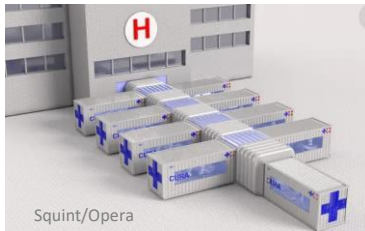


# COVID-19 – Emergency Hospital Facilities



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## 1 OBJECTIVE

To provide a guideline for the emergency provision of Emergency Hospital Facilities in response to the Covid-19 crisis facing the country.

## 2 Patient Classification

Four types of patients to consider:

- Priority 1 : CRITICAL(5%) Intensive care beds(ICU) – Requires very high level of care
- Priority 2: SEVERE (15%) High Care – Not on a ventilator but still requires special care
- Priority 3 MILD/MODERATE (80%) – 10-15% of which still require hospital care and the balance can be accommodated without nursing care – but are COVID-19 infected and require isolation from the community

## 3 Planning Process

Table 1: Planning process

<b>1.0</b>	<b>Emergency Operations Plan</b>
1.1	STAFF – Establish roles and assign responsibilities
1.2	<p>Command staff</p> <ul style="list-style-type: none"> <li>• Overall leader in charge of the command centre and all teams to ensure coordination, compliance and performance of all is in place;</li> <li>• Public information officer who disseminates information to the media if required;</li> <li>• Liaison officer who coordinates with external agencies and establish communications with health and medical agencies – updates on treatment;</li> <li>• Safety officer who ensures safety of staff, patients, and visitors, and monitors hazards;</li> <li>• Medical/technical specialist who is a subject matter expert on intensive care health provision.</li> </ul>
1.3	<p>Teams</p> <ul style="list-style-type: none"> <li>• <b>Planning team</b> tasked to collect and organize information and resources and is responsible for creating the <b>Incident Action Plan</b>;</li> <li>• <b>Logistics team</b> to supports the incident response with <b>food, supplies, and transportation</b> to meet objectives;</li> <li>• <b>Operations team</b> is in charge of tactical objectives and respond to the incident;</li> <li>• <b>Finance team</b> to track expenditures and provide funds for costs and claims;</li> </ul> <p>Under each section, there are branch managers and unit leaders that are specific for carrying out specific functions within each team.</p>
<b>2.0</b>	<b>Strategic planning</b>
2.1	<p>Before any plan can be formulated, a strategic analysis is necessary. This will require a series of crucial steps:</p> <ul style="list-style-type: none"> <li>• Review all facilities in the country utilizing the data from the 10 Year Health Infrastructure Plan as a base;</li> <li>• Review existing statistics to determine those areas that are potential hot spots;</li> <li>• Monitor the spread of the disease and Identify developing hotspots – this will be achieved through systems that provide feedback reporting from all areas;</li> </ul>

**Commented [TL1]:** I would use the term Overall Commander

**Commented [TL2]:** I would stick to the standard hospital command structure:  
 -Commander  
 -Medical Coordinator  
 -Nursing Service Manager  
 -Support Services Manager

**Commented [TL3]:** The Epidemiological Analysis and the GIS Mapping resources predicting the potential hot spot We will give you GIS map to include as an example indicating the overlay of:  
 -Social vulnerability data  
 -Health Facility data  
 -Confirmed cases data  
 -And then predictions where hot spots are going to develop.

	<ul style="list-style-type: none"> <li>Identify health facilities capable of accommodating the growing needs. These may be facilities with space to add additional accommodation to while still utilizing the facility's services (kitchen, laundry, mortuary etc) and which will fall under the existing management;</li> <li>Where there is no health facility capable of filling the requirement, identify community facilities that may be of use, can be repurposed and added to and where there is sufficient space to spread out e.g. there is a site identified in Lepelale which is available (belonging to FSM) which has prefabricated structures that can accommodate 250 bed units and has full services on site already;</li> <li>In the absence of both of the above, find an appropriate site and plan to build a new temporary structure.</li> <li>Estimate surge capacity and impact on             <ul style="list-style-type: none"> <li>space;</li> <li>staff;</li> <li>equipment;</li> </ul> </li> </ul>
<b>2.2</b>	<b>Identify possible sites of operation</b>
	<ul style="list-style-type: none"> <li>Existing or</li> <li>New</li> </ul> <p>Each province can assist in this process. Already the Eastern Cape and Western Cape have identified hospital sites capable of providing services. Facilities are in various states of disrepair in some instances, these need to be inspected for suitability and structural stability. This process needs to be coordinated throughout South Africa and the preparedness of each province determined.</p>
<b>2.3</b>	<b>Determine what is to be provided on the site</b>
	<ul style="list-style-type: none"> <li>ICU – Critical care;</li> <li>High Care;</li> <li>Mild/Moderate care;</li> <li>Isolation of suspected Covid-19 infected patients.</li> </ul>
<b>2.4</b>	<b>Determine how this is to be achieved</b>
	<ul style="list-style-type: none"> <li>Existing facilities             <ul style="list-style-type: none"> <li>Use existing beds;</li> <li>Accommodation for surge capacity                 <ul style="list-style-type: none"> <li>repurpose existing space within the facility;</li> <li>build new structures on site to link into existing services;</li> </ul> </li> </ul> </li> <li>Repurposing community facilities such as stadiums, halls and conference centres;</li> <li>Building new facilities;</li> </ul>
<b>3.0</b>	<b>Site selection and assessment</b>
	<ul style="list-style-type: none"> <li>Sites/existing buildings must be inspected by structural engineer prior to any decision to confirm that buildings are structurally sound;</li> <li>These must also be inspected by health planners to determine their suitability;</li> <li>Larger open space capabilities are more functional than smaller separate rooms. It is easier and less labour intensive to nurse patients in a large open space than in separate rooms.</li> </ul>

