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Risk and Vulnerability in a Global Perspective—Challenges and Opportunities

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Risk is the probability of a dangerous event occurring. Vulnerability is the degree to which society can manage dangerous events. Both of these factors increase in the context of natural disasters and complex emergencies, and must be addressed urgently.

For natural disasters, the triggers and hazards may be natural, but the disasters mainly are the result of risks and vulnerabilities created by societal and human forces (e.g., unplanned urban growth). Hazards are expected to increase globally due to climate changes. Risks and vulnerabilities also are increasing in some areas (e.g., HIV/AIDS-affected communities or flood-prone cities with fragile infrastructure); and each disaster increases vulnerability by increasing destitution.

In the last decade, conflict has resulted in increased numbers and severity of complex emergencies. Civilians are targets for violence more than ever before. In addition to increased vulnerability from displacement and economic disruption, the lasting consequences of this violence are reflected in the disability-adjusted life year, measured by the World Health Organization, which shows health-related impacts of conflict (e.g., spread of HIV/AIDS, trauma).

These increased risks and vulnerabilities require action. For natural disasters: (1) preparedness must improve; (2) national capacities must improve; (3) early warning and contingency planning systems must be strengthened; (4) development plans should reflect an understanding of vulnerability; and (5) emergency responses must be more timely, effective, and better coordinated. These efforts can be supported by the use of international development frameworks, that prioritize risk reduction. For complex emergencies: (1) systems for protecting civilians under International Humanitarian Law must be strengthened; (2) responses to crises of displacement must improve; and (3) access to affected populations must improve. All such initiatives should support communities' efforts to address these challenges. The World Conference on Disaster Reduction (January 2005) will be a key opportunity for moving these ideas forward.

Keywords: complex emergencies; disasters; hazards; international humanitarian law; preparedness; responses; risk; vulnerability

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Risks, Threats, Vulnerability and Myths, Paradigms, and Truths

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Universally endorsed terms and definitions are necesssary to enable and promote professional communication. For international research, as well as for international operations and cross-professional activities, definitions are even more crucial. Unless a common language is endorsed, research and evaluation of disasters will suffer extensively. This is one reason that necessary data: (1) have not been collected; (2) if collected, have not been converted into information; and (3) if converted into information, this information has validity only within the context for which these data were collected.

Such terms and definitions determine the understanding of what leads to disasters and how they are managed. Until recently, most have focused on management. Fortunately, efforts now are beginning to be directed towards explaining what causes disasters, and how they can be prevented and mitigated. There has been a shift of paradigm from post-event action to pre-event mitigation.

Three key terms are crucial in this process: risks, hazards, and vulnerability. Unfortunately, inaccurate uses of these terms have led to a host of definitions, of which many are expressed as mathematical equations. A minimum of 13 such formulas using 18 words to define risk can be found on the Internet, of which many are in use by renowned organizations like PAHO, UNESCO, the Civil Defence of Norway, etc. Practically all of these formulas seem to violate the linguistic properties of some terms, and certainly this is true of the term "risk". Risk is a mathematical entity exclusively indicating the probability that a negative event will happen, and must not be confused with damage. So far, only the Utstein template seems to acknowledge this. Since all of the others are different, at least 12 of them must be wrong. Nevertheless, they represent the current paradigm for that group or organization within which they are used. This prevents universal application and discussion. Analyses conducted using these diffuse definitions have no external validity, as they cannot be compared.

This should explain partially why disaster management and disaster research have failed to reach the standards that evidence-based science demands, and which has been reached within other sciences. Consequently, disaster medicine and disaster management still are struggling with myths and paradigms that are difficult to eradicate if wrong, and hard to confirm if right. Unfortunately, even renowned persons propagate statements, unaware that they are confusing axioms with myths and paradigms with evidence-based truth. This

applies to the cause:effect relationship about what causes disasters, as well as cause:effect relationships of different actions taken after the disaster has happened.

One of the many objectives of WADEM is to establish solid, well-conceived, and conceptualized terminology, that, together with proper and newly developed research methods, will guide us in our efforts to separate myths from axioms and paradigms from truths.

References

1. de Ville de Goyet C: Stop propagating disaster myths. *Prehosp Disast Med* 1999;14(4):213–214.

