

Reports and Session Summaries of the 18th World Congress on Disaster and Emergency Medicine

May 28 to May 31, 2013
Manchester, UK

doi:10.1017/S1049023X13009072

Editor's Introductory Note:

This section of *Prehospital and Disaster Medicine (PDM)* presents reports and summaries of the 18th World Congress on Disaster and Emergency Medicine (WCDEM) held in Manchester, UK in May of 2013. Abstracts of Congress oral and poster presentations were published in May, 2013 as a supplement to *PDM (Volume 28, Supplement 1)*.

Reports and session summaries of the 18th World Congress on Disaster and Emergency Medicine. *Prehosp Disaster Med.* 2013;28(6):636-642.

CBRNE: Session BO-23

Report submitted by Chairs/Moderators: Charles Symons and Peter Aitken, MBBS, FACEM, EMDM

Introduction

The following papers were presented during this session:

- 1) Hall L. Emergency preparedness for exposure and public health risk assessment of cross-border chemical incidents.
- 2) Symons C. Managing mass casualty decontamination: optimising operational processes and communication strategies.
- 3) Aitken P. Preparedness for short-term isolation among Queensland residents: lessons (actually!) learned after disasters.
- 4) Bredbere S. Understanding public responses to CBRN incidents: behaviour change, compliance and risk communication.
- 5) Antinori C. Planning and experimental study of an innovative conditioned air distribution system for civil protection sanitary modules.
- 6) Dacey G. Exercise Milo: disability and decontamination.
- 7) Vinitzky O. The role of information technology in epidemiological investigating and outbreak – a bioterrorism exercise model.

Issues Raised

Seven speakers presented findings from research projects on CBRNE preparedness and response protocols. Implications for optimizing emergency preparedness and civil defense practices were identified.

Principal Findings

Co-ordination of State Resources in Response to CBRNE Incidents—Vinitzky¹ addressed the problem of inter-organizational collaboration and communication difficulties following a co-ordinated hazardous biological release. She discussed the findings of “Orange Flame 6” (November 2010), a multi-agency bioterrorism preparedness exercise which took place in the Northern District of Israel. The exercise demonstrated the efficiency of an integrated ICT epidemiological system, which can quickly identify the sites of the outbreak.

Hall² presented findings from an EU-funded project on *Cross-Border Exposure Characterisation for Risk Assessment in Chemical Incidents (CERACI)*. Through a literature review, web-based survey, telephone interviews, and two international workshops, the CERACI project has examined the organization of environmental modeling and monitoring for health risk assessment during acute chemical incidents which transcend EU borders. Recommendations arising from the CERACI project include the facilitation of emergency preparedness in border areas, as well as consistent communication and risk management across the borders of EU member states.

Communication Strategies, Public Disaster Preparedness and Protective Behaviors—Bredbere³ raised the issue of maintaining public confidence in health authorities and encouraging the adoption of personal protective behaviors following a CBRNE incident. The PIRATE project tested the psychological and behavioral responses of British and German participants to simulated news broadcasts of

a smallpox outbreak and an incident involving a concealed radiological device. The results of the subsequent focus group interviews and surveys indicated that perceptions of the authorities' ability to cope with the disaster played a key role in the perceived likelihood of compliance with authorities.⁴ Perceived proximity to the source of contamination influenced behavioral intentions. The key outcome was the recommendation to pre-prepare messages to be implemented in the event of a CBRNE incident. The PIRATE project showed that effective messages should be delivered by trusted sources; they should demonstrate the openness of responders; and they should provide clear, factual, and consistent information which increases trust in authorities and addresses misperceptions and anxieties about the nature of the contamination.