Commented [TL4]: Temporary

	<ul style="list-style-type: none"> <li>• Essential services must be available on site: <ul style="list-style-type: none"> <li>○ Access to reliable water;</li> <li>○ Sufficient space for the required services to be accommodated when supplying to wards and patient areas. This includes space for water towers, workshops, electrical sub stations if needed, chillers for air conditioning, cold rooms and freezers. Space for ducting and conduits throughout;</li> <li>○ Natural drainage Site;</li> <li>○ Electrical services;</li> <li>○ Mechanical services;</li> <li>○ Sewer treatment and reticulation with sufficient ablution facilities;</li> <li>○ Water purification.</li> </ul> </li> <li>• Determine: <ul style="list-style-type: none"> <li>○ Security;</li> <li>○ Access to communication routes;</li> <li>○ Access to energy sources;</li> <li>○ Potential for future expansion – appropriate flat, level terrain on the existing site to allow for growth.</li> </ul> </li> </ul>
<b>4.0</b>	<b>Plan and design the project specific to the selected site</b>
	<ul style="list-style-type: none"> <li>• Space;</li> <li>• Human Resources;</li> <li>• Equipment (health technology and furniture)</li> <li>• Operational systems and integration.</li> </ul>
<b>5.0</b>	<b>Construction Planning</b>
	<ul style="list-style-type: none"> <li>• Site supervision;</li> <li>• Timetable;</li> <li>• Financial Management;</li> <li>• Procurement of both the building (whichever method) and equipment;</li> <li>• Contractual and legal aspects;</li> </ul>
<b>6.0</b>	<b>Commissioning</b>
	<ul style="list-style-type: none"> <li>• Systems testing</li> <li>• Receiving and placing equipment</li> <li>• Setting up goods and services storage and supply routes to the various departments on site (wards etc)</li> <li>• Training of staff (to start before hand over)</li> </ul>
<b>7.0</b>	<b>Operational Planning</b>
	<ul style="list-style-type: none"> <li>• Staffing;</li> <li>• Goods and services quantities, delivery, storage and distribution;</li> <li>• Waste management and removal of infectious substances;</li> <li>• Operational protocols;</li> <li>• Logistics;</li> <li>• Maintenance</li> <li>• Continuous training</li> </ul>

**Commented [TL5]:** I would add the norms

**Commented [TL6]:** Preferably space for expanding the facility should it be required

**Commented [TL7]:** State noms

**Commented [TL8]:** If required

**Commented [TL9]:** Including access for large trucks delivering components if required

<b>8.0</b>	<b>Decommissioning</b>
	Normalisation once the crisis is over needs to be planned including the decommissioning of the temporary emergency facility.
	<i><b>This document will discuss the planning for setting up an emergency hospital with focus on the layout and design issues.</b></i>

**Commented [TL10]:** Specially build temporary buildings can be build in such a way that it is usable as alternative facilities after the outbreak, such as Health care Centres, Nursery Schools ext

***This document will discuss the planning for setting up an emergency hospital with focus on the layout and design issues.***

### 4 Planning components

Planning needs to determine where patients will be received and treated(space) , who will care for the patients (clinical and support staff), how this can be achieved (operational process), what resources will be required (equipment, goods and services) and the time that will be required to achieve this. Therefore, no matter which option is selected to provide the emergency hospital service, planning for the care of these patients requires consideration of the following critical components:

#### 4.1 SPACE

Planning of the space to accommodate the patient care administered by the health care workers.

- Clinical patient spaces (wards)
- Clinical support spaces
  - Radiology
  - Pharmacy
  - Laboratory
  - Mortuary
- Clinical support spaces
  - Administration and office space
  - Kitchen and catering service
  - Laundry service
  - Waste collection and treatment
  - Security
- Site
  - Parking
  - Roads and access
  - Signage
- Engineering
  - Electrical
  - Mechanical – ventilation choices
  - Mechanical – medical gas provision
  - Sewer treatment and reticulation with sufficient ablution facilities
  - Waste control
  - Water purification
  - Storm water drainage

**Commented [TL11]:** If outsourced a dishing-up and washing-up facility must be planned.

**Commented [TL12]:** If not contacted out

**Commented [TL13]:** If not connected to a reliable supply

## 4.2 STAFF

It is important to establish the staff that will be required and whether they are available:

### Clinical Team required

- Specialist intensivists;
- Doctors;
- Specialist ICU Professional Nurses;
- Professional nurses;
- Nurse aids;
- Laboratory personnel.

Search through the government bodies for retired doctors and nurses prepared to return to assist.  
Build up a register of staff that can assist

### Support team members required

- Cleaners;
- Waste removal staff;
- Catering staff;
- Security staff;
- Clerks and admin assistants;
- Volunteers.

### STAFF TRAINING

- A portable training centre that can move around at great speed;
- Identify staff to train the nurses and doctors to care for ICU patients;
- Establish a short programme to train above;
- Identify staff to train all on site on protocols for waste removal, cleaning and infection control measures.

## 4.3 EQUIPMENT

- Equipment – for each type of space including clinical space for patients and support spaces;
- Planning specifications;
- Emergency procurement process planning;
- Receiving and placement of the equipment;
- Management and maintenance of the assets during operations.

## 4.4 OPERATIONAL REQUIREMENTS

- Consumables that will be required - medical and non medical including PPE equipment for infection control and protection of staff (masks, disposable gowns, gloves, head covers and foot covers);
- Services that will be needed

## 4.5 LOGISTICS

- Time to construct and prepare the facility for service provision;
- The logistics of how the goods and services will be supplied to site.

