Disaster medicine: an emerging specialty

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The diverse nature of natural and man-made disasters demands a wide range of medical skills and resources from any attendant clinician. Working in a hostile environment may also require armed protection. This article considers the types of disasters, their medical requirements and the training of doctors wishing to be involved in this field of medicine. It includes a description of the Diploma in the Medical Care of Catastrophes.

DISASTERS AND CATASTROPHES

A disaster is a disruption of the human ecology which the affected community cannot overcome with its own resources. This definition emphasizes that disasters have dimensions beyond trauma, and have implications wider than medical and social assistance. Thus a disaster may not be defined simply in terms of the number of injuries.

However, medical personnel retain a central role in most disasters. Doctors are required for on-site assessment, triage and resuscitation, hospital management and long-term rehabilitation. They are also called on to advise on matters relating to public health and disease prevention in the wake of a disaster. Over the last two decades, natural disasters alone have resulted in three million deaths, and one billion people have been affected by their aftermath, by intolerable suffering, and by the reversal of years of development.

The outcome of a disaster is not purely related to the population at risk — it also depends on the pre-existing standard of living. High-level societies take preventive measures and reduce secondary effects with sound infrastructure and adequate financing. In contrast, 95% of natural disasters occur in the developing world, where they are accompanied by a high degree of homelessness, health problems, malnutrition and involuntary migration. In these countries disasters produce marked economic setbacks, and increase the national debt and the level of inflation and unemployment. *Table 1* gives an indication of the medical and social problems that may arise following the commoner types of disasters, and indicates that any pre-existing plan must be broad-based and flexible.

Contingency planning will lead to the development of a number of likely scenarios for different needs. All will require a mix of skills and varying material support. Logistic support extends beyond equipment — any team deployed in an international disaster scene requires logistic infrastructure and support, which may include the provision of accommodation, water, power, light, transport and communication.

DISASTER MEDICINE IN THE 21ST CENTURY

Natural disasters such as droughts, earthquakes, floods and tidal waves will continue to occur with predictable regularity because of the continuing trend towards large impoverished conurbations emerging and growing in some of the most disaster-prone areas on the planet. By the year 2100, 17 of the 23 cities estimated to have more than ten million people will be in these areas.

Man-made disasters such as war, terrorist activity, and chemical and nuclear accidents will doubtless also continue well into this millennium. Despite continuing agreement on definition and classification, new and worrying trends in the field of man-made disasters have been observed over the last 25 years. The risk of global war may have receded and conventional wars between sovereign nation states are now rare. However, new forms of armed conflict flourish and will impose increasing threats to volunteers on overseas humanitarian missions. Terrorism, sponsored both by nation states and groups of individuals, is now a global problem and no country or region is immune.

The rise of nationalism, racial and religious intolerance has led to a pro-

TABLE 1.
Incidence of medical problems following disasters

	Deaths	Severe injuries	Risk of disease	Food scarcity	Population movement
War	High	High	Variable	Variable	High
Terrorism	Moderate	Moderate	No	No	No
Aircrash	High	Rare	No	No	No
Industrial accident	Variable	Variable	Possible	No	Possible
Earthquake	Variable	Variable	Possible	Possible	Possible
Drought	Variable	Low	Yes	Yes	Possible
Cyclones/typhoons	Moderate	Moderate	Possible	Possible	Possible
Flood	High	Low	Yes	Yes	Possible

From Lumley et al (1996)

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liferation of wars within nation states, often leading to long-term instability and complete breakdown of the instruments of government and social order. The terms failed state, failing state and defeated state have now entered the literature of sociology, politics and humanitarian medicine. This emerging trend has considerable importance for the humanitarian aid volunteer. Concepts such as impartiality, neutrality and respect for the safety of the volunteer need to be revisited. In recent years, United Nations and International Committee of the Red Cross personnel have been deliberately targetted and many have been taken hostage, injured and even killed. This trend is expected to continue and increase.