The issue of public disaster preparedness and protective behaviors extends beyond the realms of CBRNE. Aitken⁵ discussed the effect of the 2010 Queensland Flood on perceived disaster preparedness (access to food and water for short term isolation of 72 hours) among Queensland residents. Attitudes were measured using responses to items contained in the Queensland Social Survey (QSS) 2011 and compared to identical items in QSS 2009. The results showed an increase in preparedness (to various degrees of significance) for short-term isolation across demographic groups however some differences in perceived preparedness for short-term isolation persisted. Older people and residents outside South East Queensland were more likely to be prepared, whilst households with children and individuals working in the health and social sectors were less likely to be prepared.

Management of Casualties Following CBRNE Incident—Symons⁶ discussed mass-casualty decontamination from a behavioral science perspective and outlined parameters for improving decontamination efficacy within mobile mass decontamination units using simulants and human volunteer trials and exercises. The ORCHIS project demonstrated that the provision of a washcloth improved decontamination efficacy,⁷ and a subsequent research program, the ORCHIDS project, sought to compare a laboratory optimized decontamination protocol with the UK national standard protocol. Tested in three countries, the ORCHIDS protocol resulted in improved decontamination efficacy in half the time than current national standard protocols. Mathematical modeling on ORCHIDS exercise tracking data highlighted bottle-necks in mass decontamination processes.⁸ This threat to efficiency could be resolved through changes to the capacity of mass decontamination units and different steps of the decontamination process. Findings from both ORCHIDS exercises indicated that communication strategies were in need of improvement. Focus group interview data showed that volunteer casualties were often not provided with sufficient information about the decontamination procedure or about the incident in general. The findings from these exercises provide a range of recommendations which allow emergency responders to review and reflect on current practices. Simple changes within current provisions could increase confidence, efficacy and casualty management. The research team is currently working on a project to identify the optimum parameters for emergency decontamination systems utilizing standard fire service equipment, known as the "ladder-pipe" method.

Dacey⁹ discussed Exercise Milo, a live field exercise conducted two years before the 2012 Paralympics. Exercise Milo tested the response of local health services to the accidental release of a

hazardous chemical. Ninety-six volunteer casualties, including 37 disabled casualties, participated. Feedback from the casualty players was obtained through questionnaires and focus group interviews. Findings suggest that, given the amount of time taken to decontaminate P1 and P2 casualties, non-ambulant casualties should be provided with respiratory protective equipment to reduce respiratory exposure risk during the waiting time. Observational analysis indicated that medical staff at the receiving hospital risked contamination due to contaminated self-presenters entering cold zones. More rigorous signposting of clean/dirty zones would reduce the likelihood of cross-contamination of staff in a real event.

Antinori¹⁰ presented an additional means of optimizing the emergency response procedures by improving the thermal comfort of Civil Protection tents. The research team assessed indoor thermal comfort by measuring differences in the temperature gradient within the tent. An innovative conditioned air distribution system, consisting of breathable fabric diffusers, was tested against the current, standard system. The current distribution system results in non-uniformity of air flow. The innovative air distribution system resulted in a lower vertical temperature gradient of 3°C and uniformly distributed air, which allowed for greater indoor thermal comfort.

Implications for Best Practices

The epidemiological system tested in "Orange Flame 6" can be used to foster communications between different civil and military response agencies and to identify efficiently the sources of CBRN contamination. On a national, EU member state level, the CERACI project recommends facilitating mutual aid and facilitating emergency preparedness in border areas. On a European and international level, CERACI recommends that risk management and communication is consistent on all sides of the border, with a commonly accepted exposure risk assessment and public communication framework.

It is imperative that trusted public health authorities pre-prepare messages in advance of CBRNE incidents to encourage protective behaviors. Communication strategies should follow the framework derived from the PIRATE project by regularly updating information, addressing misperceptions and anxieties, and increasing trust in health authorities. Authorities should also address the findings from Aitken and colleagues that disaster preparedness varies across demographic groups, even after an actual disaster has occurred. Further resources should be devoted to ensuring that *all* citizens receive the required information for preparedness and self-protection in the wake of disaster.