**Commented [TL14]:** The nature of the team available will dictate the level of service that can be provided.

**Commented [TL15]:** Beware of move around – rather e-learning.



## 5 OPTIONS AVAILABLE

There are several options to achieve the provision of temporary health care facilities for the COVID-19 patients and include:

- Use existing hospital capacity - CURRENT BEDS requiring SYNCHRONIZED DECANTING<sup>1</sup>;
- Repurposing of areas within the hospital to accommodate SURGE CAPACITY<sup>1</sup>;
- Temporary additional facilities on the hospital site;
- Community facility repurposing – convert existing buildings into temporary facilities. This can include using existing structures for MASS CARE CENTRES
- and/or especially the use of SCHOOLS AND UNIVERSITY RESIDENCES, CONFERENCE CENTRES AND STADIUMS.
- New temporary facilities on a site within a hospitals grounds or on a separate site.

Commented [TL16]: Pre-calculated

### 5.1 Utilising an existing hospital

The first choice is to use existing hospital facilities. This requires planning **synchronized decanting** of existing non COVID-19 infected patients to other hospitals to free up the beds for use by COVID-19 infected patients requiring health care. The advantage is that the facility has existing infrastructure, services and staff already skilled to provide the required healthcare.

Where the hospital is too small and the numbers of infected needing care grow, spaces within the hospital such as dining halls or recreation facilities can be repurposed to accommodate the **surge capacity**.

In the event of even this being insufficient, temporary additional facilities can be built on site. These temporary additional structures may be prefabricated structures or tented structures linked to the hospital and its services. **It is therefore important that any hospital chosen must have additional space on site to enable the facility to expand should the epidemic grow beyond the ability of the infrastructure to cope.**

Commented [TL17]: Ideally have .....

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Careful planning of where to place the various patient types is essential: *Care in temporary facilities should be limited to mild/moderate category patients. Patients requiring higher levels of care should be moved/transferred into existing hospitals with capacity to render Intensive care. It is recommended that if additional intensive care facilities are required, current ward patients should be moved to temporary or surge capacity facilities, and wards converted into ICU facilities.*

<sup>1</sup> L.Wallis, W.Smith. Disaster Medicine. Page 57 and 118



## 5.2 Community facilities repurposing

The most logical repurposing of an existing communal facility is to utilise existing SCHOOL HOSTELS and UNIVERSITY HOSTELS to decant step-down and the not so ill and maternity patients to these facilities, in order to create space in existing hospitals for COVID-19 patients. The purpose is for these facilities to be utilised as a step-down before discharge, where patients cannot immediately be discharged from hospitals, where space is more acutely needed for COVID-19 patients. This will allow for High Care and ICU space to be created in exiting hospitals where all the support services are readily available. Also, to remove these patients from contact areas with COVID-19 patients.

These facilities can easily be converted back to normal use when the crisis starts sub-siding and schools are re-opened as this is not meant for “long-stay” patients.

These facilities are the most “ready” and manageable and will comply with the following requirements:

- A. The first aspect is accessibility in terms of procuring the hostels and spread thereof:
  1. Numerous schools and university hostels are available in all metropolitan areas;
  2. All FET colleges and Universities have hostels;
  3. Almost all towns in rural areas will have at least one school hostel;
  4. You have to deal with 9 Departments of Education to arrange access to school hostels. This can be done between the Ministry of Health and MEC's of Health to the MEC's of Education per Province;
  5. You have so many defined FET Colleges and Universities to contact to arrange access. This can be done by the Ministry of Higher Education to the facilities;
  6. A promulgation of sorts may be required from Government to make these available
  7. Start with one hostel per town, one university hostel in a University town and a good spread in a metropolitan area;
  8. The entire country can be covered.
- B. Existing physical facilities at these hostels will normally include:
  1. Management and Admin offices (or converted rooms)
  2. Kitchens with store-rooms, fridges and cool-rooms
  3. Ablutions with toilets and showers
  4. Laundries
  5. Existing beds (maybe even cushions and linen)
  6. Storage space
  7. Dining rooms and recreational rooms as additional space
  8. Accessibility

9. Electricity supply and in some cases standby generators
10. Water supply
11. Refuge/Waste areas
12. Can also accommodate staff on site

C. What will or may be needed additionally:

1. Pharmacy module
2. Standby generators
3. Additional Ablution

D. Health Technology as will be required including MOBILE X-RAY MACHINES.

### 5.3 Mass Care Centres

Conversion of large centres into temporary hospitals such as completed in New York at the Jacob K. Javis Center, can provide thousands of beds but requires a high level of organisational skill. This is also for the mild and moderate cases where portable oxygen can be provided. Provision of ICU care in these spaces requires a complicated set of services, medical gases and is not suitable. Patients requiring a high level of care should be transported to ICUs in the hospitals.

It has been proposed that 2010 FIFA World Cup Stadiums have the most sophisticated building services distributed in large spaces that could be repurposed to accommodate the anticipated increase in demand for hospital beds for COVID-19 infected patients. These facilities have inhouse air-conditioning, plumbing, electricity, ICT, security systems and infrastructure, parking and waste disposal areas. These stadiums are designed to deal with large numbers of people entering and leaving efficiently, have ample parking for ambulances, buses of any scale, and medical and administrative staff without any need to construct these.

Large construction firms, experienced in mega project construction, can be tendered to erect the temporary facilities within the centre.



### 5.4 New temporary facility

This includes temporary new facilities built either on an existing hospital site or on a separate site.

- Prefabricated steel structures – disadvantage is turn-around time and bulk services.

**Commented [TL18]:** And additional ICU space in hospitals

**Commented [TL19]:** Often these facilities may require additional temporary shower facilities to accommodate low-dependency care patient that require shower facilities.

**Commented [TL20]:** Is it turn-around time or lead-time?

- Tented structures – disadvantage with the upcoming winter season and bulk services.