The reasons for this newly-emerged climate of danger for volunteers are not hard to find. The historical respect for, and safety of, humanitarian volunteers was based on the existence within nation states of recognized institutions of law and order and the existence of codes of ethics and morality. Within failed and defeated states, such institutions and codes of behaviour cease to exist.

Control is usually vested in the hands of warlords or terrorists leading gangs of armed militias or irregular soldiers. This has led to the targetting of civilians including women, children and the elderly (between 1900 and 1987, about 130 million indigenous people were slaughtered by genocide within their own countries). Non-state groups such as militias may find political advantage in targeting humanitarian volunteers and organizations. The presence of humanitarian aid organizations may exacerbate conditions within some of these states: witness the hijacking in the Balkans of food aid convoys by militias to feed their own members.

PREPARATION

What, then, are the implications for the 21st century volunteer? Preparation well in advance of deployment has never been more important. Preparation is multi-faceted and must include appropriate training. The following areas must be considered:

Personal preparation

Volunteers should examine their motives when considering an overseas mission. Deployments in the future are likely to be arduous and dangerous. Physical and mental fitness are paramount. Individuals with a history of cardiovascular disease, peptic ulcer disease, psychiatric illness or those on any form of long-term medication should seek expert medical opinion before deployment (most reputable organizations demand a rigorous medical assessment). Exacerbation of an illness in a failed state may have catastrophic consequences.

Another important aspect of personal preparation relates to family and home. 'Wills and bills' should be dealt with, as should life insurance policies and other important arrangements with banks and building societies. For example, many life policies exclude death and injury in war and conflict settings. Consider too the effect of deployments, particularly lengthy ones, on family and professional life. It is easy to forget that volunteers have to return home and pick up the pieces of their personal and professional lives.

Ensure that the volunteer's UK employing agency approves of deployment and is happy to re-employ the volunteer on return.

Professional preparation

This overlaps in part with the above. The volunteers should consider the professional tasks to be undertaken and then question their own skill mix and training to perform the allotted task. A surgeon may be needed, but is there an appropriate operating room to work in? It is usually a requirement of deployments to be multi-skilled and to be adaptable.

Further consider the environment. At the very least, the volunteer should be capable of personal survival in an austere environment and should, for example, be able to prepare food, clean water, choose appropriate shelter, drive off-the-road vehicles and use a basic radio set. These skills are over and above medical skills and qualifications. Many of these skills can be acquired on courses run by a variety of organizations including the Territorial Army and Volunteer Reserves.

If the volunteer is part of a basic or higher professional training programme, assurance should be sought that no professional penalty will be imposed on the volunteer's return.

Choosing an aid organization

Over the last 30 years there has been a proliferation of non-governmental and inter-governmental organizations (NGOs and IGOs). The rise in NGO numbers is staggering. From less than 1000 in 1960, they expanded to number over 5000 by 1998.

Many of these organizations are of long standing and of repute. They take great care with the preparation and safety of their volunteers. Volunteers should spend time checking the credentials of any NGO or IGO seeking their services. A minimum requirement includes:

- A comprehensive mission briefing
- Full political and medical briefings
- Health checks, including vaccinations and malarial prophylaxis when appropriate
- Provision of a fully comprehensive medical insurance package, including repatriation arrangements
- Mission-orientated training programmes and skill/craft workshops.

Potential volunteers should obtain full details concerning mission endpoints and return home.

DISASTER PREVENTION

There may be conflicting interests in the development of preventive measures. Such actions as population resiting can influence investment and be seen as an economic threat. Many governments have no belief in preventive measures, looking on disaster reduction planning as an expensive means to protect an area against an unlikely event.

Another barrier is the acceptance of the inevitability of natural disasters, perhaps linked with local folklore and the previous failure of preventive measures. There has also been a failure to educate nationally and internationally on the value of preventive measures and preparedness.

Preventive measures are generally in a no-win situation. They are difficult to quantify, and if a disaster occurs, they are looked upon as a failure, whereas if it does not, they are rarely given prominence. This lack of visibility does not appeal to international disaster relief organizations, which are largely dependent on media exposure for their fundraising.

