

**Conclusions:** Improved mass-casualty management response is achieved where agencies act in an integrated manner using an all-hazards approach. This is evident particularly with agencies that work well together on a daily basis.

**Keywords:** all-hazards approach; command; control; coordination; emergency planning; hospitals; integrated incident response; legislation; mass casualties; remote; resources; rural

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### Using Tele-Nursing Services for Pre- and Post-event Advice and Syndromic Surveillance

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Telephone health, triage, and advice services, supported by sophisticated decision-support systems, are operating in many developed countries. In New Zealand, the entire country is covered by one 24-hours-a-day, tele-nursing, triage, and advice service. Such services are useful tools for monitoring and responding to bioterrorism and natural disasters. Healthline, New Zealand's tele-nursing triage and advice service, was used by the Ministry of Health to provide advice and decision-support systems to the community during the 2003 SARS alert period and as a means of access to health advice for populations isolated during the large scale floods in 2004. Assuming telephone services are operating, this service could be extended to the South Pacific nations during their frequent natural disasters.

Tele-nursing services create an opportunity for faster public health symptom surveillance. Syndromic surveillance is used for identifying an increase in frequency of a disease above the background pattern. In the past, outbreaks have been recognized from accumulated reports of notifiable diseases through voluntary reporting by sentinel practices and laboratories, or by alert clinicians bringing clusters of diseases to attention.

Currently, telephone triage services and the increasing availability of electronic health data combine to allow new surveillance systems to detect outbreaks earlier. An analysis of telephone triage data collected for public health, early warning systems found that data from telephone triage calls were one to five weeks ahead of surveillance data collected by the Center for Disease Control using traditional reporting methods. In England and Wales, call data (site, symptom, age-group, call outcome) on 10 key symptoms are transferred every weekday from 23 call centers to the Health Protection Agency at West Midlands for this purpose.

A recent bioterrorist study in the United States found that 87% of the respondents said they would want to talk directly with someone who can give them information or advice, or help them decide what to do so that they can make the best decisions for themselves and their families. People wanted their doctor or other health professional to be trained in advance to be able to provide the decision-making support they needed. A tele-nursing triage and advice service located outside of the danger area and staffed by nurses is placed ideally to provide advice to the community during a bioterrorist event. Briefing updates, consistent care protocols, and modifications to decision-support systems can be updated and controlled centrally, and

records of call types and caller location can be quickly collated for the controlling authorities.

**Keywords:** advice; call; Healthline; New Zealand; response; service; tele-nursing

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### "Hotch Potch or High Performance"—Aeromedical Services in Queensland, Australia

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Queensland is Australia's second largest State, covering an area of >1.7 million km<sup>2</sup>. With a coastline of more than 13,000 kilometers (8,078 miles) and a highly decentralized population approaching 4 million people, aeromedical services play a major role in the provision of emergency medical and disaster response services to this community.

Aeromedical services in Queensland include both fixed and rotary-winged operations, which are provided by an eclectic mix of State owned and operated services, community-based, non-profit organizations, contracted services, and the Royal Flying Doctor Service. With a fleet of 10 fixed-wing and 11 rotary-wing aircraft, almost 20,000 flying hours are undertaken each year in support of aeromedical operations.

Delivering these services in a coordinated and integrated way has proved quite complex. However, following a spate of incidents including two helicopter crashes that claimed a total of eight lives, aeromedical operations in the State faced a crisis of confidence. In response to these concerns, Queensland has now developed an integrated, efficient, and safe model for the provision of aeromedical services across the entire State.

This presentation examines the experiences and lessons learned in Queensland in developing a coordinated, safe, and effective aeromedical and air rescue network. It describes how these services have been effectively integrated under the Queensland Emergency Medical System (QEMS), a collaboration between the Queensland Ambulance Service (QAS) and the Queensland Department of Health. It examines the key characteristics required for safe and efficient aeromedical operations and the role of the QEMS Coordination Center in ensuring that aeromedical operations are delivered in a manner that achieves good patient outcomes while simultaneously respecting the risks inherent in aeromedical service delivery.

