

**HOSPITAL DISASTER PLANNING IN THE WESTERN CAPE:
ARE WE READY FOR 2010?**

**Master of Medicine (Emergency Medicine)
University of Cape Town
2008**

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DECLARATION

I confirm that "*Hospital Disaster Planning in the Western Cape: Are we ready for 2010?*" is entirely my own work.

I confirm that I hold the degree of MB BCh from the University of the Witwatersrand.

This dissertation is being submitted for the degree of Master of Medicine (Emergency Medicine).

I confirm that I have not submitted this dissertation for any other degree, diploma or professional qualification.

Full name:

Signature:

Date:

ACKNOWLEDGEMENTS

I wish to thank my supervisor, Professor Lee Wallis, for his constant guidance and valuable input into this study and for being a role model in establishing excellence in Emergency Medical care in Southern Africa.

I wish to thank Dr Wayne Smith for providing input from a FIFA and a Disaster Medicine perspective.

I wish to thank Ms Nikki Potgieter for her invaluable assistance with the data collection.

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GLOSSARY

DMISA	Disaster Medicine Institute of South Africa
EC	Emergency Centre
EMS	Emergency Medical Services
FIFA	Fédération Internationale de Football Association
GSA	Geographic Service Area
HAZMAT	Hazardous Material
HMIMMS	Hospital Major Incident Medical Management and Support
ICDM	Intergovernmental Committee on Disaster Management
IDNDR	International Decade for Natural Disaster Reduction
IMC	Inter-Ministerial Committee for Disaster Management
KPA	Key Performance Area
LOC	Local Organising Committee
MIMMS	Major Incident Medical Management and Support
NATHOC	National Health Operations Centre
NDMAF	National Disaster Management Advisory Forum
NDMC	National Disaster Management Centre
NDMF	National Disaster Risk Management Framework
NDOH	National Department of Health
NESF	National Emergency Medical Services Strategic Framework
NIDMC	National Interdepartmental Committee on Disaster Management
PHC	Primary Health Care
SATS	South African Triage Scale

- SOPs** Standard Operating Procedures
- UN** United Nations
- UNDP** United Nations Disaster Management Training Programme
- UNDRO** United Nations Disaster Relief Organisation
- VIP** Very Important Person

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ABSTRACT

The advent of the FIFA Soccer World Cup in South Africa in 2010 may result in an influx of people into South Africa unlike any experienced before. This means that structures need to be in place to help mitigate the risk of a disaster and, should one occur, ensure that there is a rapid and effective response. This is a vital time for South Africa to audit the scope of disaster preparedness as well as implementing recommendations to improve overall patient care and survival.

The aim of this study was to describe the current state of disaster preparedness in hospitals in the public sector in the Western Cape. This was achieved by means of a self reported hospital questionnaire. Of 41 public sector hospitals sent the questionnaire, 27 provided completed data on disaster planning.

This study was able to ascertain what infrastructure is available and what planning has been implemented in the various hospitals. It also highlighted areas that need to be addressed such as staff awareness of local hospital major incident plans, preparedness for biochemical and radiation major incidents and the importance of regular and realistic drills and training covering various aspects of the hospital plan.

There is a need to repeat this audit in the near future to ensure that hospitals in the Western Cape maintain a high standard of disaster preparedness at all times and continue to improve, not solely during the staging of the FIFA 2010 Soccer World Cup. Hospitals throughout the country need to be proactive in continuing to review their major incident plans and to make improvements and staff training and realistic drill of the plans need to be performed.

CHAPTER 1 : INTRODUCTION

On 15th May 2004, South Africa won the bid to host the 2010 Fédération Internationale de Football Association (FIFA) Soccer World Cup. This will be the first time that the tournament has been staged on the African continent. South Africa has hosted large sport events before: the Rugby World Cup was held in 1995; the Cricket World Cup in 2003; the Women's World Cup of Golf in 2005 and 2006, and the inaugural A1 GP World Cup of Motorsport in 2006. However, none of these compare in scale to the Soccer World Cup, which is the world's biggest sporting event after the Olympics; in terms of television audience, it is larger than the Olympics. An estimated 3 million international visitors have travelled to host countries in the past to be part of this sporting epic¹, and 2010 is not expected to be any different. This creates a huge logistical challenge for the host country. Danny Jordaan, CEO of the Local Organising Committee of FIFA, has summarised the sentiments of many enthusiastic South Africans, *"It must be better; it must be African and first class. This country will host a spectacular like no other."*¹

SOUTH AFRICA

South Africa, a fledgling democracy of only 14 years, has a population of over 47 million people and covers 1.2 million square kilometres². It is a melting pot of different cultures, languages and religions. There are nine provinces and eleven official languages.

HEALTH AND SOUTH AFRICA

The burden of health care and provision in South Africa is provided by government funded hospitals. These facilities are further assisted by local clinics and “day hospitals” (who traditionally do not provide a 24 hour health service). Most provinces follow the same health structure as regards referrals. Generally, local clinics refer to district hospitals, who refer to regional hospitals, where the patient is then referred to tertiary institutions as dictated by the patient’s pathology. R118 billion was spent in the government health sector in 2007/2008³. South Africa also supports a vital private health sector but only 14.3% of citizens were covered by medical aid in 2007 according to the annual general household survey conducted by Statistics South Africa⁴.

South Africa has one of the most progressive constitutions in the world and it stipulates that no one may be refused emergency medical treatment⁵. If a patient is referred to an initial hospital and requires further transfer to another institution for whatever reason, the patient should first be stabilised before transfer.

HEALTH AND 2010

As part of the guarantees given by the National Government on being awarded the 2010 games, the National Department of Health (NDoH) has provided certain health guarantees⁶. They include the following:

- The provision of a comprehensive medical service (including 24-hour emergency medical treatment) and disaster management at the disposal of the FIFIA World Cup in the host cities.

- The National Health Operations Centre (Nathoc) will be linked to all nine South African provinces, ensuring real-time monitoring, collating and reporting on the roll-out of the health plan and incident reporting.
- Free primary health care (PHC) for all spectators at official venues and dispensing machines for basic drugs available at all stadiums.
- Fully equipped medical centres, medical PHC posts and roving health care providers in all stadiums and stadium precincts.
- Active management of environmental health at stadiums.
- Compliance with local and international health requirements for all visitors at all ports of entry to South Africa.
- Local and international disease outbreak surveillance.
- Special provisions for the licensing of foreign-qualified medical and allied health professionals.
- Contingency planning and liaison with South African Police Service, National Intelligence Agency, and fire and disaster management agencies.

A multi-sectorial and intra-governmental Health Technical Task team has been established. There are 15 expert work groups, a national programme unit and nine provincial programme managers.

Multiple initiatives are in place to improve service delivery by Emergency Medical Services (EMS), hospital Emergency Centres (EC), stadium medical facilities and Port Health. Emergency care training has been enhanced by the provision of numerous courses: these courses include Major Incident Medical Management and Support (MIMMS), MIMMS for the Hospital (HMIMMS), Clinical Forensic Medical training,

use of the South African Triage Scale, and Fundamentals of Emergency Care. All of these courses will better equip health personnel with skills that will not only be of benefit for 2010, but which will continue to be of importance after the World Cup has taken place.

Prioritised ECs are in the process of being upgraded, and comprehensive bed bureaus are being established in each province. These bed bureaus will link to an incident command information centre; it is hoped that this vital information can be used to obtain real time information about the bed capacities in key hospitals and will help to streamline the emergency response. Certain ECs have being designated as key centres for the tournament, and extra support is being focused in these areas.

A number of governmental and non-governmental structures play key roles in the 2010 World Cup. These include the Local Organising Committee (LOC), government bodies (driven by the Inter-Ministerial Committee (IMC)) and host city forums. Health is a key component of the overall planning. The South African National Health System, especially the emergency and disaster medicine components, play a critical role. The World Cup has served as a catalyst to improve existing health structures: emphasis in this regard has been placed on emergency medicine and disaster medicine.

The National Emergency Medical Services Strategic Framework (NESF) is a five year plan investing in the improvement of delivery of emergency medicine healthcare. This is an existing government programme to improve the delivery of emergency medical services to all communities. Due to the staging of the FIFA Soccer World Cup in South Africa certain key areas of the NESF have been implemented. One of these is the spending of over 37 million rand to provide state-of-the-art

communication centres in major cities. The existing medical helicopter services will be extended to include all nine provinces. 450 emergency vehicles will be replaced over a three year period. 8 million rand has been ear-marked to upgrade emergency centres designated for the World Cup⁷. Similar arrangements are being made for health care on a provincial level in the Western Cape, driven by a locally appointed provincial coordinator.

THE WESTERN CAPE

The Western Cape is one of the nine provinces of South Africa. According to the mid year population estimates for 2006 from Statistics South Africa, almost 4.7 million people of the 47.4 million living in South Africa are situated in the Western Cape⁸; almost 70% of the population lives in the Cape Metropolitan area. Just over 4.2 million people live in a formal village, town or urban/city environment; life expectancy is 64.8 years and literacy is at 71.9%². The province covers 129 370 square kilometres (just over 10% of the area of the whole country). Three main languages are spoken in the region: English (29%), Xhosa (20%) and Afrikaans (51%). There are also three distinct climatic regions: the Cape Peninsula and Boland which experiences winter rainfall and sunny dry summers; the South Coast region experiences year round rainfall, and the Karoo, which is more inland, experiences summer rainfall. There are five Geographic Service Areas (GSA) which include Metropole West, Metropole East, George, Worcester and Paarl.

	Metro West	Metro East	George	Worcester	Paarl
Central	Groote Schuur Red Cross	Tygerberg			
Metro Regional	Somerset Victoria	GF Jooste Helderberg Karl Bremer			
Rural Regional			George	Worcester	Paarl
District	False Bay Wesfleur	Eerste River	Beaufort West Murraysburg Ladismith Knysna Mossel Bay Riversdale Outshoorn Uniondale Nelspoort Prins Albert	Montague Robertson Ceres Hermanus Caledon Swellendam Bredasdorp	Stellenbosch Citrusdal Clanwilliam Lapa Munnik Swartland Radie Kotze Laingsburg Vredendal Vredenburg

Table 1: Government Hospitals in the Western Cape

The Western Cape relies heavily on tourism and it is arguably the most frequently visited province by foreigners. The largest city in the Western Cape is Cape Town with a population of around three million; the next largest town is George which is situated approximately four hours east of Cape Town. The population in George in 2001 was 135 415².

HEALTHCARE IN THE WESTERN CAPE

Cape Town is situated right at the most south western corner of South Africa and is the tertiary drainage area for all patients in the province. It is not ideally situated and consequently many patients have to be transported vast distances by road or even by air. There is a very active helicopter aeromedicine service which covers Cape Town and the immediately surrounding geographical area. There is also a fixed wing aircraft which is used when the distance range exceeds that of the helicopter. There is a second helicopter based in Oudtshoorn (to cover the George area).

The health system of the Western Cape is divided into clinics, and hospitals: district, regional and central level⁹. There are 334 clinics which offer primary health care; district hospitals are capable of basic inpatient care; regional hospitals are larger and have some general specialist care on site, and the only three central hospitals in the Western Cape are situated in Cape Town (Groote Schuur, Tygerberg and Red Cross Children's Hospital). The location of the central hospitals means that patients often have to be transferred over large distances. The Western Cape, like most provinces, has a large rural proportion.

HEALTH AND 2010 IN THE WESTERN CAPE

The basis of the health preparations by the Western Cape fall under four categories¹⁰. The first category is that of Command and Control. Here a Provincial Health Operations Centre is to be developed. A Bed Bureau will be established and a Mass Casualty Bureau will be integrated into provincial health. An Operations Centre will be established and the Medical Incident Command System will be introduced.

The second category focuses on health services and this includes Environmental, Port Health, Travel medicine and Hospitals. Emergency Units are to undergo auditing with subsequent modelling of staff and facility. The South African Triage Scale (SATS) is to be introduced into all hospitals in the province. Appropriate training into Disaster Medicine is to be undertaken. Hospitals are to be integrated into the Pre-Hospital Information System. Hospitals must develop the capability to deal with biochemical hazards.

The third category looks at the provision of medical services. This includes input into the design of the medical facilities at stadia, providing emergency medical services to locations outside of the stadium, the provision of comprehensive medical care at all events, the provision of aeromedical, medical rescue and mass casualty response and the development of a new and accelerated training programme. The fourth category focuses on the provision of comprehensive forensic medicine services.