Mass-casualty decontamination systems should be systematically assessed and first responders should consider adopting the optimal parameters identified in the ORCHIDS project. The throughput of casualties would be increased with the inclusion of an additional capacity in mobile decontamination units, particularly in re-dressing areas. First responders can mitigate anxieties about the procedure and maintain compliance by adopting an effective communication strategy. Such a strategy should explain why decontamination is beneficial, stating the nature of the contaminant if known, and explaining how casualties can clean and protect themselves. The experience of casualties in CBRNE emergencies can also be mitigated through the use of the innovative conditioned air distribution system tested by Antinori and colleagues. This air distribution system improves thermal indoor comfort within Civil Protection tents, a measure which

improves overall experience of disaster response procedures. Lessons from Exercise Milo include the need to provide non-ambulant casualties with respiratory protection in the hot zone to

prevent prolonged exposure. The exercise also highlighted the need for receiving hospitals to clearly distinguish between warm and cold zones to avoid contamination of medical staff.

Pertinent References

- Vinitzky O, Merimson I, Grotto I, Poles L, Cohen-Dar M. The role of information technology in epidemiological investigating and outbreak – a bioterrorism exercise model. *Prehosp Disaster Med.* 2013;28(Suppl 1):s108-109.
- Hall L, Hoffer S, Manley K, et al. Emergency preparedness for exposure and public health risk assessment of cross-border chemical incidents. *Prehosp Disaster Med.* 2013;8(Suppl 1):s139-s140.
- Bredberre S, Jones E, Symons C, Mowbray F, Amlôt R. Understanding public responses to CBRN incidents: behaviour change, compliance and risk communication. *Prehosp Disaster Med.* 2013;28(Suppl 1):s154-s155.
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- Aitken P, Franklin R, Brown L, Watt K, Leggat P. Preparedness for short-term isolation among Queensland residents: lessons (actually!) learned after disasters. *Prehosp Disaster Med.* 2013;28(Suppl 1):s123.
- Symons C, Jones E, Bredberre S, Carter H, Riddle L, Wakefield J, Amlôt R. Managing mass casualty decontamination: optimising operational processes and communication strategies. *Prehosp Disaster Med.* 2013;28(Suppl 1):s156.
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- Egan JR, Amlôt R. Modelling mass casualty decontamination systems informed by field exercise data. *Int J Environ Res Public Health.* 2012;9(10):3685-3710.
- Dacey G, Amlôt R. Exercise Milo: disability and decontamination. *Prehosp Disaster Med.* 2013;28(Suppl 1):s91.
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Psychosocial (1): session BO-24

Report submitted by Chair/Moderator: Gloria R. Leon, PhD

Introduction

The following papers were presented during this session:

- Markenson, D. Comfort level of EMS providers in responding to WMD events: impact of training and equipment.
- Leon, G. Relationship of locus of control, psychological distress and extent of trauma exposure in groups impacted by intense political conflict in Egypt.
- Patnaik, S. Competency assessment of combat healthcare leaders: countering battle stress.
- Henderson, R. The development of a strategic plan for psychosocial recovery following the Canterbury Earthquakes, New Zealand.
- Shultz, J.M. Psychological impact of Superstorm Sandy: the trauma signature.
- Lebowitz, A. Integrating academic mental health into a community public health system Post-3/11 Japan: baseline data.
- Shultz, J.M. Trauma exposure in internally displaced women in Colombia: psychological intervention.

Issues Raised

The papers in this session covered the following topics: training and competency assessment of EMS responders and combat health care leaders; evaluation of mental health needs and strategies for providing psychosocial services to populations and vulnerable groups following natural and human-made disasters.

Principal Findings

The paper presented by Markenson surveyed the views of EMS providers on their comfort level in responding to WMD events and other public emergencies. Comfort levels were more strongly associated with the extent of hands-on training, and to a lesser extent, availability of necessary equipment to deal with events of this type. Views of the desired levels of competency/skills for effective health care delivery in the combat zone included a number of both technical (e.g., information management) and non-technical (e.g., connection with the civil population) skills (Patnaik).