Keywords: definitions; disasters; hazards; international; management; pathophysiology; research; risks; times; vulnerability; WADEM

Sundnes KO: Risks, threats, vulnerability and myths, paradigms, and truths. *Prehosp Disast Med* 2004;19(S1):s1–s2.

Gas Accident in Lillestrøm Town in 2000

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On Wednesday, 05 April 2000, at four minutes past 01:00 hours (h), the police emergency dispatcher received a message that two goods trains had collided at Lillestrøm station 20 km north of Oslo. Two of the wagons were burning and contained a total of 90 tons of liquid propane. No one was injured, but the local hospitals and ambulance service activated their contingency plans. The evacuation zone was expanded several times during the situation. It started with an area of 200 meters (m) around the scene and later was expanded to approximately 1,000 m. About 2,000 people were evacuated from their homes early in the morning on 05 April 2000. There were problems with cooling the scene, as the hoses and pumps froze due to the cold weather. The water pumps also would stop if they were not continuously refuelled. Fire engines with water cannons took over the cooling process until someone could get the pumps working again. To increase the speed of combustion, it was decided to attach technical aids onto the tanks to create a "torch or flare." Both tanks were emptied on Sunday, 09 April 2000. The media received up-to-date information in interviews, press conferences, and press reports. The public also could call an information telephone, and leaflets with information on developments were distributed. The local rescue service used a total of 1,000 servicemen, and several consultants were used. This incident cost the police 4.4 million NOK. Compensation claims were paid to individuals by their own insurance companies. A government appointed commission investigated the accident.

Keywords: cold; collision; combustion; costs; evacuation; information; propane; trains

Høidahl JL: The gas accident in Lillestrøm town in 2000. *Prehosp Disast Med* 2004;19(S1):s2.

1-1-2 Reform in Finland

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Finland is implementing a nationwide Emergency Response Center (ERC) reform. From 2001 to 2006, the rescue services' municipal emergency response centers (fire services and ambulance services) and the police force's emergency call centers will be combined into a single new structure, providing the services of several public authorities. Simultaneously, the number of ERCs will be reduced from 80 to 15. The new ERCs will operate mostly within an area covering one province, with a population varying from 150,000 to 800,000.

The ERCs operate in specially-designed, protected facilities enabling them to continue operating even during states of emergency and catastrophes. The ERCs work under the direct governance of the Emergency Response Center Agency, the central government agency. The Emergency Response Center Administration is an independent body financed directly from the budget of the Ministry of the Interior.

The ERC staff consists of operators, who previously worked at the rescue services' municipal emergency response centers, law enforcement officers from the police forces' Emergency Call Centers (both will receive five weeks of further training for the new duties), and newly-qualified ERC operators trained specifically for the new ERCs (graduates from an 18-month training program in the Emergency Services College). In ERC operator training, particular attention will be paid to performing an incident and risk assessment in connection with various kinds of emergencies and accidents.

The ERCs also employ the necessary number of administrative personnel and technical experts depending on the size of the area and its population. The total number of staff at one ERC, therefore, can vary from 30 to 100 persons. Annually, the ERCs receive approximately four million calls to the 1-1-2 emergency call number nationwide. The goal is for the ERCs to answer emergency calls within an average of 10 seconds. The ERCs also operate as the communications and support center for various authorities, relaying information to police units from the police data register, to which the ERCs have access.

The ERCs are equipped with state of the art information systems and communications technology. Plans relating to preparedness for emergency conditions, compiled by various authorities, are recorded on these systems so that the ERC operators can access them as the incident and area requires. The plans are of particular significance when major accidents occur, and require the assistance of several authorities to rescue people and property.

The ERC reform aims to: (1) ensure that citizens can access all alarm services by dialing 1-1-2; (2) quickly inform and alert several authorities simultaneously; (3) allow personnel and investments to serve several authorities; (4) use specially trained staff for ERC operations and risk assessment; and (5) enhance cooperation between authorities and advance planning for preparedness for various kinds of accidents and emergencies.

Within the coverage area of the ERC of Central Finland, Finland's most disastrous road traffic accident occurred in Äänekoski on 19 March 2004, when the collision of a coach and truck on a highway at 02:00 hours, killing 23 people and severely injuring 15. The swiftly launched rescue operations saved the lives of several severely injured people, as emergency medical care was initiated at the scene. In addition to the rescue plans, the Central Finland

Central Hospital assembled efficient crisis preparedness plans for major accidents, inspired by the railway accident at Jyväskylä Station in 1998, which killed 10 people and injured approximately 50 people. The victims of the accident in Äänekoski immediately received the best possible care, which contributed to their recovery from severe injury.