Emergency medical services has had its baseline funding raised by over R70 million per annum and over the next two years will receive a further boost of R44 million. A large proportion of the Western Cape Health funding (in the region of R40 million) has been provided to contribute towards the establishment of an upgraded emergency care centre at Somerset Hospital in Green Point where the stadium is situated¹¹.

DISASTER PHASES

Several terms are synonymous with disaster management and the phases of disasters are grouped into pre-disaster risk reduction, the actual disaster phase and post disaster recovery. Pre-disaster risk reduction consists of prevention, mitigation,

preparedness and early warning. Response, recovery, rehabilitation and reconstruction are the components of post-disaster recovery.

Prevention consists of all actions that are taken to prevent or impede the occurrence of a disaster/major incident. Training, community awareness and research are all aspects of prevention.

Mitigation refers to all the activities that occur in anticipation of a major incident and should be present in both the pre- and post-disaster phases.

Preparedness is straightforward and alludes to hospital disaster plans and the performance of regular multi-disciplinary exercises.

Early warning systems are the result of data collection used to coordinate timely responses to threats.

The actual disaster phase occurs when full resources have been mobilised to respond to a major incident in order to prevent the loss of life and to protect property. This phase may be very brief or can extend for a lengthily period of time.

Disaster triage needs to be implemented during a major incident response. Disaster triage differs from the triage performed on a day-to-day basis in an emergency centre. The Cape Triage Scale was launched in all government hospitals in the Western Cape on 1 January 2006¹². This was subsequently followed by its implementation nationally as the South African Triage Scale (SATS) in 2007. This method of triage requires numerous physiological parameters to be accurately measured and recorded. In the setting of a major incident, the number of casualties presenting to the receiving hospital may be so high that any attempt to triage them in a normal manner would result in the delay of necessary medical care and would prove to be labour intensive and cumbersome. The main aim during a major

incident is to do the most for the most number of people^{13,14,15}. There are two accepted triage tools that are utilised once a major incident has been declared. The triage sieve is a brief snapshot of the patient's condition using minimal physiological parameters and can be performed at the scene of a major incident by inexperienced personnel. The triage sort is based on the Revised Trauma Score and it based on measurable physiological parameters and needs to be performed by personnel with clinical insight. The triage sort is most often performed at the receiving hospital at the commencement of the hospital major incident reception phase.

The response phase of the post-disaster phase is the stage when rescues are carried out and survivors are actively looked for and transported and treated at the receiving hospitals.

Recovery, rehabilitation and reconstruction refer to the stages that occur after the acute response to a disaster and include the return of normality to the system as well as assessment of the impact of the disaster and the further steps that need to be taken for the continuation of normal daily conditions.

DISASTER MEDICINE IN SOUTH AFRICA

Like Emergency Medicine, Disaster Medicine in South Africa is still relatively in its infancy. South Africa has the threat of natural and human-induced threats. Although destructive earth quakes are not common, extremes of weather can cause havoc. There is also an extensive coastline which predisposes the country to possible marine threats. Certain neighbouring countries request humanitarian aid in times of crisis. Despite the increased provision of housing and electricity for thousands of South Africans, thousands more still live in conditions that make them

vulnerable to disasters. The extensive fire damage to informal settlements due to paraffin use and the widespread flooding of low lying areas in the Cape Metropole where there is low cost housing are two examples of this.

In June 1994 the Cape Flats experienced devastating floods which served to demonstrate how catastrophic a natural disaster could be and how important planning was in order to alleviate the widespread suffering that had occurred if such a natural disaster were to occur again. The South African Government decided to take decisive steps and in 1997 an Inter-Ministerial Committee for Disaster Management (IMC) was established. Widespread consultation ensued which resulted in the publication of the Green Paper on Disaster Management in February 1998. This was followed by the release of the White Paper in January 1999. The Disaster Management Bill for public discussion was published in 2000 and in 2001 the public hearings on the Bill were held. This all culminated in the promulgation of the Disaster Management Act of Parliament in 2002¹⁶. South Africa finally had a comprehensive national policy which covered all aspects of dealing with disasters and major incidents. The Disaster Management Act defines disaster medicine in South Africa as:

“a continuous and integrated multi-sectoral, multi-disciplinary process of planning and implementation of measures aimed at preventing or reducing the risk of disasters; mitigating the severity or consequences of disasters; emergency preparedness; a rapid and effective response to disasters; and post-disaster recovery and rehabilitation”.

The Disaster Management Act gives each province, metropolitan, municipal and local municipality power to establish frameworks, strategies and plans in the field of

disaster medicine. The act also serves to confirm the South African government's commitment to providing disaster management and care that is of an international standard.

1957	Director for civil protection appointed under Department of Justice
1959	Council for Civil Defence Services established
1962	Council for Civil Defence Services disbanded and Division for Emergency Planning established
1963	Directorate Emergency Planning replaced by Directorate of Civil Defence
1966	Civil Defence Act 39 of 1966 promulgated
1969	Directorate Civil Defence moved to Department of Defence
1977	Civil Defence Act 39 of 1966 was revoked and replaced by Civil Protection Act 67 of 1977
1978	Fundraising Act 107 of 1978 promulgated
1990	Civil Defence Amendment Act 82 of 1990
1994	South Africa's first democratic election, floods in Cape Flats, task team established to investigate disaster management
1995	Department of Constitutional Affairs administers Civil Protections Act 67 of 1977
1996	National Disaster Management Committee
1997	National Disaster Management Committee is replaced by Inter-ministerial Committee on Disaster Management
1998	Green Paper on Disaster Management
1999	White Paper on Disaster Management, National Disaster Management Centre established, Inter-departmental Committee on Disaster Management established
2000	First and Second Draft Bill on Disaster Management, public hearings on Disaster Management Bill commence
2003	15 January – Promulgation of Disaster Management Act 57 of 2002
2004	28 May – Draft National Disaster Management Framework (NDMF) is published for public comment

Table 2. Chronological development of Disaster Medicine in South Africa

In South Africa, the Disaster Medicine Act, defines a disaster as an event that causes severe disruption to a society with possible human, material or environmental losses.

The Disaster Medicine Institute of South Africa (DMISA) was established in 1985 as the Civil Defence Association of South Africa¹⁷. It is a self-governing body that liaises closely with the South African National Disaster Management Centre (NDMC). The 1990s saw the UN introduce the International Decade for Natural Disaster Reduction (IDNDR) and the world started to shift its focus from reacting to disasters to prevention, mitigation, relief and preparedness. This resulted in a change in approach from a purely military model to one which involved civilian stake holders. The 1990s also saw the DMISA undergo various name changes¹⁷.

1994 – Civil Protection Association of South Africa

1996 – Emergency and Disaster Management Association of South Africa

1998 – Disaster Management Association of South Africa

2000 – DMISA

The 1990s also resulted in the UN Disaster Management Training Programme (UNDP), developed by the UN Disaster Relief Organisation (UNDRO) being offered in South Africa.

The Intergovernmental Committee on Disaster Management (ICDM) is established by the President of South Africa as specified in Section 4 of the Disaster Medicine Act. This committee consists of Members of Parliament, cabinet members, Provincial Executive Council members as well as representatives from organised and local government. This committee is chaired by the Minister of the Department of Provincial and Local Government and serves to advise cabinet on disaster medicine issues.

The National Disaster Risk Management Framework (NDMF) which was founded in May 2005 guides and informs all aspects of disaster risk management for the whole of South Africa and comprises four key performance areas and three supportive enablers to achieve the objectives set out in key performance areas. This framework is a requirement according to the Disaster Medicine Act.

- Key Performance Area (KPA) 1 focuses on establishing the necessary institutional arrangements between national, provincial and municipal bodies to institute disaster risk management.
- KPA 2 recognises the need for disaster risk assessment and monitoring to set priorities, guide risk reduction and monitor the effectiveness of such efforts.
- KPA 3 focuses on disaster risk management planning and implementation to produce plans, programmes and projects to decrease disaster risks.
- KPA 4 looks at disaster response, recovery and rehabilitation.
- Enabler 1 entails the development of a sophisticated communication and information system for disaster risk management.
- Enabler 2 concentrates on the development of education, training, public awareness and research.
- Enabler 3 looks at the funding of disaster risk management in South Africa.

The National Disaster Management Centre (NDMC) is the highest administrative executive authority for disaster management in South Africa. Its aim is to promote an integrated and co-ordinated system of disaster management and to establish and maintain institutional arrangements that will enable the implementation of the provisions of the Disaster Medicine Act. The Centre is also responsible for the

collection of data pertaining to disaster management and disaster risk reduction in South Africa. The Centre also has the responsibility of training and recruiting volunteers and the community in the sphere of disaster medicine. The NDMC must also keep a comprehensive directory of the involved parties in Disaster Medicine in the country. The NDMC is also fundamental in the drawing up of disaster management plans and strategies.

The National Disaster Management Advisory Forum (NDMAF) is a national body composed of governmental and external representatives who make recommendations to the ICDM on issues concerning the NDMF. One of the forum's main functions is to give advice to a broad group of interested parties on any matters pertaining to disaster management. The forums comprise members from national and provincial government and a wide range of organisations with a vested interest in disaster management.

The National Interdepartmental Committee on Disaster Management (NIDMC) serves as a link between different levels of government in order to structure and co-ordinate their planning of disaster management strategies.

Recent events in Cape Town over this winter period have again emphasised how important it is to have disaster plans in place. The first was the flooding caused by days of continuous rain which resulted in thousands of residents of informal settlements having to be evacuated out of their homes into other makeshift accommodation. This is a yearly occurrence in Cape Town. Not enough permanent housing is available in the city and there is constant expansion of the informal settlements as people move into the area. Many families have no other option for housing and have to build makeshift structures on low lying ground that is prone to

flooding. The World Cup is being held over June-July which is precisely in the rainy season. The city's disaster management structures will be stretched to the limit if a major incident connected to the tournament were to occur at the same time that thousand of flood victims are being assisted.

The second event was the recent spate of xenophobic attacks which was not localised to Cape Town but involved many areas in South Africa. As with the floods, thousands of people fled their homes and had to be sheltered in locations around the city as well as having their basic needs of food, shelter and clothing catered for. This was an event that happened unexpectedly and serves to reinforce that there is no guarantee that a city's disaster management structures and resources will be fully available should a major incident occur.

A natural or man-made disaster used to be an event that required reaction from a variety of local and national agencies but over the years as more experience has been gained from reacting to disasters, there has been a shift towards the prevention and mitigation of disasters. Leading on from that came the focus on disaster risk management which looks closely at a community and the possible ways to lessen the impact a disaster would have on such a community. The International Strategy for Disaster Reduction defines disaster risk reduction as *"the systematic development and application of policies, strategies and practises to minimize vulnerabilities and disaster risk throughout a society to avoid (prevent) or to limit (mitigate and prepare) adverse impacts of hazards, within the broader context of sustainable development."*¹⁸

MASS-GATHERING MEDICINE

This is a concept that is fairly new to South Africa although research has been done in this area for many years overseas. The FIFA 2010 World Cup will constitute the largest amount of mass-gathering events over one month that have ever occurred in Africa. The fact that this is a planned event contributes to the prevention, mitigation and preparedness of disaster planning. Research over the past 20 years has helped the world better understand the different facets that make up this phenomenon. Large gatherings of people have become a common occurrence but despite this, our understanding of the mechanics of mass-gatherings is still not complete. Despite the obvious planning and preparation that goes into such an event, they are actually more hazardous than one would think.

Wilbert-Lampen et al¹⁹ looked at the relationship between emotional stress and the occurrence of cardiovascular events during the World Cup Soccer tournament which was held in Germany in 2006. Both men and women had an increased incidence of experiencing a cardiac event on the days that Germany played compared to a control period of time. The highest incidence was in the first 2 hours after the commencement of a game. The majority of patients were known to have cardiovascular disease. Prevention and mitigation for these observed results is difficult and the onus does fall onto the patient and medical doctor to ensure that their treatment is maximal and that they apply behaviour modification strategies to limit the emotional stress that they experience. Preparation, however, is a variable that can be manipulated in order to ensure that the responding medical staff and hospital emergency centres are aware of the increased incidence of serious cardiac events during the World Cup.