Mental health needs of populations that have experienced political turmoil in Egypt (Leon) and natural/technological disasters in Japan (Leibowitz) were described. Psychological distress was evident in the group injured during the Cairo protests; distress was also related to attitudes about personal control over one's life. The mental health screening procedures and an intervention program designed and implemented in the aftermath of the Japan earthquake, tsunami, and Fukushima reactor damage was described. Participants will continue to be evaluated periodically; the intervention program will be compared with other types of programs as well as a non-treatment control group.

The trauma signature methodology (TSIG) was presented to indicate the physical and psychological impact of Superstorm Sandy in the United States (Shultz). It was proposed that identification of the defining features and specific psychosocial stressors experienced at different phases of the disaster can provide guidance for effective disaster behavioral health support. A mental health model was described for providing psychosocial support to internally displaced women as a result of civil war in Columbia (Shultz). The strategy is to conduct home screening followed by psychoeducation and psychiatric referral as needed.

The development of a strategic plan for psychosocial recovery for the 2-5 year period following the Canterbury earthquakes was described (Henderson). Positive features of the plan include the focus on both individuals and the community, and the formation of a new government department to lead the recovery efforts.

Implications for Best Practices

The views of EMS personnel regarding their comfort level in responding to WMD events and their belief that more training in this area is necessary have clear implications for the development of advanced training programs. The papers describing specific mental health programs and models are an important step in providing support in the aftermath of disasters. However, rigorous outcome research assessing effectiveness is a necessary and crucial component of psychosocial intervention models and specified procedures.

Psychosocial (2): BO-32

Report submitted by Chairs/Moderators: Gloria R. Leon, PhD and Tracey O'Sullivan, PhD

Introduction

The following papers were presented during this session:

- 1) Kuboyama, K. Mental stress among disaster first responders in Japan from triage "Black" tagging.
- 2) Harada, N. Implementation of psychological first aid to the Great East Japan Earthquake disaster responders.
- 3) Newell, S. Psychological first aid (PFA): comparison and components analysis of PFA frameworks.
- 4) Henderson, R. Psychosocial wellbeing – collaborative emergency response and initial recovery work following the Canterbury Earthquakes, New Zealand.

Issues Raised

The topics in this session focused primarily on professional activities of disaster responders. Training of responders to be comfortable in black tagging bodies, and the provision of psychological first aid (PFA) were addressed. The formation and importance of multi-agency collaboration in meeting the psychosocial needs of communities following a disaster was described.

Principal Findings

A survey of disaster first responders found that many were reluctant to black tag victims and that this process was a stressful

one (Kuboyama). Regarding the application of PFA, a training program for medical and non-medical responders was viewed as helpful by the vast majority of trainees ((Harada). However, Newell pointed out that PFA models differ in many respects in terms of content and components, although calming and connectedness appeared in most models. The long-term individual and community psychosocial needs following the Canterbury New Zealand earthquake and the continued seismic activity in the aftermath was addressed by the formation of a psychosocial wellbeing committee (Henderson). The multi-agency collaboration model was described.

Implications for Best Practices

The reluctance to black tag disaster victims has implications for effective triage. Standardized criteria to designate a victim as beyond help is highly important in reducing the stress of responders who have to make this decision. With regard to the use of PFA, while relevant workers find this procedure helpful, evaluation of the effectiveness of differing PFA programs is necessary. The identification of crucial components across PFA programs is a positive step. In dealing with the continuing stress of a large-scale disaster, the implementation of multi-agency collaboration to support individuals and families is a strong model with application for other disasters.

Psychosocial (3): BO-40

Report submitted by Chairs/Moderators: Gloria R. Leon, PhD and Tracey O'Sullivan, PhD

Introduction

The following papers were presented during this session:

- 1) Henderson, R. The Role of specialist mental health services in the psychosocial response and recovery following the Canterbury Earthquakes, New Zealand.
- 2) Masuda, K. Effective information for "Mental Health Care Team" in large scale disasters.
- 3) Yzermans, J. Evaluation of psychosocial aftercare and health outcome assessment after a public shooting in Alpena an den Rijn, The Netherlands.

