so there is a track of which patient is where in the facility.

Fig. 6.2 *Triage layout in the proposed centre*



6.3 After screening and triage

1. Patients are referred to the "suspected cases" area until their laboratory result is known, when they:
   fulfil the case definition of suspected or probable case
   AND
   are too sick to self-isolate.
2. Patients who do not fulfil the case definition are sent home or referred to appropriate relevant care (primary care provider, telemedicine, or referral facility for other acute needs).
3. Patients who fulfil the case definition may be instructed to stay isolated in the facility or referred elsewhere according to local protocol. If testing is conducted at the facility, they should be admitted and isolated in a health facility or community facility as long as resources allow. If this is not possible, they need to remain in home isolation. If negative, they can resume their normal activities. The destination of the patient should be determined based on classification of disease severity: mild, moderate, severe or critical, to ensure appropriate care is provided.

6.4 Patient documentation

Every patient needs to have a record, containing the unique identifier and name of the patient and the notes of their disease status and progress, results of laboratory tests and other examinations, treatment, etc. Since there are several different lay-outs and set-ups in use, no particular set of documents is promoted here. Attention needs to be placed on the IPC measures related to the patient documentation. The file should not travel from a contaminated zone to a clean area. Options are to keep the file on the clean-side and communicate observations for each patient "over the fence" to a colleague who takes the notes. Electronic options may also be possible but require significant investment.

Informed consent should be requested when possible for all invasive procedures. A system should be put in place to report adverse events and near misses.

On discharge, or at referral, the patient has the right to receive a report about their stay in the facility. This is not only for information but also to ensure continuity of care when needed. A death certificate should be issued when a patient passes away, according to local protocol.

Every facility should contribute to a reporting system implemented by health authorities. This is important for following up activities in the facility, for epidemiological follow-up in the region and for follow-up of contacts and implementing actions in cooperation with other pillars of the outbreak response. The patient documentation should allow easy collection of the required data in a structured way.

6.5 Laboratory assessment

Polymerase chain reaction (PCR) for COVID-19

When resources allow, all suspected cases should be tested using a molecular test (PCR). Based on clinical judgment, clinicians may opt to order a test for the COVID-19 virus in a patient who does not strictly meet the case definition, for example, if there is acute respiratory illness among a cluster of health workers or severe acute respiratory infection or pneumonia in families, workplaces or social networks (*8*).

For mobile patients who are not significantly sick and require no admission, the sampling can be done in the triage area. Wherever possible, the patient (suspected case) should wait in the suspected cases' area until the laboratory result is known.

Patients who need to be admitted can be tested either at triage or in the suspected cases' area. Patients should always be instructed not to get in close contact with each other and to wear their mask when moving with other people. Patients requiring critical care should be referred immediately to an area or facility with critical care capacity and testing performed there.

Specimens to be collected

At a minimum, the following respiratory material should be collected:

- upper respiratory specimens: nasopharyngeal and oropharyngeal swab or wash in ambulatory patients; and/or
- lower respiratory specimens: sputum (if produced) and/or endotracheal aspirate or bronchoalveolar lavage in patients with more severe respiratory disease who are too sick to self-isolate. (Note the high risk of aerosolization; adhere strictly to IPC procedures, including airborne precautions).

Specific infection prevention and control measures when collecting and handling laboratory specimens

All specimens collected for laboratory investigations should be regarded as potentially infectious. Health workers who collect, handle or transport any clinical specimens should adhere rigorously to the following standard precaution measures and biosafety practices, to minimize the possibility of exposure to pathogens (*9*):

- ensure that health workers who collect specimens use appropriate PPE (i.e. eye protection, a medical mask, a long-sleeved gown, gloves). If the specimen is collected with an aerosol-generating procedure, personnel should wear a particulate respirator that is at least as protective as a NIOSH-certified N95, an EU standard FFP2, or an equivalent;
- ensure that all personnel who transport specimens are trained in safe handling practices and spill-decontamination procedures;
- place specimens for transport in leakproof specimen bags (i.e. secondary containers) that have a separate sealable pocket for the specimen (i.e. a plastic biohazard specimen bag), with the patient's label on the specimen container (i.e. the primary container), and a clearly written laboratory request form;
- ensure that laboratories in health-care facilities adhere to appropriate biosafety practices and transport requirements, according to the type of organism being handled;
- deliver all specimens by hand whenever possible. DO NOT use pneumatic-tube systems to transport specimens; and
- document clearly each patient's full name, date of birth and suspected COVID-19 of potential concern on the laboratory request form. Notify the laboratory as soon as possible that the specimen is being transported.

Other laboratory tests

During the patient's stay in the facility, there will be other tests required for further diagnosis and follow-up. While the capacities for testing at each facility will be different, the general principles remain the same. Everything should be done to ensure the safety of the patient (by e.g. correct identification of each sample), health worker (by e.g. taking measures to avoid needlestick injury or cross-infection), other staff members (by safe transport of contaminated samples) and laboratory staff (e.g. correct packing of samples and safe work environment, efficient waste-collection mechanisms etc.). Point-of-care testing can be considered for some tests when resources and training are available.

Laboratory tests to be considered available in the facility (*10*) include, but are not limited to:

- blood cultures;
- malaria/dengue/chikungunya;
- other respiratory viruses;
- blood gases;
- haematology and biochemistry;
- liver and kidney function; and
- lactate.

6.6 Referral systems

As already explained, patients will be referred to and from the facility. A system needs to be organized for this, including the contact details of all relevant facilities and their capacities, transport methods, criteria for referral, documentation to be completed, etc. Receiving facilities should be contacted in advance, to ensure they have the capacity and resources to take care of the patient, and patients clearly need to consent to referral, which is always based on a medical decision.

6.7 Admission/discharge criteria

Admission

It is good practice to clearly define which patients can be admitted in each zone of the facility and which patients should be discharged. This can be done using clinical parameters, but the resources needed should also be considered. In countries where access or provision of a higher level of care is difficult, palliative care could be considered.

Discharge

Discharge of COVID-19 patients can be considered if a patient shows clinical improvement and two negative PCR results with a 24-hour interval between the samples. In the presence of two negative results, but with additional clinical requirements, the patient can be referred to a non-COVID hospital or health facility for the continuation of care. A discharge note should be handed over to the patient.

If laboratory tests are not readily available, discharge can be considered after resolution of symptoms and 14 days more of isolation (in a facility or at home). See WHO guidance (*11*).

Admission packages

It is advised to provide an admission package to each patient upon admission to the facility. Items to be included could be (but are not limited to) a blanket, clothing, slippers, a cup, soap, towel and toothbrush. All these items should be for personal use and, if possible, identified with the patient's unique identifier.

Bed capacity and allocation overview

The larger the facility is, the more complicated it is to keep an overview of which patient is admitted on which ward and who has responsibility during a certain shift. Assigning specific call-signs or mobile numbers to a specific caregiver responsible for a set of patients or a certain ward can be an option for keeping this overview.

A large board with all the wards and beds listed can allow recording of the unique identifier of each patient in a specific bed, which then ensures an overview is kept of each patient's location. Regular checking to see if this is still correct is essential.

This method also allows a fast overview of bed-occupancy and empty beds if there is a request for referral or a new admission presenting at the triage area.

6.8 Suspected cases' area

Patients are admitted in the suspected cases' area until the laboratory result is known. This area should be staffed with sufficient staff numbers, as patients may also be quite sick here. Oxygen provision and initial medical care may need to be initiated here. Equipment needs to be at hand to provide qualitative and dignified care, as well as to intervene in emergencies. Four beds (for example) in a suspected cases' area of 20 beds could be equipped and staffed for ICU-level care for those patients requiring critical care who have no confirmed laboratory result.

Patient education

It is important to explain to the patient how long the average waiting time for the test result is in the specific setting, as this might take significant amounts of time.

Patients should be educated about the importance of their isolation. Breaches in isolation should be well documented and followed up, as this can mean close contact between one suspected patient and another.

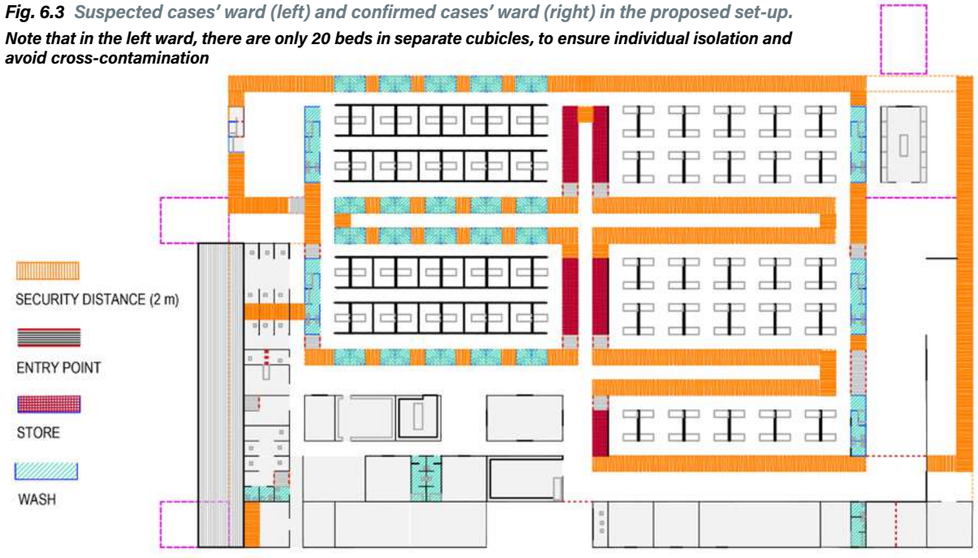
Patients should also receive guidance on hand hygiene and respiratory hygiene (covering the mouth and nose when coughing or sneezing, using paper towel or an elbow and use of a mask whenever they need to or are instructed to leave their room).

Specific infection prevention and control measures in the suspected cases' area

Until their laboratory result is known, patients should be treated in individual isolation to avoid cross-contamination (*see Fig. 6.3*). This means staff will have to don and doff PPE and ensure hand hygiene between every patient in the suspected cases' area. The safest and easiest way to guarantee this is by using individual rooms or cubicles with individual donning and doffing areas, but at a minimum there should be sufficient distance between patient cubicles, in line with WHO IPC recommendations (*9, 12*). With regard to the safe access to toilet facilities on the suspected cases' ward, two potential approaches could be taken, either having dedicated cleaning staff who will disinfect the bathroom after each use (high demand for staff and PPE), or providing individual commode toilets in separated cabins for each patient (*see below*).

All patients in this area should already be wearing a surgical mask when moving out of their individual room, as long as it is tolerated, and if no oxygen therapy is required.

Fig. 6.3 *Suspected cases' ward (left) and confirmed cases' ward (right) in the proposed set-up.*
Note that in the left ward, there are only 20 beds in separate cubicles, to ensure individual isolation and avoid cross-contamination



WaSH: water, sanitation and hygiene.

6.9 Step-down ward

Admission

A COVID-19 step-down ward provides a dedicated inpatient area, where patients recovering from COVID-19 who are not ready for or able to be discharged will be cared for, for an interim period. Step-down wards have a different staffing composition to acute medical wards; they have a rehabilitative focus and aim to help patients address the physical, respiratory, cognitive, swallowing and psychological impairments that may be experienced following severe COVID-19 (*see Fig. 6.4*). It is important to note that in this context, "step down" refers to a facility for post-acute, rehabilitation-focused care, not acute step down from critical care/mechanical ventilation. Step-down wards are not intended for acutely unwell patients or for patients who are immediately post critical care (i.e. this is not a high-dependency unit), nor are they an alternative to palliative care/patients who are not for escalation.

Fig. 6.4 *Rehabilitation in a community facility: overview of input*

Acute wards	ICU	Step down
» Mobilization and supportive respiratory techniques » Assessment: rehabilitation needs and discharge readiness » Discharge facilitation	» Optimization oxygenation » Secretion management » Mobilization	» Comprehensive rehab • Mobility • Respiration • ADL • Cognition • Swallowing/speech • Psychosocial » Discharge planning

ADL: activities of daily living; **ICU**: intensive care unit.

The objectives of the step down ward are to:

- prepare patients for discharge through nursing care, rehabilitation and discharge planning; and
- relieve medical wards of patients who do not have acute medical needs.

6.10 Training

Staff recruited to work in the facility should receive training on several topics. Since this is a long list and the numbers of available workforce are low, the advice is to start recruiting as early as possible, even before building the facility, and to start training staff as soon as possible. Examples of training to be provided include, but are not limited to:

- IPC – standard precautions, use of PPE in the context of COVID-19 (donning and doffing);
- staff behaviour in an outbreak setting: hand hygiene, respiratory hygiene;
- COVID-19 (disease symptoms, diagnosis, treatment, admission criteria, discharge criteria, etc.);
- screening and triage;
- early recognition and initial approach to the management of the acutely ill patient;
- staff, supplies and equipment and patient flow (low risk, high risk, suspected, confirmed cases);
- emergency interventions (resuscitation, alerting emergency team, etc.);
- self-care (monitoring own health, what to do if I get sick, my rights and duties, etc.);
- psychological first aid (or equivalent);
- use of equipment (oxygen concentrator, monitoring equipment, saturation, continuous positive airway pressure], etc.)
- documentation; and
- triage.

6.11 Staff health monitoring

Staff working in the facility are the most valuable resource. It is extremely important to monitor their health and to intervene as early as possible (*13*). Addressing staff health issues helps the individual health worker and prevents spread of disease in the health-care community and thus major outbreak among health workforces.

It is advised to measure the temperature of every staff member on entering and leaving the workplace, as well as monitoring for respiratory and other symptoms. Every staff member should wear a mask from the time they enter the facility, to reduce the risk of virus transmission between staff. Staff should be motivated on a regular basis to report if they notice symptoms for themselves or colleagues. Health workers should have free access to testing and health care (general health care as well as COVID-19-related care), including insurance and continued payment during sick leave, to promote seeking advice early when they feel unwell. Interventions should be put in place to prevent stigmatization of health workers who are working in the response in the communities, as well as for those becoming sick among their colleagues.

Absences from work should be monitored and followed up, to make sure that staff not showing up for their shift are not hiding away while being sick.

The need for psychosocial support should be assessed and group sessions organized on a regular basis. Case-by-case need for individual support should be assessed and offered when needed. Measures for accidental exposure should be in place.

6.12 Psychosocial support

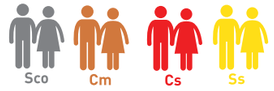
Being sick and being isolated is a huge burden on the psychological well-being of a patient. The uncertainty of a new and unknown disease is a stress factor. The fact that there is no contact possible with loved ones, as visitors are not allowed, makes it even harder to bear. The first action to undertake is to inform the patient repeatedly about the evolution of their disease and the prognosis. Patients should have access to their mobile phones, so they can maintain contact. The proposed electric plan provides electric plugs at each bed for charging purposes. If possible, wireless internet could be provided as well.

For patients who are not severely sick, entertainment can be planned for. Psychosocial support staff can also be included in the staffing schedule (see earlier). Examples can be movie evenings, information sessions, play sessions with children, etc. IPC measures need to be kept in mind strictly for patients with suspected COVID-19, so the risk of cross-infection is avoided. A lot of these activities can be organized even without entering the high-risk zone. The proposed plans have a patient relaxation area where mobile patients with confirmed COVID-19 can relax or activities can be organized.

7. Clinical modules

The following summary tables are structured in line with the main patient typologies described throughout this document. They provide details regarding the main characteristics and special considerations of each ward, and following the main “4S” approach (staff, supplies and equipment, structure, systems).

COVID-19: Screening and triage



Descriptor

Provides a dedicated area for safe initial screening and triage of the patients with symptoms of COVID-19.

Key characteristics

All health facilities, no matter the configuration, should introduce a screening and triage station at the entrance of the facility. The screening point will be the entrance point and identify those patients that fulfil the case definition of COVID-19. The triage will be the area where, according to the triage system chosen at the facility level, the acuity level of the patient will be defined. The area will have a reception area waiting room with independent cabins, and a sample area to collect testing.

Special considerations

- The screening and triage areas should consider adequately the flow between the different spaces to avoid crossing pathways.
- Screening and triage should be available 24/7 and staffed according to the needs, avoiding excessive waiting times and crowding.
- Patients wash hands at the entrance and every patient fitting the case definition should be provided a mask.
- Visitors should not be allowed to accompany the patient into the facility.
- Staff should wear a mask at all times and appropriate PPE when physically interacting with patients.
- Patients should be identified by bracelet and assigned a unique identifier. All patients, samples and documents should be identified by full name and the unique identifier.
- The triage area and facilities should be cleaned and disinfected after each patient use.

For description of patient types, see Fig. 1.1 *(see page 10)*

STAFF	
AVERAGE STAFF NUMBER: » 17 FTE nurses (4 nurses per shift) for the screening and triage management; additional staff and profiles can be added as required (e.g. medical doctors) or staffing numbers can be expanded to overcome the busier periods » Rapid response team can be called in for critical patients » Security guards » Cleaners and helpers as required **INDICATIVE ROLES:** » **Screening:** identify those patients fitting the case definition	» **Triage:** assign the acuity level to each patient according to the chosen triage system » **Sampling:** take a laboratory sample for testing for COVID-19 » **Cleaning:** clean and disinfect a specific area after use by each individual patient **STAFF SKILLS AND COMPETENCIES:** » The staff at the screening area should be trained and updated regularly on eventual changes of the case definitions » The triage personnel should have specific training in application of a standardized, validated triage tool
SUPPLIES AND EQUIPMENT	
EMERGENCY EQUIPMENT: » Stretchers » Set of emergency equipment **LABORATORY SAMPLING EQUIPMENT:** » Equipment for taking samples in a safe way	**PPE:** » Masks for staff and patients » Gloves » Eye protection » Gown » Hand-hygiene stations » Full PPE for physical interaction with patients
STRUCTURE	
FACILITIES: » Reception area, with patients' /companions' orientations » A screening place » 6 waiting room cabins (2 m × 2 m) » Triage place » A testing area » An admissions area	**SPACE NEEDED:** » Variable, but usually 240 m^2 and additional 240 m^2 with an additional waiting area **DESIGN CONSIDERATIONS:** » One-way flow
SYSTEMS	
PATIENT DOCUMENTATION: » Patient record and unique identifiers (bracelets) **OXYGEN SYSTEM:** » Set of emergency equipment **AIRFLOW VENTILATION SYSTEM:** » Natural ventilation » 60 L/s/patient **WATER:** » Water supply at lavatories » Handwashing facilities at entrance of the facility **WASTE MANAGEMENT:** » All waste bins considered as potentially infectious waste	**SANITATION:** » 2 accessible bathrooms (male and female) for the use of the patients **HYGIENE AND ENVIRONMENTAL CLEANING:** » Intensive regular cleaning of waiting areas » Dedicated cleaners for toilets after each use **ELECTRICITY AND LIGHTING:** » Power requirements will vary, depending on the electromedical devices, computers and printers connected » All areas should be well lit

FTE: full-time equivalent; **PPE:** personal protective equipment.

COVID-19: Isolation of contacts and mild suspected cases WARD 20 beds

Sco
Ss

Descriptor

Provides individually isolated accommodation and basic services for people who have been in contact with confirmed patients in those settings where home isolation is not possible, or for mildly sick patients with suspected COVID-19.

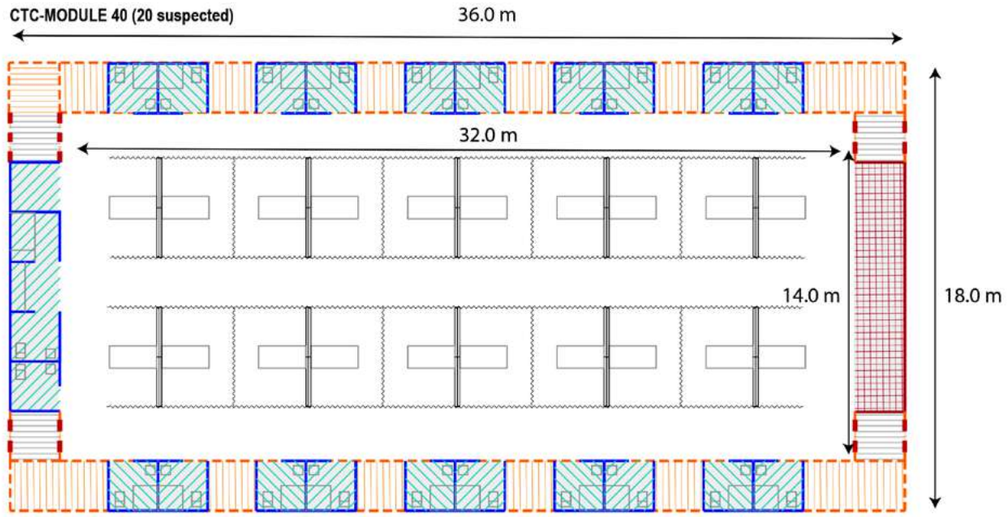
Key characteristics

In certain environments, it might be difficult for contacts or mildly sick patients at home. This might, for example, be the case in settings where larger families are living together in small, one-room houses or in very remote areas. The facility will then provide possibilities for individual isolation, where basic services such as hygiene, food and basic health care are foreseen. This means that these residents will have individual cubicles with individual sanitary facilities and showers. Staffing levels will be lower, since these patients are expected to be relatively healthy and able to take care of themselves. A permanent presence of a medical doctor and a nurse should be considered, to ensure follow-up of the health of the current residents, emergency situations and care for chronic conditions.

Special considerations

» There should be individual cubicles with individual sanitary installations.
» Residents leaving the cubicle should be wearing a mask and handwashing facilities should be widely available and their use promoted.
» Patients should be well-informed and educated about COVID-19, and the measures they need to keep in place to prevent cross-contamination.
» Staff should use new PPE for every patient contact; there is no cohorted care in these areas.
» Equipment used should be properly cleaned between each patient.
» Permanent presence of health staff should be provided. The rapid response team can be used to staff a health post to follow up on development of symptoms, serve in emergencies or ensure treatment for chronic conditions.
» Food, water and psychosocial support should be provided.
» Patients should be offered the possibility to have contact with relatives, for example, by use of their mobile phone.
» In a 20-bed ward for suspected cases, it is advised to allocate, for example, four beds for care for those patients that require high-level care but do not yet have a laboratory-confirmed result.

For description of patient types, see Fig. 1.1 *(see page 10)*



FTE: full-time equivalent; HEPA: high-efficiency particulate air; ICU: intensive care unit; WaSH: water, sanitation and hygiene; IPC: infection prevention and control; IV: intravenous; PPE: personal protective equipment.

STAFF

AVERAGE STAFF NUMBER:

- 1 head nurse and sufficient helpers/cleaners/IPC/WASH officers (e.g. 8.5 FTE)
- Health care can be provided from a health post that is staffed by members of the rapid response team
- 1 ICU nurse in every shift for every 2 ICU beds if implemented

INDICATIVE ROLES:

- **Head nurse:** organize the ward, for example, discharges and admissions, referrals; supervise the cleaners/helpers
- **Cleaners and helpers**: keep the ward clean and serve food and other services
- **Rapid response team:** provide a health post

STAFF SKILLS AND COMPETENCIES:

- Good knowledge of IPC and cleaning practices
- Rapid response team skilled in basic health care and emergency care

SUPPLIES AND EQUIPMENT

EMERGENCY EQUIPMENT:

- Basic resuscitation equipment available on the ward (ambu-bag)
- Specialized emergency equipment provided by the rapid response team in case needed
- All required ICU equipment for ICU beds if implemented

PPE:

- Masks for staff and patients
- Gloves
- Eye protection
- Gown
- Hand-hygiene stations
- Sufficient numbers of PPE needed since these patients are isolated individually

PATIENT OBSERVATION:

- Thermometer to be provided to each individual patient for self-monitoring and/or to the health post responsible for follow-up on all the patients
- Full set of vital sign monitoring equipment at the health post, to be cleaned properly between each use

ADMINISTRATIVE EQUIPMENT AND FURNITURE:

- Chair and bed for each patient
- All equipment and furniture to be easy to clean
- Patient records, stationery and furniture for staff to work efficiently

MEDICATION AND CONSUMABLES:

- Medication and consumables to ensure care for chronic conditions
- Medication and consumables for emergency care: full set of emergency equipment available for the rapid response team (defibrillator, suction unit, IV access, intubation and bag-valve ventilation, medication)

STRUCTURE

FACILITIES:

- Ward with individual cubicles and private sanitation and showers

BED CAPACITY:

- 20 beds, of which, for example, 4 are ICU beds

SPACE NEEDED:

- 448 m^2 internal dimensions, considering safety distances
- Supplementary modules of 648 m^2 external dimensions
- See detailed bill of quantities in Web Annex 4 and Excel bill of quantities tools

DESIGN CONSIDERATIONS:

- Individual cubicles with three potential configurations
- See Web Annex 3 for detailed Information

SYSTEMS

PATIENT DOCUMENTATION:

- Patient record

REFERRAL SYSTEM:

- Good and rapid access for referral of symptomatic contacts for testing and for suspected patients receiving positive test results
- A referral system should also be available for patients whose medical condition deteriorates

OXYGEN SYSTEM:

- Oxygen only needed at the health post and in the emergency equipment

AIRFLOW VENTILATION SYSTEM:

- Natural ventilation
- 60 L/s/patient
- Supported by portable ventilation HEPA filter systems

WATER:

- Water supply at lavatories
- Handwashing facilities at each toilet cubicle

WASTE MANAGEMENT:

- All waste bins considered as potentially infectious waste
- Bin available for each bed

SANITATION:

- 20 accessible bathrooms (male and female) for the individual use of the patients, or 2 gender-separated bathrooms with dedicated cleaners who will clean and disinfect after each use

HYGIENE AND ENVIRONMENTAL CLEANING:

- Intensive regular cleaning on ward
- Intensive terminal cleaning of bed and toilet
- Dedicated cleaners for toilets after each use

ELECTRICITY AND LIGHTING:

- Wall sockets for all cubicles
- Hallways, toilets and showers should be well lit

COVID-19: Mild and moderate confirmed cases WARD 40 beds

Cm

Descriptor

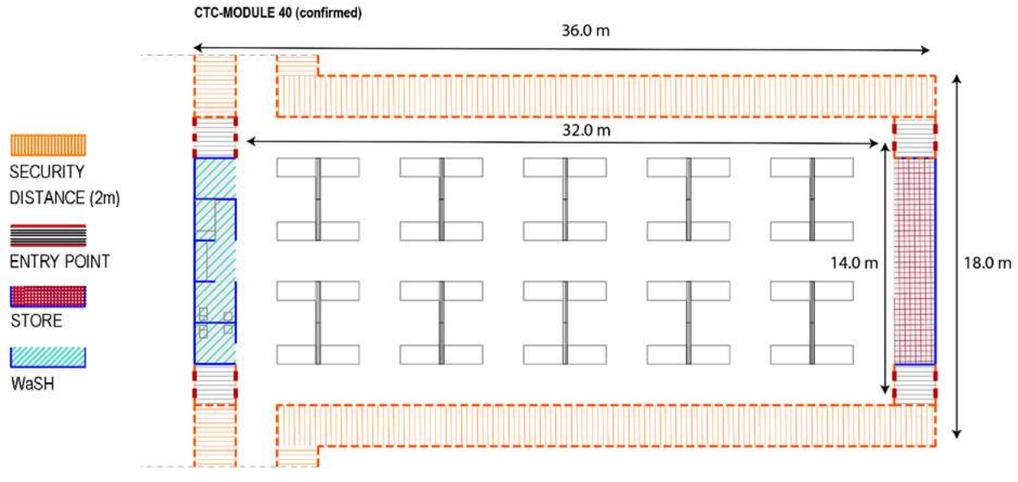
Provides cohorted care for patients who are mildly or moderately sick and have received a positive laboratory result.

