

**THEMATIC SESSION E1:  
DISASTER HEALTH MANAGEMENT**

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**ABSTRACTS**

**DISASTER HEALTH MANAGEMENT**

**Dr. R Manivelan**

The objective of this paper is to develop a viable, effective and comprehensive health care management plan at the national and state level to deal effectively the various natural and man-made disasters which are posing great threat to the lives of the affected people. India is one of the most flood prone countries in the world. On an average, the area affected by floods annually is about nine million hectares and accounts for one fifth of the global death count due to floods. The entire northern part of the Indian subcontinent lies in an earthquake prone belt and volcanic activity.

Frequent cyclonic storms have been causing considerable damage to life and property in the coastal areas of India. While no country can afford the high costs associated with natural disasters, the impact of these events is disproportionately higher for India due to various factors. The implications of such natural disasters for the health sector include damage to health care facilities and local infrastructure which interrupts provision of health care or destroying access routes to the facilities. An unexpected number of deaths, injuries and illnesses have an adverse impact on the local community. The other damages which include spread of communicable diseases and mental

illnesses, difficulty in providing safe drinking water to the affected people. Both remedial and preventive health care services may become difficult or impossible to provide. The ability of hospitals to function largely depends on lifelines and other basic services such as electrical power, water and sanitation, communications, and waste management and disposal. Hospital authorities, cognizant of the facts outlined above frequently produce emergency response plans-but such plans often fail to incorporate prevention and mitigation measures, or to strengthen the role of hospital disaster committees in risk management. Hence the need to incorporate measures for improving general safety and preserving the functionality of the key areas of the hospital which include emergency services, intensive care units, diagnostic facilities and food and drug storage.

Significant reductions in risk and potential damage are feasible if preventive measures are incorporated into design, construction and maintenance of new health facilities. Prevention aims at the formulation and implementation of long-range policies and programs to prevent or eliminate the occurrence of disaster. Disaster preparedness aims at measures which enable governments, organizations, communities and individuals to respond rapidly and effectively to disaster situations. A clear National Disaster Management Policy is essential for establishing and maintaining adequate health care management to deal with all aspects of disaster threats more effectively.

**NEW DELHI' S COPING CAPACITY IN THE EVENTUALITY OF A MAJOR EARTHQUAKE: A SWOT ANALYSIS OF THE STATUS OF EMERGENCY HEALTH CARE SERVICES**

**Sujata Satapathy**

A powerful earthquake measuring 7.6 on Richter scale rocked Pakistan & India on 8<sup>th</sup> Oct 2005 killing more than 60,000 people and causing massive destruction in both the countries. New Delhi, India's capital also experienced the earthquake of 6.8 on Richter scale, however, without any major loss, thus escaped a measure disaster. Shaking of tall buildings and deep cracks in the buildings created panic among the citizens. The earthquake, however, did ring the alarm bell for the government for strengthening and implementing the system of disaster management. Delhi falls in seismic zone IV. According to micro-zonation study, many areas of Delhi are extremely vulnerable and most risk prone because of loose soil, dilapidated buildings, faulty building structure and high population density. Over 140 aftershocks recorded after this main earthquake, 21 of them are measured more than 5 on Richter scale. Three strong tremors of up to 5.9 magnitude felt on the next day.

The present study emerged from the above-mentioned background to analyse the coping capacity of the state, in the eventuality of an earthquake more than 7 on Richter scale and massive human loss, injury and destruction. Government of India has already shown efficiency and promptness in managing the post-disaster activities during last Tsunami in December 2004 and this earthquake in Jammu & Kashmir. The key objective of carrying out a SWOT analysis is to present an overall picture of a state capital's preparedness status- with a special emphasis on emergency health management preparedness- to meet such a mass destruction event as well as

to identify the areas for human and material resource building. The study revealed the following key findings:

- Delhi's Centralized Accident and Trauma Services (CATS) has grossly inadequate number of ambulances (just 35 where as the requirement for each zone is 25 thus making the total requirement of ambulances 150), which will increase the reaction time considerably for prompt search and rescue operations.
- Though some of the major hospitals have their mass casualty management plan, a very few of them practice mock drills on them. In addition to that structural as well as non-structural vulnerability analysis of vital lifeline services, such as hospitals, has not been conceptualized.
- A very few hospitals are well-equipped and staffed to handle large-scale trauma patients. The only national level trauma centre at Delhi, which took a gestation period of 16 years to see the light of the day, is still not fully functional.
- Delhi's road traffic system is in such a bad shape that in case of a large-scale earthquake disaster, movement of lifeline service vehicles, such as ambulances, and fire brigades would be terribly affected, causing lot of human and limb loss.