Several factors have been described by Milsten et al²⁰ which have a profound effect on the demand for health care during mass-gatherings. These well known influences include:

- the weather (ambient temperature and humidity)
- event duration
- locality of event (indoors or outdoors)
- whether the crowd is seated or mobile for the duration of the event
- if the crowds are contained by fencing or uncontained
- the type of event
- availability of alcohol and/or drugs
- crowd density and geography of the terrain

Although these factors do not accurately pinpoint why certain adverse events occur at a mass gathering, they do help to illustrate that there is already a vast amount of knowledge that has been collected.

There is currently no internationally accepted definition of a mass gathering²³. Some authors use the number of people present as the only definable variable but there have been suggestions that it can be described as an event where a large amount of people are present and access to medical care may be restricted due to the number of people present as well as the locality of the event.

There is a paucity of research into mass-gathering medicine and the staging of the World Cup in South Africa will be a challenge and a test of the current systems in place. There are as of yet, no internationally accepted gold-standards. 2010 will

serve as a valuable exercise for South Africa as well as the rest of the world in order to gain more experience in the coordination of a massive crowd event. Paul Arbon alluded to various areas of research that need attention in his comprehensive review of mass-gathering literature which was published in *Prehospital and Disaster Medicine*²¹. These included :

- focusing on vulnerable populations,
- prevention and/or mitigation of health effects of mass gatherings,
- the adoption of standard terms, definitions and data points and a research framework,
- research into non-traditional and unexpected mass gatherings,
- the assessment of the potential for disasters or catastrophes during mass gatherings and
- assessing workload, patient flow and outcomes utilising frameworks existing in-hospital management research

Morimura et al published a paper in *Prehospital and Disaster Medicine* in 2004 which focused on patient load data from the FIFA World Cup held in Korea/Japan in 2002²². It is an interesting study emphasising the importance of integrated planning and data collection in order to develop a standardised approach to emergency health provision in the event of a mass-gathering.

It is clear from the data collected and research done so far into mass-gathering medicine that we still have much to learn and the FIFA 2010 World Cup provides South Africa with an extremely important opportunity to contribute to the global

understanding of the dynamics of mass-gatherings. It is vital that accurate data collection occurs so that this information can be analysed in order to expand our current knowledge.

There are no published data on the capability of hospitals in the Western Cape to deal with major incidents. This descriptive study will help to ascertain what structures and planning is already in place and what possible changes need to be made before the FIFA World Cup commences in 2010.

CHAPTER 2 : AIM

The aim of this study was to describe the current state of disaster preparedness in hospitals in the public sector in the Western Cape.

In order to achieve this aim, the study had the following objectives:

- Undertake a self reported assessment of state of readiness at all Western Cape public sector hospitals
- Identify shortfalls in the preparedness in these facilities, and make focussed recommendations to address these (on an individual facility basis)
- Identify best practice in preparedness in these facilities, and disseminate such information to other hospitals
- Make recommendations for improving the state of readiness for disasters in Western Cape public sector hospitals

CHAPTER 3 : LITERATURE REVIEW

The following databases were searched for the literature review for this study:

- Medline 1966 – Present
- Pre-Medline
- EMBASE 1982 - present

The following general search terms were used:

Disaster Medicine (+/- Planning)

Major Incident (+/- Planning)

Disaster (+/- Planning)

Soccer World Cup

FIFA

In addition, Google scholar was searched using the same terms.

All retrieved articles were assessed for topic relevance by reviewing the abstract. All relevant articles had their reference lists scanned for more pertinent articles.

A total of 9653 articles were retrieved, of which only 62 articles were deemed to be useful.

Despite the long history of the FIFA Soccer World Cup, there are very few published articles focusing on World Cup disaster planning.

CHAPTER 4 : METHODS

As part of the planning for the FIFA 2010 World Cup, the National Department of Health appointed an expert committee to coordinate improvements in disaster medicine throughout the country. One of the actions of that committee was to develop a Self Reported Assessment questionnaire for both hospitals and EMS.

The questionnaire is presented at Appendix A, and comprises four different assessment forms:

- Hospital overview
- Emergency Centre
- Disaster Planning
- Sexual assault survivor services

The forms were sent by the workgroup to all hospitals across the country, including both private and public. Completed questionnaires were entered onto a purpose built database (Verticalapps, 2008).

For the purposes of this study, all data relating to public hospitals in the Western Cape were analysed.

Inclusion and exclusion

All public sector hospitals in the Western Cape were eligible for inclusion. Hospitals were excluded if the questionnaire was not returned, or if they were not within the public sector.

Database

All data pertaining to hospital disaster planning were extracted from the FIFA database to Microsoft Excel (©Microsoft, Virginia, 2007).

All data were cross checked against the submitted questionnaires, and amended if found to have been entered incorrectly. For unclear, missing or discrepant data, the person who had completed the form was contacted and data confirmed.

Data analysis

Basic descriptive analyses were undertaken using Microsoft Excel 2007 for Windows.

Ethical considerations

The database was held on a password protected work computer. Ethical approval for the study was obtained from the Health Sciences Faculty Research Ethics Committee of the University of Cape Town (REC REF: 028/2008).

CHAPTER 5 : RESULTS

RETURNS

Of 41 public sector hospitals sent the questionnaire, 27 (68%) provided completed data on disaster planning. Fourteen hospitals (35%) provided incomplete data or did not return the forms, and so were excluded from the study.

Of the 27 respondents, three (10%) were central (tertiary) hospitals, eight (28%) were regional and the remainder district level.

QUESTIONNAIRE

The results are presented under the relevant headings from the questionnaire.

Hospital disaster planning

92.5% of hospitals have disaster plans in place: 100% for central, seven (87.5%) regional hospitals and 15 (93.7%) district hospitals. Just over half the Western Cape public hospitals (56%) have a dedicated multidisciplinary disaster planning committee which includes administrative members and controlling staff, and a similar number (50%) have a collaborative relationship with other health services (which include local EMS, local disaster management, provincial health department, local health department and the regional military health service). Only one district hospital did not have such a collaborative relationship with their local health services.

Detailed plans for internal and external disasters were available in 78% of hospitals (this included all three central, 80% of metropole regional, 66.6% of rural regional

and 75 % of district hospitals); 14.8% have not widely distributed the plan, or do not have it readily available throughout the facility. This translates to one metropole regional and three district hospitals. The latest version of the disaster plan was only available to the user at 33% of facilities. The majority of central and rural regional hospitals had good version access as opposed to the metropole regional and district hospitals.

What constitutes a major incident for that specific hospital was clearly specified in 67% of hospitals; however, only one third have included an assessment of local hazards and risks in their planning, although two thirds have included contingency plans for when routine emergency resources and facilities are inadequate. Only 15% of hospitals include specific procedures for dealing with a chemical/biological or radiation incident in their planning. The only hospitals that have these procedures as part of their plan include two central hospitals (one of which is the provincial referral centre for radiation incidents) and two metropole regional hospitals.

No.	Question	Yes answer				
		Total	District	Rural Regional	Metropole Regional	Central
1	Does the facility have a disaster plan?	93%	94%	100%	80%	100%
2	a. Is there a disaster planning committee?	56%	56%	67%	40%	67%
	b. Is it multi-disciplinary and include administrative members?	52%	56%	67%	40%	67%
	c. Do all the controlling staff serve on the committee?	44%	56%	67%	20%	0%
3	Is there currently a collaborative relationship with:- Local Emergency Medical Services (EMS) and hospitals (provincial and private)	93%	88%	100%	100%	67%
	Local Disaster Management	48%	44%	67%	40%	67%
	Provincial Health Dept	82%	81%	67%	80%	100%
	Military Health Service in the region (if applicable)	22%	19%	0%	20%	67%
	Local Health Department	48%	44%	67%	40%	67%
4	Does the plan detail actions to be taken for both internal and external disasters?	78%	75%	67%	80%	100%
5	Is the plan widely distributed and readily available throughout the facility?	85%	81%	100%	80%	100%
6	Does the plan have version controls within it to ensure that the user has the latest version?	33%	25%	67%	20%	67%
7	Does the plan state clearly the circumstances that would constitute a major incident for the hospital?	67%	69%	67%	60%	67%
8	Does it provide an assessment of local hazards / risks?	33%	38%	33%	20%	33%
9	Does it address how the hospital will manage a mass casualty incident where routine emergency resources and facilities are inadequate?	67%	63%	100%	60%	67%
10	Does it cover specific arrangements for dealing with a chemical / biological / radiation incident?	15%	0%	0%	40%	67%

Table 3. Table of questions 1 - 10 from self-assessment questionnaire including percentage of total affirmative results and percentage breakdown according to hospital.

Surveillance

In terms of perceived surge capacity, the total number of patients that can be handled at any one time in the provincial emergency centres is 1004. Only 26% of facilities have any realistic idea of their current surge capacity.

Patient Priority (triage colour)	Median, Range
Priority one (red/orange)	4 (1 – 16)
Priority two (yellow)	8 (2 – 64)
Priority three (green)	20 (0 – 54)

Table 4. Table of numbers of treatable patients in Emergency Centres in the Western Cape

Identification of authorised personnel

The majority of hospitals (78%) have a designated medical commander and have identified key personnel in their disaster plan; the same percentage has a notification system in place to alert staff. District hospitals were less likely to have identified key personnel. Only 59% of hospitals felt that the relevant personnel were familiar with the plan, and only 63% of hospitals have action cards. Action cards are not utilised at one central hospital, 40% of metropole regional, 33% of regional rural and 56% of district level hospitals.

No.	Question	Yes answer				
		Total	District	Rural Regional	Metropole Regional	Central
12	Has the facility designated a medical commander who will be responsible for the hospital's medical responses during the time the plan is activated?	78%	75%	100%	80%	67%
13	Have other key position holders who have a role in disaster management been identified?	82%	75%	100%	60%	100%
14	Is a notification system in place that can alert personnel to a potential disaster situation?	78%	75%	67%	80%	100%
15	Are those who are expected to implement and use the plan familiar with it?	59%	56%	67%	60%	67%
16	Have action cards been developed for all personnel involved in disaster response?	52%	44%	67%	60%	67%

Table 5. Table of questions 12 - 16 from self-assessment questionnaire including percentage of total affirmative results and percentage breakdown according to hospital.

Activation of the plan

Over 60% of hospitals specified the criteria necessary to activate their hospital disaster plan as well as having guidelines and procedures to escalate or step down the disaster response.

Alerting system

Eighty one percent of hospitals specified how notification in the hospital would occur, as well as having a detailed system for recalling staff back on duty.

Response

Internal disaster plans are available for 74% of hospitals, and two-thirds have a recognised system of responding to and sending resources to an external disaster. Less than 20% of hospitals have dedicated facilities to receive and treat contaminated patients. Only two hospitals (one central and one district level) have a separate entrance to the Emergency Centre for decontaminated patients and have a dedicated water system to accomplish decontamination. Only one hospital of central, metropole regional and rural regional stratification have some but not all aspects of a decontamination system. Sixty one percent have established communication links between themselves and other local agencies that would be involved in a disaster response. Almost one-third of hospitals would be able to make provision for extra mortuary facilities and for the preservation of forensic evidence. Only 22% have special arrangements for unaccompanied minors. This group includes one central, one rural regional and four district hospitals.

No.	Question	Yes answers				
		Total	District	Rural Regional	Metropole Regional	Central
21	Has the hospital developed internal disaster plans for internal emergencies?	74%	69%	100%	80%	67%
22	Has the hospital developed plans indicating how it will be able to supply resources and personnel in response to an external disaster?	67%	56%	100%	60%	100%
23	In the Emergency Centre section of the plan, are the following detailed? <ul style="list-style-type: none"> Is there a separate entry to the EC for contaminated patients? 	11%	6%	0%	0%	67%
	<ul style="list-style-type: none"> Is there a dedicated facility, area, or portable device for decontamination? 	15%	6%	33%	20%	33%
	<ul style="list-style-type: none"> Is there a hot and cold water supply to the decontamination area? 	19%	6%	33%	20%	67%
	<ul style="list-style-type: none"> Can water run-off from the decontamination area be contained? 	15%	6%	0%	20%	67%
	<ul style="list-style-type: none"> Can the ventilation system in the EC be isolated from the rest of the hospital? 	33%	31%	33%	40%	33%
	<ul style="list-style-type: none"> Is a communication method established within the EC so communication can be established and maintained with the local EMS Agencies, Disaster Management, SAPS, and the local Health Department? 	59%	56%	0%	80%	67%
24	Does it make provision for additional mortuary facilities?	37%	31%	33%	40%	67%
25	Is provision made for preservation of forensic evidence?	26%	19%	67%	0%	67%
26	Does it cover special arrangements for unaccompanied children?	22%	25%	33%	0%	33%
27	Does it cover arrangements and facilities for decontamination of casualties where potential contamination is identified before entry to the hospital?	19%	6%	33%	40%	33%

Table 6. Table of questions 21 - 27 from self-assessment questionnaire including percentage of total affirmative results and percentage breakdown according to hospital.