Issues Raised

The process of providing effective mental health care was addressed in this group of papers that focused on earthquakes in New Zealand and Japan, and a shooting incident in a mall in The Netherlands.

Principal Findings

Following the Canterbury earthquake, a specialist mental health services staff and control center were quickly assembled to develop protocols and resources to provide PFA, family support, and supervision of other mental health workers (Henderson). The importance of providing exact information following a disaster to institute effective mental health care was highlighted (Masuda). Views by victims about the quality of mental and physical healthcare/ aftercare following a shooting incident indicated that many felt the level of aftercare was scaled down too quickly (Yzermans).

Implications for Best Practices

The rapid organization of mental health service personnel to provide psychological support to the affected population, and the dissemination of accurate information are important in mitigating the effects of the disaster. Programmatic decisions on the duration of support will have an impact on views of the quality of care provided.

Mass Gathering and Radiation: BO-43

Report submitted by Chair/Moderator: Steven M. Becker, PhD

Introduction

The following papers were presented during this session:

- 1) Kipor G, Goncharov S, Pichugina N. Disaster medicine preparedness for mass-gathering events.
- 2) Hoogmartens o, Sabbe M. How to improve emergency response planning for mass gatherings: a multi-agency approach.
- 3) Turriss S, Lund A. Mass casualty incidents in the setting of mass gatherings.

- 4) Becker SM. Understanding and meeting population needs following major radiation emergencies: overarching lessons from Fukushima Dai-ichi.
- 5) Oztuna A, Sezigen S, Demirkasimoglu, M. Fukushima nuclear disaster—behind the scene: medical perspective on Turkey's awareness.

Issues Raised

The panel included five papers: three on mass-gathering events and two on the 2011 Fukushima Dai-ichi nuclear accident in Japan. The first paper, which focused on disaster medical preparedness for mass-gathering events in the Russian Federation, was presented by Gennady Kipor (co-authors S. Goncharov and N. Pichugina). Disaster medicine in Russia, said Kipor, was born about two decades ago and involves military-civil interaction and cooperation. The range of field experience with mass gatherings has been broad: sporting events (including olympic and paralympic game and sports championships), celebrations and festivals, political demonstrations and protests, and terrorism incidents. Additional experience has been gained from analysis of events in other countries (e.g., England, Poland, and Ukraine) and from tabletop and field exercises. Every aspect of disaster medical preparedness needs to be regularly reviewed, revised and updated, said Kipor. This includes plans, analysis of capabilities, analysis of scenarios, triage, mechanisms of evacuation, means of evacuation, transport and equipment readiness, staffing registries, and local warehousing of medical products. For particular events, commented Kipor, it was vital to accurately assess and forecast event capacity and needs. Major mass-gathering events require not only the preparedness of local disaster medicine resources and special medical team staff but also specialized medical field kits and reserved beds in hospitals. More generally, good planning, regularly revisiting and revising plans, and effective mass media communication were keys to success.

The second paper, by Olivier Hoogmartens (presenter) and Marc Sabbe, focused on what could be learned from an incident at a large music festival in Belgium. Featuring some 200 acts and 8 stages, the three-day Pukkelpop Rock festival near Hasselt attracts tens of thousands of people every year. In August 2011, the festival and campground were suddenly struck by a severe thunderstorm with very strong winds, large hail and torrential rain. Some concert structures collapsed, equipment was damaged, and trees were uprooted and knocked down. Several people were killed and many concert-goers were injured. The multi-agency rescue force that was on-scene responded. Thirteen casualties with life threatening injuries were evacuated to Level 1 trauma centers within four hours. Another 465 people with less serious injuries were treated on-site or evacuated by ambulance within five hours. Hoogmartens reported on the results of a retrospective analysis of various aspects of incident management, including efficacy of medical treatment by teams at the festival site, collaboration between agencies at the site, and communication between agencies, relatives of the injured, and the media. Hoogmartens highlighted several key conclusions. First, risk assessments cannot be “cut and pasted” – they must be specific. Having well-developed plans specifically tailored for the event (in this case a large music festival) is imperative for mitigating impact and reducing loss of lives when an incident strikes. Second, plans should be prepared with similar team members as those who will actually be in charge when an incident occurs. Third, the effective use of social media is critical. Establishing and implementing

