

gration of the World Trade Center towers represented the largest structural collapses in history. Only weeks later, the eastern United States found itself gripped by a series of anthrax letter attacks, which ultimately caused inhalational anthrax in 11 (killing 5), produced cutaneous anthrax in 11 others, and led to tens of thousands of others potentially exposed to anthrax-tainted mail being placed on a 60-day course of prophylactic antibiotics. Are these events random and idiosyncratic, or do they provide a sobering window into what the next 99 years of the 21st Century portend?

This presentation examined the types of disasters likely to occur during the 21st Century, and examined the forces likely to be responsible. From global warming to geopolitical tribalism, the most important factor is an ever-expanding human population trapped within a finite planet, pitting growing demands against limited resources. Medical disasters are and will continue to be a frequent result of this disequilibrium.

Regardless of the root causes of future disasters, disaster managers will be faced with planning and preparing for events that impact their communities in ways that both are routine and unprecedented. If there is any single lesson to be learned from recent catastrophic medical disasters in the world, it is that adequate medical disaster response depends on local resources in the initial period after an event. For this reason, it is imperative that those involved in Disaster Medicine become actively involved in the development of local emergency medical resources, both out-of-hospital and in-hospital, in areas of the world in which emergency medicine is underdeveloped.

**Keywords:** anthrax; disasters; global warming; terrorist attacks; World Trade Center

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### Disaster Medicine in the 21st Century: Issues and Challenges

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During the last several decades, there has been increasing understanding and study of disasters around the world, and the science and art of disaster mitigation, preparedness, response, and recovery have matured considerably, and have become much more sophisticated. Despite these advances, the discipline of disaster medicine still faces significant challenges including the unpredictability of events and casualties, communication, resource preparedness and allocation, command structure and human networking, patient management, and more. Personnel involved in disaster management always will need to confront these fundamental issues in every natural and man-made disaster. The technological and human advances of the 21st century will provide Disaster Medicine professionals with unprecedented solutions and novel challenges that never before have been faced by their predecessors. These issues include:

1. Globalization secondary to improved telecommunications infrastructure, leading to:
  - a. The development of global villages in response to

disasters;

- b. Increasing resources and capacity for disaster mitigation and management;
  - c. Personal telecommunications options; and
  - d. Increasing need for communication protocols and networking;
2. Increasing incidence and devastation of manmade disasters, due to:
    - a. Increasing dissemination and knowledge of bioterrorism and toxic disasters;
    - b. Increasing population densities; and
  3. Increasing sophistication of the general public and their expectations of timely and effective responses.

This presentation explored these distinctive challenges in this century, and how we might anticipate and face these issues.

**Keywords:** challenges; disaster medicine; globalization

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### Disaster Medicine in the 21st Century: Taiwan in the Asia-Pacific

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Taiwan is located in a high-risk area of the Asia-Pacific, and hence, it is subject to great damage, e.g., Ji Ji Earthquake of 21 September 1999 that resulted in a large number of casualties with a high rate of mortality and morbidity. This tragedy indicated that the preparation for immediate response to the event was inadequate. Thus, extra efforts in implementing a Disaster Medicine program have become important.

There are many examples of works done in the Disaster Medicine in many countries including Japan, USA, etc. However, the preparation in Disaster Medicine still is inadequate in Taiwan, and further study is mandatory. Based on the experiences from the Ji Ji Earthquake, studies of the epidemiology, traumatology, psychiatric disorders, epidemic diseases, and changes in primary illnesses, are needed. Knowledge of Disaster Medicine can be used in future planning and preparation to deal with disasters. Recommendations for such studies also must include other fields such as medical human resources, training schedules, funding programs, research institutes, executive department, etc.

In summary, there are six possible issues that need immediate attention: 1) Establish a command system; 2) Increase current research funding for post-disaster operation and research; 3) Set-up central agency for the execution, such as the CDC, etc.; 4) Reinforce the emergency medical system for disaster response; 5) Adopt a response of a mental healthcare system; and 6) Appoint major medical information facilities to undergo immediate disaster response and prevention.

**Keywords:** Disaster Medicine; earthquake; knowledge; planning; research; Taiwan

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