Hospital Disaster Operations Centre

Between 60-72% of hospitals have developed standard operating procedures for a Hospital Operations Centre, have made alternative communication arrangements should the existing system fail, and have plans to alert and establish a control team. Only 29% specified where the Hospital Operations Centre would be situated.

Security

Most facilities (85%) have a method to close down their facility to control access and egress, but less than half (45%) have actually tested this system. Half of all hospitals do not have a defined plan to control vehicular and pedestrian traffic in the event of a major incident. Four hospitals (one metropole regional and three district level facilities) do not have a security system in place to close down the facility. Conversely eight hospitals (one central, two metropole regional and five district) have all components of a tested security system.

Communication systems

Approximately half of the disaster plans have contingency plans should the existing communication system fail. The facilities that do not have any contingency plans in place are all district level hospitals.

Internal traffic flow and control

The control of internal traffic flow in has been detailed in 59% of hospitals. This includes two central and six regional hospitals.

External traffic flow and control

The majority of hospitals have considered the impact of external traffic on the flow into the hospital grounds as well as possible exit points. This includes all central, 87.5% regional and 50% of district hospitals. The majority (63%) have also specified areas for ambulances, supply vehicles and authorised personnel.

Visitors

Less than half of hospitals (40.7%) have made provision in their plans for the influx of family members and visitors to the receiving hospital and established designated areas for waiting rooms. 18% (including one central, two metropole regional, one rural regional and one district hospital) have clear instructions on dealing with the arrival of VIPs.

Media

Only 40% of hospitals have allocated a specific area in the hospital to house the media and have identified areas suitable to hold press briefings. This is achieved by all three central hospitals, by four metropole regional, one rural regional and four district hospitals. A total of 70% have a designated internal spokesperson to liaise with the media.

Reception of casualties and victims

The majority (74 – 85%) of hospitals have a system of flow within the emergency centre for triaging and identification of patients as well as plans for the movement of patients out of the unit. More than three quarters have plans in place to address the hospital's surge capacity. The majority of hospitals have an efficient plan to obtain documentation for the disaster victims and have designated areas to attend to the victims and have quick access to extra stock and supplies that may be needed. 29% have an approach to segregate contaminated disaster victims from the rest of the hospital. The hospitals that do not have these reception policies in place were mainly district level facilities.

No	Question	Yes answers				
		Total	District	Rural Regional	Metropole Regional	Central
45	Is there a precise plan of action whereby at short notice (within 1 hour), multiple casualties can be received and:					
	• Triage	82%	69%	100%	100%	100%
	• Identified and registered	82%	69%	100%	100%	100%
	• Treated in designated treatment areas	82%	69%	100%	100%	100%
	• Admitted or transferred	85%	75%	100%	100%	100%
	• Transported as needed	74%	63%	100%	100%	67%
46	On the notification of a disaster, does the plan provide for:					
	• Clearance of all non-emergency patients and visitors from the EC	74%	69%	67%	80%	100%
	• Cancellation of all elective admissions and elective surgery	78%	75%	67%	100%	67%
	• Determination of rapidly available or open beds	82%	75%	67%	100%	100%
	• Determination of space that can be converted to patient care areas	74%	75%	67%	80%	67%
	• Determination of number of patients who can be transferred or discharged	82%	75%	67%	100%	100%
47	Is the receiving and sorting area accessible and in close proximity to the areas of the hospital in which definitive care will be given?	82%	75%	100%	80%	100%
48	Is reception area equipped with auxiliary power for illumination and other essential equipment?	89%	75%	67%	100%	100%
49	Are sufficient equipment, supplies, and apparatus available, in an organized manner, to permit prompt and efficient disaster casualty management?	89%	81%	100%	100%	100%
50	Are the medical records and admission departments organized to handle an influx of casualties	82%	75%	100%	80%	100%
51	Is there a plan to segregate/isolate disaster victims from the rest of the hospital if those victims are contaminated (e.g. hazardous materials)?	30%	25%	0%	40%	67%
52	Does it identify the wards that may need to be used?	56%	50%	33%	60%	100%

Table 7. Table of questions 45 - 52 from self-assessment questionnaire including percentage of total affirmative results and percentage breakdown according to hospital.

Hospital evacuation

Sixty percent of hospitals do not have a clear plan in place to facilitate the quick discharge of patients or to transfer existing patients to other local health facilities. These hospitals were mainly district level but also included two of the three central hospitals.

Hospital out of communication or cut off from resources

In the event of a breakdown in channels of communication or services to the hospitals concerned, 70% have a designated person responsible for auxiliary power. Less than half (40%) have an assigned position for food and water rationing and waste and garbage disposal. 60% considered the rest and rotation of staff in their plan.

Equipment, services, facility and lab assessments

There was a wide range of equipment available for disaster management. The details are shown in table 8.

Equipment	Median, Range
Adult ventilators	2 (0-104)
Paediatric ventilators	1 (0-22)
Suction machines	16 (0-180)
Stretchers	10 (2-406)
Intravenous pumps	6 (0-700)
Beds	90 (15-940)
Wheelchairs	6 (2-108)

Table 8: Median and ranges of equipment in hospitals in the Western Cape

It is claimed that all but one hospital has adequate supplies maintained and readily available.

Pharmaceuticals

All levels of hospitals have adequate stocks of basic emergency drugs (Atropine, Morphine, Adrenaline and bronchodilators) and intravenous resuscitation fluids.

Post disaster recovery

Less than half (48%) of hospital plans have clear methods to deal with the post disaster recovery stages. The remaining 52% are mostly district level hospitals.

No.	Question	Yes answers				
		Total	District	Rural Regional	Metropole Regional	Central
57	Does the plan designate who will be in charge of recovery operations?	37%	50%	0%	40%	0%
58	Does the plan make provision for the following during recovery?					
	• Documentation	52%	50%	67%	80%	0%
	• Financial matters	44%	50%	33%	60%	0%
	• Inventory and re-supply	48%	50%	33%	60%	33%
	• Record preservation	48%	50%	33%	60%	33%
	• Hazard removal and cleanup	41%	44%	33%	40%	33%
	• Garbage and waste disposal	44%	50%	33%	40%	33%
	• Utility and equipment servicing	37%	44%	33%	40%	0%
	• Physical plant restoration and renovation	22%	25%	0%	40%	0%
• Formal documented debrief	26%	31%	0%	20%	33%	

Table 9. Table of questions 57 & 58 from self-assessment questionnaire including percentage of total affirmative results and percentage breakdown according to hospital.

Education and training

The majority of hospitals do not have a dedicated disaster plan training programme, or educate their new staff as to the institution’s disaster plan.

Exercising the disaster plan

Seven percent of hospitals exercise their disaster plan bi-annually; 28% ensure that all key players are familiar with the plan. Only two hospitals complied with both.

Incident command system

Almost half (48.5%) of disaster plans have identified personnel to fill each of the roles in the Incident Command System.

CHAPTER SIX : LIMITATIONS

Although every effort was made to contact the 14 hospitals who did not return their assessments, this missing information could have changed the results. However, as those hospital which did not return data were all small rural district hospitals, which will have little (if any) role during the FIFA 2010 World Cup, this is not considered to be a serious limitation in interpretation of the data.

This study was limited by use of self reported assessments. This could have resulted in respondent error or deliberate mis-information. Only missing data were traced by contact with the relevant person at the respective hospital: no other checks of data integrity were performed. However, it is very likely that any mis-information would have been in the favour of the hospital (i.e. overstating their degree of preparedness) and therefore the results of this study should be seen as a best case scenario. Visiting each hospital individually with the same data collector would have minimised any errors from this method. However, this project formed part of a national survey and assessment and it was important, therefore, that identical methodology be followed throughout the country.

CHAPTER SEVEN : DISCUSSION

Research into the state of hospital preparedness in South Africa has never been undertaken. The FIFA World Cup has served as the catalyst for the country as a whole to examine hospital disaster plans currently in place.

The question, “How is hospital disaster preparedness measured?” does not have a straight forward answer. Despite ongoing research into this topic, it is still difficult to define what complete hospital preparedness is. A “generic” scoring system for disaster preparedness has yet to be developed²³. Worldwide efforts are being made to establish an assessment tool which will be able to review the current response plan for an emergency that a hospital has in place. This tool should be able to identify strengths and weaknesses in the plan which should be addressed before the plan ever needs to be implemented.

Adini, B²⁴ has proposed the use of the preparedness pyramid which helps define the key components necessary for major incident preparedness. This includes planning and policies, equipment and infrastructure, knowledge and capabilities and training and drills. The ideal assessment tool must be focused on ascertaining the parameters of preparedness and what standards of performance are necessary. The findings need to be recorded and the system also needs to be evaluated.

A prospective, observational study conducted in America²⁵ assessed three different methods of accessing hospital disaster preparedness. An on-site survey, a structured evaluation tool and video analysis of team performance in the hospital incident command centre were all analysed. The disparate results imply that each different assessment method used contributed to assimilating information from different

aspects of a hospital disaster plan. A major stumbling block in assessing hospital disaster preparedness is the fact that there is no standard to compare to and there is no internationally accepted evaluation tool which can be universally implemented.

Numerous studies that have been conducted demonstrate that there are components of every hospital major incident plan that have certain aspects which are lacking. Lewis and Aghababian²⁶ emphasize that the initial response of a hospital to a major incident is closely linked to the awareness amongst the involved staff of the plan and that realistic drills are an integral part of training.

Research conducted into public health preparedness for mass casualty events in the United States²⁷ by means of a survey demonstrated that only a few states had implemented the correct programmes to effectively and efficiently handle a mass-casualty event. This study was conducted after the September 11 terrorist attacks when there had been more focused attention on improving disaster plans and implementation. More recently, in October 2006, in its National Report Card on the State of Emergency Medicine issued by the American College of Emergency Physicians (ACEP), the country's major incident preparedness efforts were given a grade of C-plus²⁸. Irwin Redlener MD, an advocacy and disaster preparedness expert at the Columbia University Mailman School of Public Health stated, *"we're a long way from being in a place where we can say the country is safe and secure against most major threats and that we're ready and prepared to deal with whatever happens"*²⁹.

Various studies in the United Kingdom have also reached the same conclusions as those done in the United States of America. In 1996, an analysis was done on the disaster plans of 63% of all British hospitals which had an Emergency Department

receiving more than 30 000 pts per year³⁰. Only 4% of plans included all specified elements of hospital major incident planning. The rest of the hospital plans which were received lacked certain components which included: standard alerting messages, action cards, handling of important visitors, relatives and press and plan audit.

Six years later, the British Medical Association (BMA) warned that the United Kingdom would be insufficiently prepared for the possibility of a terrorist attack using biological or chemical weapons because there was a lack of awareness about response plans³¹. In the same year, Edwards et al³² conducted a survey in the largest acute National Health Service (NHS) trust of the South West of England to ascertain the knowledge medical staff had on their local major incident plan. The results reflected the statement made by the BMA and a recommendation was made for hospital trusts to concentrate on staff training. An audit was published in the Annals of the Royal College of Surgery of England³³ and this again highlighted the widespread ignorance surrounding major incident plans that existed amongst clinicians.

The last two decades have seen research emerging on mass gathering medicine and these events are now used to assimilate important information regarding appropriate preparation and response. Flabouris et al³⁴ researched the use of incident reporting as a quality monitoring and improvement tool during the deployment of medical teams for the 2000 Sydney Olympic Games. This exercise was useful in indentifying incident contributing factors.