The authorities of Central Finland have been praised for their successful cooperation in connection with this major accident, which was due mostly to planning in cooperation between the various authorities concerned; the importance of which was once again proven in connection with this unfortunate accident.

For further information on Finland's ERC reform, please see our website: www.1-1-2.fi.

Keywords: 1-1-2; alert; emergency response centers; Finland; information systems; reform; training

Jalasvuori J: 1-1-2 Reform in Finland. ***Prehosp Disast Med*** **2004;19(S1):s2–s3.**

Emergency Alarm Systems—Do They Work?

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Though Sweden and Finland have chosen to channel all emergency calls through one gateway (all calls go to 1-1-2 at joint centers), Norway still has three options: 1-1-0 for Fire, 1-1-2 for Police, and 1-1-3 for Health.

The relevant EU regulation defines 1-1-2 as an emergency number, but explicitly states that national arrangements could be made in addition. The 1-1-0, 1-1-2, and 1-1-3 centers all have interlocking lines, enabling each to channel calls to the relevant expertise. Despite claims to the contrary, Norway, therefore, is meeting the requirements of the EU regulations.

This presentation focused on the medical emergency system, activated either through calls for 1-1-3, or via interconnecting lines from fire stations or the police. The Rocknes incident is well-covered in another session. The report is not public, so I will only refer to that particular case in a limited degree.

However, it is interesting to note that despite this incident being a typical rescue rather than health incident, 1-1-3 was alarmed by a number of callers at the same time as the police (the "correct" addressee) was contacted. Thus, there was no delay in the medical response, as might have been the case if dispatching had had to go through another call center. On the contrary, as the majority of the calls did go to the police, the hospital had the necessary resources to start dispatching responders immediately.

The emergency alarm system in health in Norway is not limited to resources traditionally utilized in emergency medicine. The general idea is that the system should be able to mobilize all health resources, ranging from highly specialized staff stationed at the air ambulance to home nurses working in the local community.

In the case of Rocknes, an air ambulance and general ambulances were dispatched on short notice, and made their way to the scene of the accident. The hospital carried out an internal alarm, and, most importantly, the hospitals not receiving casualties from Rocknes were notified that they would receive more patients than normal, as all cases from other areas would be sent to find shelter at Haukeland University Hospital. The General Casualty Department in Bergen, staffed by general practitioners, was notified that the referral center was under possible distress. The general practitioner on call at Sotra was summoned to the scene of the incident. The latter is an important part of the emergency system, most notably in areas further away from hospitals and other major medical resources.

Having stated that the system did work in the case of Rocknes, some details that are important for the system to work are necessary. An emergency call system cannot handle an emergency on its own. The role of the call system is to provide the caller with immediate advice, and, at the same time, mobilize the correct resources to respond to the scene.

In this health system, we have tried to secure the advice to callers by staffing and equipping the staff at the call center according to their needs. The caller has the right to expect a health-related call to be treated as any other demand for health care, namely professionally and according to healthcare regulations. We, therefore, staff our centers with registered nurses, who have medical expertise at their disposal. The latter may vary, but in an ideal situation, the nurses are able to draw on all of the resources at the hospital for advice. Procedures for certification, maintenance of knowledge, and quality assurance are implemented or being implemented.

However, the role of the call center is limited. For the actual handling of the patient in the field, we are dependent on pre- (or rather: extra-) hospital resources. Again, the philosophy is that all health workers should be available for this situation. This is not the case in most of the country. In central areas, the ambulances seem to be more or less the only actors at the scene. In cities, we are approaching the British situation, in which general practitioners are not involved, and do not want to be involved. Knowing that traffic blocks and difficult addressing systems may delay ambulances substantially. This is a sad state of affairs.

In more remote areas, general practitioners and home nurses are included to a varying degree. In practice, this means that we may find remote areas in the country where cases of cardiac arrest may be attended to professionally at an earlier time than they would in this city. User numbers in the proposed digital radio system indicate that only ambulance workers and possibly general practitioners will be connected, and for the Ministry of Health to accept this state of affairs implies that they are satisfied with the situation of the majority of operational health personnel in this country no longer being included in the Emergency Alarm System in health. This is a serious step backwards, which may not be accepted politically.