A combination of the two can be applied whereby patients and staff accommodation are housed in more robust (and warmer/cooler) prefabricated structures but stores, waste, decontamination areas, kitchens and workshops (support functions) can be easily assemble tent structures that are also easy to dismantle.



Frame tents made in South Africa – these are available in a variety of different mild steel and aluminum frame tent structures. Clear span sizes from

3m/4m/5m/6m/7m/9m/10m/12m/15m/18m/20m/30m/50m widths.  
They differ in eave height from 3m to 5m

## 6 Critical area requirements during a major incident<sup>2</sup>

Table 2L Area requirements during a major incident

Action	Requirements	Possible area
Routing and Parking	Unidirectional flow One entrance, many points of dispersal Single point (control, direction)	
Traffic Control Pint	Clear routing or route maps handed out Pre-prepared route markers are positioned	
Ambulance Route and Patient Route (including private vehicles carrying patients)	Clearly indicated Lead to drop-off point and triage area Additional planning may be required to address larger vehicles used in a major incidents, such as major incident buses	Existing patient routes to emergency areas
Helicopter Route	Civil Aviation Authority requirements	Existing or an adequate size and approved space to

<sup>2</sup> L.Wallis, W.Smith. Disaster Medicine. Page 59

	Additional planning may be required to accommodate large military helicopters (often mobilised in a major incident) Easy transport to triage area	accommodate large helicopters
<b>Drop-off Zone</b> Separate areas for: 1. Patients (casualties) arriving by various means of transport 2. Walking patients often arriving by mass transport such as buses 3. Uninjured survivors (worried, well)	Good lighting Crowd control Firm surface for austere weather conditions Access to Triage Area  Easy walking via triage to Priority 3: Green treatment area  Easy walking distance Closest to reconciliation area	Ambulance stop Parking area  Entrance lobby Any area close to P3 area  Administrative entrance Public visitors' entrance Visitors' area, recreation hall or large area for information
Media	Secure route to avoid media straying into sensitive areas Closest to press venue	Press liaison area, lecture room, chapel or other suitable area
Additional Staff - Hospital	Security-controlled entrance to confirm staff status	Own working area
Additional Staff - External Backup and Volunteers	Security-controlled entrance to additional staff registration venue Rapid integration Rapid orientation	Training centre, information desk, human resource management offices
Command	Space for coordination, conferences Direct contact with emergency room, theatre, ICU, press Secure access	Existing management suites or boardroom Existing and alternative communications
Tactical Command	Mobile Alternative communications	Centred in emergency centres
Signage	<i>Availability of signage directing to triage area and signage to instruct patients to alert staff if they have symptoms of COVID-19</i>	
Triage Area	Immediate proximity to drop-off points First patient contact with hospital Covered Space Adequate lighting and emergency lighting Same floor level as drop-off-point and Priority 1: Red treatment area Unidirectional flow	Ambulance drop-off point, entrance lobby

	<i>Dedicated/single examination rooms in Triage area (Dedicated room should satisfy criteria of one patient per room with door closed for examination)</i>	
Priority 1 Treatment Area (Red Area)	Space Equipped to resuscitate (medical gas, suction, oxygen in all bays etc.) Advanced resuscitation equipment in all bays (airway, breathing, circulation) Pre-packed emergency trolleys to provide additional capability	Existing emergency centre (P1 and P2 areas)
Priority 2 Treatment Areas (Yellow Area)	Oxygen Clinical assessment Minor treatment (dressings, suturing) Dressing and suture packs Emergency crash-cart for patients who may collapse (mis-triaged)	Outpatient department, physiotherapy department, patient ward if no other space available
Theatre	Existing theatres usually sufficient once elective lists cancelled	Existing theatre(s) if inadequate, consider labour wards
Radiology	Transferring patients on and off radiology tables is the single biggest delaying factor Requesting non-essential radiology shifts the major incident from the scene to the radiology department Unidirectional flow	Increase throughput by providing teams to transfer patients Essential radiology only
Pharmacy for Priority 3 Discharged Patients	Close to Priority 3 treatment area Pre-stocked Expanded as required	Existing outpatient pharmacy or a temporary capability
<b>Pickup Points</b> for: Discharged Patients and Uninjured Survivors	Traffic control point Unidirectional flow Space (much expanded)	Public parking area
Reuniting, Grieving and Counselling Including Comforting and Counselling Uninjured Survivors	Vastly expanded space as holding area Privacy for counselling Basic hospitality Furnishing and comfort with adequate ablution facilities	Outpatients department, recreation hall or ancillary health departments (for example, occupational therapy)
Staff Rest and Recovery	Privacy and comfort Facility for counselling and debriefing Familiarity Basic hygiene (toilet, shower, sleep)	Staff restaurant Departmental offices/sleepover Nurses home
Decanting	Traffic control Covered loading space Proximity to wards Away from emergency room and ambulance entrance	Service entrance / exit

Mortuary	Overflow can usually be accommodated for up to 24 hours in existing air-conditioning space Existing cold storage in vicinity May need to accommodate body identification capability and access to relatives	Emergency stock room
Priority 4 Patients	Privacy Access to family Access to counselling	Low care ward
Pharmacy	Manage and expand emergency centre dispensary Restock critical areas Re-order stock, ensure reserve maintained	Pharmacy
Communications Capability	Backup not dependent on existing land lines, mobile networks Preferably dedicated broadband	Existing switchboard Mobile radios to key personnel
Media Briefing Area (free flow of information minimises snooping) Opportunity to build positive image	Space Connectivity Lighting Audio-visual Hospitality	Lecture facility

## 7 Zoning

It is very important that there is a clear understanding of all the required components for the operation of an emergency hospital facility, no matter which option is selected.