The FIFA Soccer World Cup held in Korea/Japan in 2002³⁵ served as the perfect opportunity to collect data on mass gathering events. This research was able to examine patient presentation rates per 1000 spectators per game and it helped to identify risk factors for patient presentations. Mass gathering events on this scale do not occur regularly and each event should be utilised to obtain as much data as possible to influence decision making at future events. Research performed on data collected at the first East Asian Football Championship and the 24th European/South American Cup in Japan by Morimura et al²² in 2005 also reiterated the importance of data collection and analysis of mass gathering events.

A lot of mass gathering event data is collected retrospectively but the 2005 World Championship Games in Athletics in Helsinki³⁶ was used as an opportunity to collect prospective data. Important observations were made from the information gathered and the preparedness and resources were deemed to be sufficient for the event.

The data that was collected from government hospitals in the Western Cape reflects what overseas studies have found. In general, certain aspects of major incident plans are covered whereas there are deficiencies in other areas. These results show that although the majority of hospitals have a disaster plan on place, certain aspects (such as staff familiarity, the logistics of the disaster plan execution, post disaster recovery, staff education and training and exercising the plans) are lacking to ensure the optimal response to a disaster.

A high percentage of hospitals have disaster plans. It is of concern that some hospitals do not have a plan in place. It might be expected that the district hospitals because of their rural locality, lack of resources and small capacity would have the least number of disaster plans but it is in fact the regional hospitals. A disaster plan is a necessary component of any emergency centre. There is still time available before the beginning of the FIFA 2010 Soccer World Cup for the mentioned hospitals to draught and implement their facility disaster plans. It may be expected because the formalisation of disaster medicine in South Africa has only occurred fairly recently that there may still be shortcomings in certain plans at certain hospitals. Planning should include all levels of hospital management and clinical input is essential but lacking in 44% of hospitals. The collaboration with external health services is also poor. Each hospital's position in the province is important and this is an important consideration when focusing on the impact that a hospital's location has on the type of disaster that could occur in their drainage area. Likewise, the possible internal disasters differ from a tertiary level hospital compared to a district one. One of the perceived problems of disaster plans is that they tend to be kept in inaccessible areas and are not well distributed which results in a suboptimal disaster response. Time is a luxury that is not always available in a disaster situation. The plan is often activated and put into action immediately and the response needs to be quick and coordinated. This is why major role players need to be familiar with the plan and there should be regular opportunities to perform disaster exercises. Numerous studies have proven that very often disaster plans are not well distributed and staff are not often aware of them^{30,32,33}.

Despite the fact that South Africa's only nuclear power station, Koeberg, is situated just outside Cape Town, only four hospitals in the province have specified procedures to deal with a radiation or chemical/biological incident. These types of disasters are rare but if there isn't a structured plan in place at the receiving facility then these hospitals can themselves become contaminated and the scale of the disaster increases. Fong F et al³⁷ in 1996 raised the issue of lack of knowledge amongst emergency doctors in dealing with radiation incidents in the United States of America.

The Western Cape does have a large capacity of to treat patients in the Emergency Centres. The largest numbers of patients that can be seen are of the Triage Sort colour green (priority three). Increasing a hospital's current capacity into surge capacity is an important component of the disaster plan. Surge capacity is the maximum patient load a hospital or medical system can handle or it can be described as the ability of a facility to expand its normal capacity to accommodate the increased numbers of patients that would result from a major incident or mass gathering event. There is as of yet no universally accepted concise definition of surge capacity³⁸. Certain groups use the term daily surge to differentiate from disaster surge^{38,39,40}. Kaji et al²⁵ describe staff, stuff and structure as the key components of surge capacity. This is reiterated by Hanfl Hanfling D⁴¹ where medical equipment, supplies and pharmaceuticals are recognised as important aspects of an optimal medical response during a major incident. The world wide reality as regards surge capacity is that emergency centres are routinely operating at

full capacity. Emergency Centres in the Western Cape are no exception. Because of this constant pressure on beds for admission, a hospital may implement certain measures daily in order to cope with the increasing number of patients that need admission.

The reality is that most hospitals lack enough beds, equipment and staff to respond to a large scale disaster. Certain strategies should be implemented to enable a hospital to increase its surge capacity. These include the early discharge of patients, the use of a discharge lounge, using outpatient beds as inpatient beds, using other areas in the hospital as clinical treatment areas (e.g. physiotherapy gym). An American study⁴² described the use of closed or former hospitals as step-down facilities for medically stable patients in order that more in-patient beds could be freed up. Other public areas could also be considered (local community halls, churches etc.) The state of Utah in America⁴³ used the ingenious method of supplying tractor-trailers designated as major incident response units containing basic supplies which could be dispatched to various facilities according to need to increase capacity.

Most hospitals have a designated medical commander, identified key personnel and a system to alert staff. 40% of hospitals do not have specific criteria to activate their disaster plan. This is important to prevent incorrect or inappropriate activation which has a deleterious effect on available resources. The alerting system is vital and a large percentage of hospitals do already have one in place. The correct process needs to be followed when a major incident is declared because this act will have a huge impact on the available resources of the activating hospital but

triggering a pre-rehearsed plan can help to prevent unnecessary escalation of the major incident⁴⁴.

Clark S et al⁴⁵ highlighted that although there is a national system in place in the United Kingdom to decontaminate chemically contaminated casualties, these resources could be easily overwhelmed if there were large numbers of casualties involved. Many South African emergency centres lack sophisticated systems for decontamination, and very few in the Western Cape have such systems in place already. This is not an easy problem to rectify but certain hospitals are undergoing improvements as part of the FIFA 2010 health requirements and the lack of adequate decontamination facilities is being addressed.

Forensic services including mortuary facilities are aspects of the disaster plans which are not well catered for. Not all hospitals are able to increase the size of their mortuary facilities as specific environmental conditions are ideally required (e.g. cold storage).

Vulnerable populations which include children, the elderly and disabled are also not often considered in hospital plans and this is evident because only 22% of hospitals have special arrangements for unaccompanied minors (this includes the only paediatric central hospital). These results are compatible with a Delphi study done by Carley and Mackway-Jones^{46,47} which demonstrates that only 31% of the hospitals surveyed had specific plans in place for the care of children during major incidents. A study performed after Hurricane Katrina⁴⁸ reiterated the fact that children are a vulnerable population and prevention of intentional and unintentional injuries is an important aspect of a major incident plan. Separation of children from their guardians also plays a role in psychological trauma for a child after a major

incident. The other important concept easily forgotten is that by virtue of children's anatomy and physiology, they are inherently more vulnerable than adults to major incidents including radiation, chemical and infectious disease outbreak events⁴⁹.

The establishment of SOPs (standard operating procedures) ensures that all involved personnel speak a common language during a disaster which is vital to ensure effective communication and to prevent misunderstandings. It is always a possibility that common modes of communication (including telephones, cellular phone networks and internet connections) can be affected in a disaster and the majority of hospitals do have contingency plans in place. The location of the Hospital Operations Centre is important as it serves to co-ordinate the hospital response and only one third of hospitals have considered where this should be situated.

The majority of hospitals have methods to close down their facility if needed but less than half have tested this system. If testing is not carried out then faults cannot be identified and improvements cannot be made. During the course of a disaster, the hospital is the most obvious place for concerned family members to begin to search for their relatives. This creates pressure on an already overloaded traffic system and procedures need to be followed in order to prevent a gridlock effect as regards the traffic flow.

Communication is of utmost importance during a disaster and only half of hospitals have contingency plans if a communication system failure occurred. Once communication breaks down, the response becomes fragmented, ineffectual and precious time is lost.

Just as the external traffic flow is increased during a disaster, the internal traffic is affected as well. There should be clear instructions as to the flow inside the

Emergency Centre and the rest of the hospital to ensure rapid and streamlined assistance of patients. The influx of concerned family members and curious onlookers should never be underestimated. This sudden influx can cause extreme pressure on an already overloaded environment. Designated waiting rooms with amenities and facilities need to be provided and this group of people needs to be regularly updated about the condition of their relatives. VIPs will visit hospitals and clear procedures need to be adhered to as to what access they have to clinical areas and a hospital representative needs to accompany them during their stay. All levels of hospitals were represented as regards clear plans referring to VIPs. It is essential to have a dedicated area in the hospital to house the media and to hold press briefings. This helps to contain the media to a certain extent so that the internal flow is not affected and so that patients' privacy can be respected. Another aspect of media involvement in a major incident is the fact that they serve as a vital vehicle to disseminate information to the public. Lowney W et al⁵⁰ performed a study looking at what potential obstacles were faced by media officials and public information officers when trying to engage with the public about a major incident. The results concluded that involving journalists in major incident drills and general raising of awareness might be instrumental in the way that major incidents are reported on in the media. It would hopefully ensure that information disseminated is accurate and professionally portrayed. This is a concept that hospitals could implement in their hospital planning.

Disaster casualties can quickly overwhelm the capacity of a unit and it is important for the receiving hospital to clear the existing patients out of the Emergency Centre as soon as possible. Once the casualties start to arrive, they need to be quickly

triaged and the majority of hospitals are able to complete these tasks and have a system in place to address the hospitals surge capacity. Just less than one-third of facilities are able to isolate contaminated victims from the rest of the hospital. The remaining two-thirds need to implement a strategy for such an occurrence in order to prevent the contamination of their entire facility. There is no official data but chemical incidents requiring decontamination are not common events in South Africa. This may be one reason why such a large proportion of hospitals do not have adequate decontamination facilities. When looking at local geography and industry, some hospitals may not have adequate facilities for decontamination because it is possible that they do not perceive that they have a threat.

Only 40% of hospitals have plans in place to discharge patients quickly or to transfer them to other local health facilities. This is an important step to create space and beds for the incoming disaster victims. This falls under the scope of creating surge capacity in that specific hospital.

It is probably a reflection of the current demand on electricity and recent power shortages that most of the hospitals do have a person responsible for auxiliary power. It is always difficult to predict the duration of a disaster response but it can occupy a hospital's resources for many days if not weeks depending on the size of incident. Less than half of hospitals have a dedicated post for food and water rationing and garbage disposal. These services may also be disrupted because of the disaster's effect on local infrastructure and there should be clear guidelines to follow if local services are also adversely affected. Less than two thirds of hospitals considered the rest and rotation of their staff. This again ties into the length of

disaster response. Teams need to be given adequate time to rest between shifts as the workload will be high during the initial first few days.

Much emphasis is placed on the disaster response phase but the post recovery phase is also crucial. This process examines the impact of a disaster on the hospital. Close liaison with the financial department is vital. Large amounts of stock and equipment may have been utilised and need to be replenished. Disaster documentation needs to be preserved and processed. The Emergency Centre ultimately needs to return to its pre-disaster functioning.

A big gap in the implementation of disaster plans is the lack of education and training that exists at most hospitals. Education and training are important to ensure a coordinated and effective response between all different sectors in the hospital. Exercising the hospital disaster plan is a method of monitoring and evaluating different components of the plan. The aspect of the plan to be appraised needs to be clear and specified and can be achieved by using operational or table top exercises. A vital aspect to training and awareness is hospital plan drills but they do take time to perform and government funding and buy-in to the concept is essential for success². Bartley B et al⁵¹ make a pertinent observation, *“it is very difficult to determine how much time, money and effort should be spent on preparing for an event that may not occur.”* There is a global problem in generating multi-sectorial interest and involvement in major incident preparedness.

The Incident Command System is a collapsible hierarchy which allows for the disaster response to be adaptable to different types of hospitals, different days of the week, different incidents and different staff shifts. The response initially involves a small number of staff but can rapidly expand as more personnel arrive. These allocated

roles need to have action cards so that even staff who are unfamiliar with their role understand the steps that they need to take. Only half of hospitals responding made use of action cards, this certainly needs to be addressed.

An important test of the Western Cape's, and South Africa's, current hospital disaster planning will be the staging of the FIFA 2010 Soccer World Cup. There is still time to make improvements to the system to ensure a quick, decisive and coordinated disaster response should one be required.

CHAPTER 8 : CONCLUSION

This study has shown that most hospitals in the Western Cape have a disaster plan for their facility. Most components of the disaster plans are in place but certain aspects are lacking: these include having an easily accessible plan, staff members that are familiar with it, as well as regular plan simulations and drills. Attention needs to be given to HAZMAT incidents and a database that reflects the facility's current emergency care capability and surge capacity. Action cards need to be developed in almost half the hospitals as well as plans for vulnerable populations. Education and training is vital as is the exercising of the current plan.

It is not possible to prepare for every eventuality but having defined disaster plans in place which are well known to staff members and which are practised regularly will ensure the most effective response possible.