Key characteristics

These wards provide care in cohorts for 40 patients. There is no need for isolation at the individual level, since all these patients have confirmed COVID-19. Therefore, sanitary facilities can also be shared. Since these patients are not very dependent on medical care, staffing requirements are medium.

Special considerations

- Staff should wear PPE at all times when working in the ward.
- Mild and moderately sick patients will require some nursing care, for example, for distribution of medication, oxygen therapy and patient observations.
- Oxygen therapy could be initiated for moderately sick patients and then should be guided by oxygen saturation.
- The medical doctor of the rapid response team can provide medical supervision for these patients.



For description of patient types, see Fig. 1.1 (*see page 10*) **WaSH:** water, sanitation and hygiene.

STAFF

AVERAGE STAFF NUMBER:
- 1 head nurse and sufficient helpers/cleaners/IPC/WASH officers (e.g. 8.5 FTE)
- 8.5 FTE nurses and 8.5 FTE nurse assistants (2 each per shift)
- Medical supervision can be provided from a health post that is staffed by member of the rapid response team

INDICATIVE ROLES:
- **Head nurse:** organize the ward, e.g. discharges and admissions, referrals; supervise the cleaners/helpers
- **Cleaners and helpers:** keep the ward clean
- **Nurses:** distribute medicines, provide oxygen, assure adequate observations of the patients
- **Nurse assistants:** serve food and other services
- **Rapid response team:** provide medical supervision

STAFF SKILLS AND COMPETENCIES:
- Good knowledge of IPC and cleaning practices
- Nurses skilled in patient observation and oxygen therapy
- Rapid response team skilled in basic health care and emergency care

SUPPLIES AND EQUIPMENT

EMERGENCY EQUIPMENT:
- Basic resuscitation equipment available on the ward (ambu-bag)
- Specialized emergency equipment provided by the rapid response team in case needed

PPE:
- Mask
- Eye protection
- Hand-hygiene stations
- Gloves
- Gown

PATIENT OBSERVATION:
- Sufficient sets of monitoring equipment (blood pressure cuffs, clock/watch with second hand, oxygen saturation monitors)

ADMINISTRATIVE EQUIPMENT AND FURNITURE:
- Chair and bed for each patient
- All equipment and furniture to be easy to clean
- Patient records, stationery and furniture for staff to work efficiently

MEDICATION AND CONSUMABLES:
- Medication and consumables to ensure care for acute and chronic conditions
- Equipment for oxygen provision
- Medication and consumables for emergency care: full set of emergency equipment available for the rapid response team (defibrillator, suction unit, IV access, intubation and bag-valve ventilation, medication)

STRUCTURE

FACILITIES:
- Ward with shared toilets and showers
- Access to a relaxation area/rest area could be provided (e.g. movie shown or games to play)
- Crash room at triage
- Sterilization area
- Morgue

BED CAPACITY:
- 40 beds

SPACE NEEDED:
- 448 m^2 internal dimensions, considering safety distances
- Supplementary modules of 648 m^2 external dimensions
- See detailed bill of quantities in Web Annex 4 and Excel bill of quantities tools

DESIGN CONSIDERATIONS:
- Individual beds separated by panels and safety distance in a cohorted area, with privacy screens

SYSTEMS

PATIENT DOCUMENTATION:
- Patient record

REFERRAL SYSTEM:
- Good and rapid access for referral of symptomatic contacts for testing and for suspected patients receiving positive test results
- A referral system should also be available for patients whose medical condition deteriorates

OXYGEN SYSTEM:
- Oxygen only needed at the health post and in the emergency equipment

AIRFLOW VENTILATION SYSTEM:
- Natural ventilation
- 60 L/s/patient
- Supported by portable ventilation HEPA filter systems

WATER:
- Water supply at lavatories
- Handwashing facilities at each shared toilet

WASTE MANAGEMENT:
- All waste bins considered as potentially infectious waste
- Bin available bins for each bed

SANITATION:
- 2 accessible gender-separated bathrooms (toilet and shower) for use by the patients

HYGIENE AND ENVIRONMENTAL CLEANING:
- Intensive regular cleaning on ward and toilets
- Intensive terminal cleaning of bed

ELECTRICITY AND LIGHTING:
- Wall sockets for all bed panels
- If X-rays are portable, there should be dedicated power outlets for them
- Hallways, toilets and showers should be well lit

COVID-19: Severe confirmed cases WARD 40 beds

Cs

Descriptor

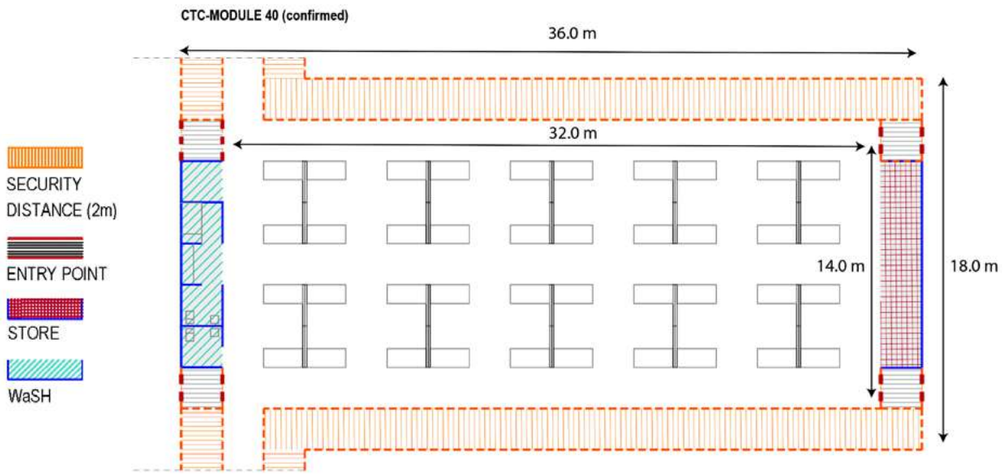
Provides cohorted care for patients who are severely sick and have received a positive laboratory result.

Key characteristics

These wards provide care in cohorts for 40 patients. There is no need for isolation at the individual level, since all these patients have confirmed COVID-19. Therefore, sanitary facilities can also be shared. Since these patients are severely sick, higher medical staffing levels are required.

Special considerations

- Staff should wear PPE at all times when working in the ward.
- Severely sick patients will have high demands in nursing and medical care.
- Oxygen therapy is likely to be required for all patients and then should be guided by oxygen saturation.
- In a facility that has no dedicated ICU, it is advised to allocate, for example, four beds for care for those patients who require critical care.



WaSH: water, sanitation and hygiene. For description of patient types, see Fig. 1.1 (*see page 10*)

STAFF

AVERAGE STAFF NUMBER:

- 1 head nurse and sufficient helpers/cleaners/IPC/WASH officers (e.g. 8.5 FTE)
- 21 FTE nurses (1 for every 8 patients in every shift) and 17 FTE nurse assistants (1 each for every 8 patients per shift during the day, 2 per ward during the night)
- 1 ICU nurse in every shift for every 2 ICU beds if implemented
- 8.5 FTE respiratory physiotherapists (or national equivalent)
- 1.5 FTE occupational therapists (or national equivalent)

INDICATIVE ROLES:

- **Head nurse:** organize the ward, for example, discharges and admissions, referrals; supervise the nurses, nurse assistants and cleaners/helpers
- **Cleaners and helpers:** keep the ward clean
- **Nurses:** distribute medicines, provide oxygen, assure adequate observations of the patients
- **Nurse assistants:** serve food and other services
- **Ward doctor:** ensure medical supervision of the patients
- **Rapid response team:** provide emergency care in case of deteriorating patient
- **Physiotherapist** (or national equivalent)**:** perform respiratory interventions and mobilization
- **Occupational therapist** (or national equivalent)**:** perform cognitive and functional assessment

STAFF SKILLS AND COMPETENCIES:

- Good knowledge of IPC and cleaning practices
- Nurses skilled in patient observation and oxygen therapy
- Rapid response team skilled in basic health care and emergency care
- Rehabilitation professionals skilled in general medical and pulmonary rehabilitation (for physiotherapists and occupational therapists

SUPPLIES AND EQUIPMENT

EMERGENCY EQUIPMENT:

- Basic resuscitation equipment available on the ward (ambu-bag)
- Specialized emergency equipment provided by the rapid response team in case needed
- All required ICU equipment for ICU beds if implemented

PPE:

- Mask
- Eye protection
- Hand-hygiene stations
- Gloves
- Gown

PATIENT OBSERVATION:

- Sufficient sets of monitoring equipment (blood pressure cuffs, clock/watch with second hand, oxygen saturation monitors)

ADMINISTRATIVE EQUIPMENT AND FURNITURE:

- Chair and bed for each patient
- All equipment and furniture to be easy to clean
- Patient records, stationery and furniture for staff to work efficiently

MEDICATION AND CONSUMABLES:

- Medication and consumables to ensure care for acute and chronic conditions
- Equipment for oxygen provision
- Medication and consumables for emergency care: full set of emergency equipment available for the rapid response team (defibrillator, suction unit, IV access, intubation and bag-valve ventilation, medication)

STRUCTURE

FACILITIES:

- Ward with shared toilets and showers
- Sterilization area
- Morgue

BED CAPACITY:

- 40 beds, of which, for example, 4 ICU are beds if there is no dedicated ICU in the facility

SPACE NEEDED:

- 448 m^2 internal dimensions, considering safety distances
- Supplementary modules of 648 m^2 external dimensions
- See detailed bill of quantities in Web Annex 4 and Excel bill of quantities tools

DESIGN CONSIDERATIONS:

- Individual beds separated by panels and safety distance in a cohorted area, with privacy screens

SYSTEMS

PATIENT DOCUMENTATION:

- Patient record

REFERRAL SYSTEM:

- Good and rapid access for referral of symptomatic contacts for testing and for suspected patients receiving positive test results
- A referral system should also be available for patients whose medical condition deteriorates

OXYGEN SYSTEM:

- Oxygen only needed at the health post and in the emergency equipment

AIRFLOW VENTILATION SYSTEM:

- Natural/hybrid mechanical ventilation
- 160 L/s/patient
- Supported by portable ventilation HEPA filter systems

WATER:

- Water supply at lavatories
- Handwashing facilities at each shared toilet

WASTE MANAGEMENT:

- All waste bins considered as potentially infectious waste
- Bin available bins for each bed

SANITATION:

- 2 accessible gender-separated bathrooms (toilet and shower) for use by the patients

HYGIENE AND ENVIRONMENTAL CLEANING:

- Intensive regular cleaning on ward and toilets
- Intensive terminal cleaning of bed

ELECTRICITY AND LIGHTING:

- Wall sockets for all bed panels
- If X-rays are portable, there should be dedicated power outlets for them
- Hallways, toilets and showers should be well lit

COVID-19: Critical confirmed cases WARD 40 beds

Cc

Descriptor

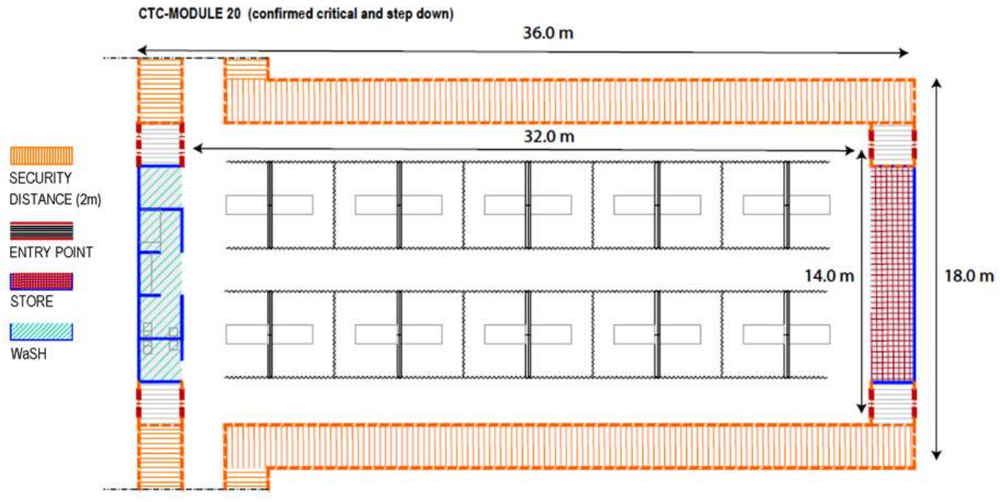
Provides a dedicated ICU area where treatment of critical cases can be provided.

Key characteristics

Critical cases are admitted in a ward area with preferably fewer beds to ensure enough working space around each bed. These patients will require artificial ventilation and invasive monitoring and, therefore, staffing level requirements (in both numbers and qualifications) will be very high.

Special considerations

- Staff should wear PPE at all times when working in the ward.
- There are very high requirements in specialized staff.
- Requirements in sanitation will be lower, as these patients are bed-bound.
- There will be high needs in specialized equipment, medicines and consumables.



WaSH: water, sanitation and hygiene. For description of patient types, see Fig. 1.1 (*see page 10*)

STAFF

AVERAGE STAFF NUMBER:

- 1 head nurse and sufficient helpers/cleaners/IPC/WASH officers (e.g. 8.5 FTE)
- 42 FTE nurses (1 for every 2 patients in every shift) and 8.5 FTE nurse assistants (2 per shift)
- 8.5 FTE ICU doctors (2 per shift)
- 8.5 FTE respiratory physiotherapists (or national equivalents)
- 1 FTE speech and language therapist (or national equivalent)

INDICATIVE ROLES:

- **Head nurse:** organize the ward, for example, discharges and admissions, referrals; supervise the nurses, nurse assistants and cleaners/helpers
- **Cleaners and helpers:** keep the ward clean
- **Nurses:** distribute medicines, provide oxygen, assure adequate observations of the patients
- **Nurse assistants:** serve food and other services
- **ICU doctor:** ensure medical supervision of the patients
- **Rapid response team:** provide emergency care in case of a deteriorating patient
- **Physiotherapist:** perform specialist respiratory interventions and early mobilization
- **Speech and language therapist:** perform swallowing assessment and interventions (conducted once patients have de-escalated to other wards)

STAFF SKILLS AND COMPETENCIES:

- Good knowledge of IPC and cleaning practices
- Nurses and doctors skilled in intensive care observation and management
- Rapid response team skilled in basic health care and emergency care
- **Physiotherapist:** skills in specialist respiratory interventions
- **Speech and language therapy:** skills in post-ICU assessment and intervention

SUPPLIES AND EQUIPMENT

EMERGENCY EQUIPMENT:

- Basic resuscitation equipment available at each bed (ambu-bag).
- Specialized emergency equipment available at key places in the ward (multiple sets)

PPE:

- Mask (N95 if aerosol-generating procedures are performed)
- Gloves
- Eye protection
- Gown
- Hand-hygiene stations

PATIENT OBSERVATION:

- Intensive care continuous monitoring equipment

ADMINISTRATIVE EQUIPMENT AND FURNITURE:

- Bed for each patient
- All equipment and furniture to be easy to clean
- Patient records, stationery and furniture for staff to work efficiently

MEDICATION AND CONSUMABLES:

- Medication and consumables to ensure care for acute and chronic conditions
- Equipment for oxygen provision, including ventilators
- Suction unit at each bed
- Multiple sets of medication and consumables for emergency care: full set of emergency equipment available at key places in the ward (defibrillator, suction unit, IV access, intubation and bag-valve ventilation, emergency medications)
- Continuous infusion pumps for medications

STRUCTURE

FACILITIES:

- Ward with sufficient space around each bed
- Crash room at triage
- Sterilization area
- Morgue

BED CAPACITY:

- 20 beds

SPACE NEEDED:

- 448 m^2 internal dimensions, considering safety distances
  - Supplementary modules of 648 m^2 external dimensions
  - See detailed bill of quantities in Web Annex 4 and Excel bill of quantities tools

DESIGN CONSIDERATIONS:

- Individual beds separated by panels and safety distance in a cohorted area, with privacy screens

SYSTEMS

PATIENT DOCUMENTATION:

- Patient record

REFERRAL SYSTEM:

- Good and rapid access for referral of recovering patients who can move back to a ward for severe patients or step-down area

OXYGEN SYSTEM:

- Oxygen and ventilator available for every bed

AIRFLOW VENTILATION SYSTEM:

- Natural/hybrid mechanical ventilation
- 160 L/s/patient
- Supported by portable ventilation HEPA filter systems

WATER:

- Water supply at lavatories
- Handwashing facilities at each shared toilet

WASTE MANAGEMENT:

- All waste bins considered as potentially infectious waste
- Bin available bins for each bed

SANITATION:

- 2 accessible gender-separated bathrooms (toilet and shower) for use by the patients

HYGIENE AND ENVIRONMENTAL CLEANING:

- Intensive regular cleaning on ward and toilets
- Intensive terminal cleaning of bed

ELECTRICITY AND LIGHTING:

- Several wall sockets for all cubicles
- Hallways, toilets and showers should be well lit

COVID-19: Step down cases WARD 20 beds

Sd

Descriptor

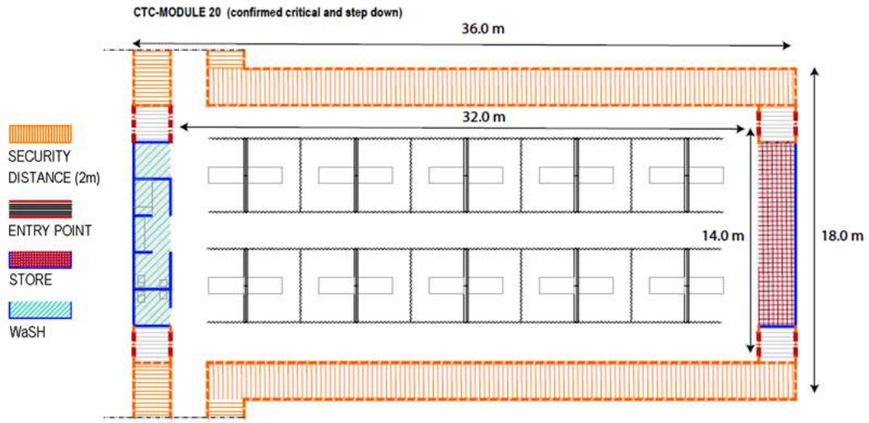
Provides a dedicated inpatient area where patients recovering from severe COVID-19, who are not ready for or able to be discharged, will receive rehabilitation and nursing support for an interim period.

Key characteristics

In centres where severe and ICU cases are being managed, it is essential to consider a dedicated inpatient area where recovering severe cases will be cared for for an interim period. This may be known as a "step down area". Recovering severe cases are likely to present with ongoing challenges that will delay safe discharge, including post-intensive care syndrome, and may require some ongoing respiratory support, but they will also require lower medical and nursing staffing ratios than severe cases. It is common for patients with severe COVID-19, especially those who have been mechanically ventilated, to experience substantial weakness and functional decline. When this is the case, some patients may require a period of inpatient recovery in a step-down ward before being discharged home. These wards provide care in cohorts of 20 patients (10 per gender), with a dedicated space left open for rehabilitation activities. These wards are designed for COVID-19-positive patients; therefore, there is no need for isolation at the individual level and sanitation facilities can be shared. These patients are no longer severely sick, so lower medical staffing levels are required, while rehabilitation staffing levels are higher. Permanent nursing presence in the ward is still required.

Special considerations

- Staff should wear PPE at all times when working in the ward.
- There will be lower needs in medicines and consumables, although it should be expected that patients are likely to require dressings for pressure areas.
- Permanent presence of health staff should be provided.
- Most patients will require some nursing care, for example, for distribution of medication, mobility assistance and patient observations.
- The medical doctor of the mild-moderate ward can provide medical care to these patients.
- Equipment used should be properly cleaned between each patient.
- Patients should be encouraged to have contact with relatives, for example, by use of their mobile phone.
- Separate step-down areas for (recovering) COVID-negative patients should be considered.



WaSH: water, sanitation and hygiene. For description of patient types, see Fig. 1.1 (*see page 10*)

STAFF

AVERAGE STAFF NUMBER:

- Medical, nursing and support staffing based on mild/moderate ward cover
- 10 FTE rehabilitation professionals with the suggested composition of (where locally applicable): 3 FTE physiotherapists (2 per shift); 3 FTE occupational therapists (2 per shift); 1 FTE speech and language therapist; and 1 FTE psychologist

NOTE: rehabilitation professionals are not required to work overnight in step down.

INDICATIVE ROLES:

- **Physiotherapist** (or national equivalent)**:** functional rehabilitation, graded exercise, basic respiratory interventions, and balance training
- **Occupational therapist** (or national equivalent)**:** cognitive assessment and intervention, occupational based exercise, activity of daily living retraining, discharge planning
- **Speech and language therapist** (or national equivalent)**:** swallowing assessment and intervention, speech assessment and retraining
- **Psychologist** (or national equivalent)**:** counselling and other psychological techniques

STAFF SKILLS AND COMPETENCIES:

- Good knowledge of IPC and cleaning practices; psychological first aid
- Nurses skilled in patient observation and oxygen therapy
- Rapid response team skilled in basic health care and emergency care in post-ICU
- Swallowing assessment and rehabilitation (for speech and language therapists); Trauma counselling (for psychologists)

SUPPLIES AND EQUIPMENT

PPE:

- Adequate PPE for staff

REHABILITATION-SPECIFIC EQUIPMENT:

- 4× tables and 10 basic chairs for table-based activities and meals
- 4× inpatient wheelchairs
- 4× pulpit/gutter frames
- 8× four-wheel walkers/walking frames
- Elastic exercise bands of varying resistance, or 4 sets of free weights (or locally manufactured equivalent) for basic strengthening
- Over toilet-frame (1 per toilet) and/or 2 portable commodes
- Shower chair with back and armrests (1 per shower)
- Equipment for basic food preparation/assembly (not for cooking)
- Table-based games, for example, cards, board games, puzzles
- Access to supportive discharge equipment (a small number of walking frames and wheelchairs) is desirable

STRUCTURE

FACILITIES:

- Ward area with shared toilets and showers
- Small rehabilitation/relaxation space

BED CAPACITY:

- 20 beds

SPACE NEEDED:

- 448 m^2 internal dimensions, considering safety distances
- Supplementary modules of 648 m^2 external dimensions
- See detailed bill of quantities in Web Annex 4 and Excel bill of quantities tools

DESIGN CONSIDERATIONS:

- Individual beds separated by panels and safety distance in a cohorted area, with privacy screens
- Divide the bed portion of the ward in two for single-gender use (10 beds each side)

SYSTEMS

REFERRAL SYSTEM:

- Good and rapid access for referral of patients from mild-severe wards (patients should not be referred directly from ICU/critical care)
- Ensure clear referral criteria are established

CONSIDER THE FOLLOWING FOR EACH PATIENT:

- Has significantly reduced function from baseline and is not suitable for discharge (considering support available at home)
- Is medically stable
- Is able to actively participate in rehabilitation
- Has established referral links with local outpatient and community-based rehabilitation services for follow-up

All the other items listed in previous tables are also required: Oxygen system, Airflow ventilation system, Water, Waste management, Sanitation, Hygiene and environmental cleaning, Electricity and lighting,

FTE: full-time equivalent; **HEPA:** high-efficiency particulate air; **ICU:** intensive care unit; **IPC:** infection prevention and control; **IV:** intravenous; **PPE:** personal protective equipment.

8. Operational support

8.1 Communication

Patient to relatives

As discussed in Section 4.11, patients in a COVID-19 ward should have access to a mobile phone and/or internet to stay in contact with their relatives. If this is not possible, or the patient is too sick to contact relatives, contact details of a central contact point should be given to relatives or vice versa, so the medical doctor or other staff member can keep contact with relatives of the patients.

Patient to staff

If the patient needs support from a nurse, there should be a system to call for assistance. This can be a sophisticated bedside call system or a simple bell.

Staff internal

Different systems are possible for staff to keep contact with each other in the facility. While staff members should not be allowed to take their mobile phones inside the potentially contaminated zones, specific mobile phones could be provided for use in these zones (and stay in there). Other options are the use of VHF radio or other radio communication systems or landlines. This is highly recommended during the construction phase.

Rapid response team

A priority communication line should be available to alert the rapid response team in case a patient deteriorates and specialized assistance is needed. For this option too, radio or mobile phone could be an option.

Communication with other health-care facilities

It is advised to have a rapid system for referring patients to other facilities or to accept referrals from other facilities. The mobile phone is the best option for this, but the number needs to be assigned to the right person and handed over at shift change. This person should have an overview on the availability of resources (beds, staff, specialized equipment) for the specific patient.

8.2 Decentralized stocks and restocking

In a large facility, experience has shown that it is extremely useful to establish standard lists of consumables and medications that should be available in the wards. Every ward serving the same category of patients should use the same list.

Once a standard list (with the name of each item and required minimum and maximum stock) is established, this can be used to stock the decentralized stores in each ward to the maximum level on opening the ward. Later the list can be used as an order list to restock the wards, for example, twice per week, once the minimum stock has been reached for a specific item. The minimum stock should always be sufficient to last until the next restocking moment.

The pharmacy and warehouse can use these ordering lists to deliver the items to each ward. Attention must be given to the fact that an item that has been handed out to a specific ward can never move to a "cleaner" zone any more (e.g. not from the confirmed patients' area to the suspected patients' area, or not back outside of the patient zones from any non-patient area).

8.3 Food distribution

To avoid big logistical challenges and risks for cross-infection, the best way to provide food will probably be to use reusable plates and cutlery; in the case of disposable plates and cutlery, it is important to be aware of the high volume of daily waste to be dealt with. Systems for distribution of food and drinking water and collection of leftovers and waste need to be well in place, respecting the one-way flow (from the clean/safe side to the more contaminated zones). Meals for patients could be introduced in to the high-risk area by the side walls of the central corridors, via a specific wall closet fitted with compartments for safe transfer.

8.4 Oxygen system

Oxygen in the temporary facility could be supplied in four different ways: oxygen cylinders, oxygen concentrators, an oxygen generator supply system, or liquid oxygen tanks connected to an oxygen supply system. See WHO guidance on *Oxygen sources and distribution for COVID-19 treatment centres* (*1*) for more details on oxygen supply and distribution. For a correct calculation, regardless of the chosen system, the high oxygen consumption of a COVID-19 patient must be taken into consideration. It is also necessary to provide oxygen supply for the treatment area for suspected cases.