Patient health care includes inpatient care, clinical support facilities and hospital support facilities and services to enable effective operations. Three clear areas (zones) should be adopted in the design layout on site as advised by the Right to Care document “Additional Hospital Facilities”.

This is more difficult to attain in an existing facility but for stand alone facilities these zones can be implemented at the onset of the design which makes control of infection contamination a reduced risk.

*Figure 1: Separation of key areas into Zones<sup>3</sup>*

**Commented [TL21]:** In a communicable disease outbreak

<sup>3</sup> Right to Care publication High Security Bio-Safety Isolation: The Three-Step Guide (Ligthelm, 2014)

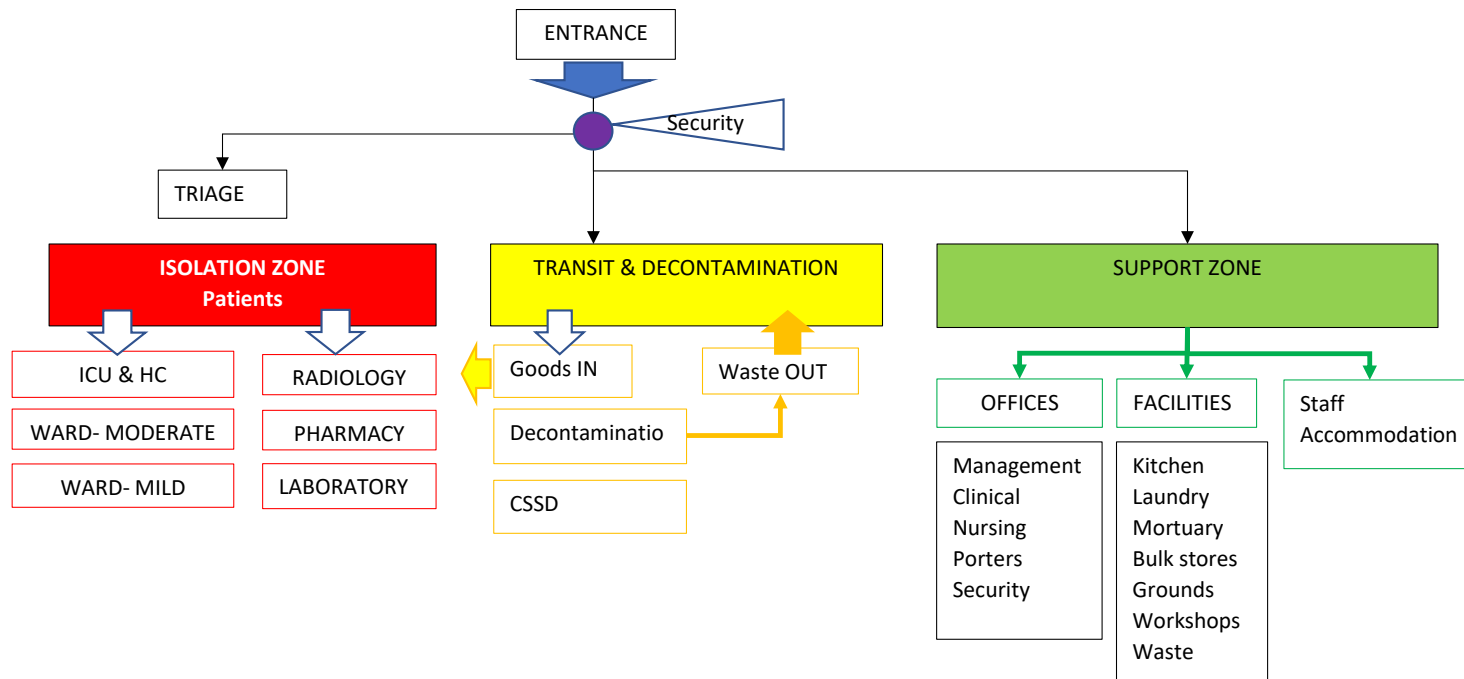


The following figure illustrates how these zones should be separated into sub areas.



