



RIGHT TO CARE
COVID-19 DATA ANALYSIS AND ADVICE
GROUP

TECHNICAL ADVICE DOCUMENT: BED
OCCUPANCY MONITORING TOOL

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DISASTER MEDICINE CONSULTANT: RIGHT TO CARE

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2 INTRODUCTION

Based on the Disaster Medicine literature (Ciotone, 2006), and our experience as the Governments Assessment Team to Sierra Leone during the Ebola outbreak in 2014 some technical aspects are highlighted for hospital bed occupancy monitoring¹ during a mass outbreak.

These concepts were also tested in detail during the Avian Wind Scenario Exercise in Germany (United States European Command, 2006) in preparation for the H5N1 Avian Influenza outbreak in June 2006 with 14 countries participating. These recommendations are also mirrored against the current experiences in China, Italy, Spain, the UK and USA.

It is emphasised that these recommendations are mainly influenced by the observations in Sierra Leone during the Ebola-Outbreak which brought the total health service of the country to a standstill.

This technical advice document must be read along with the Plan to Manage COVID-19: Spatial Response Strategy for the Epidemic (Republic of South Africa, 2020).

3 PHASED RESPONSE

Although the PLANNING for additional hospital capabilities must be FULLY done based on the predicted epidemiological curve and continuous updates, the IMPLEMENTATION should be staged in a phased reactive response. Reactive response can however only be done if planning was done comprehensively in advance and epidemiological analysis, including GIS mapping, is done continuously.

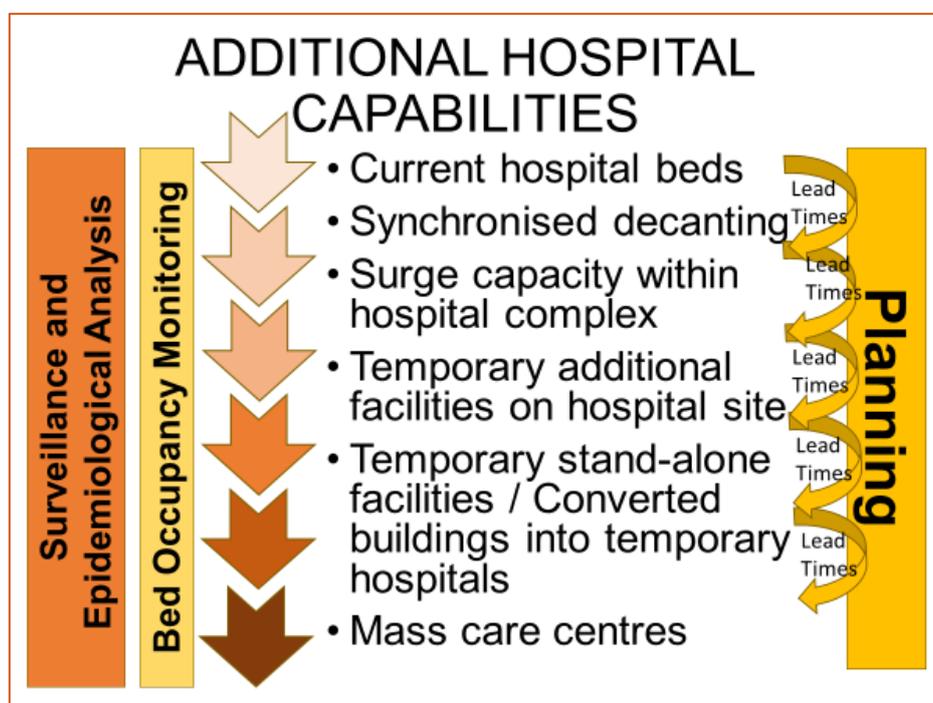


Figure 1: Phased Response

¹ For the purpose of this concept document hospital facilities is not graded and facilities within the hospital is largely discussed under the generic term hospital beds without detailing specialist requirements.