- **Oxygen cylinders:** these are suitable for short-term missions and a relatively small hospital (limited number of beds).
  - *Advantages:* easy to deploy, personal cylinder per bed/operating room
  - *Disadvantages:* logistics are more complicated, difficult to take on aircraft, requires refilling, and puts great emphasis on safety in storage and use
- **Oxygen concentrators:** these are suitable for a small-medium size hospital.
  - *Advantages:* easy to deploy, one oxygen concentrator per bed/per 2 beds, some models could be connected to an accessory device to the oxygen concentrator that enables refilling of custom portable oxygen cylinders
  - *Disadvantages:* difficult market availability for large numbers, requires continuous power supply

» **Oxygen plant connected to an oxygen supply system:** suitable for long-term facilities, and for a medium-large size hospital.
- *Advantages:* gives logistical independence, does not require refilling
- *Disadvantages:* heavy, demanding special layout. High demand for electricity supply is a critical element for a pressure swing adsorption (PSA) oxygen plant. Deployment takes time and requires trained personnel for repair, operation and supervision 24/7. Can be damaged and therefore requires the backing of oxygen cylinders

» **Liquid oxygen tanks connected to an oxygen supply system:** suitable for long-term facilities, and for a medium-large size hospital
- *Advantages:* gives logistical independence, could be set up in more semi-permanent structures
- *Disadvantages:* needs refilling or replacement of the tank (if the oxygen tank is set up in a truck). Deployment takes time and requires trained personnel for repair, operation and supervision 24/7. Liquid oxygen needs to be converted into gas through vaporization, adding complexity to the process Can be damaged and therefore requires the backing of oxygen cylinders

The selected option depends on the country's own resources and skills. In this document, oxygen concentrators are proposed as the first-phase option while a more suitable system is set up (*2*).

All areas where patients with severe acute respiratory infection are cared for should be equipped with pulse oximeters, functioning oxygen systems and disposable, single-use, oxygen-delivering interfaces (nasal cannula, nasal prongs, simple face mask and mask with reservoir bag).

8.5 Airflow ventilation system

To help prevent airborne and droplet infections in health-care facilities, adequate ventilation in necessary in all patient-care areas (*3*). The design and set up of a COVID-19 facility in community settings must take fluctuations in ventilation rate and predominant wind direction into account. When natural ventilation alone cannot satisfy the recommended ventilation requirements, alternative ventilation systems should be considered. Hybrid (mixed-mode) natural ventilation, for example, should be used, or if that is not enough, mechanical ventilation.

Noting that in low-resource settings with the use of contingency facilities (e.g. outdoor isolation tents open to the wind), when the prevailing wind direction and average velocity may be used, the design of natural ventilation for infection control should consider the worst-case situation – that is, when the wind is absent, and where supplementary mechanical ventilation may be needed. It is also important to consider that large openings in natural ventilation without any protection increase the risk of security breaches and the spread of vector-borne diseases. Purpose-designed barred windows and semi-transparent mosquito meshes can be used in these situations. If the COVID-19 community facility will surge to care for ICU patients, then adequate ventilation must be put into place. See the recently released manual from the Severe Acute Respiratory Infections Treatment Centre for more information (*2*).

8.6 Water

Water supply – **quality**

The most likely scenario is that the facility will have access to existing water supply systems that will be functional; however, residual chlorine testing should be performed regularly and corrective measures taken if needed. If there is no water supply system, conventional, centralized water-treatment methods that utilize filtration and disinfection via chlorination should be used to inactivate COVID-19.

Systematic disinfection should be ensured by proper chlorination of all water supplied, with monitoring. For more information, see the WHO publication, *Essential environmental health standards in health care* (*4*). For effective centralized disinfection, there should be a residual concentration of free chlorine of ≥0.5 mg/L after at least 30 min contact time at pH < 8.0. A chlorine residual should be maintained throughout the distribution system.

Factors for proper monitoring of water quality include turbidity, free residual chlorine (FRC) concentration and pH. For more detailed information, see *The Sphere handbook: humanitarian charter and minimum standards in humanitarian response* (*5*).

Any COVID-19 treatment centre in a temporary facility should be able to test and monitor the quality and safety of their treated water, and this includes an ability to analyse the raw water in order to optimize water treatment; if turbidity is higher than 5 NTU (nephelometric turbidity units), it is important to change the source or pre-treat. In case of doubt and/or if possible, rapid tests should be used and/or laboratory analysis performed for chemical compounds (*6*). If changes appear after preparation of chlorine solutions (colour, smell, etc.), analysis should be carried out.

Water supply – **quantity**

Effective functioning of a health-care facility, and the ability to prevent the spread of infections, relies on a sufficient and reliable supply of water through estimations of minimum and peak demand. This should include supply for all staff, patients, procedures and potential visitors and should include other water demands, for example, water for pour/flush latrines, water for sterilizers, water for cleaning facilities and water for producing disinfecting solutions. Large quantities of water are required for cleaning/decontamination procedures, laundry, drinking and personal hygiene (including hand hygiene). Water consumption depends more on the number of staff and size of the centre than on the number of patients.

Estimation of water quantity requirement, based on two scenarios: [1]

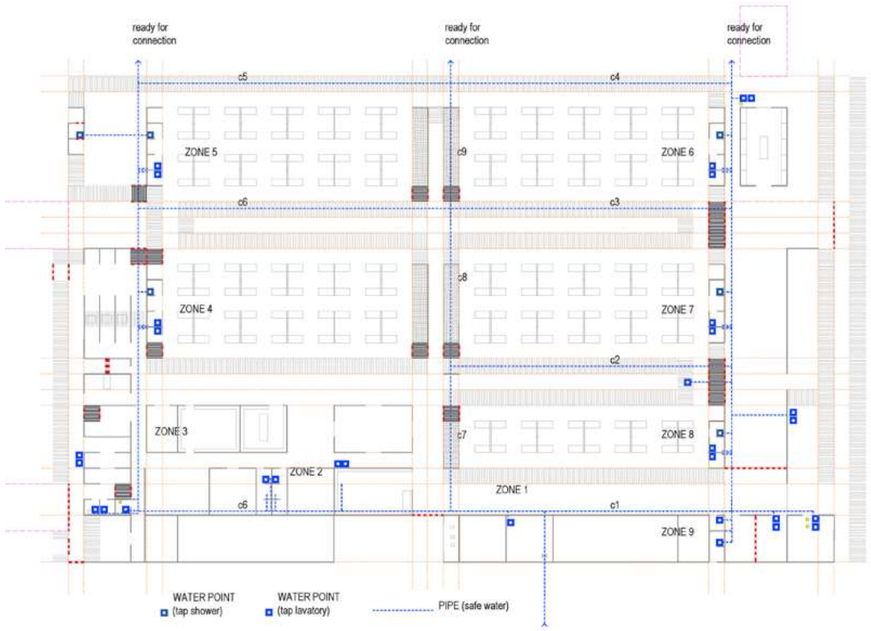
1. Model M (100 m × 80 m): 160 moderately ill inpatients + 20 SIPA beds + 60 staff: around 20 000 L/day; 40 000 L storage capacity required
2. Model XL (180 m × 100 m): 480 moderately ill inpatients + 20 SIPA beds + 140 staff: varound 56 0000 L/day; 112 000 L storage capacity required

Water supply – **distribution**

The most likely scenario is that the facility will have access to existing water supply systems that will be functional but when setting up the facility it must have, as a minimum, water access points at each toilet area, within each clinical work area, and at shower, waste-management, laundry and food-preparation points (*see Fig. 8.1*). All equipment in contact with water or chlorine solutions must be made of plastic, to avoid damage. Several fundamental parameters must be considered when designing the network that will supply water to the hospital:

- a ring-based rather than reticular layout should be implemented – this allows even pressure distribution throughout the facility; the possibility of doing repairs at any point of the system without compromising the water supply; circulation of water in cold weather conditions, to avoid freezing; and, in case of high retention time, the ability to recirculate for further chlorination;
- at all times the hospital and facilities in the operational support area must have a supply system that covers the needs at times of both peak and low demand;
- sufficient pressure should be provided by pumps, ensuring that patients, health and support staff receive the water they need at all water supply points:
  - pressure should be maintained between 1 bar and 3 bar (10 m and 30 m of water column);
  - water velocity in the pipeline should be kept between 0.5 m/s and 2 m/s at peak consumption; and
- residual chlorination should be ensured, so that between 0.2 mg/L and 0.5 mg/L (or parts per million [ppm]) is maintained at all water supply points.

Fig. 8.1 *Proposed design for the water supply network for the Model M (100 m × 80 m) 160 moderately ill inpatients + 20 specific inpatient profile area beds*



WaSH: water, sanitation and hygiene.

8.7 Waste management

Safe management of health-care waste

Best practices for safely managing health-care waste should be followed, including assigning responsibility and sufficient human and material resources to dispose of such waste safely. All staff who handle health-care waste should wear appropriate PPE (that is, boots, apron, long-sleeved gown, thick gloves, mask and goggles or a face shield) and perform hand hygiene after removing it. For more information refer to the WHO guidance, *Safe management of wastes from health-care activities: a summary* (*7*) and *Overview of technologies for the treatment of infectious and sharp waste from health care facilities* (*8*).

Waste-**management plan**

The waste management plan should detail the supplies needed, including PPE, sharps containers, waste bins and bags, cleaning supplies and the type and capacity of waste-treatment technology or off-site treatment arrangements with public or private bodies. In planning supplies, it is important to calculate the usage of consumables and restocking needs. Finally, the plan should consider weather conditions and protection of waste from rain to avoid run-off. The division of a simple clear waste-management plan will help to structure the daily waste-management activities for the COVID-19 community facility from the outset. This should include a brief descriptor of the responsibilities of all team members, specialist assigned roles and an outline of the daily waste routine, which should all help to control the build-up of waste and reduce it where possible. Best practices for safely managing health-care waste should be followed, including assigning responsibility and sufficient human and material resources to dispose of such waste safely.

Waste **generation**

In emergency situations like outbreaks of infectious diseases, the volume of waste rises quickly and needs to be considered in the selection of waste-treatment technologies. Owing to the elevated numbers of PPE used, the COVID-19 community facility should plan for an increase of containment capacity as waste generation is likely to be increased.

Waste **segregation**

All health-care waste produced during the care of COVID-19 patients should be considered as infectious waste. The four major categories of health-care waste recommended for organizing segregation and separate storage, collection, and disposal are:

- sharps (needles, scalpels, etc.), which may be infectious or not;
- infectious waste (anatomical waste, pathological waste, dressings, used syringes, used single-use gloves, used disposable PPE, all health-care waste during the care of COVID-19 patients, except sharps);
- general waste (paper, packaging, etc.); and
- hazardous waste (expired drugs, laboratory reagents, radioactive waste, insecticides, etc.).

Estimation of health-care waste-management requirement, based on two scenarios:[1]

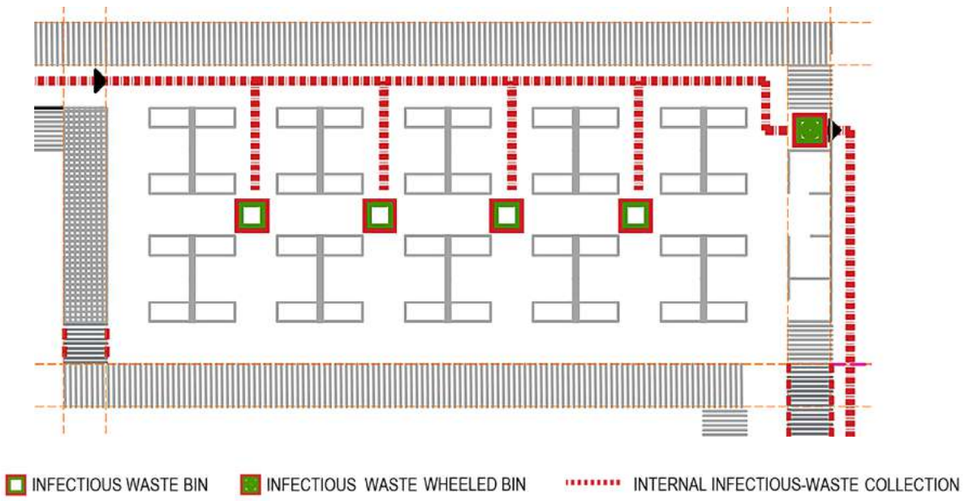
1. Model M (100 m × 80 m): 160 moderately ill inpatients + 20 SIPA beds + 60 staff:
   - **General waste:** 2 kg/patient /day = 360 kg/day
   - **Sharps:** 0.1 kg/ patient/day = 18 kg/day
   - **Infectious waste:** 0.4 kg/patient /day – 72 kg/day
2. Model XL (180 m × 100 m): 480 moderately ill inpatients + 20 SIPA beds + 140 staff:
   - **General waste:** 2 kg/patient/day = 1000 kg/day
   - **Sharps:** 0.1 kg/patient/day = 50 kg/day
   - **Infectious waste:** 0.4 kg/patient/day = 200 kg/day

Functional colour-coded and/or clearly labelled waste bins in close proximity to all waste-generation points should be made available; such containers should not be more than three-quarters full, and should be leak-proof with a lid and pedal opening and be clearly labelled (i.e. easily distinguishable according to a colour, label or symbol). Single-use PPE should be placed in waste bins (such as 220 L barrels) at the entrance to the doffing area.

Waste **collection**

Waste-collection routes are designed to minimize contact of waste-management staff with the high-risk area (*see Fig. 8.2*). Clinical staff entering the wards would be responsible for replacing bags that are three-quarters full for empty ones and depositing the three-quarters-full bags in the wheeled bin on the external side. Different collection routes for suspected and confirmed patients should be coordinated with PPE renewal and disinfection of collection containers.

Fig. 8.2 *Proposed collection mechanism for inpatient wards*



Collection will be made by waste-management staff and wheeled containers should be directed to the waste-management area (*see Fig. 8.3*). It is essential to implement stringent waste-handling precautions, using full PPE, based on the recommendations provided in *Rational use of personal protective equipment for coronavirus disease* (COVID-19) (*9*).

Fig. 8.3 *Proposed collection mechanism for the community facility by type of waste*

Waste **treatment**

Waste should be dealt with onsite or as close as possible to where it is generated, and should be separated (combustible/recyclable). In some cases, waste may be treated offsite. If so, there should be a means to confirm it is treated safely once removed from the facility premises.

Estimation of containment capacity requirement, based on two scenarios:[1]

1. Model M (100 m × 80 m): 160 moderately ill inpatients + 20 SIPA beds + 60 staff:
   a minimum containment capacity for infectious waste of 720 l every 2 days
2. Model XL (180 m × 100 m): 480 moderately ill inpatients + 20 SIPA beds + 140 staff:
   a minimum containment capacity for infectious waste of 2000 litres for every two days

Regarding treatment of infectious waste as per WHO guidelines (*8*), non-incineration technologies are the preferred option, that is, steam-based technologies (autoclaves, microwaves), dry-heat technologies or chemical-based technologies (such as ozone treatment and alkaline hydrolysis). If incineration technology is used, an incinerator for the treatment of infectious and sharp waste should be functional and of a sufficient capacity (if designed for infectious waste and not just general waste).

Specific design requirements must be followed, such as using bricks/refractory bricks and mortar rather than common building bricks, to withstand the temperatures needed for these incinerators (greater than 800 °C). For complete burning, a dual-chamber incinerator is needed that reaches temperatures above 800 °C and 1100 °C, respectively. If dual incinerators are not available and there is an immediate need for public health protection, small-scale incinerators may be used. This involves a compromise between the environmental impacts from controlled combustion and an overriding need to protect public health if the only alternative is indiscriminate dumping.

Estimation of the minimum capacity of waste-treatment technology, based on two scenarios[2]

1. Model M (100 m × 80 m): 160 moderately ill inpatients + 20 SIPA beds + 60 staff:
   a minimum treatment capacity for infectious waste of 8 kg/h, assuming 10 working hours
2. Model XL (180 m × 100 m): 480 moderately ill inpatients + 20 SIPA beds + 140 staff:
   a minimum treatment capacity for infectious waste of 20 kg/h, assuming 10 working hours

Waste- **management area**

The waste-management area should be considered as a normal health-care facility waste zone. A cleaning and disinfection point, temporary waste storage, organic pit, sharp pit and incinerator with ash pit should be planned (*7,10*).

8.8 Sanitation

Wastewater

All wastewater coming from patients' showers, sinks, handwashing points and laundry should be properly treated before infiltration. If greywater includes disinfectant used in prior cleaning, it does not need to be chlorinated or treated again. However, it is important that such water is disposed of in drains connected to a septic system or sewer, or in a soakaway pit. If greywater is disposed of in a soakaway pit, the pit should be fenced off within the health facility grounds, to prevent tampering and avoid possible exposure in the case of overflow. Means should be made available for safely disposing of greywater or water from washing PPE, surfaces and floors.

The recommended technology for the proposed layout is illustrated in Fig. 8.4. All handwashing stations, showers and emptying/filling basins for cleaning should be connected to a gravity-fed grease trap with the possibility of performing treatment in those stations that are being used by infectious patients. The last stage would be a pumping station connecting to the existing sewage systems, infiltration trenches, soakaway pit or temporary containment storage, such as flexible greywater tanks.

Fig. 8.4 *Proposed collection mechanism for wastewater*

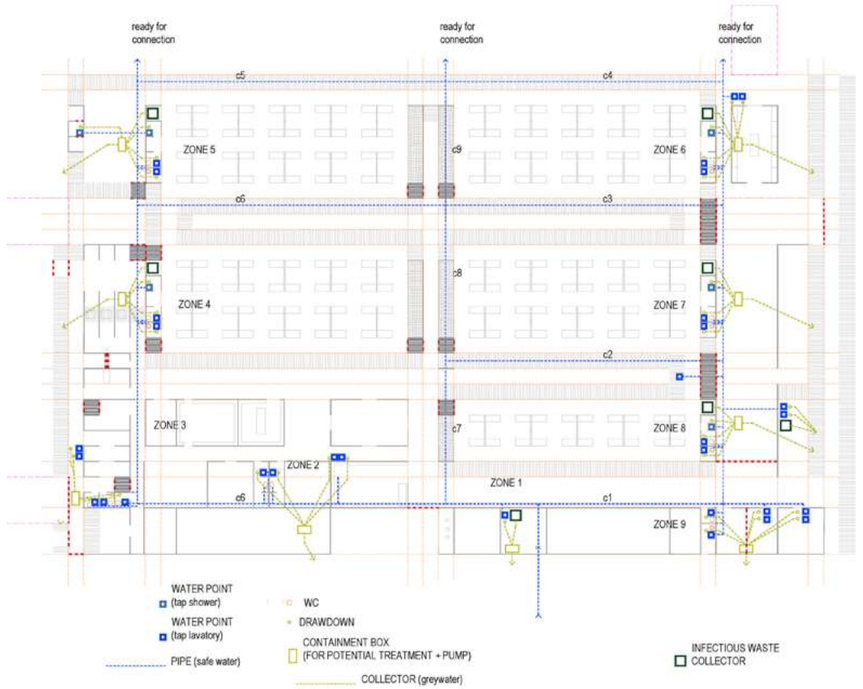
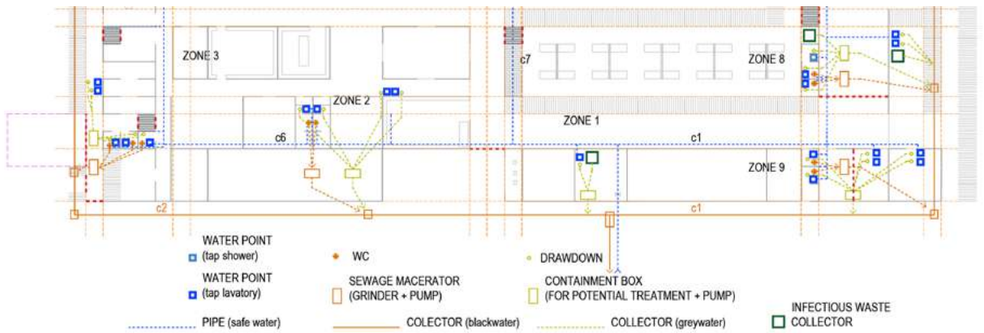


Fig. 8.5 *Proposed collection mechanism for faecal sludge and greywater*



Excreta disposal

People with suspected or confirmed COVID-19 should be provided with a flush toilet or latrine that has a door that closes to separate it from the patient's room. Flush toilets should operate properly and have functioning drain traps. When possible, the toilet should be flushed with the lid down, to prevent droplet splatter and aerosol clouds. Furthermore, and consistent with existing guidance, staff and health workers should have toilet facilities that are separate from those used by all patients.

WHO recommends the use of standard, well-maintained plumbing (*7*), such as sealed bathroom drains, and backflow valves on sprayers and taps, to prevent aerosolized faecal matter from entering the plumbing or ventilation system (*11*), together with standard wastewater treatment (*12*).

The recommended technology for the proposed layout, illustrated in Fig. 8.5, consists of individual prefabricated cubicles with pour-flush technology, which will create a hydraulic seal avoiding odours and flies; this would be connected to a macerator (shredding and pumping) type that will pump the sewage out to the existing sewage systems.

If health-care facilities are connected to sewers, a risk assessment should be conducted to confirm that wastewater is contained within the system (i.e. the system does not leak), prior to its arrival at a functioning treatment or disposal site, or both. Risks pertaining to the adequacy of the collection system or to treatment and disposal methods should be assessed following a safety planning approach (*13*), with critical control points prioritized for mitigation.

Excreta should be retained in impermeable storage containers and left for as long as feasibly possible, to allow for a reduction in virus levels before moving the containers off-site for additional treatment or safe disposal, or both. A two-tank system with parallel tanks would help to facilitate inactivation by maximizing retention times, as one tank could be used until full, then allowed to sit while the next tank is being filled. Particular care should be taken to avoid splashing and the release of droplets while cleaning or emptying tanks.

Fig. 8.6 illustrates the proposed sanitation system for a Model M facility.

Handling of faeces

It is critical to conduct hand hygiene when there is suspected or direct contact with faeces (soap and water is preferred after handling exposures to bodily fluids; if not available, use alcohol-based hand rub). If the patient is unable to use a latrine, excreta should be collected in either a diaper or a clean bedpan and immediately and carefully disposed of into a separate toilet or latrine used only by suspected or confirmed COVID-19 cases, respectively. In all health-care settings, including those with suspected or confirmed COVID-19 cases, faeces must be treated as a biohazard and handled as little as possible. Anyone handling faeces should follow WHO guidelines (*14*) and use PPE instructions for COVID-19 (*9*) to prevent exposure, including boots, apron, long-sleeved gown, thick gloves, mask and goggles or a face shield. If diapers are used, they should be disposed of as infectious waste, as they would be in all situations.

Fig. 8.6 *Proposed sanitation system for Model M (100 m × 80 m) 160 moderately ill inpatients + 20 specific inpatient profile area beds + 60 staff*

Workers should be properly trained in how to put on, use and remove PPE, so that these protective barriers are maintained and not breached (*15*). If a bedpan is used, after disposing of excreta from it, the bedpan should be cleaned with a neutral detergent and water, disinfected with a 0.5% chlorine solution, and then rinsed with clean water; the rinse water should be disposed of in a drain or a toilet or latrine. Other effective disinfectants include commercially available quaternary ammonium compounds, such as cetylpyridinium chloride, used according to the manufacturer's instructions, and peracetic or peroxyacetic acid at a concentration of 500–2000 mg/L (*16*).

Chlorine is ineffective for disinfecting media containing large amounts of solid and dissolved organic matter. Therefore, there is limited benefit to adding chlorine solution to fresh excreta and it is possible this will introduce risks associated with splashing.

Emptying latrines and holding tanks, and transporting excreta off-site

There is no reason to empty latrines and holding tanks of excreta from suspected or confirmed COVID-19 cases unless they are at capacity. In general, the best practices for safely managing excreta should be followed. PPE (that is, boots, apron, long-sleeved gown, thick gloves, mask and goggles or a face shield) should be worn at all times when handling or transporting excreta offsite, and great care should be taken to avoid splashing. For crews, this includes pumping out tanks or unloading pumper trucks. After handling the waste, and once there is no risk of further exposure, individuals should safely remove their PPE and perform hand hygiene before entering the transport vehicle. Soiled PPE should be put in a sealed bag for later safe laundering (*see Section 8.9*, Cleaning procedures).

Latrines or holding tanks should be designed to meet patient demand, considering potential sudden increases in cases, and there should be a regular schedule for emptying them, based on the wastewater volumes generated. Where there is no off-site treatment, in-situ treatment can be done using lime. Such treatment involves using a 10% lime slurry added at 1 part per 10 parts of waste.

8.9 Hygiene and environmental cleaning

Hand-hygiene practices

Hand hygiene is extremely important. Cleaning hands with soap and water or an alcohol-based hand rub should be performed according to the instructions known as "My 5 moments for hand hygiene" (*17*). If hands are not visibly dirty, the preferred method is to perform hand hygiene with an alcohol-based hand rub for 20–30 s, using the appropriate technique (*18*). When hands are visibly dirty, they should be washed with soap and water for 40–60 s, using the appropriate technique (*19*). Hand hygiene should be performed at all five moments, as well as before putting on PPE and after removing it or when changing gloves; after any contact with a patient with suspected or confirmed COVID-19 infection or their waste; after contact with any respiratory secretions; before eating; and after using the toilet (*14*). If an alcohol-based hand rub and soap are not available, then using chlorinated water (0.05%) for handwashing is an option, but it is not ideal because frequent use may lead to dermatitis, which could increase the risk of infection and asthma and because prepared dilutions might be inaccurate (*20*). However, if other options are not available or feasible, using chlorinated water for handwashing can be an interim solution. All efforts should be made to procure soap and water and/or alcohol-based hand rub, as these are the two recommended and validated practices.

Functional hand-hygiene facilities should be present for all health workers at all points of care and in areas where PPE is put on and taken off. In addition, functional hand-hygiene facilities should be available for all patients, family members and visitors, and should be available within 5 m of toilets, as well as in waiting and dining rooms and other public areas. In all suspected and confirmed patient areas, there should ideally be hand-hygiene points at all cubicles (or at least strategically placed), to allow for hand-hygiene.

Cleaning procedures

Existing recommended cleaning and disinfection procedures for health-care facilities should be followed consistently and correctly (*21*). Laundry should be done and surfaces in all environments in which COVID-19 cases receive care (e.g. treatment units, community care centres) should be cleaned at least twice a day (regular cleaning) and when a patient is discharged (terminal cleaning) (*21*). Moreover, particular attention must be paid to cleaning and sanitizing surfaces with the aim of constantly reducing the viral load across 24 hours. Many disinfectants are active against enveloped viruses, such as the COVID-19 virus, including commonly used hospital disinfectants. Currently, WHO recommends using:

- 70% ethyl alcohol to disinfect small areas between uses, such as reusable dedicated equipment (for example, thermometers); and
- sodium hypochlorite at 0.1% (equivalent to 1000 ppm) for at least 1 minute of contact time for disinfecting surfaces.

Procedures for spills of COVID-19 patient blood/fluids

If there are spills of patient blood or fluids from a COVID-19 patient, the area should then be cleaned and disinfected (with, for example, 0.5% chlorine-containing disinfecting solution), following published guidance on cleaning and disinfection procedures for spilled body fluids (*22*).

Staff should perform hand hygiene after exposure to blood or body fluids and after removing PPE.

8.10 Laundry

All individuals dealing with soiled bedding, towels and clothes from patients with COVID-19 infection should wear appropriate PPE before touching it, including boots, apron, long-sleeved gown, thick gloves, mask and goggles or a face shield.

