

Disaster Preparedness Assessment tool for Cecilia Makiwane Hospital, Mdantsane, Eastern Cape, South Africa

Abstract

Disaster Preparedness Plan is necessary for all hospitals considering the rapid technological advances and climate changes in the world. The hospital is a regional one with tertiary facilities.

Keywords: Cecilia makiwane hospital; Eastern cape; South Africa; Surgery; Health care

Introduction

Cecilia Makiwane Hospital is situated at Mdantsane. Mdantsane is about 17 kms from East London in the province of Eastern Cape. It is the second biggest township after Soweto. Mdantsane was a part of the former independent homeland of Ciskei and Cecilia Makiwane Hospital named after the first black registered nurse in South Africa, caters to a population of nearly three million [1].

This hospital had at one time one thousand two hundred beds and considered as a tertiary centre. At the moment it has seven hundred and thirty-seven beds and has been declared as a regional hospital with tertiary outlook. It is affiliated to Walter Sisulu University.

It has twenty-six wards and an Intensive Care Unit with 12 beds. Six Hundred and seventy-eight nurses are employed here [2].

All speciality departments including super specialities like Paediatric Surgery, Urology and Neuro –Surgery are available at all times. The hospital works in a conjoint effort with Frere Hospital, situated in East London.

The Accident and Emergency Unit of this hospital spread over eight hundred square meters has seven full time doctors and are supported by five doctors from the Department of Family Medicine and two doctors from the private practice [3].

It has thirty-eight nurses who work on a shift basis. The Accident and Emergency Department has six trauma and six non-trauma beds. It has a resuscitation unit with two

Research Article

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beds; two minor theatres are shared with the Department of Surgery.

A fully equipped Adult and Paediatric Triage sections are available. Three senior nurses have been trained in Trauma from Witwatersrand University.

Five doctors of the Accident and Emergency Department have completed the advanced life support courses. Two of them have post graduate qualifications.

- The Metro Ambulance of Mdantsane has six ambulances available at all times. Each ambulance can carry two patients. Sixteen paramedics work round the clock.
- The Metro Ambulances of Mdantsane are used within a sixty km radius.
- The Metro Ambulance Helipad is next to the Accident

and Emergency Department and has landing facility for one helicopter [4].

Summary of Medical Centre Hazard Analysis

Natural Hazard – Relative Risk – 0.04

Technological – Relative Risk – 0.11

Human – Relative Risk – 0.22

Hazmat – Relative Risk – 0.01

Total for the facility is 0.08

Natural Disasters occurring in Mdantsane

The Average Score given is 4 percent.

High Winds, Tornado and Thunderstorms are always a possibility.

Preparedness for such a disaster is high.

The probability and severity of an event like Epidemic taking place is high and mitigation procedures remains moderate as expected number of patients can overwhelm the hospitals capacity to treat [5].

Technological Hazards

The average score given is 11 percent.

We had experienced Electrical and Generator failure in the past and seen human impact due to this failure. We are far more prepared than what we were before. The probability of such an incident taking place is always high [6].

We have been experiencing transportation failure from time to time primarily because we are dependent on Metro Ambulances who may not reach the hospital to pick up the patient for onward referral to Frere Hospital. The relative risk for this incident to happen would be as high as 50 percent

Heating, Ventilation and Air Conditioning failure is always high due to structural and mechanical problems but also can be due to Electrical and Generator failure. The relative risk is 50 percent [7].

Supply Shortage is being experienced from time to time.

Disruption in Supply Chain is one of the primary causes. The relative threat remains as high as 50 percent.

Human Hazards

The relative risk is the highest among all hazards. It is 22 percent.

Mass Casualty Incident (Trauma, Medical and Infectious). The likelihood of such an incident happening always remains high for all hospitals. The human impact depends on the type of this incident and the preparedness for such an impact.

Being a multi speciality hospital, preparedness and response to such an incident would be high.

Civil Disturbance, Labour Action and Forensic admission events remain high in the scale of probability and severity. The preparedness for such an event is moderate to high. The Risk therefore for Civil Disturbance is 67 percent, labour action is 61 percent and Forensic admission is 50 percent [8].

An event such as a VIP situation outside the hospital has a risk of 33 percent and the preparedness for countering such an incident is high.

Bomb threat always remains a probability, its preparedness, internal and external response remains moderate.

Hazmat Incident

Historically this hospital never experienced a Hazmat incident. Internal Radiological exposure is a probability and radiological exposures badges are screened regularly. The preparedness for such an incident is moderate considering the multidisciplinary approach.

The probability of Hazards to Medical Centre, the relative impact on facility is 0.35 in a score of 0.0 to 1.00. The severity score is 0.25 [8].

The probability is the likelihood of occurrence and the severity is the measurement of catastrophic to minor incidents.

The aim would be to further bring down the score by mitigation plans.

The Hazard Specific Relative risk to the Medical Centre would be:

0.04 – Natural

0.11 – Technological

0.22 – Human

0.01 – Hazmat

In a relative threat from 0.00 to 1.00

Mitigation and Recommendation

A Hospital Committee should be formed that should go in detail into each Hazard Specific Risk.