Figure 2: Functions within each Zone

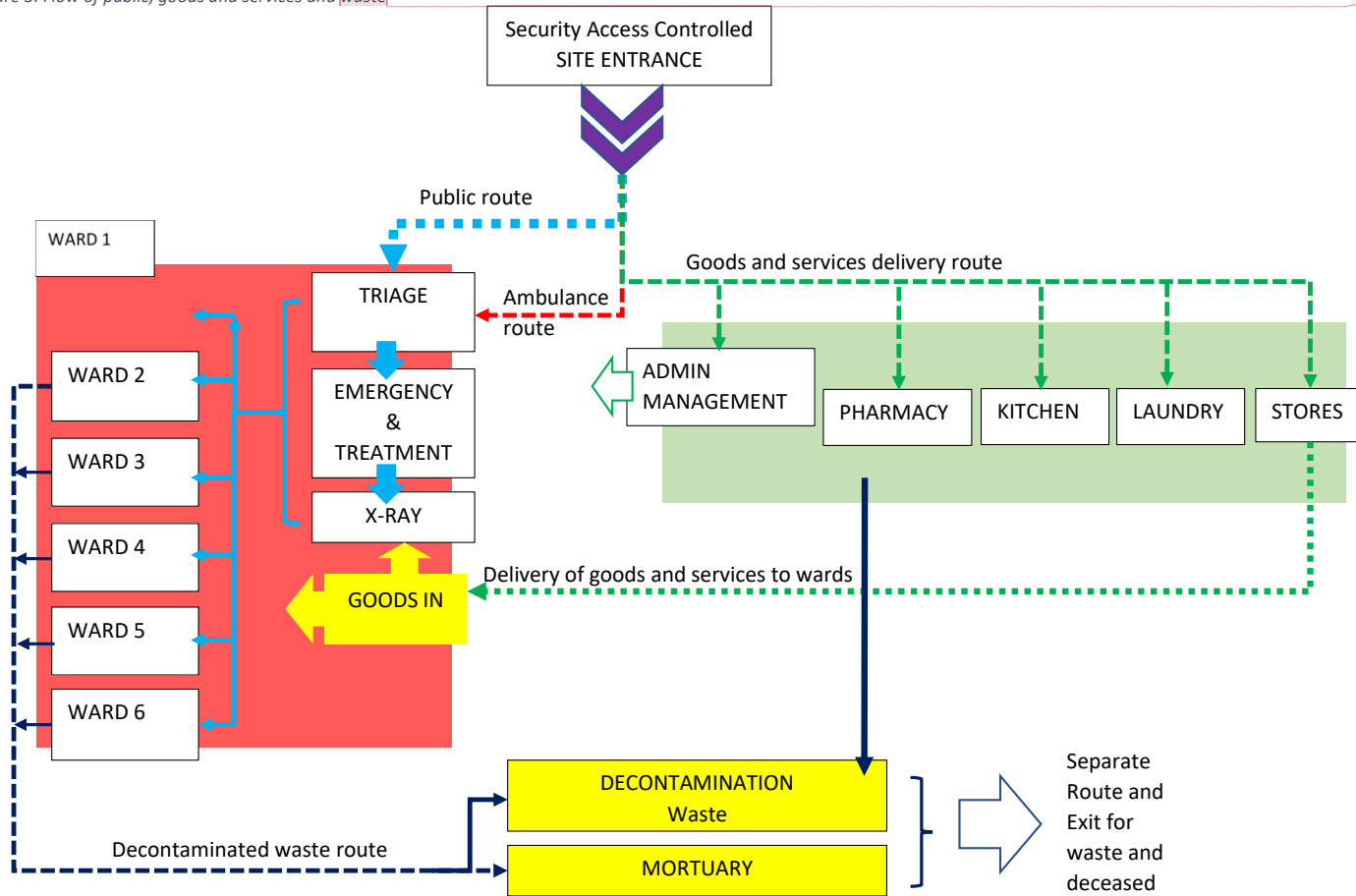
**Commented [TL22]:** Move radiology pharmacy and laboratory to the green area. Only Mobile Radiology in Red area



Each function, to work as a whole, must be understood and the space requirements clear to enable efficiency. Rooms per sub department are annexed in Annexure 1 – LIST OF ROOMS. The objective is to provide guidance while planning and designing space and relationships and to provide checklists when assessing existing facilities to establish what space exists so that it can be measured against what is required and spaces allocated accordingly.

Figure 3: Flow of public, goods and services and waste

**Commented [TL23]:** Add yellow block before red – flow is green to yellow to red and back red to yellow to green.



## 8 Space planning

Surge capacity calculations are included in the following description. These are extracted from the guideline “. Disaster Medicine”( L.Wallis, W.Smith)

### 8.1 Entrance area

#### Reception and waiting

Space available/m <sup>2</sup> divided by 6 x (60min divided by 5)= capacity per hour
---

### 8.2 Triage

Space required : 6m <sup>2</sup> per patient
--

Allow 5 minutes per patient
-----------------------------

Essential provision:

- Emergency lighting
- Trolleys, gurneys, wheelchairs

### 8.3 Resuscitation and treatment

Availability of theatres a major consideration required

#### Priority 1 patient

Space to resuscitate one priority 1 patient prior to admission
--

Capacity resuscitation + (60 divided by facility throughput time) x N bays = capacity per hour for Priority 1 patients
--

EXAMPLE

*So essentially 2 patients per hour per bay = capacity per hour for Priority 1 patients  
Presume this is for an emergency department so presumably assume 1 hour per patient for a Resus Bed / Case.*

*Therefore, if the Emergency has 2 Resus beds and 8 trauma bays it could handle 2 + (8 \* 2) = 18 patients hour in optimal conditions.*

*(Using 30 minutes as time per patient)*

Planning time throughput – 28 minutes
---------------------------------------

Space required 7m <sup>2</sup> per patient
--

Essential provision:

- Emergency lighting
- 2 x oxygen outlet
- 1 x suction
- 4 x power outlets – 2 to be on emergency backup

- Overhead IV hook x 4

**Priority 2 patient**

Space to stabilise/treat one priority 2 patient prior to admission
Capacity resuscitation + (60 divided by facility throughput time) x N spaces = capacity per hour for Priority 1 patients
Planning norm throughput time– 17 minutes
Space required 5m <sup>2</sup> per patient

Essential provision

- Emergency lighting
- Oxygen outlet
- 1 x suction
- 4 x power outlets
- Overhead IV hook x 2

**Priority 3 patient**

Space to stabilise/treat one priority 3 patient prior to admission or discharge
capacity resuscitation + (60 divided by facility throughput time) x N areas = capacity per hour for Priority 1 patients
Planning norm throughput time– 10 minutes
Space required 5m <sup>2</sup> per patient

Essential provision

- lighting
- access to resuscitation equipment
- consider using surge capacity space

**8.4 Inpatient areas – space for hospitalization (admission of patients)**

**Priority 1 – Space suitable to nurse a priority 1 patient requiring ICU care**

Space :8m <sup>2</sup>
Spacing: 2.5m nose to nose (prefer 4m)

Essential provision

- infusion hooks x 4
- oxygen outlet x 2
- medical air x 1

- suction outlet x 2
- power supply x 6 three pin sockets
- power supply on backup x 2 three pin sockets
- emergency lighting
- ventilator x 1
- monitoring system x 1
- Linen – 1 rotation set per day per patient. 2 sets per bed