Soiled linen should be placed in clearly labelled, leak-proof bags or containers, after carefully removing any solid excrement and putting it in a covered bucket to be disposed of in a toilet or latrine. Machine washing with warm water at 60–90 °C and laundry detergent is recommended. The laundry can then be dried according to routine procedures. If machine washing is not possible, linens can be soaked in hot water and soap in a large drum, using a stick to stir and being careful to avoid splashing. The drum should then be emptied, and the linen soaked in 0.05% chlorine-containing disinfecting solution for approximately 30 minutes. Finally, the laundry should be rinsed with clean water and the linen allowed to dry fully in sunlight.

If excreta are on surfaces (such as linen or the floor), they should be carefully removed with towels and safely disposed of immediately, in a toilet or latrine. If the towels are single use, they should be treated as infectious waste; if they are reusable, they should be treated as soiled linen.

The area should then be cleaned and disinfected (with, for example, 0.5% chlorine-containing dis-infecting solution), following published guidance on cleaning and disinfection procedures for spilled body fluids (*22*).

Current WHO recommendations are to clean utility gloves or heavy-duty, reusable plastic aprons with soap and water and then decontaminate them with 0.5% sodium hypochlorite solution after each use. Single-use gloves (i.e. nitrile or latex) and gowns should be discarded after each use and not reused; hand hygiene should be performed after PPE is removed.

8.11 Management of dead bodies

To date, there is no evidence of persons having become infected from exposure to the bodies of persons who have died from COVID-19. The safety and well-being of everyone who tends to bodies should be the first priority. Before attending to a body, people should ensure that the necessary supplies for hand hygiene and PPE are available.

- The dignity of the dead, their cultural and religious traditions, and their families should be respected and protected throughout.
- It is important to ensure that personnel who interact with the body (health or mortuary staff) apply standard precautions, including hand hygiene, before and after interaction with the body and the environment; and use appropriate PPE according to the level of interaction with the body, including a gown and gloves. If there is a risk of splashes from the body fluids or secretions, personnel should use facial protection, including the use of face shield or goggles and medical mask.
- The body should be prepared for transfer, including removal of all lines, catheters and other tubes.
- Any body fluids leaking from orifices should be contained.
- Both the movement and handling of the body should be kept to a minimum.
- The body should be wrapped in cloth and transferred as soon as possible to the mortuary area.
  - There is no need to disinfect the body before transfer to the mortuary area.
  - Body bags are not necessary, although they may be used for other reasons (e.g. excessive leakage of body fluid leakage) (*23*).

8.12 Fire safety system

As in all health facilities, a system should be in place to prevent fire (e.g. no smoking) and to alert and contain if there is a fire (siren, smoke detectors, carbon monoxide detectors, bell, fire extinguishers, fire blankets, hoses), as well as an evacuation procedure if the fire cannot be contained (first from the zone where the fire actually is to another zone and, if needed, outside of the facility). Everything possible should be done to prevent mixing of suspected and confirmed patients (e.g. separate evacuation zones), but of course saving lives is the most important action in case of fire.

Staff should be trained on using the fire safety system, and contacts with the local fire department should be initiated early on, including informing the fire department on IPC measures in place.

These basic indications should always be followed:

- fire training is given to the personnel, especially to the security and maintenance personnel;
- the telephone number of the fire service is put in a visible position;
- the evacuation route is signposted;
- ABC[1] 6 kg powder extinguishers are sited in wards, stores and offices; and
- 6 kg carbon dioxide extinguishers are sited in the area of the generators and electrical boards.

8.13 Electricity and illumination

Sufficient and safe power supply and lighting for clinical care and support services is a key component for fulfilling all needs for this type of set-up where clinical care teams and facilities require reliable power and lighting (*see Fig. 8.7*). The electric system should be made available for:

- general illumination, around the perimeter and in the main paths;
- specific illumination (cable 2 × 1.5 mm)
  - in beds
  - in rooms; and
- Sockets and point for electricity (3G2.5 mm^2)
  - in beds for patient's use;
  - for medical equipment: oxygen, X-ray, fridge, laboratory.

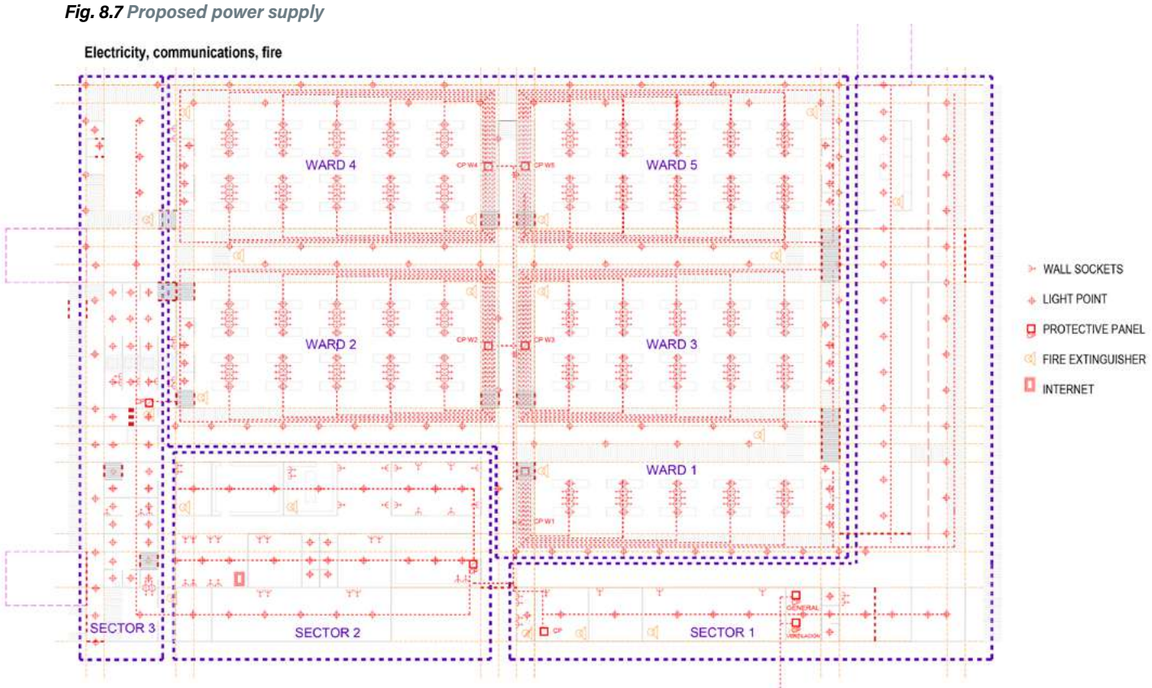
All circuits and electrical cabling and boards must be rated for their intended use and should be installed and certified for use by a qualified electrician in the site, with regular maintenance checks performed (using similar routines as per normal health clinic electrical equipment in their country). The recommended set-up for wiring[2] where there are no underground pass ways would be an aerial installation, with cables following the security area paths to avoid contact with anyone in the facility.

Generators can produce noise that can interfere with patients' rest and the centre's communication. A quiet generator model should be chosen, or, if not, a location should be chosen to avoid possible annoyance. If the supply is by means of the local power supply network, generators should be installed as an auxiliary system. A 50-kVA generator is needed as back-up.

Generators and electrical boards should be centralized, to facilitate their control. The different circuits should be independent, especially those specific to the high-risk area, which should have independent power and lighting circuits.

The high-risk area should be lit from the low-risk area where possible, and its switching should always be controlled from the low-risk area. All dimensioning is made available for the 180-bed model. The use of LED lamps for the exterior is recommended. The electrical system should be aerial but if it goes underground, it should be protected. Attempts should be made to adapt the lighting in the patient area so that it is sufficient during the night, but also guarantees an atmosphere that is suitable for rest and privacy.

***Fig. 8.7** Proposed power supply*



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9	[1] *In this document, suspected and probable cases will be treated as one category.*
12	[1] *The WHO Regional Office for Europe has developed a suite of complementary surge calculators (2), including two for health workforces. All tools use the same base clinical attack rate ranges and classify the health workforce using International Labour Organization International Standard Classification of Occupations codes (3), but their outputs are intentionally different due to their primary focus.* [2] *WHO has developed another complementary surge calculator that provides specific, focused outputs, including detailed quantifications of equipment and consumables (4).*
16	[1] *per 20 inpatients (separated for men, women, children and health workers).*
45	[1] *A contact is a person who experienced any one of the following exposures during the 2 days before and the 14 days after the onset of symptoms of a probable or confirmed case:* *A. face-to-face contact with a probable or confirmed case within 1 m and for more than 15 min;* *B. direct physical contact with a probable or confirmed case;* *C. direct care for a patient with probable or confirmed COVID-19 without using proper PPE; or* *D. other situations as indicated in local risk assessments.*
48	[1] *A contact is a person who experienced any one of the following exposures during the 2 days before and the 14 days after the onset of symptoms of a probable or confirmed case:* *A. face-to-face contact with a probable or confirmed case within 1 m and for more than 15 min;* *B. direct physical contact with a probable or confirmed case;* *C. direct care for a patient with probable or confirmed COVID-19 without using proper PPE; or* *D. other situations as indicated in local risk assessments.*
73	[1] *See detailed calculations and assumptions in Web Annex 5.*
75	[1] *See detailed calculations and assumptions in Web Annex 5.*
77	[1] *See detailed calculations and assumptions in Web Annex 5.*
78	[2] *See detailed calculations and assumptions in Web Annex 5.*
85	[1] *ABC dry powder extinguisher is a multi-purpose extinguisher suitable for use on Class A, B and C fires involving combustible solids, flammable liquids and gases.* [2] *See Web Annex 3 for detailed electrical layout.*

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COMMUNITY FACILITIES

for preparedness and response to COVID-19

isolation, treatment and step down of COVID-19 cases in community facilities

1

WEB ANNEX

Analysis tool for construction of COVID-19 community facilities and treatment centres

World Health Organization

Context

- [ ] To obtain information on the characteristics of pre-existing health infrastructures
- [ ] To choose a location with appropriate characteristics
- [ ] Good access and communications
- [ ] To guarantee good access to the infrastructures
- [ ] To understand the physical characteristics of the environment
- [ ] To obtain information about the socio-cultural characteristics of the location

WHO reference no.:

Areas of analysis

1. Functional-spatial analysis

Area 1 Triage/admission and registration area

- [ ] Entry
- [ ] Reception
- [ ] Waiting room
- [ ] Crash room
- [ ] Triage
- [ ] Sample area
- [ ] Admission
- [ ] Waiting for results room
- [ ] Exit
- [ ] Bathrooms

Area 2 Technical area

Clinical

- [ ] Entry for staff
- [ ] Office
- [ ] Personal access
- [ ] Changing room
- [ ] Store PPE
- [ ] Storage scrubs
- [ ] Bathrooms
- [ ] Rest/leisure, staff
- [ ] Coordination area
- [ ] Meeting point
- [ ] Laboratory
- [ ] Pharmacy
- [ ] Donning room
- [ ] Changing rooms male/female

Operational support

- [ ] Technical room
- [ ] Water supply
- [ ] Equipment warehouse
- [ ] Electricity area
- [ ] Laundry
- [ ] Drying area
- [ ] Sterilization
- [ ] Doffing area
- [ ] Waste area 1
- [ ] Waste area 2
- [ ] Rest area
- [ ] Mortuary store
- [ ] Transfer of deceased patients
- [ ] Visitors' and relatives' area
- [ ] Waste management area
- [ ] Sterilization room
- [ ] Bathroom

Area 3 Wards

Inpatient area (Module of 40 beds)

- [ ] Entrance
- [ ] Wards
- [ ] Water modules
- [ ] Storage modules
- [ ] Rest area for patients
- [ ] Exit, staff with PPE
- [ ] Doffing area
- [ ] Bathrooms
- [ ] Exit, not admitted patients

Area 3 Wards - *continued*

High supervision (Module of 20 beds)

- ☐ Wards
- ☐ Crash room
- ☐ Discharge shower
- ☐ Bathrooms

Area 4 Other complementary areas

- ☐ Resting areas for staff
- ☐ Kitchen
- ☐ Living room
- ☐ Parking
- ☐ Visitors' area
- ☐ Warehouse, external
- ☐ Control and security points

Access and routes: entrances, exits, paths and zones

- ☐ Vehicle access: ambulances, logistics, personnel, visitors
- ☐ Footpaths: patients, staff, visitors
- ☐ Equipment path: contaminated/ uncontaminated
- ☐ Waste path
- ☐ Signage

2. Technical programme

Inspection of technical infrastructure

- ☐ Structural system
- ☐ Construction system
- ☐ Electricity and lighting system
- ☐ Fire prevention and extinguishing system
- ☐ Telecommunications system
- ☐ Medical equipment
- ☐ Laboratory equipment
- ☐ Oxygen system
- ☐ Furniture

- ☐ Water system
  - ☐ storage
  - ☐ treatment
  - ☐ distribution system
  - ☐ water points

- [ ] Sanitation and hygiene system
  - [ ] WC
  - [ ] showers
  - [ ] drainage greywater
  - [ ] drainage blackwater
- [ ] Waste management
  - [ ] general waste
  - [ ] infectious waste
  - [ ] sharp waste
  - [ ] treatment technology

3. Implementation needs

- [ ] Physical and technical definition (drawings and documentation)
- [ ] Human resources
- [ ] Materials, resources and tools
- [ ] Timeline
- [ ] Budget
- [ ] Conservation and maintenance programme

COMMUNITY FACILITIES

for preparedness and response to COVID-19

isolation, treatment and step down of COVID-19 cases in community facilities

WEB ANNEX

Criteria for the reuse of the spaces

World Health Organization

WHO reference no.:

Spaces for reuse as COVID-19 community facilities and treatment centres

<table>
<tr><td>Location</td><td colspan="2">» Strategic location, close to or well connected with the health system.
» Strategic location in relation to urban hubs.
» Communications: accessible for pedestrians and vehicles.
» Roads and perimeters appropriate for ambulances and trucks.
» Connection with public transport.
» Distant from other crowded places (markets, schools, etc.)</td></tr>
<tr><td>Relevant characteristics</td><td>» Flexibility: capacity to adapt the space for different uses.
» Wide spaces: large spaces (wide with high ceilings) without obstacles.
» Accessibility: entries, circuits and spaces accessible for population.
» IPC-friendly.
» Parking: areas for vehicles or logistic uses.
» Storage: areas to store materials safely and in good condition (dry, clean), including medical, logistic and technical equipment.</td><td>» Comfort: Places with comfortable areas to work, offices, rooms, outdoor spaces.
» Privacy: Possible areas for private activities (meetings, rest, psychological support, etc.).
» Roofing: Consider whether the space is covered or could be.
» Floor: Suitable floor covering to allow cleaning, disinfection and maintenance.
» Materials: The surfaces can be easily cleaned and disinfected.
» Support areas and services: laundry, kitchen, security, maintenance, etc.</td></tr>
<tr><td>Facilities</td><td>» Consider the state of existing facilities for the following:
• water (quantity and quality)
• sanitation: drainage grey- and blackwater
• toilets and showers
• electricity and illumination
• communication
• area for waste management
• fire system
• air conditioning
• security.</td><td>» Possibilities to install new facilities: WCs, showers, kitchen, etc.
» Consider installing other systems: medical equipment (oxygen, X-ray machines, call for nurses)
» Consider increasing the existing facilities: waste management, electricity, fire safety system, etc.</td></tr>
<tr><td>Comfort level</td><td colspan="2">» Consider the control and improvement of:
• ventilation system (natural and forced)
• air flow
• temperature
• humidity
• illumination
• noise levels.</td></tr>
<tr><td>Others</td><td colspan="2">» Impact of the use of the building in the medium and long term.
» Capacity to adapt systems and dismantle them without damage to the building.
» Capacity to provide accommodation for staff if needed.
» Human resources: companies or assembly teams to assemble and disassemble the facilities, laundry service, catering service, security service, etc.
» Community acceptance.</td></tr>
</table>

Possible locations and their main characteristics

	ADVANTAGES	DISADVANTAGES
Exhibition halls, congress venues, events spaces	Communication Logistics Extra support services	Potential difficulties with adding new systems or facilities
Sports pavilions	Location Communication	Size may be insufficient
Stadiums, sports fields	Size IPC friendly	Lack of roof Floor not appropriate
Hotels, resorts	Comfort Extra support services	No visual control for the staff Not IPC friendly Potential difficulties with logistics
Warehouses	Big space Easily adaptable Easy to install facilities	Location Lack of comfort
Airports and ports	Big size Good communications Extra support services	Location

Possible locations and their main characteristics

	LOCATION	SIZE	PHYSICAL CHARACTERISTICS	FLEXIBILITY	FACILITIES	IPC FRIENDLY	LOGISTICS CHARACTERISTICS	COMFORT
Exhibition halls, congress venues, event spaces								
Sports pavilions								
Stadiums, sports fields								
Hotels, resorts								
Warehouses								
Airports and ports								

COMMUNITY FACILITIES

for preparedness and response to COVID-19

isolation, treatment and step down of COVID-19 cases in community facilities

3

WEB ANNEX

Detailed plans

World Health Organization

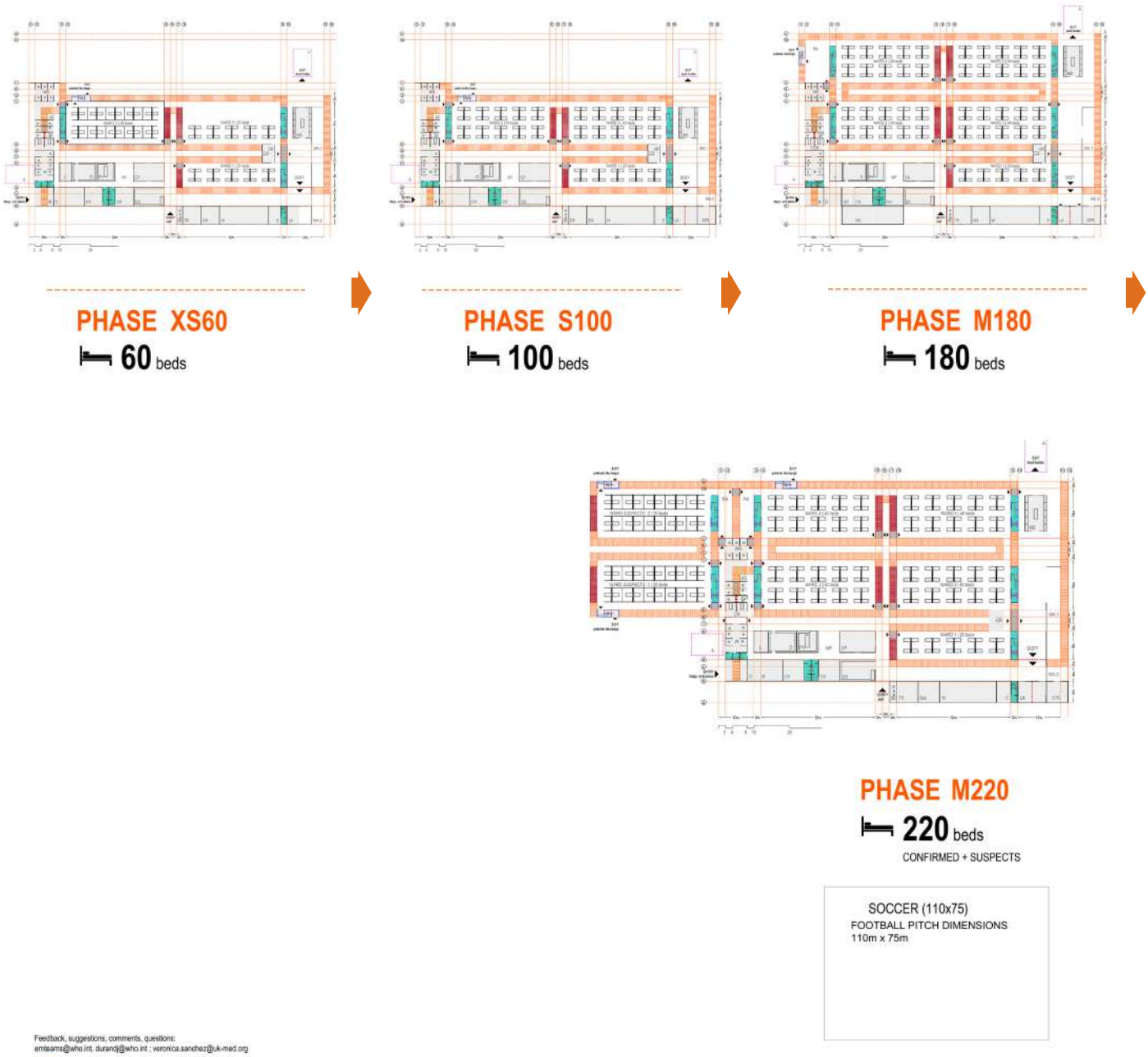
For further information, suggestions or comments on the plans included in this document, contact emteams@who.int

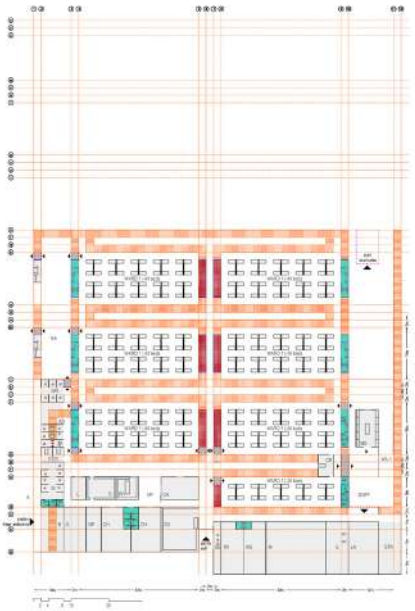
WHO reference no.:

Contents

Fig. A3.1

Scaling up plan – strategy from S to XL





PHASE L260

260 beds

PHASE L340

340 beds

PHASE XL420

420 beds

STADIUM (180x100)

STADIUM FIELD DIMENSION
180 m x 100 m

PHASE XL500

500 beds

Fig. A3.2

Alternative plan – layout for 100 beds

Feedback, suggestions, comments, questions:
emtasms@who.int, durandj@who.int ; veronica.sanchez@uk-med.org

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A AMBULANCES
AD ADMISSION
CP COORDINATION POINT
CH CHANGING ROOM
CR CRASH ROOM
D DONNING
DF DOFFING
E ELECTRICITY
EW EQUIPMENT WAREHOUSE
L LABORATORY
LA LAUNDRY
MO MORGUE
MP MEETING POINT
O OFFICE
PH PHARMACY
R RECEPTION
RA REST AREA PATIENTS
RL REST/LEISURE STAFF
T TRIAGE
TA TESTING AREA
TR TECHNICAL ROOM
S STORAGE
SE SECURITY POINT
SS STORAGE SCRUBS
STR STERILIZATION ROOM
SP STORE PPE
W WAITING ROOM
WR WAITING RESULTS
WA WASTE AREA
WC WC
WS WATER SUPPLY

SECURITY DISTANCE (2 m)
ENTRY POINT
STORE
WASH

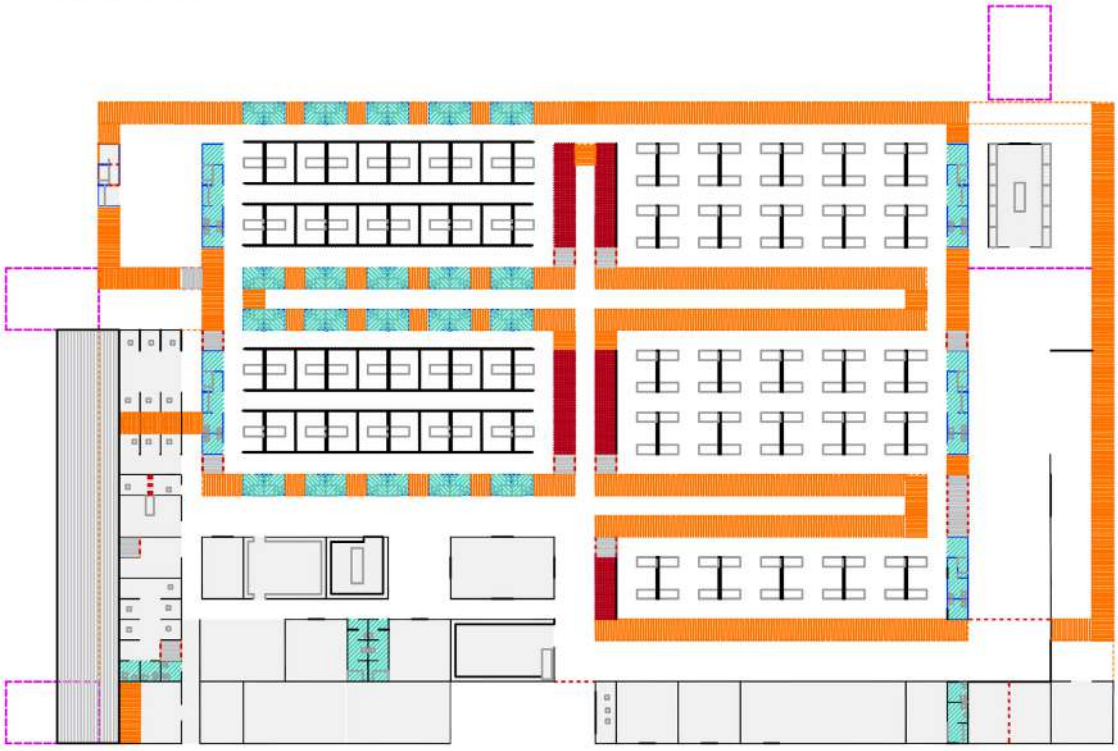
CTC-S100

CTC_S100 (SMALL SIZE)
COVID-19 TEMPORARY CENTRE
IN COMMUNITY FACILITIES
Version_05_20200412
e. 1/400 - 1/600

Fig. A3.3

Alternative plan – layout for 180 beds

CTC-M180-90s



CTC-M180-40s+100c

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A AMBULANCES
AD ADMISSION
CP COORDINATION POINT
CH CHANGING ROOM
CR CRASH ROOM
D DONNING
DF DOFFING
E ELECTRICITY
EW EQUIPMENT WAREHOUSE
L LABORATORY
LA LAUNDRY
MO MORGUE
MP MEETING POINT
O OFFICE
PH PHARMACY
R RECEPTION
RA REST AREA PATIENTS
RL REST/LEISURE STAFF
T TRIAGE
TA TESTING AREA
TR TECHNICAL ROOM
S STORAGE
SE SECURITY POINT
SS STORAGE SCRUBS
STR STERILIZATION ROOM
SP STORE PPE
W WAITING ROOM
WR WAITING RESULTS
WA WASTE AREA
WC WC
WS WATER SUPPLY