Natural-Probability – Known risk to Epidemics is taken care.

Historical Data – Unknown.

Issues for response – Time to Marshall an on-scene response – possible.

Scope of Response Capability – high.

Human Impact – staff death and patient death is a possibility.

Internal Resources – Plans should be made for type and volume of supplies, staff availability and backup system.

Mitigation -Isolating Victims with a new strain of Flu.

Evacuation of Wards to keep such patients is a priority. Prior identification of such wards and arranging protective clothing for the staff is a necessity.

Preparedness will include training status and awareness campaign

Technological

Historical - After the reporting of baby deaths caused by electricity failure which caused a country wide furor, back up electricity and generator plans have been put into action. Routine electricity switching off for regular maintenance is informed one day in advance.

The Hazard Specific Relative Risk to the Medical Centre is 0.11 in a scale from 0.00 to 1.00.

The Probability of incidents relating to technological disaster is 0.47 and the severity is 0.24.

Electricity, Generator, Transportation, Sewer, Heating, Ventilation, Air Conditioning, Information System, Fire and Supply Shortage failures have been identified.

The Engineering Department of the hospital needs to have a back up plan in failures relating to power and generators need to be checked on a daily basis [9].

Basic and appropriate fire fighting equipment must be positioned according to governance and hospital staff must be trained and exercised to use the equipment.

Staff must be trained and exercised to prevent and fight a fire effectively and to raise the alarm immediately in case of a fire.

Evacuation plan must be at place for patients and staff in a disaster plan.

Evacuations usually follow the regular triage order of prioritising the sickest patient. In some instances of perceived imminent structural collapse, hospitals have successfully evacuated in reverse triage order, ambulatory patient first followed by non critical patients with limited mobility and finally by those few needing the most resources.

When electrical power fails, staff will need to carry the patient and manually bag ventilated patients.

Human Hazard

Mass Casualty Incident involving Trauma, Medical and Infectious is the greatest risk to this hospital.

A Major Incident Plan written beforehand is most necessary.

The hospital needs to rapidly expand and reorganise its capabilities to meet the requirements of the situation.

Surge deals with the expansion measures to accommodate a sudden influx of patients.

Allocating Areas for these expansion plans.

These include:

Command – Space for Coordination and Conferences.

Tactical Command – For Mobile and Alternative Communication.

Triage Areas – Proximity to drop off points.

Priority 1 Red Space equipped to resuscitate.

Priority 2 Yellow- Oxygen, Suction, Medical Gas.

Priority 3 Green – Oxygen, Clinical assessment.

Theatre – Elective lists are cancelled.

Radiology – Essential Radiology only.

Pharmacy – Close to Priority 3.

Pickup Points – For Discharged Patients.

Staff Rest and Recovery – Privacy and Comfort

Mortuary- Overflow can be accommodated up till 24 hours after that nearby mortuaries (Police) need to assist.

Major Incident Store Room – Specialist items such as triage tags and additional spine boards, splints. Provide stock to cover period from Activation until standard stores can provide stocks. Stocks are rotated to prevent expiry.

Communication Capability – Back up not dependent on existing land lines, mobile networks. Preferably dedicated broad band.

Need for Assistance from nearby Frere Hospital, its resources and disaster planning can be shared during such events.

Civil Disturbance, Labour Action and Forensic Admission has a high risk score from 50 to 67 percent

Forensic Admissions can be due to Mass Assault injuries and Sexual Assault Injuries. Gender based Violence is a common occurrence in the township of Mdantsane. We have a Thuthuzela Centre which specifically deals with Sexual Assault Victims and has Doctors and Nurses trained in examining such victims.

Trained Counsellors are available round the clock. The Thuthuzela Centre works under the guidance of the Accident and Emergency Department.

Hazmat Threat

The Hazmat threat to this hospital is minimal. It stands at 1percent.

Radiological Internal Exposure is a possibility. Therefore, Badges being worn by Radiographers and Radiologists are sent for radiation screening.

Twice a year all those people handling Radiological Equipment, their blood should be sent for a comprehensive haemogram.

In the end

I can only say although this hospital stands in a township and caters to the health needs of the township, one must remember the population that has exceeded to far more than what it was expected to cater when it was built 35 years back.

According to STAS South Africa.

The population size of Mdantsane is 175,786. 40% of the population is under 15yrs old, with 55% females and 45% male.

42% of the population is unemployed and 13% is employed in the formal sector. Approximately 35% of the economically active population earns less than R1 000.00 per month.

Critical Challenges

- supply and storage of potable water,
- accessibility of public transport facilities,
- road and pedestrian access-way networks,
- safety and security of residents,
- internal collector roads, and
- poor stormwater management.

Conclusion

A Disaster Plan should be in place at the earliest and Disaster Preparedness and Disaster Drill should be performed annually to understand the efficacy of such a plan.

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