However, at the same time the advantage of being India's capital could also be not marginalized. The findings –strengths, weakness, opportunities and threats - were discussed in an integrated and holistic manner so as to clearly focus on what needs to be done to meet the repercussions of such an eventuality.

## **DRINKING WATER MANAGEMENT IN DISASTER SCENARIO: MICROBIOLOGICAL ISSUES**

Antaryami Singh, S. K. Jain and P. K. Khatri

Lack of safe drinking water is the cause for a large number of deaths in the aftermath of a natural disaster. Providing drinking water to the victims is thus a vital issue in disaster management operations. Microbiological quality of water is the main concern as it generally deteriorates during any disaster scenario.

The quality of rivers, lakes, reservoirs and ground water used as drinking water sources get contaminated during disasters. These water sources become polluted with coliform and pathogenic microorganisms from normal, diseased or carrier human and animal excrements. Pathogenic and toxigenic microbiological agents in drinking water can cause diseases and deaths amongst the consumers. Microbiological parameters can provide unique information on water quality that ultimately decides whether the water is fit for human consumption or otherwise. Water quality monitoring at site is thus needed that can provide information necessary to implement appropriate treatment methods. Defence Laboratory, Jodhpur has developed a potable water testing kit which is best suited for this purpose.

The effect of the Super Cyclone (Orissa, October 1999) on drinking water quality was investigated when the laboratory was engaged in the disaster management activity. Various drinking water sources like well water, under ground (pump water), rural water supply samples and canal water in 5 most affected districts of Orissa - Ersama, Gadabishunpur, Balidiha, Kujang (Jagatsinghpur Distt)), Astarang, Bhutapada, Kanhaiya Vidyadharpur (Puri

Distt.), Baliana (Khurda Distt.), Cuttack and Bhuwaneshwar were evaluated. Microbiological testing was carried out using H<sub>2</sub>S strip and GCFL medium for rapid detection of coliforms and faecal coliforms developed by the laboratory. Floods had washed away human beings and animals and made water unfit for drinking. Sanitation condition in the affected area was seriously inadequate due to floating corpses of animals and human being, rotting of dead bodies and mixing of sewage with water sources. Eight water purification systems comprising of 5 µ & 20 µ filters, charcoal filter and chlorination treatment were installed at site to supply safe drinking water thus prevented outbreaks of diseases due to intake of contaminated water by the residents.

The above measures undertaken by the lab. proved adequate during the Orissa cyclone disaster operations. However, if the disaster results into other types of contamination in water e.g. salinity, nuclear/chemical contaminants, different technologies will then be required to handle such disaster scenario. Defence Laboratory, Jodhpur has developed mobile water purification systems which can adequately address these disaster situation also.

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### **TELEMEDICINE: A TOOL FOR DISASTER MANAGEMENT**

Dr. V.K. Singh\*

Telemedicine is additional tool available to medicals for On-Site management of disasters. It is not feasible always to dispatch specialist/medical officer at the site of incidence but a consultation through

telemedicine link between On-Site Junior doctor, nurse or paramedical and hospital could make a difference of life and death to the casualty.

The telemedicine has been used by U.S. Army extensively and it has now made in road in India. The corporate hospitals are using the links to increase the patient base while in government sector it has been used for providing 'e-health' for far flung areas and it was also used during tsunami catastrophe. The link could be static or mobile providing video conferencing facility to medical fraternity through satellite or ISDN line. The technology details and applicability for disaster management would be explained in the paper.

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### **DELHI SERIAL BOMB BLASTS: A HOSPITAL'S RESPONSE TO A MCI**

\*Dr.Anand R T, §Dr.Sidhartha Sathpathy, ‡Dr. (Col). J.P.Prasad

India's capital, New Delhi was the target of terrorist's attack in the form of serial bomb blasts on the evening of 29 October 2005, a pre-festival weekend. Three explosions within a span of twenty minutes, resulted in the loss of 62 lives, and left more than 200 injured thus making it the worst strike in a decade. This was largely due to the modus operandi of the terrorists in causing blasts in crowded areas near inflammable items like cooking and Compressed Natural Gas cylinders thereby causing an "Impact Multiplier effect". This paper attempts to describe the management of the Mass Casualty Incident (MCI) in the form of a case study/report with focus on the pre-hospital and definitive management of victims at a tertiary care hospital.