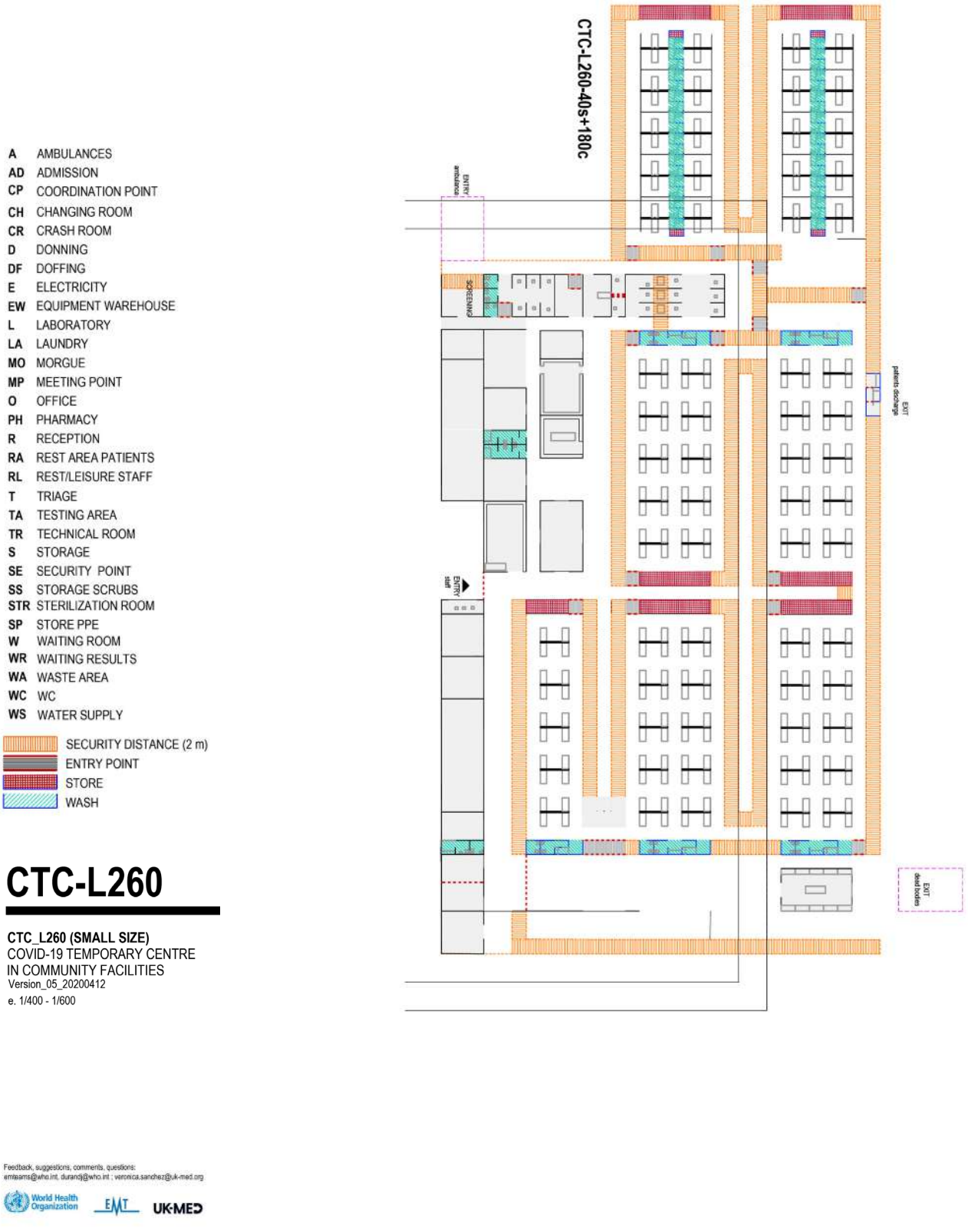
SECURITY DISTANCE (2 m)
ENTRY POINT
STORE
WASH

CTC-M180

CTC_M180 (SMALL SIZE)
COVID-19 TEMPORARY CENTRE
IN COMMUNITY FACILITIES
Version_05_20200412
e. 1/400 - 1/600

Fig. A3.4

Alternative plan – layout for 260 beds (suspected area and confirmed area)



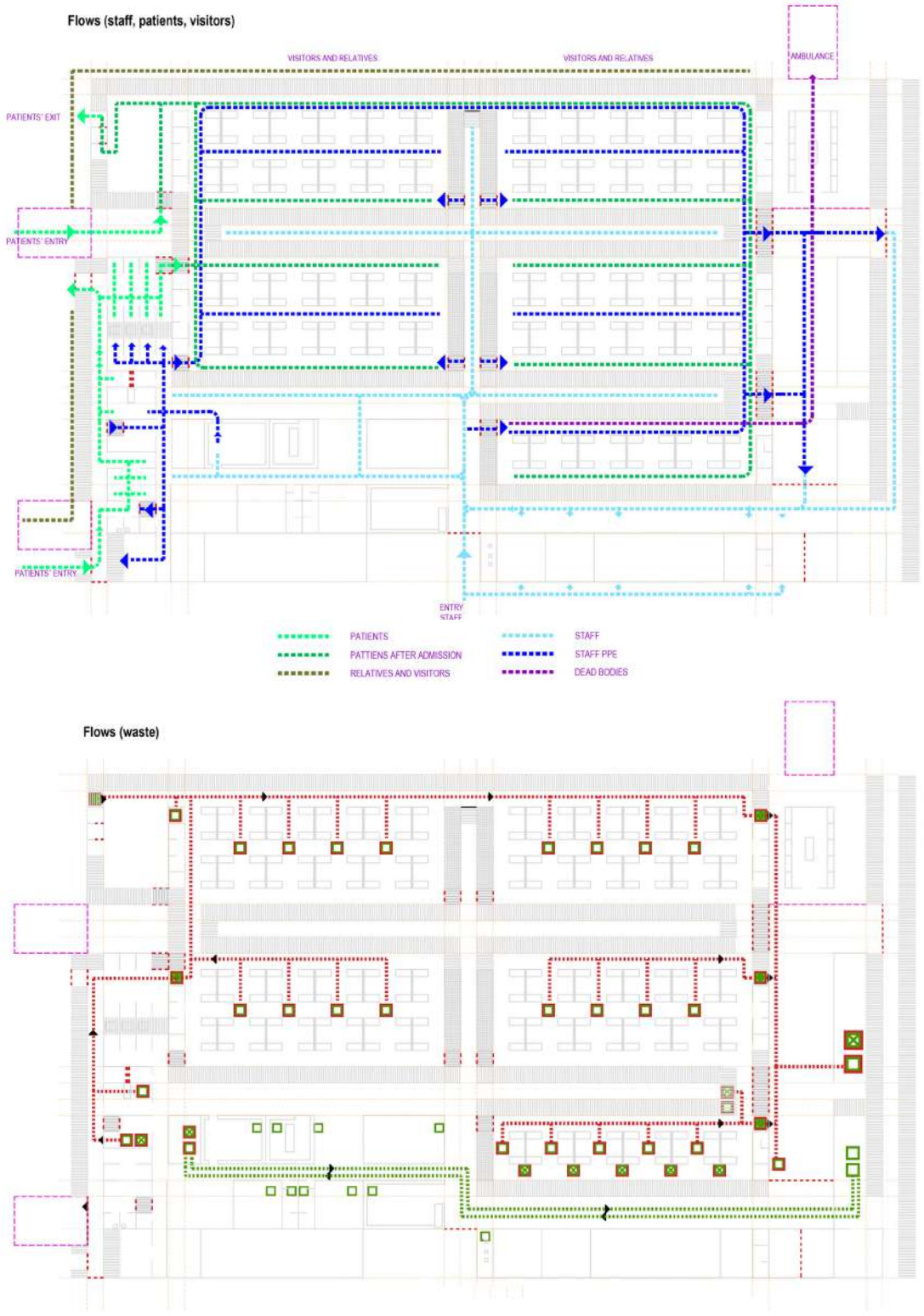

CTC-L260-260c
ENTRY patients
EXIT no suspected cases of COVID-19
ENTRY ambulance
waiting shadow area
EXIT no isolated patients
ENTRY Ambulance confirmed cases Triage
EXIT patients discharged
EXIT patients discharged
SCREENING
W
DF
T
TA
WR
AD
RA
O
R/L
SP
CH
CH
L
D
PH
MP
CA
SS
WARD 1 | 40 beds
WARD 1 | 40 beds
WARD 1 | 40 beds
WARD 1 | 40 beds
ENTRY staff
SE
TR
WS
M
E
LA
WARD 1 | 20 beds
WARD 1 | 40 beds
WARD 1 | 40 beds
WARD 1 | 40 beds
DOFF
WA-2
WA-1
DOFF
DOFF
DOFF
MS
EXIT dead bodies

Fig. A3.5

Alternative plan – layout for 500 beds

Fig. A3.6

Plan of layout showing patient and staff flows



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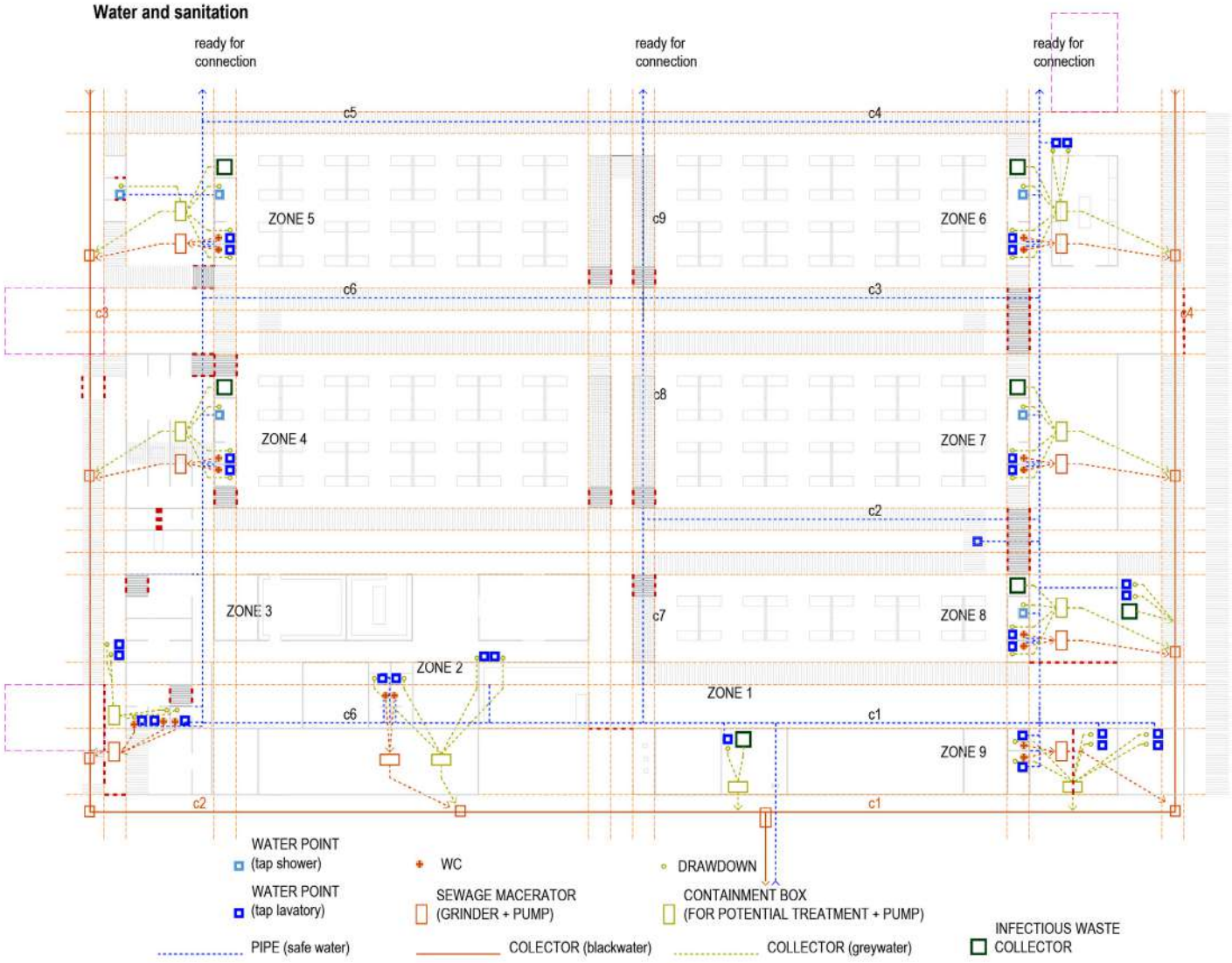
F2-FLOWS

CTC_L180
COVID-19 TEMPORARY CENTRE
IN COMMUNITY FACILITIES
Version_05_20200412
e. 1/500

Fig. A3.7

Plan of facilities



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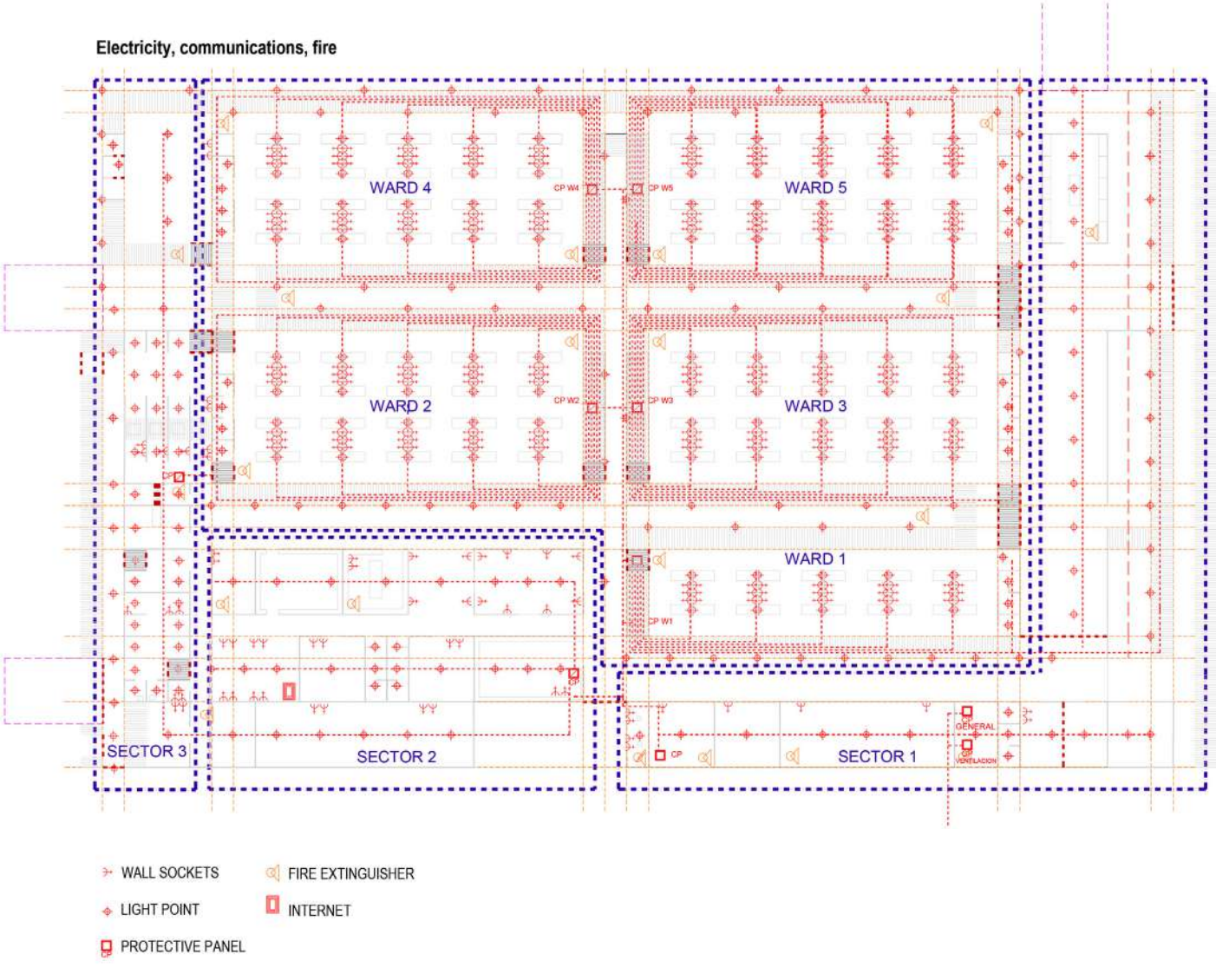
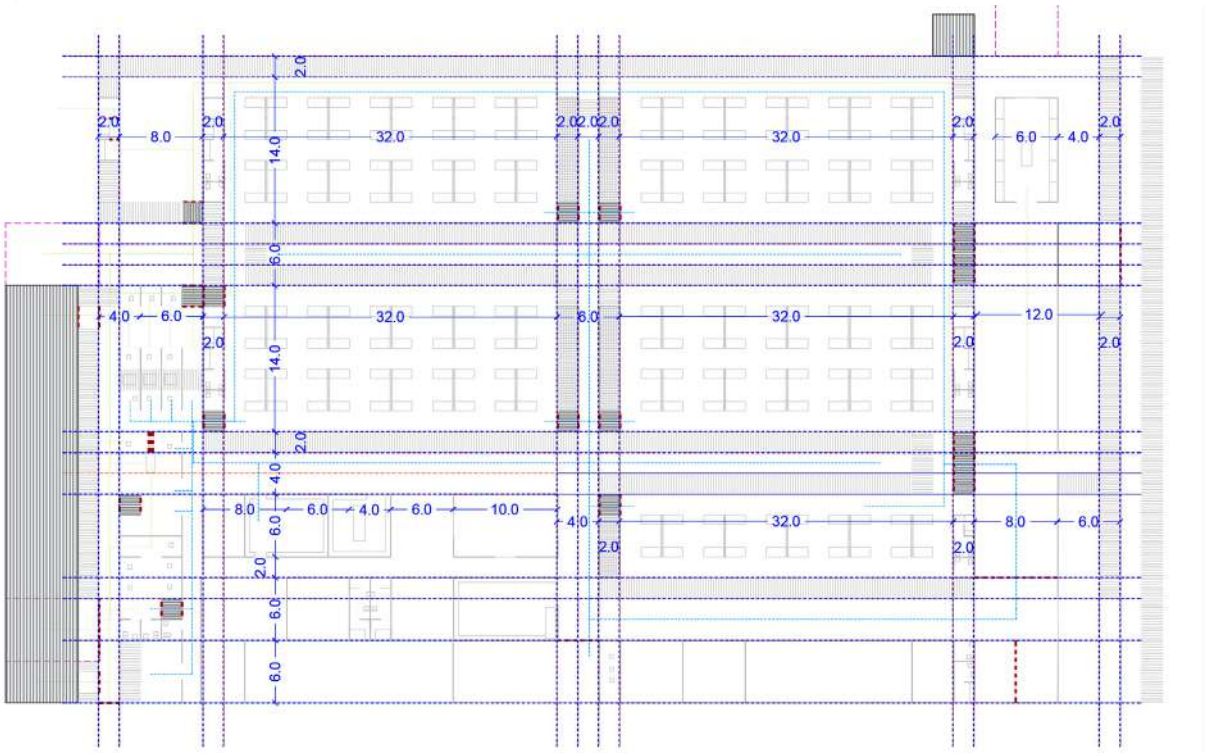


F1-FACILITIES

CTC_L180
COVID-19 TEMPORARY CENTRE
IN COMMUNITY FACILITIES
Version_05_20200412
e. 1/500

Fig. A3.8

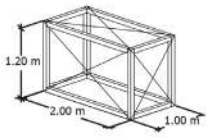
Plan of structures



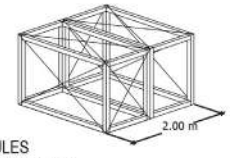
CORNER MODULES
fences support, lighting support, storage....

C1

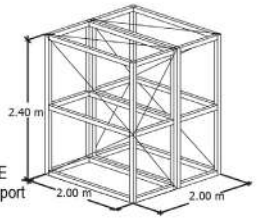
WOODEN VERSION
- Wooden profiles 80 x 80 mm
- Steel cable diagonals with turnbuckles



BASIC MODULE

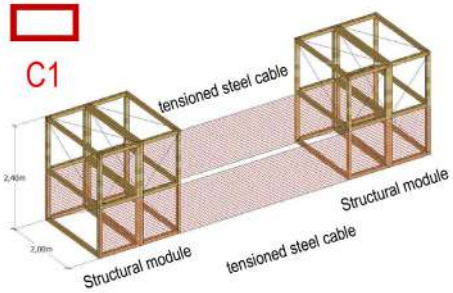


2 x BASIC MODULES
shaping the structural module



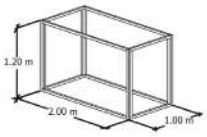
HIGH MODULE
for lighting support

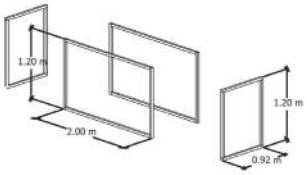
C1



C1

STEEL VERSION
- Steel profiles 40 x 40 mm
- Frames made of welded profiles, screwed together



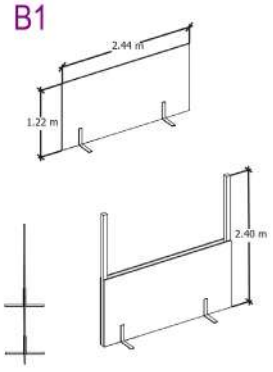


BED PANELS: support for facilities

- OSB panel of standard dimensions (1.22 x 2.44 m), 20 mm thick
- Metal angles 30 x 30 cm, 40 cm from the end of the panel.

DOUBLE HEADBOARD with high profiles
with hoops on the top to receive
electrical cables

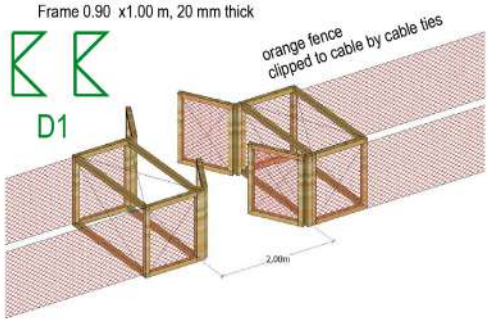
B1



DOORS

Frame 0.90 x1.00 m, 20 mm thick

D1



Feedback, suggestions, comments, questions:
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World Health Organization EMT UK-MED

C1-STRUCTURE

CTC_L180
COVID-19 TEMPORARY CENTRE
IN COMMUNITY FACILITIES
Version_05_20200412
e. 1/400

Fig. A3.9

Detailed view of ward modules

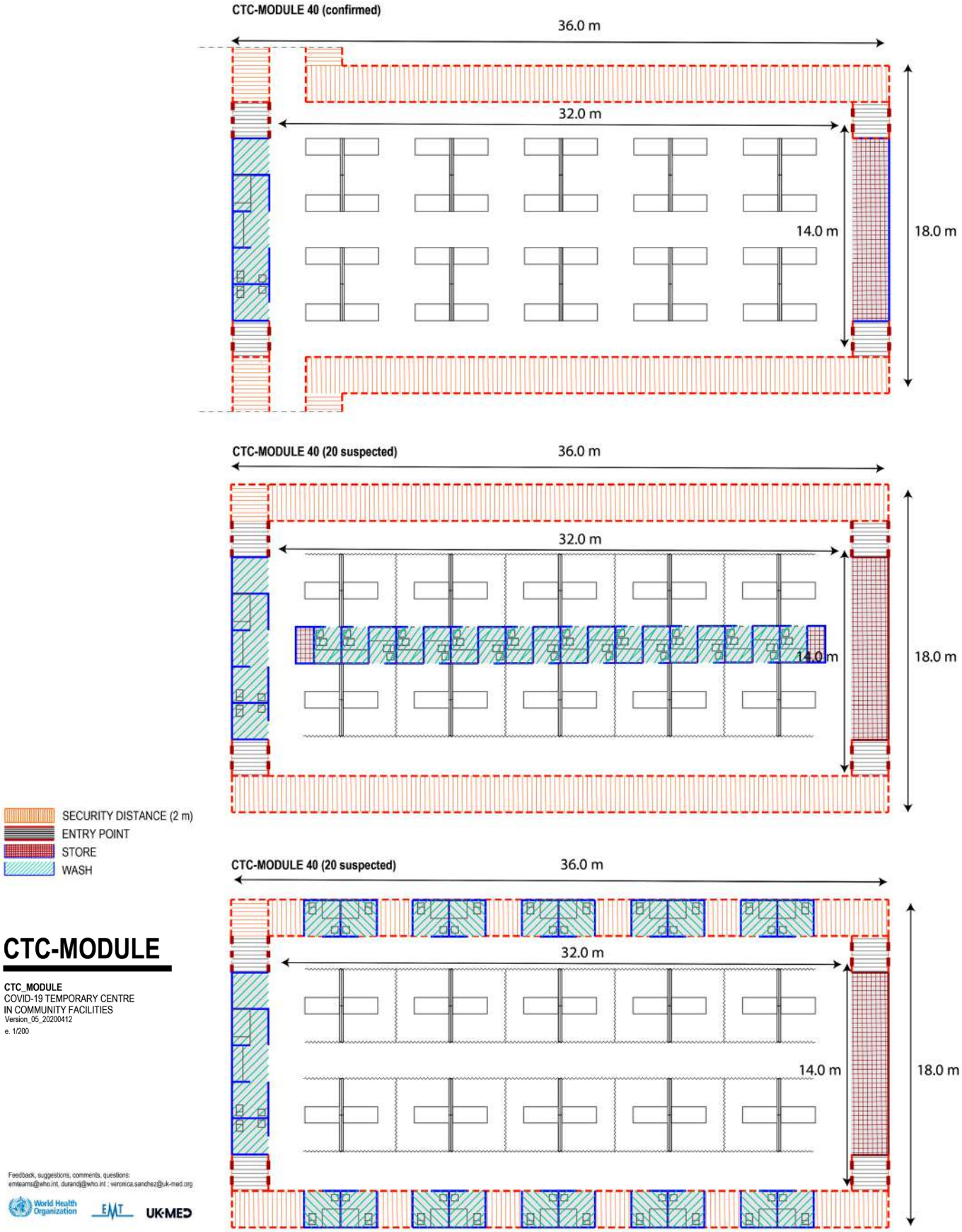
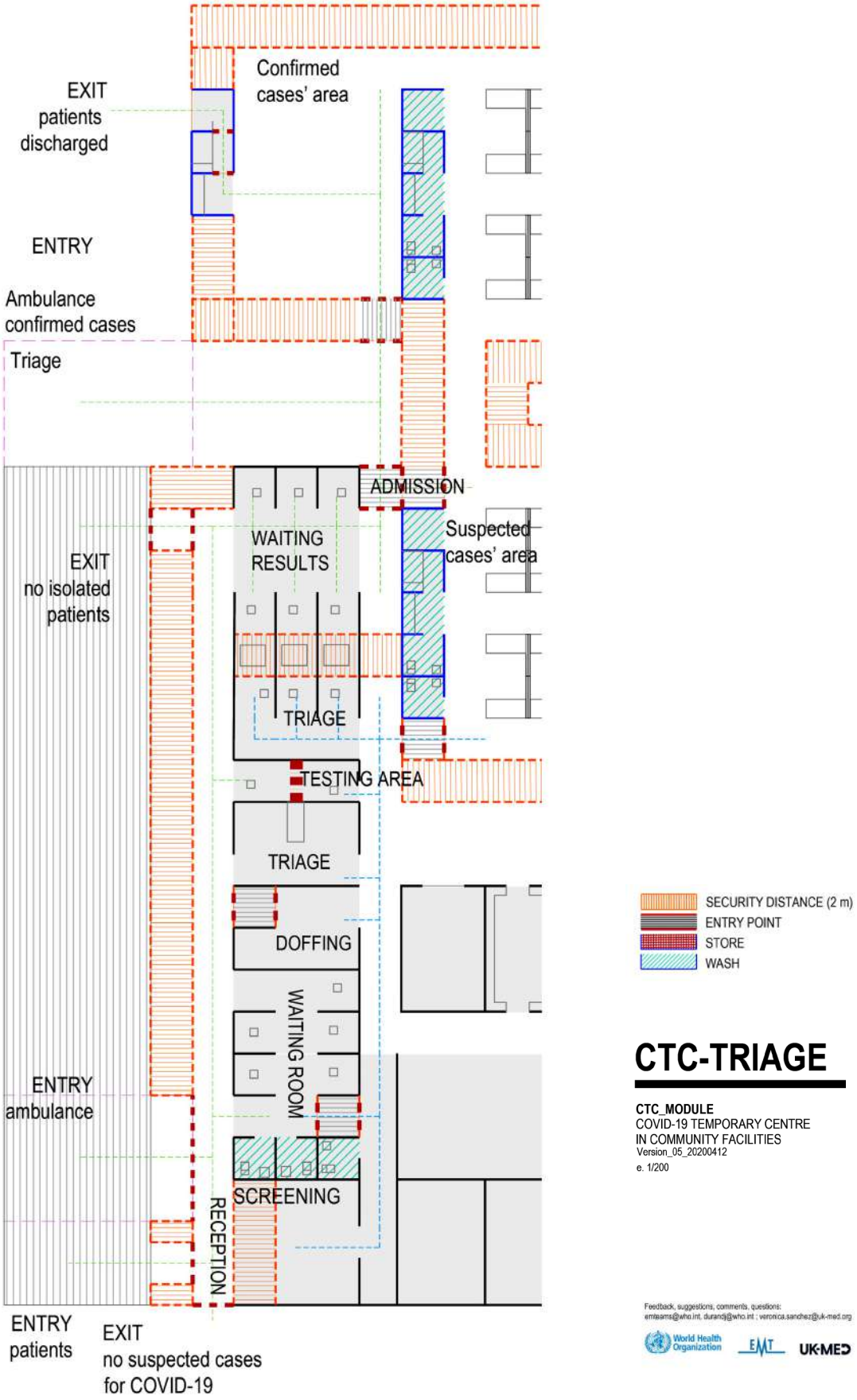