social media strategies prior to an emergency event is a key factor in improving crisis communication when an incident occurs.

The third paper, by Sheila Turriss (presenter) and Adam Lund (both from Canada), provided an analysis and overview of the literature on mass-casualty incidents at mass gatherings. The aim was to discover what is currently known about MCIs in the context of mass-gathering events. Both the published scholarly literature and “grey literature” (e.g., media reports) from the last three decades were examined. MCIs at mass gatherings were not uncommon, noted Turriss. Indeed, 290 reports of MCIs during mass gatherings were found in the literature search. (Other cases likely occurred as well, but did not appear in the literature.) The search found MCIs in both developing and developed nations. Interestingly, however, some 85 percent of the fatalities were in developing nations. The 290 reports were organized by event type, type of MCI and number of casualties. Many were unanticipated (e.g., stampedes at sporting events or religious events). But there were also predictable or “planned MCIs,” such as marathons, where thousands of patient encounters occur simultaneously at the finish line. Although high quality details regarding contributory factors were often not available, said Turriss, some risk factors were apparent. These included site geography (e.g., uneven terrain), the unique dynamics or characteristics of a particular event or event type (e.g., crowd behavior, onsite risks such as motor vehicles), and the effects of climate instability (e.g., high winds and stage collapse). Such information, and follow-up research, said Turriss, can help provide guidance to event planners, emergency managers and medical teams preparing for mass gatherings.

The remaining papers in the session discussed the Fukushima Dai-ichi nuclear accident in Japan. The accident began when the nuclear generating station was seriously damaged by the devastating earthquake-tsunami disaster that struck Japan on March 11, 2011. Steven M. Becker was a member of a three-person Radiological Emergency Assistance Mission that was asked to come to Japan in response to the accident. The assistance team carried out extensive fieldwork in affected areas, and provided radiological information and training to more than 1,100 Japanese hospital and healthcare personnel and first responders. More than 40 lessons for better understanding and meeting population needs were learned from the mission. In this presentation, Becker looked across the entire body of lessons and drew three overarching conclusions. The first is that risk communication continues to be an “Achilles Heel” in radiation emergency response. Population information needs are immense during a radiation incident. The agent is unfamiliar, fear levels can be high, and people urgently want to know what is happening, what protective measures to take, and what potential health impacts there may be. As in past radiation disasters, communication with the public during the Fukushima Dai-ichi accident was inadequate. The second overarching conclusion is that there are not nearly enough appropriately trained personnel to meet the range of population needs in large-scale radiation emergencies. In Japan, only a limited number of trained personnel were ready to go, and others had to be found and trained. No country, said Becker, currently has enough trained personnel in place to meet the full range of population needs such as radiological screening, healthcare, information, and reproductive counseling. The third overarching lesson is that radiation emergency recovery planning remains too narrow in approach, leaving out such important population issues as social stigma and

discrimination, and the departure of young families due to radiation concerns. Improving readiness for radiation emergencies worldwide, said Becker, will require a more proactive approach that learns from the experience with Fukushima Dai-ichi.