Major incidents are not predictable and occur with very little, if any, warning. The advent of the FIFA Soccer World Cup will result in a large influx of people into South Africa and the new stadia being built nationally will be able to hold thousands of fans. Preparations for mass-gathering major incidents need to be in place. South Africa has committed to providing emergency and disaster medical care. It is critical that the disaster management aspect of the Soccer World Cup is efficient and well coordinated because this will then ensure the lowest rate of morbidity and the least number of lives lost.

This international event must be used to increase our knowledge of the dynamics of disaster medicine and should also be used by healthcare professionals as a mechanism to improve the healthcare for all South Africans.

CHAPTER 9 : RECOMMENDATIONS

General

- Complete data is required from all Western Cape hospitals: those which have not submitted data yet are to be contacted and data analysed.
- All hospitals need to have an up to date major incident plan.

Plan distribution

- Hospital managers must be urged to hold meetings with important stakeholders so that plan awareness can be raised.
- Management at every hospital should ensure that all new staff in the hospital are orientated as regards the local major incident plan.
- Each hospital clinical division must take responsibility to ensure that the plan is easily accessible in their area.

HAZMAT Preparation

- An expert committee is required, tasked with assisting hospitals to prepare for these types of major incidents.

Hospital Surge Capacity

- Hospital surge capacity must be urgently addressed.

- The Department of Health should convene a provincial surge capacity committee. This committee's major role would be to analyse the bed capacity in the province and to ascertain where surge capacity could be developed.

Decontamination

- Hospitals which are currently undergoing refurbishment or are being rebuilt need to make provision for adequate decontamination facilities.

Hospital Security

- There is no continuity as regards the security companies working at government hospitals in the Western Cape. Each hospital needs to ensure that there are security representatives involved in major incident planning, and that the security components of hospital plans are disseminated amongst all security personnel.

Communication

- The infrastructure for communication at district hospitals is poor. The Department of Health needs to consider making communication upgrades at these hospitals a priority and funding needs to be allocated accordingly.

Training

- Hospital Major Incident Medical Management and Support (HMIMMS) course training should be prioritised and expanded across the province.

Multidisciplinary Exercise

- Each geographic region must strive to hold a multidisciplinary major incident exercise before the 2010 FIFA Soccer World Cup.

Repeat Audit

- The Self Reported Questionnaire should be redistributed in early 2010 and repeat data collected to confirm that necessary changes to the major incident plans have been implemented across the Western Cape.

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APPENDICES

A - Hospital Self Reported Accreditation Questionnaire: FIFA 2010

World Cup

B - South African Triage Scale: Adult

C - South African Triage Scale: Child

D - South African Triage Scale: Infant

E - Triage Sieve

F - Triage Sort

HOSPITAL SELF REPORTED ACCREDITATION: FIFA 2010 WORLD CUP

PURPOSE

The purpose of this document is to allow hospitals to undertake a self reported assessment of their current situation.

This information is for the Provincial 2010 World Cup coordinator, to allow him / her to identify strengths and weaknesses in current healthcare provision within the province (including private sector facilities). This will allow creation of a gap analysis, and formulation of an action plan to improve healthcare provision within your region.

The information will also be provided to the Hospital and Emergency Medicine Workgroup of the 2010 Health Technical Task Team. The aim of sharing this information is to allow a national picture to be developed, in which priority areas for support and development can be identified and budgeted for.

METHOD

Appended to this document are 4 assessment forms. Each is as basic in detail as is possible, without losing utility. Assessment forms are provided for:

- **Overview**
- **Emergency Centre**
- **Disaster Planning**
- **Sexual Assault Survivor Services**

You are required to complete **each form** for all the hospitals identified in your province. Hospitals may be identified as being important to:

- Stadium
- Fan parks
- Tourists
- FIFA ViPs
- Players
- Other use

These forms are to be returned to the Provincial Coordinator by **1st October 2007**.

Please be honest when completing the forms, and provide as much information as possible. This is not an exercise to identify areas where performance is poor as a means of punishment or ridicule, but to facilitate improvements in the health system where they are needed in time for the 2010 World Cup.

Please complete each assessment in full.

All information will be treated in the strictest confidence.

**Appendix 1a
Overview: Hospital**

PERSON UNDERTAKING ASSESSMENT	
Name of person doing the assessment	
Date of assessment	
Signature of assessor	
Contact Telephone number	
Contact Fax number	
Contact Cell number	

City name	
Suburb name	
Hospital name	
Street Name	
GIS LON	
GIS LAT	

(PROVINCIAL COORDINATOR TO COMPLETE)	
Stadium	
Fan Park	
Tourism	
ViP	
Player	
Other (specify)	

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Appendix 1b
Self assessment: Hospital Emergency Centre

1. Patient Population seen in the EC (PLEASE TICK ONE ONLY):

Adult only

Pediatric only

Adult and Pediatric

2. Hospital Beds

	Ward	High care	ICU trauma	ICU surgical	ICU medical	ICU other
ADULT						
PAEDIATRIC						
NEONATAL						

3. EC beds

	Resus Beds	Trolleys (P2 / Yellow)
ADULT		
PAEDIATRIC		
NEONATAL		

4. Number of cases that can be dealt with at one time

	Resus (P1 / Red / Orange)	Trolleys (P2 / Yellow)	Walking (P3 / Green)
ADULT			
PAEDIATRIC			
NEONATAL			

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Appendix 1b
Self assessment: Hospital Emergency Centre

5. Temporary increases in treatment capability in a disaster

	Resus (P1 / Red / Orange)	Trolleys (P2 / Yellow)	Walking (P3 / Green)
ADULT			
PAEDIATRIC			
NEONATAL			

6. Percentage priority one seen in last year

	Total EC cases	Total Red / Orange	%
ADULT			
PAEDIATRIC			
NEONATAL			

7. South African Triage Scale implemented in EC (PLEASE TICK)

Yes

No

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Appendix 1b
Self assessment: Hospital Emergency Centre

HOSPITAL EMERGENCY CENTRE				
EMERGENCY ENTRANCE GATE				
No.	Question	Yes	No	Comments
1	Entrance gate manned 24/7			
2	Illuminated and Clear signage directing to EC			
EC ENTRANCE				
No.	Question	Yes	No	Comments
3	Entrance door manned 24/7			
4	Illuminated and Clear signage at entrance to EC			
TRIAGE / RECEPTION AREA				
No.	Question	Yes	No	Comments
5	Trolley / wheelchair parking (& no. of trolleys)			
RESUSCITATION AREA				
No.	Question	Yes	No	Comments
6	Unobstructed access from EC Entrance to resus			
7	Emergency power provided for essential equipment and lighting			
GENERAL TREATMENT AREA				
No.	Question	Yes	No	Comments
8	Sufficient space for staff, equipment and activity			
9	Emergency power provided for all essential equipment and lighting			
OBSERVATION WARD				
No.	Question	Yes	No	Comments
10	Observation beds in gender-defined wards of good functional condition available (state number of beds)			

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Appendix 1b
Self assessment: Hospital Emergency Centre

ORGANISATION				
No.	Question	Yes	No	Comments
11	Hospital has a disaster coordinator			
12	Hospital has an Emergency Centre Director (state his / her qualifications)			
MEDICAL SERVICES AVAILABLE 24/7				
No.	Question	Yes	No	Comments
13	The following are available 24 hours a day:			
	• Emergency Medicine			
	• General Surgery			
	• Anaesthesia			
	• Trauma surgery			
	• Orthopaedic Surgery			
	• Intensive Care			
	• Internal Medicine			
	• Obstetric/Gynaecology			
	• Paediatric Surgery			
	• Paediatrics			
	• Plastic Surgery			
	• Radiology			
	• Psychosocial support services / councillor			
EC PERSONNEL				
No.	Question	Yes	No	Comments
14	Designated doctor in charge of the EC (state qualifications)			
15	Doctor with special competence in care of critically injured / ill present in EC 24 / 7			
16	ATLS® trained personnel 24 / 7			

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Appendix 1b
Self assessment: Hospital Emergency Centre

17	ACLS™ trained personnel 24 / 7			
18	APLS™ trained personnel 24 / 7			
19	Total number EC nursing staff			
20	Number of EC nursing personnel trauma trained			
21	Number of EC nursing personnel ICU trained			
EQUIPMENT: RESUS				
No.	Question	Yes	No	Comments
22	The following equipment is available in resus:			
	Laryngoscopes			
	Endotracheal tubes of all sizes			
	Bag-mask resuscitator			
	Pocket masks			
	Oxygen			
	Pulse oximetry			
	End-tidal CO ₂ determination			
	Suction devices (portable or fixed)			
	Electrocardiograph			
	Defibrillator			
	Standard IV fluids and administration devices			
	Apparatus to establish central venous catheter venous pressure monitoring			
	Sterile surgical sets for			
	a. Cricothyrotomy			
	b. Thoracotomy			
	c. Vascular access (cutdown)			
	d. Chest decompression			
	e. Suturing			
	X-ray availability, 24 hours a day			
	Two-way communication with EMS vehicles			

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Appendix 1b
Self assessment: Hospital Emergency Centre

	Skeletal traction devices, capability for traction			
	Thermal control equipment			
	a. For patient - Patient warming			
	b. For blood and fluids - High capacity			
	c. For blood and fluids - Fluid warming			
OPERATING THEATRES				
No.	Question	Yes	No	Comments
23	Operating Theatre adequately staffed in-house and immediately available 24 / 7			
24	Thermal control equipment			
	a. For patient - Patient warming blanket			
	b. For blood and fluids - High Capacity			
	c. For blood and fluids - Fluid warming			
INTENSIVE CARE UNIT				
No.	Question	Yes	No	Comments
25	Designated director of Trauma ICU			
26	Designated director of Surgical ICU			
27	Designated director of Medical ICU			
28	Designated director of Paediatric ICU			
29	Physician with training in critical care available in ICU 24 / 7			
30	Nursing acuity Trauma ICU			
31	Nursing acuity Surgical ICU			
32	Nursing acuity Medical ICU			
33	Nursing acuity Paediatric ICU			

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Appendix 1b
Self assessment: Hospital Emergency Centre

SUPPORT SERVICES: IMMEDIATE ACCESS TO				
No.	Question	Yes	No	Comments
34	Sexual Assault Services			
35	Organised burn care			
36	Acute spinal cord management capability			
37	Acute head injury management capability			
38	Dedicated counselling services			
39	Rehabilitation			
RADIOLOGY SPECIAL SERVICES				
No.	Question	Yes	No	Comments
40	Radiological technician promptly available			
41	In-house CT technician 24 / 7			
CLINICAL LABORATORY SERVICE (AVAILABLE 24/7)				
No.	Question	Yes	No	Comments
42	Full Blood Count			
43	Urea and Electrolytes			
44	Blood Glucose			
45	Urinalysis			
46	Blood typing and cross-matching			
47	Coagulation studies			
48	Access to banked blood			
49	Blood gases with pH and lactate determinations			
50	Microbiology			

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Appendix 1b
Self assessment: Hospital Emergency Centre

QUALITY IMPROVEMENT				
No.	Question	Yes	No	Comments
51	Morbidity reviews held monthly			
52	Multidisciplinary CME held at least once a month			
ORGAN PROCUREMENT ACTIVITY				
No.	Question	Yes	No	Comments
53	EC refers all potential Organ donors to a transplant procurement program			
HELIPAD				
No.	Question	Yes	No	Comments
54	The hospital has a dedicated Heli pad			
55	Heli pad is CAA approved			
56	If no, distance to nearest landing facility			
57	Number of Helicopter landings year			
CLINICAL GOVERNANCE				
No.	Question	Yes	No	Comments
58	Hospital has clinical governance programme			

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Appendix 1c
Hospital Disaster plan: self assessment

DISASTER PLANNING				
No.	Question	Yes	No	Comments
1	Does the facility have a disaster plan?			
2	a. Is there a disaster planning committee? b. Is it multi-disciplinary and include administrative members? c. Do all the controlling staff serve on the committee?			
3	Is there currently a collaborative relationship with:- Local Emergency Medical Services (EMS) and hospitals (provincial and private)			
	Local Disaster Management			
	Provincial Health Dept			
	Military Health Service in the region (if applicable)			
	Local Health Department			
4	Does the plan detail actions to be taken for both internal and external disasters?			
5	Is the plan widely distributed and readily available throughout the facility?			
6	Does the plan have version controls within it to ensure that the user has the latest version?			
7	Does the plan state clearly the circumstances that would constitute a major incident for the hospital?			
8	Does it provide an assessment of local hazards / risks?			
9	Does it address how the hospital will manage a mass casualty incident where routine emergency resources and facilities are inadequate?			
10	Does it cover specific arrangements for dealing with a chemical / biological / radiation incident?			