Fig. A3.10

Detailed view of screening and triage



COMMUNITY FACILITIES

for preparedness and response to COVID-19

isolation, treatment and step down of COVID-19 cases in community facilities

4

WEB ANNEX

Bill of quantities

World Health Organization

WHO reference no.:

Source: *This publication: COVID-19 community facilities and treatment centres*

C1. STRUCTURES

ITEM	Units	Model S 100 beds	Model L 180 beds	Model L 260 beds	Model L 340 beds	Model XL 420 beds	Model XL 500 beds
		Total qty	Total qty	Total qty	Total qty	Total qty	Total qty
Structure water modules W3 (2 m × 6 m × 2.40 m)	pieces	5	6	7	8	9	10
Structure water modules W5 (2 m × 10 m × 2.40 m)	pieces	2	4	6	8	10	12
Structure shelter modules Sh2 (6 m × 4 m × 2.40 m)	pieces	3	3	3	3	3	3
Structure shelter modules Sh3 (6 m × 6 m × 2.40 m)	pieces	6	6	6	6	6	6
Structure shelter modules Sh4 (6 m × 8 m × 2.40 m)	pieces	7	8	9	10	11	12
Structure shelter modules Sh5 (6 m × 10 m)	pieces	6	6	6	6	6	6
Structure storage module St3 (2 m × 6 m × 1.20 m)	pieces	2	2	2	2	2	2
Structure storage module St5 (2 m × 10 m × 1.20 m)	pieces	3	4	5	6	7	8
Structure doors module (2 m × 1.2 m – 2 units)	pieces	8	10	12	14	16	18
Structure corner module (2 m × 1.2 m × 1 m)	pieces	28	80	132	184	236	288
Structure beds module (1.2 m × 2.4 m × 0,10 m)	pieces	25	45	65	85	105	125
Fence	m	600	1,000	1,400	1,800	2,200	2,600
Floor (not considered – to build in existing facility)	m^2	5,000	7,000	10,000	12,000	14,000	16,000
Roofing (not considered – to build in existing facility)	m^2	0	0	0	0	0	0

F1. SANITATION

ITEM	Units	Model S 100 beds	Model L 180 beds	Model L 260 beds	Model L 340 beds	Model XL 420 beds	Model XL 500 beds
		Total qty	Total qty	Total qty	Total qty	Total qty	Total qty
WC cubicles superstructure (gender-appropriate)	pieces	5	6	7	8	9	10
Plastic or resin latrine slabs 1.20 × 1.80	pieces	12	16	20	24	28	32
P-Trap adaptor	pieces	12	16	20	24	28	32
Commode toilet seat	pieces	12	16	20	24	28	32

F1. SANITATION *continued*		**Model S 100 beds**	**Model L 180 beds**	**Model L 260 beds**	**Model L 340 beds**	**Model XL 420 beds**	**Model XL 500 beds**
ITEM	Units	Total qty	Total qty	Total qty	Total qty	Total qty	Total qty
Flexible irrigation hose 3/4" with nozzle	pieces	12	16	20	24	28	32
Teflon	rolls	30	40	50	60	70	80
Basin	pieces	5	7	9	11	13	15
Grease trap	pieces	8	10	12	14	16	18
Grey water pump	pieces	8	10	12	14	16	18
Shower (1 × 20 persons)	pieces	10	14	18	22	26	30
Macerator	pieces	7	9	11	13	15	17
32 mm flexible grey PVC pipe	lineal metres	240	300	360	420	480	540
32 mm PVC gate valve	pieces	10	12	14	16	18	20
32 mm PVC tee	pieces	16	20	24	28	32	36
PVC glue	tubes	14	18	22	26	30	34
90 mm rigid PVC pipe	lineal metres	150	210	270	330	390	450
90 mm rigid PVC wye (Y) connection		4	8	12	16	20	24

F1. WATER DISTRIBUTION NETWORK		**Model S 100 beds**	**Model L 180 beds**	**Model L 260 beds**	**Model L 340 beds**	**Model XL 420 beds**	**Model XL 500 beds**
ITEM	Units	Total qty	Total qty	Total qty	Total qty	Total qty	Total qty
High-density polyethylene (HDPE) pipe 25 mm	m	336	560	784	1,008	1,232	1,456
Tee 25 mm	pieces	22	32	42	52	62	72
Elbow 25 mm	pieces	2	4	6	8	10	12
Gate valves 25 mm	pieces	28	40	52	64	76	88
Water supply points connections	connections	22	28	34	40	46	52
PVC reducer 1"× 3/4"	pieces	22	28	34	40	46	52
PVC pressure tubing 3/4 "	pieces	22	28	34	40	46	52
PVC ball valves 3/4 "	pieces	22	28	34	40	46	52

F1. WATER DISTRIBUTION NETWORK *continued*		Model S 100 beds	Model L 180 beds	Model L 260 beds	Model L 340 beds	Model XL 420 beds	Model XL 500 beds
ITEM	Units	Total qty	Total qty	Total qty	Total qty	Total qty	Total qty
Elbow action taps 3/4 "	pieces	22	28	34	40	46	52
Sink	pieces	10	16	22	28	34	40
PVC valve, tank outlet 1 1/2"	pieces	4	10	16	22	28	34
Tanks HDPE 5000 L	pieces	4	10	16	22	28	34
Red plastic paint (5 kg)	pieces	3	4	5	6	7	8
Yellow plastic paint (5 kg)	pieces	3	4	5	6	7	8
Green plastic paint (5 kg)	pieces	3	4	5	6	7	8
Teflon	rolls	100	120	140	160	180	200

F2. ELECTRICITY

		Model S 100 beds	Model L 180 beds	Model L 260 beds	Model L 340 beds	Model XL 420 beds	Model XL 500 beds
ITEM	Units	Total qty	Total qty	Total qty	Total qty	Total qty	Total qty
Generator 250 KVA	pieces	1	1	1	1	1	11
Protective electrical panels	pieces	8	9	10	11	12	13
Earthing system	pieces	1	1	1	1	1	45
Cable 2 × 1.5 mm	m	2,770	3,000	3,230	3,460	3,690	3,920
Cable 3G2.5 mm	m	4,680	5,000	5,320	5,640	5,960	6,280
Cable 5G6 mm	m	200	200	200	200	200	200
Cable 5G16 mm	m	500	500	500	500	500	500
Cable 4 × 25 mm	pieces	50	50	50	50	50	50
Staples for cable (100-unit box)	pieces	23	25	27	29	31	33
Connection boxes	pieces	138	150	162	174	186	198
Connection plugs	pieces	138	150	162	174	186	198
Wall sockets	m	560	620	680	740	800	860
LED lights 10W		120	160	200	240	280	320
Metal tray for cable conduction		160	200	240	280	320	360

F2. TELECOMS

ITEM	Units	Model S 100 beds	Model L 180 beds	Model L 260 beds	Model L 340 beds	Model XL 420 beds	Model XL 500 beds
		Total qty	Total qty	Total qty	Total qty	Total qty	Total qty
Radio system	pieces	1	1	1	1	1	1
Internet system	pieces	1	1	1	1	1	1

F2. FIRE SAFETY

ITEM	Units	Model S 100 beds	Model L 180 beds	Model L 260 beds	Model L 340 beds	Model XL 420 beds	Model XL 500 beds
		Total qty	Total qty	Total qty	Total qty	Total qty	Total qty
Extinguishers CO_2 6 kg	pieces	18	22	26	30	34	38
Extinguishers ABC powder 6 kg	pieces	2	2	2	2	2	2

F2. VENTILATION

ITEM	Units	Model S 100 beds	Model L 180 beds	Model L 260 beds	Model L 340 beds	Model XL 420 beds	Model XL 500 beds
		Total qty	Total qty	Total qty	Total qty	Total qty	Total qty
Individual ventilators		100	180	260	260	420	500
Portable high efficiency particulate air (HEPA) filtration units		3	5	7	7	11	13

F4. WASTE MANAGEMENT

ITEM	Units	Model S 100 beds	Model L 180 beds	Model L 260 beds	Model L 340 beds	Model XL 420 beds	Model XL 500 beds
		Total qty	Total qty	Total qty	Total qty	Total qty	Total qty
Pedal opening bins 30 L (infectious waste)	pieces	22	30	38	46	54	62
Biohazard bags	pieces	1,500	2,000	2,500	3,000	3,500	4,000
IPC box 3 L (sharp waste)	pieces	8	10	12	14	16	18
IPC bins 30 L (general waste)	pieces	9	10	11	12	13	14
IPC wheeled bins 120 L (3 colours)	pieces	3	3	3	3	3	3
IPC bucket for disinfection 120 L	pieces	2	2	2	2	2	2
Pressure washer	pieces	1	1	1	1	1	1

F4. HYGIENE AND ENVIRONMENTAL CLEANING

ITEM	Units	Model S 100 beds	Model L 180 beds	Model L 260 beds	Model L 340 beds	Model XL 420 beds	Model XL 500 beds
		Total qty	Total qty	Total qty	Total qty	Total qty	Total qty
Liquid soap dispensers	pieces	10	16	22	28	34	40
Liquid soap	pieces	70	90	110	130	150	170
Alcohol-based hand rub	pieces	60	108	156	204	252	300
Chlorine, NaDCC 65%	pieces	40	60	80	100	120	140
IPC bucket for laundry 120 L	pieces	8	12	16	20	24	28
IPC bucket for washing 15 L	pieces	6	10	14	18	22	26
IPC sprayers 10 L	pieces	3	4	5	6	7	8
IPC body bags	pieces	10	40	70	100	130	160
IPC mops	pieces	4	6	8	10	12	14

F4. EQUIPMENT AND FURNITURE

ITEM	Units	Model S 100 beds	Model L 180 beds	Model L 260 beds	Model L 340 beds	Model XL 420 beds	Model XL 500 beds
		Total qty	Total qty	Total qty	Total qty	Total qty	Total qty
Medical equipment, X-ray	pieces	2	2	2	2	2	2
Furniture, tables	pieces	6	8	10	12	14	16
Furniture, chairs	pieces	40	50	60	70	80	90
Furniture, mirrors	pieces	19	21	23	25	27	29
Furniture, clocks	pieces	8	10	12	14	16	18
Furniture, benches	pieces	6	6	6	6	6	6
Furniture, shelves	pieces	12	12	12	12	12	12
Furniture, beds	pieces	102	182	262	342	422	502
Signage	pieces	36	40	44	48	52	56

F2. TELECOMS

ITEM	Units	Ward module suspected 20 beds	Ward module confirmed 20 beds	Core area +20 SIPA beds
		Total qty	Total qty	Total qty
Structure, water modules W1 (2 m × 1.5 m × 2.40 m)		20	0	4
Structure, water modules W3 (2 m × 6 m × 2.40 m)	pieces	1	1	0
Structure, water modules W5 (2 m × 10 m × 2.40 m)	pieces	0	0	4
Structure, shelter modules Sh2 (6 m × 4 m × 2.40 m)	pieces	0	0	6
Structure, shelter modules Sh3 (6 m × 6 m × 2.40 m)	pieces	0	0	6
Structure, shelter modules Sh4 (6 m × 8 m × 2.40 m)	pieces	0	0	6
Structure, shelter modules Sh5 (6 m × 10 m)	pieces	0	0	2
Structure, storage module St3 (2 m × 6 m × 1.20 m)	pieces	0	0	2
Structure, storage module St5 (2 m × 10 m × 1.20 m)	pieces	1	1	6
Structure, doors module (2 m × 1.2 m – 2 units)	pieces	2	2	-24
Structure, corner module (2 m × 1.2 m × 1 m)	pieces	14	14	5
Structure, beds module (1.2 m × 2.4 m × 0.10 m)	pieces	10	10	200
Fence	m	220	220	3,000
Floor (not considered – to build in existing facility)	m^2	648	648	3,000
Roofing (not considered – to build in existing facility)	m^2	648	648	0
SIPA, specific inpatient profile area.				

F1. SANITATION

ITEM	Units	Ward module suspected 20 beds	Ward module confirmed 20 beds	Core area +20 SIPA beds
		Total qty	Total qty	Total qty
WC cubicles superstructure (taking into account gender)	pieces	20	2	8
Plastic or resin latrine slabs 1.20 × 1.80	pieces	20	2	8
P-trap adaptor	pieces	20	2	8
Commode toilet seat	pieces	20	2	8
Flexible irrigation hose 3/4" with nozzle	pieces	20	2	8
Teflon	rolls	12	2	20
Basin	pieces	20	2	3
Grease trap	pieces	2	1	6
Grey water pump	pieces	1	1	6
Shower (1 × 20 persons)	pieces	20	1	6
Macerator	pieces	1	1	5
32 mm flexible grey PVC pipe	lineal metres	240	60	180
32 mm PVC gate valve	pieces	4	2	8
32 mm PVC tee	pieces	4	2	12
PVC glue	tubes	16	2	10
90 mm rigid PVC pipe	lineal metres	100	25	90
90 mm rigid PVC wye (Y) connection		18	4	0

F1. WATER DISTRIBUTION NETWORK

ITEM	Units	Ward module suspected 20 beds	Ward module confirmed 20 beds	Core area +20 SIPA beds
		Total qty	Total qty	Total qty
HDPE pipe 25 mm	m	140	112	112
Tee 25 mm	pieces	22	5	12
Elbow 25mm	pieces	2	2	0
Gate valves 25 mm	pieces	22	6	16
Water supply points connections	connections	22	3	16
PVC reducer 1"× 3/4"	pieces	22	3	16
PVC pressure tubing 3/4"	pieces	22	3	16

F1. WATER DISTRIBUTION NETWORK *continued*		Ward module suspected 20 beds	Ward module confirmed 20 beds	Core area +20 SIPA beds
ITEM	Units	Total qty	Total qty	Total qty
PVC ball valves 3/4"	pieces	22	3	16
Elbow action taps 3/4"	pieces	22	3	16
Sink	pieces	22	3	4
PVC valve, tank outlet 1 1/2 "	pieces	0	0	-2
Tanks HDPE 5000 L	pieces	0	0	-2
Red plastic paint (5 kg)	pieces	0	0	2
Yellow plastic paint (5 kg)	pieces	0	0	2
Green plastic paint (5 kg)	pieces	0	0	2
Teflon	rolls	48	12	80

F2. ELECTRICITY

		Ward module suspected 20 beds	Ward module confirmed 20 beds	Core area +20 SIPA beds
ITEM	Units	Total qty	Total qty	Total qty
Generator 250 KVA	pieces	0	0	1
Protective electrical panels	pieces	1	1	7
Earthing system	pieces	0	0	1
Cable 2 × 1.5 mm	m	115	115	2,540
Cable 3G2.5 mm	m	160	160	4,360
Cable 5G6 mm	m	0	0	200
Cable 5G16 mm	m	0	0	500
Cable 4 × 25	pieces	0	0	50
Staples for cable (100-unit box)	pieces	1	1	21
Connection boxes	pieces	6	6	126
Connection plugs	pieces	6	6	126
Wall sockets	m	30	40	500
LED lights 10W	pieces	20	20	80
Metal tray for cable conduction	pieces	20	20	120

F2. TELECOM

ITEM	Units	Ward module suspected 20 beds	Ward module confirmed 20 beds	Core area +20 SIPA beds
		Total qty	Total qty	Total qty
Radio system	pieces	0	0	1
Internet system	pieces	0	0	1

F2. FIRE SAFETY

ITEM	Units	Ward module suspected 20 beds	Ward module confirmed 20 beds	Core area +20 SIPA beds
		Total qty	Total qty	Total qty
Extinguishers CO_2 6 kg	pieces	2	2	14
Extinguishers ABC powder 6 kg	pieces	0	0	2

F2. VENTILATION

ITEM	Units	Ward module suspected 20 beds	Ward module confirmed 20 beds	Core area +20 SIPA beds
		Total qty	Total qty	Total qty
Individual ventilators	pieces	20	40	20
Portable HEPA filtration units	pieces	2	1	1

F4. WASTE MANAGEMENT

ITEM	Units	Ward module suspected 20 beds	Ward module confirmed 20 beds	Core area +20 SIPA beds
		Total qty	Total qty	Total qty
Pedal opening bins 30 L (infectious waste)	pieces	4	4	14
Biohazard bags	pieces	250	250	1,000
IPC box 3 L (sharp waste)	pieces	2	2	6
IPC bins 30 L (general waste)	pieces	0	0	8
IPC wheeled bins 120 L (3 colours)	pieces	0	0	3
IPC bucket for disinfection 120 L	pieces	0	0	2
Pressure washer	pieces	0	0	1

F4. HYGIENE AND ENVIRONMENTAL CLEANING		Ward module suspected 20 beds	Ward module confirmed 20 beds	Core area +20 SIPA beds
ITEM	Units	Total qty	Total qty	Total qty
Liquid soap dispensers	pieces	20	3	4
Liquid soap	pieces	10	10	50
Alcohol-based hand rub	pieces	24	24	12
Chlorine, NaDCC 65%	pieces	10	10	20
IPC bucket for laundry 120 L	pieces	2	2	4
IPC bucket for washing 15 L	pieces	2	2	2
IPC sprayers 10 L	pieces	1	1	2
IPC body bags	pieces	10	10	20
IPC mops	pieces	1	1	2

F4. EQUIPMENT AND FURNITURE		Ward module suspected 20 beds	Ward module confirmed 20 beds	Core area +20 SIPA beds
ITEM	Units	Total qty	Total qty	Total qty
Medical equipment, X-ray	pieces	0	0	2
Furniture, tables	pieces	1	1	4
Furniture, chairs	pieces	20	5	30
Furniture, mirrors	pieces	1	1	17
Furniture, clocks	pieces	1	1	6
Furniture, benches	pieces	0	0	6
Furniture, shelves	pieces	0	0	12
Furniture, beds	pieces	20	40	22
Signage	pieces	2	2	32

A1 Module, PPE

WHO CODE	WHO description	Model S 100 beds	Model L 180 beds	Model L 260 beds	Model L 340 beds	Model XL 420 beds	Model XL 500 beds
		Qty kit nCoV 100 patients	Qty kit nCoV 180 patients	Qty kit nCoV 260 patients	Qty kit nCoV 340 patients	Qty kit nCoV 420 patients	Qty kit nCoV 500 patients
YMEQGLASWSI--AI	GOGGLES PROTECTIVE, wraparound, soft frame, indirect vent	300	540	780	1020	1260	1500
PEXTALCOIG---AI	ALCOHOL-BASED HAND RUB, gel, 100 mL, bottle	60	108	156	204	252	300
EWASBAGBR007 -AI	BAG BIOHAZARD, REFUSE,AUTOCLAVABLE , 30 × 50 cm, yellow	100	180	260	340	420	500
EWASYCHN5GI--AI	CHLORINE NaDCC, 45–55%, granules, 1 kg, pot	8	15	21	28	34	40
CPPEGOWI3L---AI	GOWN,AAMI level 3, nonsterile, disp., size L	540	972	1404	1836	2268	2700
CPPEGOWI3M ---AI	GOWN,AAMI level 3, nonsterile, disp., size M	630	1134	1638	2142	2646	3150
CPPEGOWI3XL--AI	GOWN,AAMI level 3, nonsterile, disp., size XL	450	810	1170	1530	1890	2250
CPPEGOWI3XXL-AI	GOWN,AAMI level 3, nonsterile, disp., size XXL	180	324	468	612	756	900
CMSUGLENILI--AI	GLOVE EXAMINATION, nitrile, size L	22,00	3,960	5,720	7,480	9,240	11,000
CMSUGLENIMI--AI	GLOVE EXAMINATION, nitrile, size M	4,200	7,560	10,920	14,280	17,640	21,000
CMSUGLENISI--AI	GLOVE EXAMINATION, nitrile, size S	4,200	7,560	10,920	14,280	17,640	21,000
CMSUGLENIXL--AI	GLOVE EXAMINATION, nitrile, size XL	1,600	2,880	4,160	5,440	6,720	8,000
CPPEMASS2RL--AI	MASK SURGICAL, type IIR, level 2, s.u., nonsterile, earloop, size L	1,100	1,980	2,860	3,740	4,620	5,500
CPPEMASS2RM--AI	MASK SURGICAL, type IIR, level 2, s.u., nonsterile, earloop, size M	1,100	1,980	2,860	3,740	4,620	5,500
CPPEMASS2RS--AI	MASK SURGICAL, type IIR, level 2, s.u., nonsterile, earloop, size S	1,100	1,980	2,860	3,740	4,620	5,500
CPPEMASPF205-AI	RESPIRATOR, mask, FFP2/N95, type IIR, single use, unvalved, noseclip	6,000	10,800	15,600	20,400	25,200	30,000
CPPEFSHIE002-AI	FACESHIELD,clear plastic, disp.	2,700	4,860	7,020	9,180	11,340	13,500
CMSUTHERIOI--AI	THERMOMETER, INFRARED, no contact, handheld	30	54	78	102	126	150
CINSCONTC51--AI	SAFETY BOX, needles/syringes, 5L, cardboard for incineration	40	72	104	136	168	200
OPACUN62BS1--AI	BOX, triple packaging, biological substance UN3373 + pouch	100	180	260	340	420	500
OPACUN621SI--AI	BOX, triple packaging, infectious substance UN2814	20	36	52	68	84	100
CMSUBAGB4A04-AI	BAG BODY, 8 handles, U-shaped zip, white, 400 microns, adult, 230 × 100 cm	20	36	52	68	84	100

A2.2 Personal protective equipment (PPE) and scrubs

Source: *Severe Acute Respiratory Infections Treatment Centre: Practical manual to set up and manage a SARI treatment centre and a SARI screening facility in health care facilities, WHO, March 2020*

Kit staff module, uniform × 4 shifts

WHO CODE	WHO description	Model S 100 beds	Model L 180 beds	Model L 260 beds	Model L 340 beds	Model XL 420 beds	Model XL 500 beds
		Qty kit nCoV 100 patients	Qty kit nCoV 180 patients	Qty kit nCoV 260 patients	Qty kit nCoV 340 patients	Qty kit nCoV 420 patients	Qty kit nCoV 500 patients
YPPESTUTROSS-AI	SET, TUNIC + TROUSERS SURGICAL. woven, reusable, green, size (S)	50	80	112	142	172	200
YPPESTUTROSM-AI	SET, TUNIC + TROUSERS SURGICAL. woven, reusable, green, size (M)	88	140	196	249	301	350
YPPESTUTROSL-AI	SET, TUNIC + TROUSERS SURGICAL. woven, reusable, green, size (L)	75	120	168	213	258	300
YPPESTUTROSXLAI	SET, TUNIC + TROUSERS SURGICAL. woven, reusable, green, size (XL)	38	60	84	107	129	150
OUFBOOTW38--AI	BOOTS, rubber, size (38), dark colour (green or black), pair	32	50	70	89	108	125
OUFBOOTW40--A1	BOOTS, rubber, size (40), dark colour (green or black), pair	63	100	140	178	215	250
OLIFBOOTW42--AI	BOOTS, rubber, size (42), dark colour (green or black), pair	50	80	112	142	172	200
OUFBOOTW44--AI	BOOTS, rubber, size (44), dark colour (green or black), pair	38	60	84	107	129	150
OLIFBOOTW46--A1	BOOTS, rubber, size (46),dark colour (green or black), pair	19	30	42	54	65	75

Kit nCoV hygienist staff module × 4 shifts: uniform and PPE

WHO CODE	WHO description	Model S 100 beds	Model L 180 beds	Model L 260 beds	Model L 340 beds	Model XL 420 beds	Model XL 500 beds
		Qty kit nCoV 100 patients	Qty kit nCoV 180 patients	Qty kit nCoV 260 patients	Qty kit nCoV 340 patients	Qty kit nCoV 420 patients	Qty kit nCoV 500 patients
YPPESTUTROSS-AI	SET, TUNIC + TROUSERS SURGICAL. woven, reusable, green, size (S)	50	80	112	142	172	200
YPPESTUTROSM-AI	SET, TUNIC + TROUSERS SURGICAL. woven, reusable, green, size (M)	88	140	196	249	301	350
YPPESTUTROSL-AI	SET, TUNIC + TROUSERS SURGICAL. woven, reusable, green, size (L)	75	120	168	213	258	300
YPPESTUTROSXLAI	SET, TUNIC+ TROUSERS SURGICAL. woven, reusable, green, size (XL)	38	60	84	107	129	150
OUFBOOTW38--AI	BOOTS, rubber, size (38),dark colour (green or black), pair	32	50	70	89	108	125
OUFBOOTW40--A1	BOOTS, rubber, size (40),dark colour (green or black), pair	63	100	140	178	215	250
OLIFBOOTW42--AI	BOOTS, rubber, size (42),dark colour (green or black), pair	50	80	112	142	172	200
OUFBOOTW44--AI	BOOTS, rubber, size (44), dark colour (green or black), pair	38	60	84	107	129	150
OLIFBOOTW46--A1	BOOTS, rubber, size (46),dark colour (green or black), pair	19	30	42	54	65	75
CPPEMASPF205-AI	RESPIRATOR, mask, FFP2/N95, type IIR, single use, unvalved, noseclip	48	64	80	96	112	128
YMEQGLASWSI–AI	GOGGLES PROTECTIVE, wraparound, soft frame, indirect vent	48	64	80	96	112	128
	APRON, disposable	1,440	1,920	2,400	2,880	3,360	3820
	APRON HEAVY DUTY, reusable	48	64	80	96	112	128