The final paper, presented by Ali Oztuna, also dealt with the Fukushima Dai-ichi accident. But in this paper, the focus was on reactions and responses by other countries. In particular, the paper discussed the actions of agencies in Turkey following the nuclear accident. Turkish nationals, noted Oztuna, were advised by Foreign Affairs officials to leave the accident area. To facilitate the process, a joint team from the Turkish Health Ministry and the Turkish Atomic Energy Authority was sent to Japan. Meanwhile, authorities undertook a variety of preparedness measures inside Turkey. People arriving from Japan were screened, as was their baggage. Civil defense units were deployed at the airports in case there was a need for decontamination. Designated hospitals and ambulances were also notified to be prepared if the situation became dire and there was a need for medical management of contaminated patients. To assist, medical CBRN units were assigned to hospitals. To increase awareness and help train emergency department health providers, a short radiation emergency preparedness course was designed and delivered.

Principal Findings

- 1) Mass-casualty incidents during special events are not uncommon.
- 2) Categories of events (eg, sport-related) may be associated with specific types of MCIs.
- 3) An understanding of the relationships between categories of events and specific types of MCIs contribute to the development of more effective prevention/mitigation strategies.

Pertinent References

Mass-gathering Events

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3. Lund A, Turriss SA, Amiri N, Lewis K, Carson M. Mass-gathering medicine: creation of an online event and patient registry. *Prehosp Disaster Med*. 2012;27(6):601-611.
4. Lund A, Wong D, Lewis K, Turriss SA, Vaisler S, Gutman S. Text messaging as a strategy to address the limits of audio-based communication during mass-gathering events with high ambient noise. *Prehosp Disaster Med*. 2013;28(1):2-7.

The Fukushima Dai-ichi Nuclear Accident

1. Ha WH, Yoo J, Yoon S, et al. Radioactive contamination monitoring for the Korean public following Fukushima nuclear accident. *Appl Radiat Isot*. 2013, Mar 16. doi: 10.1016/j.apradiso.2013.03.023 Epub ahead of print.
2. Rubin GJ, Amlôt R, Wessely S, Greenberg N. Anxiety, distress and anger among British nationals in Japan following the Fukushima nuclear accident. *Br J Psychiatry*. 2012;201(5):400-407.

- 4) Developing an effective response plan is not a one-time activity. It is crucial to revisit and revise response plans regularly, and ensure they are realistic and workable.
- 5) It is essential for hospitals, health departments, fire departments and ambulance services to be familiar with, and have training for, large-scale radiation emergencies.
- 6) Communication with the public remains a weak area in radiation emergency response. Better meeting public information needs is vital for preventing and reducing impacts, maintaining public confidence, and successfully managing an incident.

Implications for Best Practices

- 1) Preparedness for MCIs in mass-gathering events should be informed by current research and field experience.
- 2) Regularly revisit and revise response plans to ensure that they are realistic and workable.
- 3) Prepare plans with similar team members as those who will actually be in charge when an incident occurs.
- 4) Accurately assess and forecast event capacity and needs.
- 5) Ensure that hospitals, health departments, fire departments and ambulance services are familiar with, and have had training for, large-scale radiation emergencies. Also ensure that radiation emergency recovery planning is broader in approach.
- 6) For all types of incident, make effective communication with the public a priority.
- 7) Establish and implement social media strategies prior to an emergency event. They can be very valuable in improving crisis communication when an incident occurs.
- 8) Work closely with the press and media who are working on-site.

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Earthquakes and Tsunamis: BO-53 and BO-62

Report submitted by Chair/Moderator: Takashi Ukai, MD, Yuichi Koido, MD, PhD and Yasufumi Asai, MD, PhD

Introduction

Twelve papers, one from Turkish and eleven from Japanese participants, were presented in these sessions. Most of the papers from Japan were associated with the experiences of the recent mega-disaster, “the Great East Japan Earthquake and Tsunami (GEJET).”

Principal Findings

Dr. T. Takeda of Mie University pointed out the confusion after GEJET mainly caused by the destruction of the capacity of the local government to perform exact rapid assessment. It was estimated that if the structured approach of need assessment was

executed by the local government, health care management could be much better than it was in the affected area.