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Appendix 1c
Hospital Disaster plan: self assessment

SURVEILLANCE				
No.	Question	Yes	No	Comments
11	What is the maximum number of patients that can be managed at any given time?			
	How many of these are P1?			
	How many of these are P2?			
	How many of these are P3?			
	Does the facility currently have a database of its emergency care capability and additional capacity?			
IDENTIFICATION OF AUTHORISED PERSONNEL				
No.	Question	Yes	No	Comments
12	Has the facility designated a medical commander who will be responsible for the hospital's medical responses during the time the plan is activated?			
13	Have other key position holders who have a role in disaster management been identified?			
14	Is a notification system in place that can alert personnel to a potential disaster situation?			
15	Are those who are expected to implement and use the plan familiar with it?			
16	Have action cards been developed for all personnel involved in disaster response?			
ACTIVATION OF THE PLAN				
No.	Question	Yes	No	Comments
17	Does the plan specify the circumstances under which the plan can be activated?			
18	Have activation stages been established and roles outlined with each stage?			

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Appendix 1c
Hospital Disaster plan: self assessment

	<p><i>Alert:</i> Disaster situation possible: there is an increased level of preparedness</p> <p><i>Stand by:</i> Disaster situation probable: available for immediate deployment.</p> <p><i>Call out:</i> Disaster situation exists: deployment</p> <p><i>Stand down:</i> Disaster situation is contained.</p>			
ALERTING SYSTEM				
No.	Question	Yes	No	Comments
19	Does the plan specify how notification within the hospital will be carried out?			
20	Does the plan detail responsibility to initiate a system for recalling staff back on duty?			
RESPONSE				
No.	Question	Yes	No	Comments
21	Has the hospital developed internal disaster plans for internal emergencies?			
22	Has the hospital developed plans indicating how it will be able to supply resources and personnel in response to an external disaster?			
23	In the Emergency Centre section of the plan, are the following detailed?			
	• Is there a separate entry to the EC for contaminated patients?			
	• Is there a dedicated facility, area, or portable device for decontamination?			
	• Is there a hot and cold water supply to the decontamination area?			
	• Can water run-off from the decontamination area be contained?			

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Appendix 1c
Hospital Disaster plan: self assessment

	<ul style="list-style-type: none"> • Can the ventilation system in the EC be isolated from the rest of the hospital? 			
	<ul style="list-style-type: none"> • Is a communication method established within the EC so communication can be established and maintained with the local EMS Agencies, Disaster Management, SAPS, and the local Health Department? 			
24	Does it make provision for additional mortuary facilities?			
25	Is provision made for preservation of forensic evidence?			
26	Does it cover special arrangements for unaccompanied children?			
27	Does it cover arrangements and facilities for decontamination of casualties where potential contamination is identified before entry to the hospital?			
HOSPITAL DISASTER OPERATION CENTRE				
No.	Question	Yes	No	Comments
28	Does the plan indicate where the Hospital Operation Centre is to be located (with preference given to an area away from the EC)?			
29	Have standard operating procedures been developed for the Operation Centre?			
30	Is there provision for alternative communication arrangements in the event the hospital communication system fails or is overloaded?			
31	Does the plan contain arrangements for promptly alerting and establishing a control team?			

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Appendix 1c
Hospital Disaster plan: self assessment

SECURITY				
No.	Question	Yes	No	Comments
32	Does the hospital have the ability to lock down so entry and exit to all parts of the facility can be controlled?			
	Has this process been tested?			
33	Is there a plan to control vehicular traffic and pedestrians?			
COMMUNICATION SYSTEMS				
No.	Question	Yes	No	Comments
34	Is there provision for alternative communication arrangements in circumstances where the communication system fails/overloads?			
35	Is there an organized runner, messenger system as back-up for communication system and power failures?			
INTERNAL TRAFFIC FLOW AND CONTROL				
No.	Question	Yes	No	Comments
36	Have provisions been made for internal traffic that allow for movement of patients through corridors and staff movement throughout their areas?			
EXTERNAL TRAFFIC FLOW AND CONTROL				
No.	Question	Yes	No	Comments
37	Have arrangements been made for both vehicular and people entrance to and exit from the hospital premises?			
38	Have the following been established:			
	• Uninterrupted flow of ambulances and other vehicles to casualty sorting areas or EC entrances			
	• Access and egress control of authorized vehicles carrying supplies and equipment to a dock area			
	• Authorized vehicle parking			

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Appendix 1c
Hospital Disaster plan: self assessment

	<ul style="list-style-type: none"> Direction for authorized personnel and visitors to proper entrances 			
VISITORS				
No.	Question	Yes	No	Comments
39	Does the plan include mechanism to deal with anticipated increases in visitors and curious onlookers seeking to gain entrance during disasters?			
40	Has provision been made to establish waiting areas, with supportive counselling, away from the EC to minimize unwanted access to the relatives and friends of disaster victims?			
41	Does the plan contain arrangements for dealing with VIP visits following a disaster?			
MEDIA				
No.	Question	Yes	No	Comments
42	Do the media have a designated area?			
43	Does the plan designate an internal spokesperson as a media contact?			
44	Have locations been identified for press briefings?			
RECEPTION OF CASUALTIES AND VICTIMS				
No.	Question	Yes	No	Comments
45	Is there a precise plan of action whereby at short notice (within 1 hour), multiple casualties can be received and:			
	<ul style="list-style-type: none"> Triaged 			
	<ul style="list-style-type: none"> Identified and registered 			
	<ul style="list-style-type: none"> Treated in designated treatment areas 			
	<ul style="list-style-type: none"> Admitted or transferred 			
	<ul style="list-style-type: none"> Transported as needed 			

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Appendix 1c
Hospital Disaster plan: self assessment

46	On the notification of a disaster, does the plan provide for:			
	• Clearance of all non-emergency patients and visitors from the EC			
	• Cancellation of all elective admissions and elective surgery			
	• Determination of rapidly available or open beds			
	• Determination of space that can be converted to patient care areas			
	• Determination of number of patients who can be transferred or discharged			
47	Is the receiving and sorting area accessible and in close proximity to the areas of the hospital in which definitive care will be given?			
48	Is reception area equipped with auxiliary power for illumination and other essential equipment?			
49	Are sufficient equipment, supplies, and apparatus available, in an organized manner, to permit prompt and efficient disaster casualty management?			
50	Are the medical records and admission departments organized to handle an influx of casualties			
51	Is there a plan to segregate/isolate disaster victims from the rest of the hospital if those victims are contaminated (e.g. hazardous materials)?			
52	Does it identify the wards that may need to be used?			
HOSPITAL EVACUATION				
No.	Question	Yes	No	Comments
53	Is there an organized discharge routine to handle large numbers of patients upon short notice?			
	Is there an organised plan with emergency transfer agreements to transfer patients to other hospitals in the			

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Appendix 1c
Hospital Disaster plan: self assessment

	local area?			
HOSPITAL OUT OF COMMUNICATION OR CUT OFF FROM RESOURCES				
No.	Question	Yes	No	Comments
54	In the event the hospital/healthcare facility is completely out of communication or cut off from resources, has the plan assigned position holders responsible for the following:			
	• Auxiliary power?			
	• Rationing of food and water?			
	• Waste and garbage disposal?			
	• Rest and rotation of staff?			
EQUIPMENT, SERVICES, FACILITY AND LABORATORY ASSESSMENT				
No.	Question			Comments
55	Current number of the following pieces of equipment readily available within the hospital?			
	• Ventilators (adult)			
	• Ventilators (neonate)			
	• IV pumps			
	• Suction Machines			
	• Beds			
	• Stretchers			
	• Wheelchairs			
	Current level of medical supplies maintained and readily available within the hospital, particularly items that provide personal protection (i.e. masks, gloves etc)			
PHARMACEUTICALS				
No.	Question			Comments

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Appendix 1c
Hospital Disaster plan: self assessment

56	What is the current level of stock for the following pharmaceuticals:			
	• Atropine			
	• IV fluids			
	• Morphine			
	• Adrenaline			
	• Bronchial dilators			
POST DISASTER RECOVERY				
No.	Question	Yes	No	Comments
57	Does the plan designate who will be in charge of recovery operations?			
58	Does the plan make provision for the following during recovery?			
	• Documentation			
	• Financial matters			
	• Inventory and re-supply			
	• Record preservation			
	• Hazard removal and cleanup			
	• Garbage and waste disposal			
	• Utility and equipment servicing			
	• Physical plant restoration and renovation			
	• Formal documented debrief			
EDUCATION AND TRAINING				
No.	Question	Yes	No	Comments
59	Does the plan specify who is responsible for the training program?			
60	Does the hospital have ongoing, mandatory disaster training programs?			

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Hospital Disaster plan: self assessment

61	Does the program provide disaster education material at staff orientation to facilitate staff awareness?			
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Appendix 1c
Hospital Disaster plan: self assessment

EXERCISING THE DISASTER PLAN				
No.	Question	Yes	No	Comments
62	Does the hospital program conduct a bi-annual exercise?			
63	Does the exercise ensure all key participants are familiar with the contents of the plan?			

KEY INTERNAL PERSONNEL (add to list as required)

PERSONNEL	CONTACT
Facility CEO	
Medical Superintendent (hospital manager)	
Emergency Physician (Dr in charge of EC)	
Head of Administration	
Head of Security	
Head of Nursing	
Head of Clinical Services	
Head of Support Services	
Head of Blood Bank	

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Appendix 1c
Hospital Disaster plan: self assessment

KEY EXTERNAL PERSONNEL/AGENCIES (add to list as required)

PERSONNEL	CONTACT
Local Disaster Management	
Local Public EMS	
Local Private EMS	
Provincial Health Department	
Local Law Enforcement	
Other area hospitals	

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Appendix 1c
Hospital Disaster plan: self assessment

INCIDENT COMMAND SYSTEM				
No.	Question	Yes	No	Comments
64	Have you identified positions, not an individual, to fill each role in the Incident Command System (ICS)?	<input type="checkbox"/>	<input type="checkbox"/>	

ICS POSITION	CURRENT POSITION	ACTION CARD AVAILABLE?
Hospital Medical Commander		
Hospital Nursing Commander		
Hospital Administrative Commander		
Emergency Centre Medical Commander		
Emergency Centre Nursing Commander		
Emergency Centre Triage officer		
Resident MLSO		
Senior porter		
Senior telephonist		
Medical triage officer		
Surgical triage officer		
P1 treatment team		
P2 treatment team		
P3 treatment team		

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Appendix 1d
Sexual Assault Survivor Services: self assessment

FACILITY				
No.	Question	Yes	No	Comments
1	Private room available for sexual assault survivors			
2	Private ablution facility available - for toilet and washing requirements.			
3	Clean clothing for patients - available in EC			
4	Toiletry packs for patients - available in EC			
5	Availability of counsellors - experienced / trained in sexual assault counselling			
6	Availability of survivor support person (SAPS / NGO / Trauma counselling centres)			
7	Availability of contact numbers for crisis centres in area of patients residence			
8	Number of staff members trained / experienced in assisting sexual assault survivors			
9	Lock up facility for storage of Forensic Evidence Collection Kits (FECK) and documentation in the EC			
10	Telephone list available for support services.			
DOCUMENTATION				
No.	Question	Yes	No	Comments
11	Dedicated sexual assault medical records in use			
12	National Forensic J88 in use			
13	Files in progress kept in EC in a lock up facility			
14	Dedicated area for filing and storage of sexual assault files within the EC			

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Appendix 1d
Sexual Assault Survivor Services: self assessment