One of the most potent barriers to preventive measures is the separation of hazard management and development of planning, each usually being invested with independent ministries or agencies. The opportunity to incorporate disaster mitigation measures at an early stage of development is therefore lost. Extensive, prolonged and persistent initiatives are required to overcome barriers in disaster mitigation, and to ensure a successful outcome. Cost benefits of risk analysis in disaster mitigation need to be fully investigated, and these factors must be developed at a local level, encompassing local, national and international expertise. Involvement is more likely to influence local communities of the value of any relevant findings.

APPRAISAL

A poorly-trained clinician arriving in a disaster zone can become another refugee requiring support from the already-depleted local resources. The setting up of the Diploma of the Medical Care of Catastrophies (DMCC) by the Society of Apothecaries of London has laid the way for formal recognition and assessment of disaster training.

The Diploma examines the candidate's ability to manage each aspect of disaster medicine. The first section considers the requirements of living in a hostile environment, and the team structure needs for different types of disaster: candidates have to prove their ability to work within this team structure. Every candidate has to possess a certificate of a life support system — the modular examination gives credit for the majority of postgraduate qualifications, thus recognizing the wide spectrum of expertise that is required in different disaster situations.

Fieldcraft can only be fully examined in the field environment, and candidates have to undertake and pass recognized courses in this module. The Preventive Medicine and Entomological module is compulsory, and includes an understanding of public relationships and political sensitivities that arise in disaster situations. Candidates are required to write a dissertation on an aspect of medical care in catastrophes. Many candidates have already been exposed to situations which provide suitable topics. For less experienced candidates, a list of titles is held by the Registrar of the Society of Apothecaries.

Once a candidate has completed the necessary modules for entry, the first part of the examination consists of two 20-minute vivas, each with two examiners. Questions are based on slide presentations, one viva using a structured marking system, the vivas together covering a wide range of disaster scenarios.

Candidates entering the second part of the examination are offered a mentor to advise on their dissertation. Since 1999, candidates can present the dissertation at a later stage, after they have obtained experience in the field of disaster medicine. Dissertations may be submitted in an unbound form for initial assessment and, if reaching an entry standard, are then examined by a 20-minute viva.

The majority of candidates entering the early examinations came from a military background, and the examination served to recognize the extensive training obtained through these commissions. However, the examiners were concerned that as less experienced candidates entered the examination, the diverse nature of disaster medicine made it difficult for candidates to prepare for the examination. They therefore took on the task of producing a multi-author text (Lumley et al, 1996) covering the important theoretical material and to guide the reader through the practical requirements of the examination.

CONCLUSIONS

Natural and man-made disasters have a devastating toll on life and produce extensive injury, suffering and dissipation of human resources. Immediate suffering is in terms of loss of material possessions, but long-term effects are loss of job, home and land, resulting in loss of production and markets, possibly destroying a local community. Hunger, poverty and under-development may be followed by mass migration and decampment, themselves promoting disease and early death.

The pre-existing socioeconomic state of the country has a major influence on a society's vulnerability to natural disasters. The developing world is at particular risk, both from this vulnerability and from increasing population concentrations in proximity to natural hazard areas.

The changing pattern of man-made disasters has not only increased the need for aid workers, but also has increased the danger for these volunteers. It is now essential that all doctors wishing to work in the disaster field should be trained and certified to do so. A knowledge of the problems of disaster management, both in the acute response and disaster prevention, will stimulate medical personnel to bring pressure to bear on policy-makers worldwide. International understanding and cooperation are basic requirements for coexistence and world peace. HM

Conflict of interest: none.

Lumley JSP, Ryan JM, Baxter PJ, Kirby N (1996) *Handbook of the Medical Care of Catastrophes*. Royal Society of Medicine Press, London

KEY POINTS

- Natural and man-made disasters are increasing in number worldwide.
- Many impoverished communities live in some of the most disaster-prone areas on the plant.
- The increase in the number of failed states has produced new challenges for the aid worker.
- All aid workers must be appropriately trained.
- The Diploma of the Medical Care of Catastrophes provides a structured assessment of training in disaster medicine.