The activation of the next step in the phased response, per geographical area is directly linked to the availability of accurate and continuous updating of bed occupancy statistics.

4 BED OCCUPANCY STATISTICS

During the major incident hospital preparations for events such as the hospital strike actions, the 1994-contingency planning, the Y2K planning and observations in Sierra Leone a system of bed occupancy statistic is recommended.

4.1 PATIENT CLASSIFICATION

Patients are graded per ward by the nursing staff on a daily basis, utilising input from treating clinicians. This entails classifying each patient as:

- Suitable for discharge with advice
 - (A subcategory of only suitable for discharge in an extreme situation may be used to enable hospitals to decant more patients in an emergency)
- Suitable for transfer to a lower level of care, surge capacity facility or a temporary facility
- Not suitable for discharge or transfer from current facility and must remain at the level of care
- Requiring upgrade to higher level of care

This classification is totalled per ward.

4.2 BED CLASSIFICATION SYSTEM

As various hospitals and various Private Hospital Groups use various classifications for hospital beds, a universal simple classification is recommended for bed occupancy monitoring.

Distinction is made between:

- adult and
- paediatrics

and between:

- intensive care capable (ventilation possible) and
- non-intensive care beds.

For the purpose of pandemic management incubators and baby (new-born) cradles are ignored in the statistics.

The Patient Classification per ward/unit as discussed above are then grouped into the above bed classification system and rolled up for the hospital.

The result is that there are daily statistics available per hospital indicating how many of the beds in the bed classification system are occupied and what is the classification of the patients in these beds.

4.3 HOSPITAL BED STATUS

The bed status of each hospital can then be turned into a percentage, based on the number of beds available and then colour coded automatically based on parameters determined by the Ministerial Advisory Committee. For example:

• Green = Bed Occupancy < 90%
• Yellow = Bed Occupancy between 90-95%
• Red = Bed Occupancy between 95-100%
• Purple: Bed Occupancy > 100%

These figures are rolled-up into a dashboard per hospital, cluster, region and the country.

4.4 BED OCCUPANCY DASHBOARD

Within the bed classification system as indicated above, utilising the bed occupancy a dashboard is created per hospital, region and province.

The dashboard then further breaks down the data and displays the patient classification data per hospital, region and province. Within the hospital the dashboard can display info down to the individual ward/unit base.

4.5 DECANTING

The moment that a hospital starts to show yellow indicators on the dashboard an instruction is given to activate decanting of a specific category of patient for example adult non-intensive care.

The patient classification system dashboard should indicate the number that can be decanted and what the expected result may be.

Decanting always has a lead time, so parameters to indicate activation of decanting action needs to take that into account. In urban areas decanting may be ordered as soon as bed occupancy reaches, for example, 90% while in rural areas with long traveling distances decanting may need to be activated, for example, at an 80% level.

Decanting can be done for a specific hospital, region or a whole province depending on indicators.

5 SURGE CAPACITY

The next phased response to an increase on the dashboard after decanting was already activated; for a hospital will be to activate surge capacity.

Surge capacity figures must be available on the system to immediately recalculate the hospital's occupancy figures as surge capacity is activated.

It can be expected that standard non-intensive care bed figures will change as ward space may be upgraded to temporary surge intensive care units. Additional intensive care capacity may also become available in theatre recovery rooms and even in theatres itself.

As additional surge capacity spaces are opened up for non-intensive care patients, the figures per hospital will change and indicators on the dashboard will change.

Activation of surge capacity also has a lead time requiring activation again at, for example, 90% occupation.

6 TEMPORARY FACILITIES ON SITE

As soon as surge capacity is activated for a specific facility the deployment of a temporary facility (facilities) may be activated. Based on epidemiological data temporary facilities may be erected in advance at specific facilities, but only opened up as soon as decanting results are known.

Activation of flexible resources by utilising short lead-time tented facilities may be indicated by sudden surges identified on the dashboard.