EVIDENCE COLLECTION				
No.	Question	Yes	No	Comments
15	Separate register for sexual assault survivors			
16	Availability of key to lock up facility			
17	FECKs in stock in a lock up facility			
18	Used FECKs kept in separate lock up area			
19	Evidence collection register in use.			
20	Filing system in place for easy retrieval of files.			
21	Record of notification of SAPS regarding collection of FECK			
22	Record of notification of patient prior to destroying FECK after 6 months (no case opened)			
23	FECK of patients not reported to SAPS:- not older than 6 months			
24	Record of attempts to contact patient @ six months to enquire about decision on reporting case			
EDUCATION / MEETINGS				
No.	Question	Yes	No	Comments
25	Attendance Bi-monthly regional Sexual Assault meeting by Sexual Assault Coordinator			
26	CME's - 1 every six months			
27	Record of staff attendance @ training sessions / CME's			
28	Community outreach program in place			
29	Bi-monthly meetings with SAPS in your area - minutes available			
30	Bi-monthly multidisciplinary unit meetings - minutes available			

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Appendix 1d
Sexual Assault Survivor Services: self assessment

GENERAL				
No.	Question	Yes	No	Comments
31	Daily allocation of staff member responsible for Sexual Assault patients			
32	Record of statistics: New patients			
33	Record of statistics: Follow up visits			
MEDICATION				
No.	Question	Yes	No	Comments
34	Documentation regarding exactly what is given and side-effects, and how to take meds			
35	Medication issued as per protocol			
36	Receipt of medication signed by patient in patient documentation			
37	Drug register maintained for all Sexual Assault drugs; adults & paedes			
38	Pre-packed 3 day, 10 day, 15 day packs of ARV's available in unit			
BLOODS / COUNSELLING / FOLLOW UP				
No.	Question	Yes	No	Comments
39	Pre test counselling done- Councillors name documented			
40	HIV consent signed by patient			
41	Post test counselling done - Councillors name documented			
42	Record of follow up appointments recorded			
43	Follow up compliance documented			

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ADULT TRIAGE SCORE

	3	2	1	0	1	2	3	
Mobility				Walking	With Help	Stretcher/ Immobile		Mobility
RR		less than 9		9-14	15-20	21-29	more than 29	RR
HR		less than 41	41-50	51-100	101-110	111-129	more than 129	HR
SBP	less than 71	71-80	81-100	101-199		more than 199		SBP
Temp		less than 35		35-38.4		38.5 or more		Temp
AVPU				Alert	Reacts to Voice	Reacts to Pain	Unresponsive	AVPU
Trauma				No	Yes			Trauma

over 12 years / taller than 150cm

Colour	RED	ORANGE	YELLOW	GREEN	BLUE	
TEWS	7 or more	5-6	3-4	0-2	DEAD	
Target time to treat	Immediate	less than 10 mins	less than 60 mins	less than 240 mins		
Mechanism of injury		High energy transfer				
Presentation		Shortness of breath - acute		ALL OTHER PATIENTS	DEAD	
		Coughing blood				
		Chest pain				
		Haemorrhage - uncontrolled				Haemorrhage - controlled
	Seizure - current	Seizure - post ictal				
		Focal neurology - acute				
		Level of consciousness reduced				
		Psychosis / Aggression				
		Threatened limb				
		Dislocation - other joint	Dislocation - finger or toe			
		Fracture - compound	Fracture - closed			
			Burn over 20%			Burn - other
			Burn - electrical			
	Burn - circumferential					
	Burn - chemical					
	Poisoning / Overdose	Abdominal pain				
	Hypoglycaemia - glucose less than 3	Diabetic - glucose over 11 & ketonuria	Diabetic - glucose over 17 (no ketonuria)			
		Vomiting - fresh blood	Vomiting - persistent			
		Pregnancy & abdominal trauma or pain	Pregnancy & trauma			
	Pregnancy & PV bleed					
Pain		Severe	Moderate	Mild		
	Senior Healthcare Professional's Discretion					

CHILD TRIAGE SCORE

CHILD TRIAGE SCORE								
	3	2	1	0	1	2	3	
Mobility				Walking	With Help	Stretcher/ Immobile		Mobility
RR	less than 15	15-16		17-21	22-26	27 or more		RR
HR	less than 60	60-79		80-99	100-129	130 or more		HR
SBP	less than 70	70-79		80-130	131-149	150 or more		SBP
Temp		less than 35		35-38.4		38.5 or more		Temp
AVPU				Alert	Reacts to Voice	Reacts to Pain	Unresponsive	AVPU
Trauma				No	Yes			Trauma

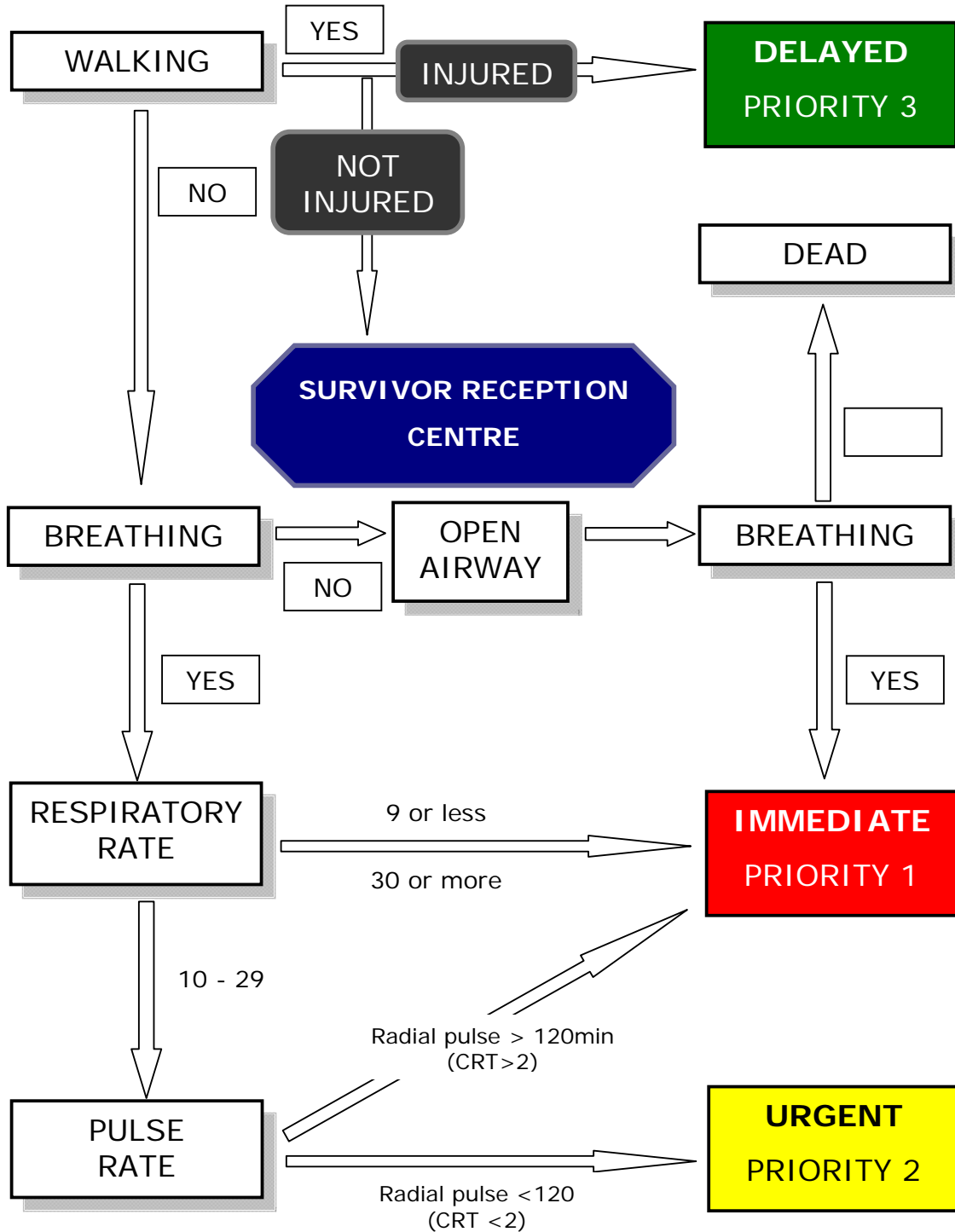
3 to 12 years old / 96 to 150 cm tall

COLOUR	RED	ORANGE	YELLOW	GREEN	BLUE	
TEWS	7 or more	5-6	3-4	0-2	DEAD	
Target time to treat	Immediate	less than 10 mins	less than 60 mins	less than 240 mins		
Mechanism of injury		High energy transfer				
Presentation	Drooling	Shortness of breath				
		Stridor				
		Wheeze				
			Haemorrhage - uncontrolled	Haemorrhage - controlled		
	Seizure - current	Seizure - post ictal				
			Focal neurology - acute			
			Level of consciousness reduced			
			Exhaustion			
			Purpura			
			Dislocation - other joint	Dislocation - finger or toe		
			Fracture - compound	Fracture - closed		
	Burn - face / inhalation		Burn over 10%			
			Burn - electrical			
			Burn - circumferential			
			Burn - chemical		Burn - other	
		Poisoning / Overdose	Abdominal pain			
Hypoglycaemia - glucose less than 3		Diabetic - glucose over 11 & ketonuria	Diabetic - glucose over 17 (no ketonuria)			
		PR bleeding	Vomiting - persistent			
			Inappropriate history			
Pain		Severe	Moderate	Mild		
Senior Healthcare Professional's Discretion						

INFANT TRIAGE SCORE								
	3	2	1	0	1	2	3	
Mobility				Normal for age		Stretcher/Immobile		Mobility
RR	less than 20	20-25		26-39		40-49	50 or more	RR
HR	less than 70	70-79		80-130		131-159	160 or more	HR
SBP	less than 60	60-69		70-110		111 or more		SBP
Temp		less than 35		35-38.4		38.5 or more		Temp
AVPU				Alert	Reacts to Voice	Reacts to Pain	Unresponsive	AVPU
Trauma				No	Yes			Trauma
younger than 3 years / smaller than 95cm								

COLOUR	RED	ORANGE	YELLOW	GREEN	BLUE	
TEWS	7 or more	5-6	3-4	0-2	DEAD	
Target time to treat	Immediate	less than 10 mins	less than 60 mins	less than 240 mins		
Mechanism of injury		High energy transfer				
Presentation	Drooling	Shortness of breath				
	Stridor	Wheeze				
		Haemorrhage - uncontrolled	Haemorrhage - controlled			
	Seizure - current	Seizure - post ictal				
			Focal neurology - acute			
			Level of consciousness reduced			
			Floppy infant			
			Purpura			
			Dislocation - other joint	Dislocation - finger or toe	ALL OTHER PATIENTS	DEAD
			Fracture - compound	Fracture - closed		
				Unable to weight bear		
			Burn - face / inhalation	Burn - other		
			Burn over 10%			
			Burn - electrical			
			Burn - circumferential			
Burn - chemical						
	Poisoning / Overdose	Abdominal pain				
Hypoglycaemia - glucose less than 3						
		PR bleeding	Vomiting - persistent			
			Not feeding			
			Not urinating			
			Inappropriate history			
			Prolonged or uninterrupted crying			
Pain		Severe	Moderate	Mild		
Senior Healthcare Professional's Discretion						

TRIAGE SIEVE



Capillary refill test (CRT) is an alternative to pulse rate, but is unreliable in the cold or dark: if it is used, a CRT of > 2 seconds indicates **PRIORITY 1**

TRIAGE SORT

STEP 1: Calculate the GLASGOW COMA SCORE (GCS)

A Eye opening:	B Verbal response:	C Motor response:
spontaneous 4	orientated 5	obeys commands 6
to voice 3	confused 4	localises 5
to pain 2	inappropriate 3	pain withdraws 4
none 1	incomprehensible 2	pain flexes 3
	no response 1	pain extends 2
		no response 1

$$\text{GCS} = A + B + C$$

STEP 2: Calculate the TRIAGE SORT SCORE

X GCS	Y Respiratory rate	Z Systolic BP
13 – 15 4	10 – 29 4	≥ 90 4
9 – 12 3	≥ 30 3	76 – 89 3
6 – 8 2	6 – 9 2	50 – 75 2
4 – 5 1	1 – 5 1	1 – 49 1
3 0	0 0	0 0

$$\text{TRIAGE SORT SCORE} = X + Y + Z$$

STEP 3: Assign a triage PRIORITY

12 = PRIORITY 3
11 = PRIORITY 2
≤10 = PRIORITY 1

STEP 3: Upgrade PRIORITY at discretion of senior clinician, dependent on the anatomical injury/working diagnosis