There currently is an ongoing project that suggests changes in our Emergency Alarm System. At the time of writing this abstract, the suggestions are unknown. In the capacity of Director at the National Center on Emergency Communication in Health, my main concern is that changes in the system should address our shortcomings (the accessibility of the joint hospital expertise, and all available health resources) as laid down in the present regulations. As for joint control-rooms etc., there is a significant potential in the sharing of management systems, maps etc., but that is possible even without losing out on the principle of having medical staff available as first line call-takers for medical calls.

Keywords: alarm; centers; emergency calls; emergency communications; equipment; health; Norway; Rocknes; staff

Bovim E: Emergency alarm systems—Do they work? ***Prehosp Disast Med*** **2004;19(S1):s3.**

Role of the Media

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The rhetoric of the mass media, particularly in their tabloid form, polarize, simplify, personify, problematize, concretize, brutalize, and vulgarize traumatic events. The so-called "11 on top" criteria for the press are: (1) news; (2) consequence; (3) conflict; (4) drama; (5) rarity; (6) trendy; (7) personal focus; (8) "good news"; (9) exclusivity; (10) "journalist knows a journalist"; and (11) proximity.

The above aspects of modern media and the work situation of journalists ought to be known by professionals in the rescue service and in the medical preparedness organization for accidents and disasters. The media have important societal responsibilities in connection with traumatic events and for that reason may be of valuable help in the disaster work. But, the media themselves, may represent a considerable stress on the actors.

The experience demonstrates that one's media strategy ought to be open, honest, engaged, warm, and self-critical. If you appear infallible, inaccessible, critical, and cold: "You asked for it." A media strategy presumes that there is contingency planning, a press center, a spokesman with clear authorization, media knowledge, a mandate to take initiatives (for example to hold press conferences), an understanding of the media's professional background and their resources, the 24-hour cycle of the media is known, that there is collaboration, and that leaders are willing to expose themselves to the media, if necessary.

Good risk communication, (situations in which there is a need to calm, but not to deny/belittle) demands that the communicator is perceived as: (1) competent; (2) being open and honest; and (3) having a capacity for empathic communication.

Division of responsibility for disseminating information when the main rescue centers/ local rescue centers are involved in large transport accidents is as follows:

1. The transport company may: (1) confirm the event/facts related to the event; (2) take care of the interest of the injured, diseased and their next of kin; (3) provide information about the background of the accident; (4) provide information about the transport company's implemented support services and about the consequences for continued transport activities ("business in the crisis"); and (5) prepare for interviews with survivors and/or witnesses.
2. The rescue service is responsible for all information: (1) about the rescue operation; (2) about injured/diseased and survivors; and (3) may make identities of deceased known and inform next of kin about the deceased or missing (coordination).
3. The hospitals are responsible for informing the next of kin of the injured, may give permission for journalists to interview the injured, and may inform the media about physical injuries.
4. When it comes to foreign citizens, it is that person's national embassy, that is entitled to disseminate information about the involved citizens and the consequences for its own activity, and may disseminate the name of the injured and deceased and inform about other actions.

Keywords: communications; information; journalists; media; responsibility; rhetoric; risk

Weisæth L: Role of the media. ***Prehosp Disast Med*** **2004;19(S1):s4.**

A Systems Approach at 66°N: Natural Hazards in Iceland

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Iceland is a country with vast and various natural hazards. Examples include the 1973 volcanic eruption on the Vestmannaeyjar Islands and the earthquake in the south central region of the country in 2000. Numerous casualties have occurred from avalanches: two such catastrophes occurred in 1995 when two villages were hit by avalanches on separate occasions, claiming 34 lives. Another natural hazard is sub-arctic tempests, a risk particularly to seafarers.

The Icelandic Civil Defense Organization originally was established in the 1960s, mainly to tackle the threat of war and possible nuclear catastrophes. Participation in civil defense as a means of disaster preparedness was mandatory for all governmental agencies and all individuals 18–65 years of age. Later, attention was focused more on natural disasters. This was emphasized particularly in the 1970s by non-governmental organizations, such as the all-volunteer search and rescue teams and the Icelandic Red Cross, the latter of which has played an integral role in developing a modern EMS system in the country. Healthcare institutions became more involved in the 1980s and public safety services followed suit. In 1985, an incident command system was formally included as a component of civil defense. Guidelines for triage of multiple casualties also were published.