**Priority 2** – Space suitable to nurse a priority 2 patient requiring ICU care

Space :6m <sup>2</sup>
Spacing: 1.5m nose to nose

Essential provision

- Ablution facilities
  - shower/bath – 1 per 12 patients
  - Urinals – 1/20 patients
  - Toilet – 1/12 patients (maximum 1/20 patients)
  - Basins- 1/12 patients
- Basic emergency lighting
- Linen – 1 rotation set per day per patient. 2 sets per bed

**Commented [TL24]:** We need to include priority 3 guidelines.

## 8.5 General

### 8.5.1 Ablutions General

- a. Toilets 1/12persons minimum
- b. Showers/baths 1/12persons minimum
- c. Wash hand basins 1/12persons minimum

### 8.5.2 Water requirements: 1000 litres per patient per bed (rural field facilities 300 litres per day per patient)

### 8.5.3 Electricity: 1,5 to 2 KVa per bed

### 8.5.4 Critical infection control principles

- Separation of patients from non clinical areas;
- Separation of patients from other non COVID-19 infected patients;
- Sanitation principles to be applied - Supply of hand washing facilities and hand sanitizer;
- Attention to ventilation and correct air flow is critical – negative pressure in the patient care areas.
- Train all staff on protocols of gowning and ungowning, hand washing and all infection control processes required.

- Signage throughout emphasizing the infection control principles including graphics of hand washing.
- Signage directing patients from site entry to triage and wards

### 8.6 Staff accommodation

One staff member per bed (this norm is referring to all staff necessary to operate a temporary hospital and does not refer to nursing staff only). (China used the staffing norm of 1.5 staff members per bed for its temporary hospitals, but these hospitals provided ICU care).

## 9 Allocation of beds

Table 3: Allocation of priority patient beds<sup>4</sup>

Patient Category	Description	Allocation
PRIORITY 1	CRITICAL (5% of all COVID-19 patients) Priority 1: Intensive care beds(ICU) – Requires very high level of care	Not in stand alone facilities
PRIORITY 2	SEVERE (15% of all COVID-19 patients) Priority 2: High Care – Not on a ventilator but still requires special care	1-2 30 bed modules for high dependency care
PRIORITY 3	Mild/Moderate (80% of all COVID-19 patients) Priority 3: 10-15% Still require care but at a much lower level . Suspected Covid-19 infected – require isolation from the community and other suspected sufferers and infected patients	3-4 30 bed modules for low dependency care

Commented [TL25]: Of the 80%

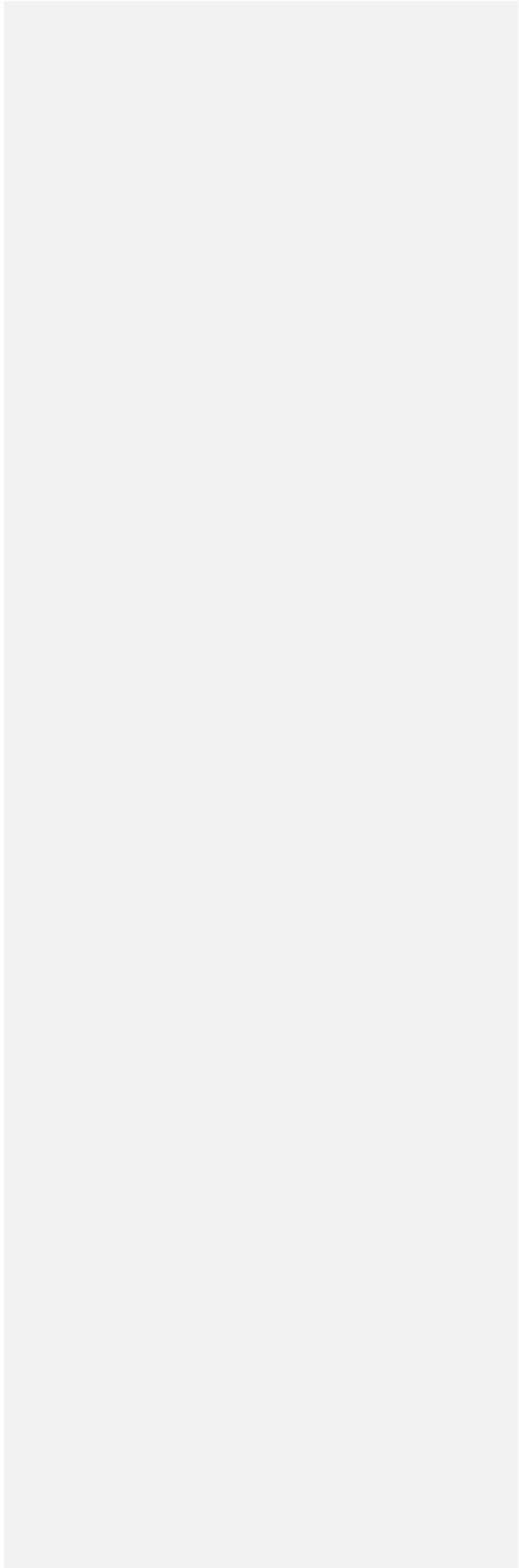
## 1.0 REFERENCES

- 1.0 IUSS GUIDELINE documentation
- 2.0 Right to Care : Additional Hospital Facilities
- 3.0 L.Wallis, W.Smith: Disaster Medicine
- 4.0 Tanzib Hossain, MD, MSA, Marya Ghazipura, PhD(c), MSb, Jeffrey R. Dichter, MDc Intensive Care Role in Disaster Management Critical Care Clinics
- 5.0 National Centre for Disease Control, India: COVID-19 Outbreak- Guidelines for Setting up Isolation Facility/Ward
- 6.0 Australian Health Facility Guidelines: HPU 360 Intensive Care Unit
- 7.0 Randy S. Wax, Preparing the Intensive Care Unit for Disaster