Dr. Y. Koido of National Disaster Medical Center reported the effect of GEJET on the function of the disaster base hospitals in Tohoku area. Forty-two disaster base hospitals out of forty-four suffered partial damage to the hospital buildings. However, disaster base hospitals took central roles as was expected and accepted many patients at one time with transfer to other hospitals as needed. The necessity for further efforts to improve structural and non-structural hospital safety including communication means was discussed.

Dr. Y. Suzuki of Hirosaki University surveyed the damages to the operation rooms of hospitals in the disaster area caused by GEJET. In total, 474 patients were undergoing surgical procedures when the disaster occurred. In 102 hospitals out of 213, surgical operations were not able to continue. Shaking and black-out were the main reasons of discontinuation of operations. In the hospitals which were not directly affected by the earthquake and tsunami, shortage of medical supplies due to insufficient logistic support was the major factor in hampering continuing operations days after the disaster.

Prof. K. Nakata of Toa University reported experience on the establishment of a temporary clinic that was imported from Norway in Ohtsuchi, Iwate Prefecture, where the local hospital and clinics were all destroyed by GEJET. Several months were required before it was possible to start the clinic medical services because of stringent legal and non-legal limitations. One such limitation was the Japan standard of construction and industry that was applied to the foreign buildings and equipment even after the extraordinary situation like GEJET.

Dr. H. Yamamura of Osaka City University surveyed the actual usefulness of several communication devices such as mobile phones (MP), satellite phones (SP) and internet (laptop computer, LC) which were used by 197 DMAT teams after GEJET. Among these three communication means, SP got the best satisfaction by the users, yet 47% of users failed to use SP satisfactorily in the acute phase.

Dr. S. Tekeli-Yesil of the Ministry of Health of Turkey reported health response to two earthquakes in Van province, Turkey. In Turkey, Health Disaster Coordination Center of Minister of Health coordinated the response after the disasters and about 6,000 personnel including Medical Rescue (UMKE) were deployed to the disaster immediately after the earthquakes where they provided relief services not only in the acute phase but

also in the sub-acute phase. The Emergency Health Response System in Turkey is a worthwhile model for teaching such skills and methods.

A second presentation by Prof. T. Takeda was on the public education on disaster preparedness in Mie Prefecture, where a high probability of damage by earthquake and tsunami is anticipated in the near future. The education programs include knowledge of natural and social science of disasters and emergency/disaster medicine targeting local residents and medical personnel.

Dr. K. Hayashi of National Institute of Public Health, Japan, reported his participation in the training of health providers on "Cluster Approach" and "Sphere Standard", which was not well permeated among the medical team members who worked in the sub-acute to chronic phase after GEJET. He stressed the importance of public health training for health workers who may be involved in disaster relief especially with senior citizens.

Dr. M. Kuno of Nippon Medical School Tamanagayama hospital introduced triage skill training provided by the Japanese Association for Disaster Medicine and discussed its effectiveness and the future improvement of the training program.

Dr. Y. Asai of Hakodate Shintoshu Hospital compared two tsunami disasters; one that occurred in 1993 and hit Okushiri Island of Hokkaido and the GEJET of 2011. Although the extent of damage was different, similar situations were observed in these two tsunami disaster. Tsunamis struck the Japan archipelago repeatedly and people suffered serious damages each time. Yet, people are apt to forget the lessons of past disasters. Continuous education on the threat of natural disasters is a key to reduce the number of victims and the community damage.

Ms. T. Ito of the Japanese Red Cross College of Nursing presented two papers on vulnerable populations in big disasters, focusing on the foreigners who lived in disaster affected area of GEJET. They are apt to be isolated due to lack of communication and information exchange. Regular meeting with them with their native language was quite helpful. Also analyzed was behavior changes in after disasters and the major problems encountered.

Most of the presentations were from Japanese participants, but discussion was made active by participants of many countries. The problems and challenges of disaster medical care in GEJET and the Van earthquake in Turkey were shared by the participants from various countries, leaving many valuable suggestions to all attendants to this session.