Kit COVID-19 – module medical equipment

Medical area	Medical purpose	Medical item	Type	Designation (EN)	Variable	Per bed	Per case	Model S 100 beds	Each increase of 80 moderate beds
Severe	Monitoring	Patient monitor	Equipment	MONITOR PATIENT, NIBP, w/o ECG, battery, trolley, +acc.	Per bed	1		80	80
Severe	Oxygen therapy	Pulse oximeter	Equipment	PULSE OXIMETER – FINGERTIP	Per bed	0.8		64	65
Severe	Oxygen therapy	Concentrator O^2	Equipment	CONCENTRATOR O2 10L, 230V, 50 Hz + acc.	Per bed	1		80	81
Severe	Oxygen therapy	Concentrator O^2	Accessories	(humidifier) HOSE CONNECTOR	Per equipment			8	9
Severe	Oxygen therapy	Concentrator O^2	Accessories	HUMIDIFIER, autoclavable	Per equipment			8	9
Severe	Oxygen therapy	Concentrator O^2	Accessories	(concentr. O2) FLOW SPLITTER paediat., 5 flowmeters 0-2L/min	Per equipment			8	9
Severe	Oxygen therapy	Concentrator O^2	Consumables	NASAL OXYGEN CANNULA, 2.1m, 2 prongs + tube, adult	Per case		0.8	92	92
Severe	Oxygen therapy	Concentrator O^2	Consumables	NASAL OXYGEN CANNULA, 2 prongs + tube, paediatric	Per case		0.15	18	17
Severe	Oxygen therapy	Concentrator O^2	Consumables	NASAL OXYGEN CANNULA, 2 prongs + tube, neonate	Per case		0.05	6	6
Severe	Oxygen therapy	Concentrator O^2	Consumables	Mask, oxygen, with connection tube, reservoir bag and valve, high-concentration, adult, non-sterile, single use	Per case		0.8	92	92
Severe	Oxygen therapy	Concentrator O^2	Consumables	Mask, oxygen, with connection tube, reservoir bag and valve, high-concentration, paediatric, non-sterile, single use	Per case		0.15	18	17
Severe	Oxygen therapy	Concentrator O^2	Consumables	Venturi mask, with percent O2 lock + 2.1 m tubing , adult	Per case		0.8	92	92
Severe	Oxygen therapy	Concentrator O^2	Consumables	Venturi mask, with percent O2 lock + 2.1 m tubing , paediatric	Per case		0.15	18	17
Severe	Oxygen therapy	Concentrator O^2	Consumables	Catheter, nasal, 8 Fr, 40 cm, with lateral eyes, sterile, single use	Per case		0.8	92	92
Severe	Oxygen therapy	Concentrator O^2	Consumables	CONNECTOR, biconical, symmetric, ext. diam. 7–11 mm, autoclavable	Per case		1	115	114
Severe	Oxygen therapy	Concentrator O^2	Consumables	TUBE, silicone, autoclavable, int. diam. 5 mm, 25 m	Per case		2	229	229
Severe	Oxygen therapy	O_2 wall	Equipment	Flowmeter, Thorpe tube, for oxygen 0-15 L/min	Per bed	2		160	161
Severe	Oxygen therapy	CPAP, infant	Equipment	CPAP 10 machine, w/twin flowmeters	Per bed	0.01		1	1
Severe	Oxygen therapy	CPAP, adult	Equipment	CPAP unit w/nasal tubing and mask for adult	Per bed	0.08		7	6
Severe	Oxygen therapy	Suction pump	Equipment	SUCTION PUMP, MECHANICAL + collection bottles	Per centre			12	0
Severe	Oxygen therapy	Suction pump	Consumables	TUBE, silicone, autoclavable, int. diam.8 mm, 10 m	Per case		0.025	3	3
Severe	Drug administration	Drop counter	Equipment	ELECTRONIC DROP COUNTER, IV fluids infu. gravity monitor, alarm, batt. AA	Per bed	1		80	81
Severe	Blood chemistry	Chemistry analyser	Equipment	CLINICAL CHEMISTRY ANALYSER	Per centre			3	0
Severe	Blood chemistry	Chemistry analyser	Consumables	CARTRIDGE for chemistry analyser (lactic acidosis and hyperlactataemia)	Per case		2	229	229
Severe	Blood chemistry	Chemistry analyser	Consumables	CARTRIDGE (metabolic status and renal function)	Per case		1	115	114
Severe	Blood Chemistry	Chemistry Analyser	Consumables	CONTROL, solution 1	Per equipment			6	0

Source: *Electro-mechanical medical equipment for NCoV case management WHE/OSL V 1.0*

Kit COVID-19 – module medical equipment - *continued*

Medical area	Medical purpose	Medical item	Type	Designation (EN)	Variable	Per bed	Per case	Model S 100 beds	Each increase of 80 moderate beds
Severe	Blood Chemistry	Chemistry analyser	Consumables	CONTROL, solution 2	Per equipment			6	0
Severe	Blood chemistry	Chemistry analyser	Consumables	CONTROL, solution 3	Per equipment			6	0
Severe	Blood chemistry	Chemistry analyser	Consumables	TUBE, VACUUM, plastic, Li-HEPARIN, 2 mL green	Per case		2	229	229
Severe	Blood chemistry	Chemistry analyser	Consumables	TUBE, VACUUM, plastic, Li-HEPARIN, 4 mL green	Per case		2	229	229
ICU	Monitoring	Patient monitor	Equipment	MONITOR PATIENT, multiparamet, ECG/CAPNO/SpO2/NIBP/Temp,230V,+acc	Per bed	1		20	NA
ICU	Monitoring	Patient monitor	Consumables	(ECG) ELECTRODE GEL, bottle	Per case		0.05	3	NA
ICU	Oxygen therapy	Pulse oximeter	Equipment	PULSE OXIMETER – FINGERTIP	Per bed	0.8		16	NA
ICU	Oxygen therapy	Concentrator O^2	Equipment	CONCENTRATOR O2 10 L, 230 V, 50 Hz + acc.	Per bed	1		20	NA
ICU	Oxygen therapy	Concentrator O^2	Accessories	(humidifier) HOSE CONNECTOR 9/16	Per equipment			2	NA
ICU	Oxygen therapy	Concentrator O^2	Accessories	HUMIDIFIER, autoclavable	Per equipment			2	NA
ICU	Oxygen therapy	Concentrator O^2	Accessories	(concentrator O2) FLOW SPLITTER paediat., 5 flowmeters 0–2 L/min	Per equipment			2	NA
ICU	Oxygen therapy	Concentrator O^2	Consumables	NASAL OXYGEN CANNULA, 2.1 m, 2 prongs + tube, adult	Per case		0.8	35	NA
ICU	Oxygen therapy	Concentrator O^2	Consumables	NASAL OXYGEN CANNULA, 2 prongs + tube, paediatric	Per case		0.15	7	NA
ICU	Oxygen therapy	Concentrator O^2	Consumables	NASAL OXYGEN CANNULA, 2 prongs + tube, neonate	Per case		0.05	3	NA
ICU	Oxygen therapy	Concentrator O^2	Consumables	Mask, oxygen, with connection tube, reservoir bag and valve, high-concentration, adult, non-sterile, single use	Per case		1	43	NA
ICU	Oxygen therapy	Concentrator O2	Consumables	Mask, oxygen, with connection tube, reservoir bag and valve, high-concentration, paediatric, non-sterile, single use	Per case		1	43	NA
ICU	Oxygen therapy	Concentrator O2	Consumables	Venturi mask, with percent O2 lock + 2.1 m tubing , adult	Per case		1	43	NA
ICU	Oxygen therapy	Concentrator O2	Consumables	Venturi mask, with percent O2 lock + 2.1 m tubing , paediatric	Per case		1	43	NA
ICU	Oxygen therapy	Concentrator O2	Consumables	Catheter, nasal, 8 Fr, 40 cm, with lateral eyes, sterile, single use	Per case		1	43	NA
ICU	Oxygen therapy	Concentrator O2	Consumables	CONNECTOR, biconical, symmetric, ext. diam. 7–11 mm, autoclavable	Per case		1	43	NA
ICU	Oxygen therapy	Concentrator O2	Consumables	TUBE, silicone, autoclavable, int. diam. 5 mm, 25 m	Per case		2	86	NA
ICU	Oxygen therapy	O2 wall	Equipment	FLOWMETER, Thorpe tube, for oxygen 0–15 L/min	Per bed	2		40	NA
ICU	Airway management	Independent	Equipment	CRICOTHYROTOMY, SET, emergency, 6 mm, sterile, single use, w/acc.	Per centre			12	NA
ICU	Airway management	Independent	Consumables	AIRWAY, NASOPHARYNGEAL, sterile, set, single use (from Fr20 to Fr36)	Per case		1	43	NA
ICU	Airway management	Independent	Consumables	AIRWAY, OROPHARYNGEAL, Guedel, sterile, set, single use (00, 0, 1, 2, 3, 4, 5)	Per case		1	43	NA
ICU	Airway management	Independent	Consumables	ENDOTRACHEAL TUBE INTRODUCER, Bougie, sterile, single use, Fr15, 70cm	Per case		1	43	NA

Kit COVID-19 – module medical equipment - *continued*

Medical area	Medical purpose	Medical item	Type	Designation (EN)	Variable	Per bed	Per case	Model S 100 beds	Each increase of 80 moderate beds
ICU	Airway management	Independent	Consumables	ENDOTRACHEAL TUBE INTRODUCER, Bougie, sterile, single use, Fr10, 60cm	Per case		1	43	NA
ICU	Airway management	Independent	Consumables	ENDOTRACHEAL TUBE INTRODUCER, Stylet, sterile, single use, Fr14, 30 to 45 cm	Per case		1	43	NA
ICU	Airway management	Independent	Consumables	ENDOTRACHEAL TUBE INTRODUCER, Stylet, sterile, single use, Fr10, 30 to 45 cm	Per case		1	43	NA
ICU	Airway management	Independent	Consumables	TUBE, ENDOTRACHEAL, No. 2, w/o cuff, sterile, single use	Per case		1	43	NA
ICU	Airway management	Independent	Consumables	TUBE, ENDOTRACHEAL, No. 2.5, w/o cuff, sterile, single use	Per case		1	43	NA
ICU	Airway management	Independent	Consumables	TUBE, ENDOTRACHEAL, No. 3, w/o cuff, sterile, single use	Per case		1	43	NA
ICU	Airway management	Independent	Consumables	TUBE, ENDOTRACHEAL, No. 3.5, w/o cuff, sterile, single use	Per case		1	43	NA
ICU	Airway management	Independent	Consumables	TUBE, ENDOTRACHEAL, No. 4, w/o cuff, sterile, single use	Per case		1	43	NA
ICU	Airway management	Independent	Consumables	TUBE, ENDOTRACHEAL, No.5, w/o cuff, sterile, single use	Per case		1	43	NA
ICU	Airway management	Independent	Consumables	TUBE, ENDOTRACHEAL, No. 4, w/ cuff, sterile, single use	Per case		1	43	NA
ICU	Airway management	Independent	Consumables	TUBE, ENDOTRACHEAL, No. 5, w/ cuff, sterile, single use	Per case		1	43	NA
ICU	Airway management	Independent	Consumables	TUBE, ENDOTRACHEAL, No. 6, w/ cuff, sterile, single use	Per case		1	43	NA
ICU	Airway management	Independent	Consumables	TUBE, ENDOTRACHEAL, No. 7, w/ cuff, sterile, single use	Per case		1	43	NA
ICU	Airway management	Independent	Consumables	TUBE, ENDOTRACHEAL, No.8, w/ cuff, sterile, single use	Per case		1	43	NA
ICU	Airway management	Independent	Consumables	TUBE, ENDOTRACHEAL, No. 9, w/ cuff, sterile, single use	Per case		1	43	NA
ICU	Airway management	Independent	Consumables	LARYNGEAL MASK AIRWAY (LMA), size 2, sterile, single use	Per case		1	43	NA
ICU	Airway management	Independent	Consumables	LARYNGEAL MASK AIRWAY (LMA), size 3, sterile, single use	Per case		1	43	NA
ICU	Airway management	Independent	Consumables	LARYNGEAL MASK AIRWAY (LMA), size 4, sterile, single use	Per case		1	43	NA
ICU	Airway management	Independent	Consumables	COLORIMETRIC END TIDAL CO2 DETECTOR, adult, single use	Per case		1	43	NA
ICU	Airway management	Independent	Consumables	COLORIMETRIC END TIDAL CO2 DETECTOR, paediatric, single use	Per case		1	43	NA
ICU	Airway management	Independent	Consumables	SYRINGE, Luer slip, 10 mL, sterile, single use	Per case		1	43	NA
ICU	Airway management	Independent	Consumables	LUBRICATING jelly, 5 g, box of 150	Per case		1	43	NA
ICU	Airway management	Independent	Consumables	FORCEPS, MAGILL, paediatric, 15 cm	Per case		1	43	NA
ICU	Airway management	Independent	Consumables	FORCEPS, MAGILL, child, 19 cm	Per case		1	43	NA
ICU	Airway management	Independent	Consumables	FORCEPS, MAGILL, adult, 24 cm	Per case		1	43	NA
ICU	Airway management	Laryngoscope, adult	Equipment	LARYNGOSCOPE, fib.opt, ad/ch, diam. 28 mm, blades (Macintosh2/3/4 + Miller1), sp. bulbs	Per case			24	NA

Kit COVID-19 – module medical equipment - *continued*

Medical area	Medical purpose	Medical item	Type	Designation (EN)	Variable	Per bed	Per case	Model S 100 beds	Each increase of 80 moderate beds
ICU	Airway management	Laryngoscope, infant	Equipment	LARYNGOSCOPE, fib. opt, neonate, diam.19 mm, blades (Macintosh 0/1/2), sp. bulbs, batt.	Per centre			12	NA
ICU	Mechanical ventilation	Resuscitator, adult	Equipment	SELF-INFLATING BAG, ad./child + masks RH5 / RH2 (Ambu type)	Per centre			12	NA
ICU	Mechanical ventilation	Resuscitator, infant	Equipment	SELF-INFLATING BAG, child/neonate + masks RH2/S1 (Ambu type)	Per centre			6	NA
ICU	Mechanical ventilation	Suction device	Equipment	SUCTION BULB, for newborn, reusable, autoclavable	Per centre			6	NA
ICU	Oxygen therapy	Suction pump	Equipment	SUCTION PUMP, MECHANICAL + collection bottles	Per centre			12	NA
ICU	Oxygen therapy	Suction pump	Consumables	TUBE, silicone, autoclavable, int. diam. 8 mm, 10 m	Per case		0,025	2,00	NA
ICU	Mechanical ventilation	Independent	Consumables	FILTER, HEAT AND MOISTURE EXCHANGER (HMEF), high efficiency, with connectors, adult, single use	Per case		0,8	35	NA
ICU	Mechanical ventilation	Independent	Consumables	FILTER, HEAT AND MOISTURE EXCHANGER (HMEF), high efficiency, with connectors, paediatric, single use	Per case		0,2	9	NA
ICU	Gastro-enteral feeding	Independent	Consumables	TUBE, FEEDING, NASOGASTRIC, 10 Fr, 50 cm, ENFit tip, sterile, single use	Per case		1	43	NA
ICU	Gastro-enteral feeding	Independent	Consumables	TUBE, FEEDING, NASOGASTRIC, 12 Fr, 90 cm, ENFit tip, sterile, single use	Per case		1	43	NA
ICU	Gastro-enteral feeding	Independent	Consumables	TUBE, FEEDING, NASOGASTRIC, 14 Fr, 90 cm, ENFit tip, sterile, single use	Per case		1	43	NA
ICU	Gastro-enteral feeding	Independent	Consumables	TUBE, FEEDING, NASOGASTRIC, 6 Fr, 50 cm, ENFit tip, sterile, single use	Per case		1	43	NA
ICU	Gastro-enteral feeding	Independent	Consumables	TUBE, FEEDING, NASOGASTRIC, 8 Fr, 50 cm, ENFit tip, sterile, single use	Per case		1	43	NA
ICU	Gastro-enteral feeding	Independent	Consumables	SYRINGE, FEEDING, 1 mL, LDT, ENFit, sterile, single use	Per case		1	43	NA
ICU	Gastro-enteral feeding	Independent	Consumables	SYRINGE, FEEDING, 10 mL, ENFit, sterile, single use	Per case		1	43	NA
ICU	Gastro-enteral feeding	Independent	Consumables	SYRINGE, FEEDING, 2.5 mL, LDT, ENFit, sterile, single use	Per case		1	43	NA
ICU	Gastro-enteral feeding	Independent	Consumables	SYRINGE, FEEDING, 20 mL, ENFit, sterile, single use	Per case		1	43	NA
ICU	Gastro-enteral feeding	Independent	Consumables	SYRINGE, FEEDING, 5 mL, LDT, ENFit, sterile, single use	Per case		1	43	NA
ICU	Gastro-enteral feeding	Independent	Consumables	SYRINGE, FEEDING, 60 mL, ENFit, sterile, single use	Per case		1	43	NA
ICU	Gastro-enteral feeding	Independent	Consumables	LUBRICATING jelly, 50 g, tube	Per bed	1		20	NA
ICU	Gastro-enteral feeding	Independent	Consumables	PAD, absorbent	Per case		1	43	NA
ICU	Gastro-enteral feeding	Independent	Consumables	BASIN, KIDNEY, stainless steel, 825 mL	Per bed	1		20	NA
ICU	Gastro-enteral feeding	Independent	Consumables	STETHOSCOPE, binaural, double cup, adult/child, single use	Per bed	1		20	NA
ICU	Central line	Independent	Consumables	CENTRAL VENOUS CATHETERS KIT	Per case		1	43	NA
ICU	Central line	Independent	Consumables	Transparent adhesive plasters, washproof, 5 × 5 cm	Per case		3	129	NA
ICU	Urine collection	Independent	Consumables	Bag, collecting, urine, with outlet tap, with non-return valve, 2000 mL, adult, non-sterile, single use	Per case		1	43	NA

Kit COVID-19 – module medical equipment - *continued*

Medical area	Medical purpose	Medical item	Type	Designation (EN)	Variable	Per bed	Per case	Model S 100 beds	Each increase of 80 moderate beds
ICU	Urine collection	Independent	Consumables	CATHETER, URETHRAL, Foley, 2-way, 10 Fr, sterile, single use	Per case		1	43	NA
ICU	Urine collection	Independent	Consumables	CATHETER, URETHRAL, Foley, 2-way, 12 Fr, sterile, single use	Per case		1	43	NA
ICU	Urine collection	Independent	Consumables	CATHETER, URETHRAL, Foley, 2-way, 14 Fr, sterile, single use	Per case		1	43	NA
ICU	Urine collection	Independent	Consumables	CATHETER, URETHRAL, Foley, 2-way, 16 Fr, sterile, single use	Per case		1	43	NA
ICU	Urine collection	Independent	Consumables	CATHETER, URETHRAL, Foley, 2-way, 18 Fr, sterile, single use	Per case		1	43	NA
ICU	Urine collection	Independent	Consumables	CATHETER, URETHRAL, Foley, 2-way, 20 Fr, sterile, single use	Per case		1	43	NA
ICU	Urine collection	Independent	Consumables	CATHETER, URETHRAL, Foley, 2-way, 8 Fr, sterile, single use	Per case		1	43	NA
ICU	General supplies	Independent	Consumables	Compress, gauze, 10 × 10 cm, 8 to 12 ply, sterile, single use	Per case		1	43	NA
ICU	General supplies	Independent	Consumables	Tape, surgical, hypoallergenic, 5 × 2.5 cm	Per case		1	43	NA
ICU	General supplies	Independent	Consumables	Drape, surgical, nonwoven, sterile, single use	Per case		1	43	NA
ICU	General supplies	Independent	Consumables	Gloves, examination, nitrile, powder-free, pair-packed, large, sterile, single use	Per case		1	43	NA
ICU	General supplies	Independent	Consumables	Gloves, examination, nitrile, powder-free, pair-packed, medium, sterile, single use	Per case		1	43	NA
ICU	General supplies	Independent	Consumables	Gloves, examination, nitrile, powder-free, pair-packed, small, sterile, single use	Per case		1	43	NA
ICU	General supplies	Independent	Consumables	Antiseptic wipe with alcohol and chlorhexidine	Per case		1	43	NA
ICU	Blood Chemistry	Independent	Consumables	Arterial blood sample kits	Per case		1	43	NA
ICU	Mechanical ventilation	Patient ventilator	Equipment	VENTILATOR PATIENT, for adult, paediatric and neonate w/acc.	Per bed	0.5		10	NA
ICU	Mechanical ventilation	Patient ventilator	Consumables	Breathing circuit (tubes/balloon/valves/mask), ADULT, single use	Per case		0.8	35	NA
ICU	Mechanical ventilation	Patient ventilator	Consumables	Breathing circuit (tubes/balloon/valves/mask), PAEDIATRIC, single use	Per case		0.15	7	NA
ICU	Mechanical ventilation	Patient ventilator	Consumables	Breathing circuit (tubes/balloon/valves/mask), NEONATE, single use	Per case		0.05	3	NA
ICU	Oxygen therapy	HFNC	Equipment	High flow nasal cannula (HFNC)	Per bed	0.5		10	NA
ICU	Oxygen therapy	HFNC	Consumables	Optiflow + nasal cannula, small, pack of 20	Per case		1	43	NA
ICU	Oxygen therapy	HFNC	Consumables	Optiflow + nasal cannula, medium, pack of 20	Per case		1	43	NA
ICU	Oxygen therapy	HFNC	Consumables	Optiflow + nasal cannula, large, pack of 20	Per case		1	43	NA
ICU	Oxygen therapy	HFNC	Consumables	Disinfection kit	Per case		0,8	35	NA
ICU	Oxygen therapy	HFNC	Consumables	Cleaning sponge stick, pack of 20	Per case		0.15	7	NA
ICU	Oxygen therapy	HFNC	Consumables	Disinfection filter, pack of 2	Per case		0.05	3	NA

Kit COVID-19 – module medical equipment - *continued*

Medical area	Medical purpose	Medical item	Type	Designation (EN)	Variable	Per bed	Per case	Model S 100 beds	Each increase of 80 moderate beds
ICU	Oxygen therapy	Suction pump	Equipment	SUCTION PUMP, ELECTRICAL, 100–230 V, 50–60 Hz	Per bed	1		20	NA
ICU	Oxygen therapy	Suction pump	Consumables	BACTERIA FILTER, unit	Per case		0.5	22	NA
ICU	Oxygen therapy	Suction pump	Consumables	TUBE, silicone, autoclavable, int. diam. 8 mm, 10 m	Per case		1	43	NA
ICU	Drug administration	Infusion pump	Equipment	INFUSION PUMP	Per bed	1		20	NA
ICU	Drug administration	Infusion pump	Consumables	(infusion pump) INFUSION LINE	Per case		2	86	NA
ICU	Drug administration	Drill	Equipment	DRILL, FOR VASCULAR ACCESS, with transport bag	Per centre			3	NA
ICU	Drug administration	Drill	Consumables	NEEDLE + STABILIZER KIT, 15 G, 15 mm, PAEDIATRIC	Per case		0.1	5	NA
ICU	Drug administr-ation	Drill	Consumables	NEEDLE + STABILIZER KIT, 15 G, 25 mm, ADULT	Per case		0.08	4	NA
ICU	Monitoring	Defibrillator	Equipment	DEFIBRILLATOR, mobile, semi-auto., multi-paramet, AC/DC, w/acc + trolley	Per centre			3	NA
ICU	Monitoring	Defibrillator	Consumables	(defibrillator) ELECTRODE PADS, adult, adhesive, disp.	Per case		0.08	4	NA
ICU	Monitoring	Defibrillator	Consumables	(defibrillator) ELECTRODE PADS, paediatric, adhesive, disp.	Per case		0.02	1	NA
ICU	Monitoring	ECG	Equipment	ELECTROCARDIOGRAPH, portable, 3 ch + ACC	Per centre			3	NA
ICU	Monitoring	ECG	Consumables	(ECG) RECORDING PAPER, pack	Per bed-day			6	NA
ICU	Monitoring	ECG	Consumables	(ECG) ELECTRODE GEL, bottle	Per case		0.01	1	NA
ICU	Diagnostic imaging	Ultrasound	Equipment	ULTRASOUND, SYSTEM, MOBILE, transducer, trolley, 220 V, w/acc.	Per centre			3	NA
ICU	Diagnostic imaging	Ultrasound	Consumables	(ultrasound transducer) CONDUCTIVE GEL, 5 L, container	Per case		0.01	1	NA
ICU	Blood chemistry	Chemistry analyser	Equipment	CLINICAL CHEMISTRY ANALYSER	Per centre			3	NA
ICU	Blood chemistry	Chemistry analyser	Consumables	CARTRIDGE for chemistry analyser (lactic acidosis and hyperlactatemia)	Per case		2	86	NA
ICU	Blood chemistry	Chemistry analyser	Consumables	CARTRIDGE (metabolic status and renal function)	Per case		1	43	NA
ICU	Blood chemistry	Chemistry analyser	Consumables	CONTROL, solution 1	Per equipment			6	NA
ICU	Blood chemistry	Chemistry analyser	Consumables	CONTROL, solution 2	Per equipment			6	NA
ICU	Blood chemistry	Chemistry analyser	Consumables	CONTROL, solution 3	Per equipment			6	NA
ICU	Blood chemistry	Chemistry analyser	Consumables	TUBE, VACUUM, plastic, Li-HEPARIN, 2 mL green	Per case		2	86	NA
ICU	Blood chemistry	Chemistry analyser	Consumables	TUBE, VACUUM, plastic, Li-HEPARIN, 4 mL green	Per case		2	86	NA

Kit COVID-19 – module medical equipment - *continued*

Medical area	Medical purpose	Medical item	Type	Designation (EN)	Variable	Per bed	Per case	Model S 100 beds	Each increase of 80 moderate beds
ICU	Monitoring	Table, neonate	Equipment	Table, resuscitation, neonate	Per centre			6	NA
Ancillary	Drug administration	Scale, infant	Equipment	INFANT SCALE, electronic, 0–20 kg	Per centre			6	NA
Ancillary	Drug administration	Scale, adult	Equipment	SCALE, electronic, 50 g/0–200 kg	Per centre			6	NA
Ancillary	Sterilization	Autoclave, 39 L	Equipment	AUTOCLAVE, 39 L, with single burner	Per centre			3	NA
Ancillary	Sterilization	Autoclave, 39 L	Consumables	Indicator, TST (Time, Steam, Temperature), Type 5	Per bed-day			300	NA
Ancillary	Sterilization	Autoclave, 39 L	Consumables	Paper sheet, crepe, for sterilization, 60 g/m2, 90 × 90 cm	Per bed-day			300	NA
Ancillary	Sterilization	Autoclave, 39 L	Consumables	Paper sheet, non-woven, for sterilization, 120 × 120 cm	Per bed-day			300	NA
Ancillary	Sterilization	Autoclave, 39 L	Consumables	Tape, adhesive, indicator Type 1, for steam sterilizer, 18 mm × 48 m	Per bed-day			300	NA
Ancillary	Sterilization	Autoclave, 39 L	Equipment	Kerosene stove, electric heating plate	Per centre			3	NA
Ancillary	Sterilization	Autoclave, 39 L	Equipment	Timer	Per centre			3	NA

Acc, accessories; CPAP, continuous positive airway pressure; ICU, intensive care unit; int. diam., internal diameter; LDT, low-dose tip; Li-HEPARIN, lithium heparin; NA, not applicable; s.u., single use; ster., sterile; w/, with; w/o, without.