<sup>4</sup> Right to Care: Additional Facilities



**ANNEXURE 1 – LIST OF ROOMS**





## ANNEXURE 2 : SITE ASSESSMENT

SITE ASSESSMENT										
<b>A</b>	<b>DETAILS</b>									
1	Name of facility									
2	Physical Address									
3	Province									
4	Coordinates (Degrees Minutes Seconds): i.e (25°44'27.40"S; 28°11'24.18"E)									
5	Contact person									
6	Phone number									
7	Email address									
8	Alternative contact person									
9	Type of building									
	Hospital	School	Residence	Community Hall	Other					
<b>B</b>	<b>LOCATION</b>									
11	Located away from residential areas?							YES	NO	
12	Distance (km) from closest residential area:									
13	Located away from areas of mass gathering (e.g. places of worship, sports stadium,etc)							YES	NO	
<b>C</b>	<b>ACCESS AND SECURITY</b>									
14	Security control at the entrance?							YES	NO	
15	How many access points to the site?									
16	Is there Perimeter fencing?							YES	NO	
17	24 hour security is available							YES	NO	
18	Roads to site are acceptable?							YES	NO	
19	Roads on site are acceptable?							YES	NO	
20	Signage on site is adequate?							YES	NO	
21	Is there a suitable area to unload and drop off patients by ambulance?							YES	NO	
22	How far is the nearest hospital capable of ventilating patients - ICUs									
<b>D</b>	<b>BUILDING</b>									
23	How many buildings on site? (List the buildings below)									
24	Are plans available							YES	NO	
25	Are there separate entry and exit points to the buildings?							YES	NO	
26	<b>BUILDING</b>	<b>Type of facility</b>	<b>No of floors</b>	<b>Stretcher Lift</b>		<b>Condition (1 to 5)</b>	<b>Suitability (1 to 5)</b>	<b>Bedroom Number</b>	<b>Patient Bed Number</b>	
	1					<b>(1-bad 5-good)</b>				
	2			YES	NO					
	3			YES	NO					
	4			YES	NO					
	5			YES	NO					

	6			YES	NO				
	7			YES	NO				
	8			YES	NO				
	9			YES	NO				
27	<b>BEDS - Number of beds</b>								
28	Single bedroom		Double bedrooms		Dormitories		Beds per dormitory		
	<b>Ablutions</b>								
29	Toilets		Showers		Baths		WHB		
30	En suites to bedrooms ?							YES	NO
31	How many toilets are blocked								
	<b>Ventilation</b>								
32	Independent air conditioning in bed rooms/patient areas							YES	NO
33	Windows open to outside in bed rooms/patient areas							YES	NO
34	Exhaust or other fans in the bed areas?							YES	NO
	<b>Lighting</b>								
35	Natural lighting in bed areas is good?							YES	NO
36	<b>Flooring</b>		<b>Comment</b>						
	Carpets	YES	NO						
	Vinyl	YES	NO						
	Concrete	YES	NO						
37	<b>OFFICES – number of</b>								
38	Single office		Open Plan		Meeting room		Boardroom		
	<b>Ablutions</b>								
39	Toilets		Showers		Washbasins		Urinals		
40	How many toilets are blocked?								
	<b>Ventilation</b>								
41	Independent air conditioning in offices and meeting areas							YES	NO
42	Windows open to outside in offices and meeting areas							YES	NO
43	Exhaust or other fans in the offices and meeting areas							YES	NO
	<b>Lighting</b>								
44	Natural lighting is good?							YES	NO
45	<b>Flooring</b>		<b>Comment</b>						
	Carpets	YES	NO						
	Vinyl	YES	NO						
	Concrete	YES	NO						
	<b>SUPPORT FACILITIES</b>								
46	Kitchen	YES	NO	Number		Functional and sufficient?	YES	NO	
47	Laundry	YES	NO	Number		Functional and sufficient?	YES	NO	
48	Staff Rest areas	YES	NO	Number		Functional and sufficient?	YES	NO	
49	Cleaners	YES	NO	Number		Functional and sufficient?	YES	NO	
50	Stores	YES	NO	Number		Functional and sufficient?	YES	NO	
51	Garages	YES	NO	Number		Functional and sufficient?	YES	NO	
52	Workshops	YES	NO	Number		Functional and sufficient?	YES	NO	

<b>E</b>	<b>SERVICES</b>		
1	Is the water supply uninterrupted?	YES	NO
2	Is the water supply sufficient?	YES	NO
3	What is the size of the electrical power supply in KVa?		
4	Is the electricity supply sufficient to accommodate additional load?	YES	NO
5	Is there an emergency supply of electricity?	YES	NO
6	How many stand by power generators on site?		
7	Capacity of standby generator in KVa?		
8	Are the generators operational?	YES	NO
9	Is the sewer system operational	YES	NO
10	Is the sewer on site connected to mainline sewer line?	YES	NO
11	Does the facility utilize septic tank system	YES	NO
13	Number of parking bays		
14	Is there access to internet?	YES	NO

## ANNEXURE 2 : HUMAN RESOURCE ASSESSMENT

<b>HUMAN RESOURCE ASSESSMENT</b>	
<b>Name of facility</b>	
<b>Physical Address</b>	
<b>Coordinates (Degrees Minutes Seconds): i.e (25°44'27.40"S; 28°11'24.18"E)</b>	
<b>Contact person</b>	
<b>Phone number</b>	
<b>Email address</b>	
<b>Alternative contact person</b>	
<b>Type of building</b>	

<i>Item</i>	<i>Name</i>	<i>Functional Area</i>	<i>Designation /Category</i>	<i>Cell phone number</i>	<i>E-mail</i>



**ANNEXURE 3: REQUIREMENTS FOR TEMPORARY ICU FACILITIES**