**Keywords:** aeromedical; Australia; emergency medical services; fixed-wing; helicopters; operations; Queensland; rotary-wing

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### Medical Assistance for Train Explosion Disaster in North Korea

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**Introduction:** A massive explosion occurred at noon on Thursday, 22 April 2004 at Yongcheon railway station in

the Democratic People's Republic of Korea. Two train cars loaded with ammonium nitrate exploded during a shunting operation. The blast obliterated the station and caused immediate damage within a radius of 4 km, killing 161 people and injuring approximately 1,300. The blast also destroyed approximately 1,850 homes, and >27,000 people experienced a lack of water supply as a result of the explosion.

**Methods:** The accident report and related content were investigated through a website search. Also, in the case of South Korean assistance, preparation material was reviewed, including reports and press releases. Although it is difficult to obtain accurate information during a disaster situation, efforts were made to evaluate the overall disaster situation and medical assistance.

**Results:** The Korean International Foundation for Health and Development developed an emergency medical assistance team, the Yongcheon Emergency Medical Assistance Team (YEMAT), composed of 10 health-related organizations. YEMAT prepared medical personnel resources, drugs, equipments, and others. These materials (worth >3 million dollars) were sent to North Korea via airplane; however, the medical team could not enter North Korea. More than 15 governments and non-governmental organizations from about 15 countries supported North Korea during the acute phase of the event.

**Conclusions:** In the case of a large technological event in a confined area, the impact is strong and public health is of utmost importance. Early international cooperation and coordination are required for health assistance and the optimal method of evaluating the situation should be developed despite a lack of complete information.

**Keywords:** disaster; explosion; information; medical assistance; North Korea; response; train

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## Injuries on the Farm: Fertile Ground for Injury Prevention

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Agriculture remains among the most dangerous occupations in North America. Despite modest gains in survival during recent years, at 21 deaths per 100,000 workers, agricultural injuries are second only to mining injuries as an occupational cause of death. The causes of both fatal and non-fatal farm-related injuries are multi-factorial, but can be grouped arbitrarily into three general areas: (1) environmental; (2) equipment-related; and/or (3) human factors. In addition, there are significant differences in injury patterns and injury risk related to age, gender, farm type, and location. Environmental issues include animals, toxic chemicals, silos, polymicrobial wound contamination, and delays in provision of definitive care. Equipment dangers exist on virtually all farms and include tractors, the leading cause of death, as well as power take-offs (PTOs), augers, balers, cutters, and moving chains, belts, and other devices. Safety equipment designed to protect the user is effective, but may break and not be replaced. Human factors include

long hours, fatigue, risk exposure at the extremes of age, alcohol use, falls, and failure to wear protective garments, and eyewear.

Farm workers and those who live on farms, including children, are exposed to a highly hazardous environment, and most farms, because they employ <10 workers, do not fall under the [US] Occupational Safety and Health Act (OSHA) regulations. Therefore, farm safety is not mandated, but must be promulgated through safer equipment design, incentive programs, and education. Examples of safer equipment design include protective shields and cages for PTOs and augers, roll-over protection devices for tractors, and improved ergonomics. Incentive programs link reductions in insurance premiums or workman's compensation costs with participation in safety and training programs directed at farm-specific activities and/or equipment use. Education is most effective when defined within the context of the Health Belief Model (HBM), originally described by Rosenstock (1974). The HBM defines costs and benefits, emphasizing the consequences of failing to change behavior. Because the costs are so high in terms of loss of life, injury severity and the impact on farm productivity, several studies have demonstrated that the use of the HBM is a valid approach to improving farm safety. Safety checklists, farm "walkabouts" to identify potential hazards, and farm safety health fairs all raise awareness of the risks unique to farm life. In this report, specific reference is made to the type of hazard, the risk to the farmer/farmworker, and the injury sustained therefrom. Emphasis is placed on hazard reduction and how best to implement an appropriate injury prevention program.

In summary, the lethality of farm injuries and the impact of disabling injuries on the farm, farmer, and farm family warrant continued emphasis on farm-specific injury prevention.

**Keywords:** deaths; education; equipment; farm; hazard reduction; Health Belief Model (HBM); incentives; injuries; insurance; prevention; safety

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## Theme 17: Landmines

*Chairs: Berndt Schneider; Ron Stewart*

### What More Is to Be Done after the Nairobi Review Conference in December 2004: Inventing the Wheel Twice?

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**Introduction:** During the anniversary Congress of the World Association for Disaster and Emergency Medicine (WADEM) in the late 1990s; WADEM's Declaration on Landmines was approved by its General Assembly in Mainz.