During the avalanche rescue and relief operations in 1995, this system was tested in many ways. Overall system performance was quite adequate, but, based on lessons learned, many amendments have been made. As examples, the incident command system was extensively reviewed, a new approach to disaster drills was instituted, a proposal was written for a nationwide trauma system, and a new National Rescue Coordination Center has just been inaugurated. The main principle has been to integrate disaster preparedness with everyday emergency services.

Keywords: avalanche; coordination and control; disasters; drills; emergency medical services; events; hazards; Iceland; incident command system; threats

Baldursson J: A systems approach at 66°N: Natural hazards in Iceland. ***Prehosp Disast Med*** **2004;19(S1):s4.**

Handling of Medico-Legal Work in Greater Accidents and Catastrophes

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In Norway, the handling of greater accidents and catastrophes is the responsibility of the head of police in the local police district. However, the practical work is delegated to the Disaster Victim Identification (DVI) Group of the National Criminal Investigation Service. The DVI Group consists of three divisions: (1) criminal technicians; (2) forensic pathologists; and (3) forensic odontologists. All of the Nordic countries have similar groups, and these DVI groups meet once each year, and are part of a worldwide network organized from Interpol in Lyon.

The Steering Group of the Norwegian DVI group consists of a leader (police officer), the head of the criminal technicians, the head of the forensic pathologists, and the head of the forensic odontolo-

gist. In case of a mass disaster, they meet immediately and organize the DVI work. Often, pathologists and odontologists are sent to assist criminal technicians with the work at the scene.

Logistics is extremely important. Often, freezing carriages are used for transport and storage of the victims. If there are suitable autopsy facilities available, these will be used; otherwise autopsy rooms must be improvised. A center for gathering information about the missing persons, dental journals, medical information, and tactical information must be organized, and all post-mortem information must be reported to this center, so that the final identification can take place.

Since 1985, DNA analyses have been applied in DVI-work. Most of the 159 victims of the Scandinavian Start disaster in 1990 were identified based on dental records; whereas, after the air crash in Spitsbergen in 1996, all but one of the 141 victims were identified based on DNA profiles. However, forensic odontologists are not outdated: in the recent terrorist bomb attacks in Madrid, 146 out of 191 victims were identified by means of dental records. Based on experience of mass disasters during the last five years, most western DVI teams start identification work using all available means, and adjusting the extent of the operation according to the conditions.

Keywords: criminal technicians; events; logistics; medico-legal; odontologists; pathologists; police; responsibility; terrorist; victim identification

Rognum O: Handling of medico-legal work in greater accidents and catastrophes. ***Prehosp Disast Med*** **2004;19(S1):s4–s5.**

NATO's Role in Disaster Management and International Cooperation—Joint Medical Committee's Contribution

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In May 1991, the North Atlantic Council (NAC) decided to establish the Joint Medical Committee (JMC). The JMC works according to its Terms of Reference (TOR) and the NAC approved Ministerial Guidance for Civil Emergency Planning (CEP), and reports to the NAC via the Senior Civil Emergency Planning Committee (SCEPC).

The roles of the CEP are to support the Military Operations (Article 5), Crisis Response Operations (non-Article 5), and the National Authorities in Civil Emergencies, to protect the civilian population against the effects of weapons of mass destruction (WMD), and to cooperate with partner countries.

In addition to the JMC, there are seven planning boards and committees providing the SCEPC with advice, input, and studies concerning different fields of activities in a modern society (transport, food and agriculture, civil communications, industry, and civil protection). National representation in the JMC is both civil and military, both currently serving each with background and current services in the healthcare profession. The JMC also may draw upon a group of medical experts: disaster medicine, movement of casualties, chemical, biological, radio-nuclear, tropical medicine, medical logistics, public health, military medicine, and blood provision and supply.

The JMC responsibilities include medical emergency planning, information, and recommendation to NATO, participation in exercises, conducting studies, addressing medical logistic issues, and carrying out tasks from the SCEPC.