A2.4 Medical drugs

Source: ECOVID-19 100 PATIENT KIT - MODULE DRUGS & Med Supplies_050320_2

Kit COVID-19 – 100 patients/20 severe: module drugs, general cargo

WHO CODE	WHO Description	Total qty
PINJADEN6A---A1	ADENOSINE, 3 mg/mL, 2 mL, amp.	15
PEXTALCO1G---A1	ALCOHOL-BASED HAND RUB, gel, 100 mL, bottle	100
PEXTALCO5S---A1	ALCOHOL-BASED HAND RUB, solution, 500 mL, bottle	50
PINJAMIO1A---A1	AMIODARONE hydrochloride, 50 mg/mL, 3 mL, amp.	15
PORLAMOC15S1-A1	AMOXICILLIN 125 mg/CLAVULANIC acid 31.25mg, eq.156.25 mg/5 mL, oral suspension, 100 mL bottle	50
PORLAMOC5T1--A1	AMOXICILLIN 500 mg/CLAVULANIC acid 125 mg, eq. 625 mg/tab, tablet	200
PORLAMOX2T---A1	AMOXICILLIN, 250 mg, tab.	200
PORLAMOX5T---A1	AMOXICILLIN, 500 mg, tab.	1000
PINJAMPI1V---A1	AMPICILLIN, 1 g, powder, vial	250
PINJAMPI5V---A1	AMPICILLIN, 500 mg, powder, vial	100
PORLASCA2T---A1	ASCORBIC acid (vitamin C), 250 mg, tab.	200
PORLATEN5T---A1	ATENOLOL, 50 mg, tab.	100
PINJATRO1A---A1	ATROPINE sulfate, 1 mg/mL, 1 mL, ampoule	20
PORLAZIT2S---A1	AZITHROMYCIN, 200 mg/5 mL, powder oral suspension, 15 mL, bottle	50
PORLAZIT2T---A1	AZITHROMYCIN, 250 mg, tab.	100
PORLAZIT5T---A1	AZITHROMYCIN, 500 mg, tab	200
PINJPENB5V---A1	BENZYLPENICILLIN, 5 MIU (3 g), powder, vial	100
PINJCALG1A1--A1	CALCIUM GLUCONATE, 100 mg/mL, 10 mL, ampoule	25
PINJCEFT25V--A1	CEFTRIAXONE sodium, 250 mg, powder, vial	200
PINJCEFT1V---A1	CEFTRIAXONE sodium, eq. 1 g base, powder for injection, vial	500
PORLCHLA5T---A1	CHLORAL HYDRATE, 500 mg, tab.	250
PEXTCHLH1C15SA1	CHLORHEXIDINE digluconate 1.5% + CETRIMIDE 15%, solution, 1000 mL, bottle	50
PORLCHLM2T---A1	CHLORPROMAZINE hydrochloride, eq. 25 mg base, tab.	100
PINJCLOX5V---A1	CLOXACILLIN sodium salt, 500 mg, powder, vial	300
PORLCLOX2C---A1	CLOXACILLIN sodium, eq. 250 mg base, caps.	100
PINJDEXA4A---A1	DEXAMETHASONE phosphate, 4 mg/mL, 1 mL, ampoule	200
PINJDEXM1A2--A1	DEXMEDETOMIDINE, 100 mcg/mL, IV, 2 mL amp.	30
PINFDEXT5N1--A1	DEXTROSE (GLUCOSE) 5%, 1 L, plastic pouch	50
PINFDEXT5N5--A1	DEXTROSE (GLUCOSE) 5%, 500 mL, plastic pouch	20

Kit COVID-19 – 100 patients/20 severe: module drugs, general cargo - *continued*

WHO CODE	WHO Description	Total qty
PORLDOXY1T---A1	DOXYCYCLINE salt, 100 mg, tab.	300
PINJEPIN1AV--A1	EPINEPHRINE (adrenaline) tartrate, eq. 1 mg/mL base, 1 mL amp. IV	100
PINJFLUM1A5--A1	FLUMAZENIL, 0.1 mg/mL, IV, 5 mL amp.	15
PINJFURO1A---A1	FUROSEMIDE, 10 mg/mL, 2 mL, ampoule	100
PORLFURO4T---A1	FUROSEMIDE, 40 mg, tab.	100
PINJGLUC5V5--A1	GLUCOSE hypertonic, 50%, 50 mL, vial	20
PORLGLYT3T---A1	GLYCERYL TRINITRATE, 0.3 mg, sublingual tab.	100
PINJGLYT5A1--A1	GLYCERYL TRINITRATE, 5 mg/mL, for infusion, 10 mL amp.	15
PINJHYDA2A---A1	HYDRALAZINE hydrochloride, 20 mg, powder, ampoule	40
PORLHYDO5T---A1	HYDROCHLOROTHIAZIDE, 50 mg, tab.	100
PINJHYDR1V---A1	HYDROCORTISONE sodium succinate, eq. 100 mg base, powder, vial	100
PORLIBUP4T---A1	IBUPROFEN, 400 mg, tab.	200
PINJLIDO1V2--A1	LIDOCAINE hydrochloride, 1%, for injection, 20 mL, vial	100
PINJMAGS5A1--A1	MAGNESIUM sulfate, 500 mg/mL, 10 mL, ampoule	40
PINJMETO5A---A1	METOCLOPRAMIDE hydrochloride, 5 mg/mL, 2 mL, amp.	500
PINJMPRO1A---A1	METOPROLOL tartrate, 1 mg/mL, IV injection, 5 mL, amp.	15
PINJMETN5SR1-A1	METRONIDAZOLE, 5 mg/mL, 100 mL, semi-rigid bot.	100
PORLMULT1T---A1	MULTIVITAMINS, tab.	200
PINJNALO4A1--A1	NALOXONE hydrochloride, 0.4 mg/mL, 1 mL, ampoule	50
PINJNORA1AV4-A1	NORADRENALINE tartrate, solution for infusion, eq. 1 mg/mL base, 4 mL, amp/vial	200
PORLNYST1S---A1	NYSTATIN, 100.000 IU/mL, oral suspension	50
PORLOMEP2CG--A1	OMEPRAZOLE, 20 mg, gastro-resistant, caps.	100
PINJOMEP4V---A1	OMEPRAZOLE, 40 mg, powder, vial	100
PINJONDA2A---A1	ONDANSETRON hydrochloride, 2 mg/mL, 2 mL, amp.	50
PORLONDA4A---A1	ONDANSETRON hydrochloride, 4 mg, tab.	200
PORLORSA2S---A1	ORAL REHYDRATION SALTS (ORS) low osmolarity, sachet 20.5 g/1L	100
PORLPARA1T---A1	PARACETAMOL (acetaminophen), 100 mg, tab.	300
PINJPARA1B5--A1	PARACETAMOL (acetaminophen), 10 mg/mL, inject, 50 mL, bottle	20
PINJPARA1I1N-A1	PARACETAMOL (acetaminophen), 10mg/mL, inject., 100 mL, plastic pouch	80

Kit COVID-19 – 100 patients/20 severe: module drugs, general cargo - *continued*

WHO CODE	WHO Description	Total qty
PORLPARA1S10-A1	PARACETAMOL (acetaminophen), 120 mg/5 mL, syrup, 100 mL, bottle	80
PORLPARA5T---A1	PARACETAMOL (acetaminophen), 500 mg, tab.	2000
PORLPHEY10T--A1	PHENYTOIN sodium, 100 mg, coated tab.	450
PINJPHEY5V5--A1	PHENYTOIN sodium, 50 mg/mL, 5 mL, vial	100
PINJPOTC1A---A1	POTASSIUM chloride, 100 mg/mL, 10 mL, amp.	100
PORLPRED5T---A1	PREDNISOLONE, 5 mg, tab.	1000
PORLRANI1T---A1	RANITIDINE, 150 mg, tab.	75
PINFRINL1N1--A1	RINGER lactate, 1L, plastic pouch	400
PINFRINL1N5--A1	RINGER lactate, 500 mL, plastic pouch	50
PORLSALB2S---A1	SALBUTAMOL sulfate, eq. 0.1mg base/puff, 200 puffs, inhaler	100
PINJSODB8A2--A1	SODIUM BICARBONATE, 8.4%, 1 mEq/mL, 20 mL amp.	10
PINFSODC9N1--A1	SODIUM chloride, 0.9%, 1L, plastic pouch	100
PINFSODC9N5--A1	SODIUM chloride, 0.9%, 500 mL, plastic pouch	25
PORLSULF4T8T-A1	SULFAMETHOXAZOLE 400 mg/TRIMETHOPRIM 80 mg, tab.	200
PORLTHIA5T---A1	THIAMINE hydrochloride (vitamin B1), 50 mg, tab.	100
PINJWATE1A1--A1	WATER for injection, 10 mL, ampoule	4000
PORLYINS2T---A1	ZINC sulfate, eq. to 20 mg zinc mineral, dispersible tab.	100
	Saline ampoules, 10 cc	
	Linezoli IV	
	Heparin LMW	
	Lacilube	

Kit COVID-19 - 100 patients/20 severe: module drugs, cold chain

WHO CODE	WHO Description	Total qty
PINJATRB1A5--A1	ATRACURIUM BESILATE, 10mg/mL, 5mL, amp. INSULIN RAPID (Actrapid), rDNA insul.,100 IU/mL, 10mL, vial SUXAMETHONIUM CHLORIDE, 50mg/mL, 2mL, amp.ADENOSINE, 3 mg/mL, 2 mL, amp.	45
PINJINSH1V1R-A1	ALCOHOL-BASED HAND RUB, gel, 100mL, bottle	25
PINJSUXA5A2--A1	ALCOHOL-BASED HAND RUB, solution, 500mL, bottle	45

Kit COVID-19 – 100 patients/20 severe: module drugs, controlled drugs

WHO CODE	WHO Description	Total qty
PORLDIAZ5T-–A1	DIAZEPAM, 5 mg, tab.	100
PINJDIAZ5A2--A1	DIAZEPAM, 5 mg/mL, 2 mL, amp.	100
PINJFENT1A-–A1	FENTANYL citrate, e.q. 0.05 mg/mL base, 2 mL, amp.	50
PINJFENT5A-–A1	FENTANYL, 0.05 mg/mL, 10mL, amp.	50
PINJHALP5A1--A1	HALOPERIDOL, 5 mg/mL, solution for injection, 1 mL, ampoule	200
PINJKETA5V---A1	KETAMINE hydrochloride, eq. 50 mg/mL base, 10 mL, vial	50
PINJMIDA5A3--A1	MIDAZOLAM, 5 mg/mL, 3mL, amp.	50
PINJMORP10A1-A1	MORPHINE sulfate, 10 mg/mL, 1 mL, amp.	100
PINJPHEN20A1-A1	PHENOBARBITAL (sodium), 200 mg/mL, 1 mL, amp.	100
PORLPHEN5T---A1	PHENOBARBITAL, 50 mg, tab.	100
PINJPROP1A-–A1	PROPOFOL, 10 mg/mL, 10 mL, amp.	100

Kit COVID-19 – 100 patients/20 severe: supplies for medicine administration

MEDICAL PURPOSE	WHO CODE	WHO Description	Total qty
Injection, intravenous, infusion		Gloves, examination, nitrile, powder-free, large, non-sterile, single use	300
Injection, intravenous, infusion		Gloves, examination, nitrile, powder-free, medium, non-sterile, single use	200
Injection, intravenous, infusion		Gloves, examination, nitrile, powder-free, small, non-sterile, single use	100
Injection, intravenous, infusion	CINSSETI2----A1	SET, INFUSION 'Y', Luer lock, air inlet, sterile, single use	2,000
Injection, intravenous, infusion		Infusion giving set, with air intake, with injection port, with burette, sterile, single use	200
Injection, intravenous, infusion	CINSIVCRW16–A1	IV CATHETER, retractable, 16 G (1.7 × 45 mm), wings, grey	200
Injection, intravenous, infusion	CINSIVCRW18--A1	IV CATHETER, retractable, 18 G (1.2 × 45 mm), wings, green	200
Injection, intravenous, infusion	CINSIVCRW20–A1	IV CATHETER, retractable, 20 G (1.0 × 32 mm), wings, pink	200
Injection, intravenous, infusion	CINSIVCRW22–A1	IV CATHETER, retractable, 22 G (0.8 × 25 mm), wings, blue	200
Injection, intravenous, infusion	CINSIVCRW24--A1	IV CATHETER, retractable, 24 G (0.7 × 19 mm), wings, yellow	200
Injection, intravenous, infusion	CINSSCAV21---A1	SCALP VEIN, butterfly needle, 21 G (0.8 × 19 mm), single use, sterile, green	200

Kit COVID-19 – 100 patients/20 severe: supplies for medicine administration - *continued*

MEDICAL PURPOSE	WHO CODE	WHO Description	Total qty
Injection, intravenous, infusion	CINSSCAV23-–A1	SCALP VEIN, butterfly needle, 23 G (0.6 × 19 mm), single use, sterile, blue	200
Injection, intravenous, infusion	CINSSCAV25---A1	SCALP VEIN, butterfly needle, 25 G (0.5 × 19 mm), single use, sterile, orange	200
Injection, intravenous, infusion	CINSEXTS3----A1	Stopcock, 3-way, for infusion giving set, with connection line, sterile, single use	200
Injection, intravenous, infusion		Stopper/closing cone, for IV sets, with male and female Luer lock, sterile, single use	2,000
Injection, intravenous, infusion	CINSNEED18H1-A1	NEEDLE, hypodermic, Luer, 18 G, sterile, single use, pink	200
Injection, intravenous, infusion	CINSNEED19H1-A1	NEEDLE, hypodermic, Luer, 19 G × 1.5" (1.1 × 40 mm), sterile, single use, cream	200
Injection, intravenous, infusion	CINSNEED21H1-A1	NEEDLE, hypodermic, Luer, 21 G × 1.5" (0.8 × 40 mm), sterile, single use, green	300
Injection, intravenous, infusion	CINSNEED22H1-A1	NEEDLE, hypodermic, Luer, 22 G, sterile, single use, black	200
Injection, intravenous, infusion	CINSNEED23H1-A1	NEEDLE, hypodermic, Luer, 23 G × 1"(0.6 × 25mm), sterile, single use, blue	200
Injection, intravenous, infusion	CINSSYDL20---A1	SYRINGE, Luer, 20 mL, sterile, single use	100
Injection, intravenous, infusion	CINSSYDL05---A1	SYRINGE, Luer, 5 mL, sterile, single use	1,000
Injection, intravenous, infusion	CINSSYDL02---A1	SYRINGE, Luer, 2 mL, sterile, single use	1,000
Injection, intravenous, infusion	CINSSYDL10---A1	SYRINGE, Luer, 10 mL, sterile, single use	200
Injection, intravenous, infusion	YMEQTOURR01--A1	TOURNIQUET, elastic, rubber, latex free, single use, 100 × 1.8 cm	20
Injection, intravenous, infusion	CINSCONTC51–A1	SAFETY BOX, needles/syringes, 5 L, cardboard for incineration	20
Injection, intravenous, infusion		Adhesive plasters, washproof, spot shape or 2 × 1.3 cm	2,500
Injection, intravenous, infusion		IODINE POVIDONE, 10%, solution, 1 L, bottle	8
Injection, intravenous, infusion	CDRECOTW5R---A1	COTTON WOOL, hydrophilic, 500 g, roll	20
Injection, intravenous, infusion		COMPRESS, GAUZE, 10 × 10 cm, 8 plys, 17 thr., sterile, 2 pcs	1,000
Injection, intravenous, infusion		COMPRESS, GAUZE, 10 × 20 cm, 12 plys, 17 threads, non-sterile	1,000
Injection, intravenous, infusion		FORCEPS, DRESSING, BLANK, 14.5 cm, atraumatic serration	4
Injection, intravenous, infusion		BOWL, ROUND, 100 mL, 80 × 35 mm, stainless steel	4
Injection, intravenous, infusion	CDRETAPZO2-–A1	ZINC OXIDE, TAPE, self-adhesive, 2.5 cm × 5 m, white, roll	50
Injection, intravenous, infusion		Spacer, for metered dose inhaler	20

COMMUNITY FACILITIES

for preparedness and response to COVID-19

isolation, treatment and step down of COVID-19 cases in community facilities

WEB ANNEX

Calculations

World Health Organization

WHO reference no.:

Source: *EMT technical consultants' assumptions based on standards*

A3.1.1 Water quantity calculations

WATER DEMAND ESTIMATE

Table A3.1L Model *(100 m × 80 m) 160 moderate inpatients + 20 ICU beds + 60 staff – around 20,000 litres per day*

WATER QUANTITY

There is enough water to drink, to prepare food, "to perform personal grooming and medical activities, cleaning and laundry at all times."

Use		Patients/person/ toilets	Unit	Quantity according to standard (litre/unit/day)	Standard[a]	Needed water supply (litres per day)
Drinking	Running water	180	Inpatient	60	Sphere/WHO	10,800
		60	EMT staff	40	Sphere/WHO	2,400
Other uses	Flush toilets	400	Toilet uses per day	5	Sphere	2,000
	Cleaning floors	8000	Total m^2 installations	0.2	–	1,600
	Cleaning inpatient	180	Inpatients' beds	20		3,600
	Cleaning toilets	14	Toilets	20	Sphere	280
						20,680

[a] For further information on these standards see: Water and sanitation for health facility improvement tool (WASH FIT). World Health Organization and United Nations Children's Fund; 2018 (https://www.washinhcf.org/resources/); Adams J, Bartram J, Chartier Y. Essential environmental health standards in health care. Geneva: World Health Organization; 2008 (https://apps.who.int/iris/bitstream/handle/10665/43767/9789241547239_eng.pdf?sequence=1); chapter on water supply, sanitation and hygiene promotion in: The Sphere handbook. Sphere; 2018 (https://handbook.spherestandards.org/).

Table A3.2 XL Model *(180m × 100m) 480 moderate inpatients + 20 ICU beds + 140 staff*

WATER QUANTITY

There is enough water to drink, to prepare food, "to perform personal grooming and medical activities, cleaning and laundry at all times."

Use		Patients/person/ toilets	Unit	Quantity according to standard (litre/unit/day)	Standard[a]	Needed water supply (litres per day)
Drinking	Running water	500	Inpatient	60	Sphere/WHO	30,000
		140	EMT staff	40	Sphere/WHO	5,600
Other Uses	Flush toilets	12,00	Toilet uses per day	5	Sphere	6,000
	Cleaning floors	180,00	Total m^2 installations	0.2	–	3,600
	Cleaning inpatient	500	Inpatients' beds	20		10,000
	Cleaning toilets	50	Toilets	20	Sphere	1,000
						20,680

[a] For further information on these standards see: Water and sanitation for health facility improvement tool (WASH FIT). World Health Organization and United Nations Children's Fund; 2018 (https://www.washinhcf.org/resources/); Adams J, Bartram J, Chartier Y. Essential environmental health standards in health care. Geneva: World Health Organization; 2008 (https://apps.who.int/iris/bitstream/handle/10665/43767/9789241547239_eng.pdf?sequence=1); chapter on water supply, sanitation and hygiene promotion in: The Sphere handbook. Sphere; 2018 (https://handbook.spherestandards.org/).

A3.1.2 Water storage capacity calculations

STORAGE CAPACITY: If there is a continuous water supply, it would be expedient to store a certain amount of water for contingency purposes.

Table A3.3 L Model *(100 m × 80 m) 160 moderate inpatients + 20 ICU beds + 60 staff – 40,000 litres*

WATER STORAGE

There is enough water storage capacity for 48 hours' supply

Total water storage capacity required	39,440 litres/day	Number of storage tanks 1000 litres	40	Units
		OR		
		Number of storage tanks 2000 litres	20	Units
		OR		
		Number of storage tanks 5000 litres	8	Units

Table A3.4 XL Model *(180 m × 100 m) 480 moderate inpatients + 20 ICU beds + 140 staff*

WATER STORAGE

There is enough water storage capacity for 48 hours supply

Total water storage capacity required	112,400 litres/day	Number of storage tanks 5000 litres	23	Units
		OR		
		Number of storage tanks 10,000 litres	12	Units
		OR		
		Number of storage tanks 20,000 litres	6	Units

A3.1.3 Water distribution network calculations

Table A3.5 L Model *(100 m × 80 m) 160 moderate inpatients + 20 ICU beds + 60 staff*

Model L	Quantity	Units
Total pipe length	511.95	metres
Total tee 25 mm	32	units
Total elbow	4	units
Total gate valves	45	units
Total water supply points connections	24	connections

Table A3.6 XL Model *(180 m × 100 m) 480 moderate inpatients + 20 ICU beds + 140 staff*

Model XL	Quantity	Units
Total pipe length	1138.59	metres
Total tee 25 mm	64	units
Total elbow	12	units
Total gate valves	88	units
Total water supply points connections	48	connections

A3.2.1 Waste generation calculations

Table A3.7 L Model *(100 m × 80 m) 160 moderate inpatients + 20 ICU beds + 60 staff*

Average quantity of waste (kg/ bed/day)	Standard	Comments	kg/day
2	WHO	GENERAL WASTE 2 kg/patient/day	360
0.1	WHO	SHARPS 0.1 kg/patient/day	18
0.4	WHO	INFECTIOUS WASTE 0.4 kg/patient/day	72
			450 kg/day

Table A3.8 XL Model *(180 m × 100 m) 480 moderate inpatients + 20 ICU beds + 140 staff*

Average quantity of waste (kg/ bed/day)	Standard	Comments	kg/day
2	WHO	GENERAL WASTE 2 kg/patient/day	1000
0.1	WHO	SHARPS 0.1 kg/patient/day	50
0.4	WHO	INFECTIOUS WASTE 0.4 kg/patient /day	200
			1250 kg/day

A3.2.2 Waste containment calculations

Table A3.9 L Model *(100m × 80m) 160 moderate inpatients + 20 ICU beds*

Containment needs for infectious waste			
Assumptions:	**i)** maximum storage period for infectious waste should be 2 days; **ii)** The average density of the uncompacted waste is 200 kg/m^3 or 1000 litres/200 kg		
	Volume of waste/day (m^3)	Containment capacity for 2 days (m^3)	Containment capacity for 2 days (litres)
INFECTIOUS WASTE	0.36	0.72	720

Table A3.10 XL Model *(180 m × 100 m) 480 moderate inpatients + 20 ICU beds*

Containment needs for infectious waste			
Assumptions:	**i)** maximum storage period for infectious waste should be 2 days **ii)** The average density of the uncompacted waste is 200 kg/m^3 or 1000 litres/200 kg		
	Volume waste/day (m^3)	Working hours, treatment technology (hours)	Treatment capacity needed (kg/hour)
INFECTIOUS WASTE	72	10	8

Table A3.12 XL Model *(180 m × 100 m) 480 moderate inpatients + 20 ICU beds*

Containment needs for infectious waste			
Assumptions: 10 working hours			
	weight (kg/day)	Working hours, treatment technology (hours)	Treatment capacity needed (kg/hour)
INFECTIOUS WASTE	72	10	8

A3.3 Sanitation

A3.3.1 Sanitation facilities calculations

Table A3.13 L Model *(100 m × 80 m) 160 moderate inpatients + 20 ICU beds + 60 staff*

Estimating the demand for sanitation facilities TST

Adequate, accessible and culturally appropriate toilets and showers are available to patients, staff and caregivers.

Area	Facility	Quantity	Unit	Quantity according to standard ratio persons per facility	Standard[a]	Comments	WCs/ bathrooms needed
Triage/ reception	WC	1	Area	1	Sphere/ WHO	Separate facilities for males and females	2
	Basin	2	Area	1			2
2 modules of 40 beds (80 patients)	WC	80	Inpatient	20	Sphere/ WHO	For greater comfort, 20 people:1 toilet is suggested Separate facilities for males and females	8
	Shower	80	Inpatient	40			8
	Basin	2	Area	1			4
Module ICU 20 patients	WC	20	Inpatient	20	Sphere/ WHO	For greater comfort, 20 people:1 toilet is suggested Separate facilities for males and females	2
	Shower	20	Inpatient	40			2
	Basin	1	Area	1			1
Technical area	WC	4	Inpatient	1	Sphere/ WHO	For greater comfort, 20 people:1 toilet is suggested Separate facilities for males and females	4
	Shower	4	Inpatient	1			4
	Basin	4	Area	1		Waste management	4

[a] For further information on these standards see: Water and sanitation for health facility improvement tool (WASH FIT). World Health Organization and United Nations Children's Fund; 2018 (https://www.washinhcf.org/resources/); Adams J, Bartram J, Chartier Y. Essential environmental health standards in health care. Geneva: World Health Organization; 2008 (https://apps.who.int/iris/bitstream/handle/10665/43767/9789241547239_eng.pdf?sequence=1); chapter on water supply, sanitation and hygiene promotion in: The Sphere handbook. Sphere; 2018 (https://handbook.spherestandards.org/).

Table A3.14 XL Model *(180 m × 100 m) 480 moderate inpatients + 20 ICU beds*

Estimating the demand for sanitation facilities TST

Adequate, accessible and culturally appropriate toilets and showers are available to patients, staff and caregivers.

Area	Facility	Quantity	Unit	Quantity according to standard ratio persons per facility	Standard[a]	Comments	WCs/ bathrooms needed
Triage/ reception	WC	1	Area	1	Sphere/ WHO	Separate facilities for males and females	2
	Basin	2	Area	1			2
6 module 80 patients	WC	80	Inpatient	20	Sphere/ WHO	Separate facilities for males and females For greater comfort, 20 people:1 toilet is suggested	24
	Shower	80	Inpatient	40			24
	Basin	2	Area	1			12
Module ICU 20 patients	WC	20	Inpatient	20	Sphere/ WHO	Separate facilities for males and females For greater comfort, 20 people:1 toilet is suggested	2
	Shower	20	Inpatient	40			2
	Basin	1	Area	1			1
Technical area	WC	4	Inpatient	1	Sphere/ WHO	Separate facilities for males and females For greater comfort, 20 people:1 toilet is suggested	4
	Shower	4	Inpatient	1			4
	Basin	4	Area	1		Waste management	4

[a] For further information on these standards see: Water and sanitation for health facility improvement tool (WASH FIT). World Health Organization and United Nations Children's Fund; 2018 (https://www.washinhcf.org/resources/); Adams J, Bartram J, Chartier Y. Essential environmental health standards in health care. Geneva: World Health Organization; 2008 (https://apps.who.int/iris/bitstream/handle/10665/43767/9789241547239_eng.pdf?sequence=1); chapter on water supply, sanitation and hygiene promotion in: The Sphere handbook. Sphere; 2018 (https://handbook.spherestandards.org/).