Data was collected from all relevant sources *viz.*, media, hospital records and through direct observation of the hospital disaster preparedness and management. Reports indicate that 75% of the injured were brought to four public hospitals and about 68% of the dead were taken to two designated public hospitals, having local jurisdiction for medico-legal cases. The study focused upon the mode of transportation of victims and their arrival pattern, activation of the disaster management plan and its response, triage, emergency management, clinical characteristics of victims who required admission, injury profile, clinical management, length of stay and outcome. The study also focused on the effect of the hospital's response to the Mass Casualty Incident, on the hospital functioning on the subsequent days.

The study identified the good practices which need to be reinforced, the problems and pitfalls in activation and implementation of the disaster management plan, which require counteractive action for empowering hospitals in gearing up to the challenges of disasters like terrorist attacks in future.

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## **ALTERED STANDARDS OF CARE IN MASS CASUALTY EVENTS**

**Dr Ashwini Vanarse\***

### **Health and Medical Care Delivery in a Mass Casualty Event**

Substantial work has already been done and continues to be undertaken throughout the country to improve the ability of health systems to respond to acts of terrorism or other public health emergencies. Much of the planning in this area focuses on increasing the surge capacity of affected delivery systems through the rapid mobilization and deployment of additional resources from the community, State, regional, or national levels to the affected area. However, few of these plans specifically address a situation in which the delivery system is unable to respond (even if only temporarily) according to established standards of care due to the scope and magnitude of a mass casualty event.

A key issue upon which the experts agreed is that the goal of the health and medical response to a mass casualty event is to save as many lives as possible. There is consensus that, to achieve this goal, health and medical care will have to be delivered in a manner that differs from the standards of care that apply under normal circumstances. This issue is not addressed in a comprehensive manner in many preparedness plans.

Finally, the experts also agreed that for health and medical care delivered under these altered standards to be as effective as possible in saving lives, it is critically important that current preparedness planning be expanded to explicitly address this issue and to provide guidance, education, and training concerning these altered care standards.

Standards of health and medical care, broadly defined, address not only what care is given, but to whom, when, by whom, and under what circumstances

or in what places. A comprehensive set of standards for health and medical care specifies the following:

**What**-what types of interventions, clinical protocols, standing orders, and other specifications should be used in providing health and medical care?

**To whom**-which individuals should receive health and medical care according to their condition or likelihood of response?

**When**-with what urgency should health and medical care be provided?

**By whom**-which individuals are certified and/or licensed to provide care within a defined scope of practice and other regulations?

**Where**-what facility and system standards (pre-hospital, hospital, alternate care site, etc.) should be in place for the provision of health and medical care?

Under normal conditions, current standards of care might be interpreted as calling for the allocation of all appropriate health and medical resources to improve the health status and/or save the life of each individual patient. However, should a mass casualty event occur, the demand for care provided in accordance with current standards would exceed system resources. In a small rural hospital, 10 victims from a local manufacturing accident might be considered a mass casualty event. In a metropolitan area, several hundred victims would be manageable within system resources. In an event involving thousands of victims, preserving a functioning health care system will require a move to altered standards of care. It may also be necessary to create both pre-hospital operations and alternate care sites to supplement hospital care.

The term "altered standards" has not been defined, but generally is assumed to mean a shift to providing care and allocating scarce equipment, supplies, and personnel in a way that saves the largest number of lives in contrast to

the traditional focus on saving individuals. For example, it could mean applying principles of field triage to determine who gets what kind of care. It could mean changing infection control standards to permit group isolation rather than single person isolation units. It could mean limiting the use of ventilators to surgical situations. It could mean creating alternate care sites from facilities never designed to provide medical care, such as schools, churches, or hotels. It could also mean changing who provides various kinds of care or changing privacy and confidentiality protections temporarily.

\* Qualified Disaster management expert in the Mass Integrated management System, HAZMAT, CBRN from UK

## **THE FACTORS INFLUENCING EMERGENCY RESPONSE FOR MAJOR INCIDENTS**

The Case Studies of London Bombings on July 7, 2005 and Delhi Bombings on October 29, 2005 with "Eclectic, Adaptive Case Study Approach".

**Dr. Arnol Joshi**

### **Research Aim:**

To investigate through a case study approach the factors that influence the emergency response to major incidents like terrorist attacks, and to explore how these factors influence the emergency response time.

### **Research Design:**

The adaptive eclectic case study approach was selected as a research approach during an emergent study design. The approach stems from the field of ethnography where the researcher's intention is to use a case study of the London bombings and a case study of a similar attack in Delhi, to draw out themes relating to emergency responses.

### **Subjects and Data collection:**

Data was obtained in a variety of formats, and from many sources including first responders, NOD volunteers, witnesses and the relatives of victims, government officials, politicians, health authorities, media personalities, and the general population. Published literature relating to social and cultural practices in the society of London and Delhi was reviewed to provide the contextual evidence. Reviews of audiovisual material, including photographs of the emergency responses and rescue work helped identify some of the issues such as effectiveness of cordons, and the use of protective clothing and equipment. The views and feelings of the general population were evident in visual documentary research and television programmes. Various

research papers, newspaper reports and official documents relating to emergency planning in both cities were studied.

### **The Outcome Measures:**

The review of the literature on emergency planning and emergency response enable a theoretical framework to be structured to aid in the review of the case study materials. These were:

- ❖ The assessment of risk and proactive management;
- ❖ Emergency Planning, Training and exercise;
- ❖ Incident command systems;
- ❖ Disaster preparedness and readiness;
- ❖ Standard health and safety procedures;
- ❖ Effective communication and public information systems; .
- ❖ Mental health response in the emergency;
- ❖ Environmental health response;
- ❖ The role of NGOs and volunteers during the emergencies.

### **Results:**

The review of the London bombings showed a quick and effective response to the serial explosions. The main successful elements in the London bombings were effective emergency planning, continuous training and exercise, proactive risk management, application of incident command system, strict adherence to health and safety procedures, communication disturbances leading to the application of other methods of communication, innovative and controlled public information systems, organised mental health response, and business continuity planning leading to quick and controlled transport of 450 victims to various hospital in an organised manner. During the Delhi bombings, in contrast, the review provided the evidence of absence of implementation of almost all of the

above factors leading to a much poorer response.

**Conclusion:**

The conclusion of the study was that there are opportunities for the lessons learned from London to be, in part, transposed to other major cities such as Delhi. There is also a need to recognise the cultural and social factors that influence emergency responses and not just the efforts of the emergency professions. It provides three basic themes, protocols, procedures and practices. The study leads to more answers than questions. It creates a platform for further studies on the status of risk management, disaster preparedness of Indian hospitals, and public- private partnership in emergency management in India.

## **POST-DISASTER HEALTH SCENARIO: PROBLEMS AND EXPERIENCES**

**A. Mitra, T. Mandal, J. Murmu**

Medical Service Centre, Kolkata

Medical Service Centre (M S C), a socio-medical voluntary organisation, has been providing first medical response through mobile teams throughout India since 1977 following disasters like floods, Bhopal Gas Disaster, earthquakes at Darbhanga, Latur, Jabalpur, Gujarat, cyclones along Bay of Bengal coast, notably Supercyclone Orissa 1999, Tsunami 2004. The emergency medical unit of M S C created its first two field hospitals (FH) following the Supercyclone Orissa 1999, and subsequently after the Gujarat Earthquake 2001, and 4 FHs after the Tsunami.

Based upon cumulative experience immediate survey is conducted, and depending on necessity, non-availability of government medical support system and local people's participation, location for base camp is selected to put up a FH. Doctors, nurses, medical and nursing students, pharmacists, paramedical staff and general volunteers have done extensive medical and psychosocial care through both in-patient, out-patient, as well as satellite camps and mobile teams up to the doorsteps of interior villages continuously over months in batches with hand-over between the in-coming and out-going batch. Good number of patients do somewhat benefit out of such medical services and valuable lives have been saved. Details of the work and findings, problems faced and steps taken to overcome the same would be discussed. The coordinated approach by M S C helped to develop network

Abstracts: Thematic Session – Disaster Health Management

with better result. The paper can serve as a good guideline for disaster service.