The JMC also is cooperating with other NATO committees/bodies on the military side, especially when it comes to WMD issues. The Committee is providing medical support to the Euro-Atlantic Disaster Response Coordination Center (EADRCC) when the Center is activated in disaster management or in exercises. In addition, the JMC participates in the planning and accomplishment of seminars/workshops and in the development of treatment protocols for CBR-N agents. It is important for the JMC to emphasize the work with plans and procedures and to contribute to the medical interoperability within nations in medical emergencies.

The JMC cooperates with the Civil Aviation Planning Committee (CAPC), the military authorities concerning aeromedical evacuation, the Committee of the Chiefs of Military Medical Services in NATO (COMEDS) when it comes to civil-military support, the Food and Agriculture Planning Committee (FAPC) when it comes to medical justification for the introduction of restriction of movements of people and animals, and the Civil Protection Committee and the WMD-Center in the protection of the civilian population against WMD.

The CEP/JMC in NATO have a dialogue with the World Health Organization. Information is exchanged between NATO and the European Union.

The work in the JMC is based both on the Work Program developed for a period of two years (2003–2004) and CEP Action Plan. In this regard, the JMC provides civil inputs to the Inventory of National Medical Capabilities concerning CBR-N attacks, civil inputs to a Laboratory Response Network, and conducts a review on Epidemiological Surveillance Systems in the EAPC countries.

Keywords: assistance; biological; chemical; civil-military cooperation; disaster management; humanitarian; Joint Medical Committee; North Atlantic Treaty Organization (NATO); planning; radio-nuclear; role; terrorism; weapons of mass destruction (WMD)

Kovdal A: NATO's role in disaster management and international cooperation—Joint Medical Committee's contribution. ***Prehosp Disast Med*** **2004;19(S1):s5.**

International Collaboration in Humanitarian Assistance: The Military-Civilian Relationship

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Cooperation between military and civilian agencies covers a large variety of relationships. It includes the conduct of the occupants towards the occupied (and vice versa), the way to avoid civilian structures when waging war, and recently, how military forces and humanitarian agencies may join forces to promote health, peace, and well-being.

The dual faces of a military force, aimed at preventing disasters through a mechanism of deterrence and their ability to actually create disasters, complicate this relationship between the military forces and the humanitarian agencies, and also between the military forces and the affected population.

On the other hand, military forces, as a rule, command huge quantities of resources, which when properly administrated, are

capable of addressing both complicated and urgent humanitarian matters. To benefit fully from the potentials of the use of these military resources, a thorough understanding of the different sets of paradigms and backgrounds as reflected in different military set-ups, is mandatory by all parties involved. This includes understanding the conceptual differences between a UN-Peace operation (commanded by the UN system) and military alliance-led operations (e.g., commanded by NATO). It includes the differences between a professional military force and a force based on drafted civilians where the population has compulsory military service. It also necessitates a thorough distinction between when Civilian-Military Cooperation is seen as a "Combat Support Operation" (current NATO-CIMIC doctrine) or as Civilian-Military Coordination (CMCoord) as presented by the UN Office for Coordination of Humanitarian Affairs.
Conclusion: Inter-agency and international cooperation/coordination is a must for all international humanitarian assistance. Beyond providing a safer environment, military forces could contribute significantly to humanitarian operations. However, all such relationships have strengths, weaknesses, opportunities, and threats. Understanding them will facilitate any such joint operations.

Keywords: civil-military cooperation; health; humanitarian operations; international; North Atlantic Treaty Organization (NATO); peace; resources; United Nations (UN); war

Sundnes KO: International collaboration in humanitarian assistance: The military-civilian relationship. ***Prehosp Disast Med*** **2004;19(S1):s5–s6.**

How to Make a Local Plan Functional

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Norwegian municipal administrations have been making emergency/preparedness plans for decades. Former plans mainly included preparations for war, but never were put into action. By 01 January 2002, new laws of health and social emergency planning were made effective. This law shifted the focus for planning preparedness for war towards disasters in civil life.

Making a health-emergency plan for municipal services is demanding. Keeping it updated at any time is equally exacting work. At the beginning of making new plans, some principal questions had to be dealt with:

1. How can these plans be made in the most effective way?
2. Who are the natural participants in making one plan that every municipal administration easily could adjust to their own?
3. How can the plan give easy access to basic knowledge for emergency situations and at the same time give exact information about special situations considered to be at high risk for each community?
4. How can the plan be functional and easy to update?

During the session, a process originally conceptualized by public health doctors, continued to be worked on by the Norwegian Board of Health in the Buskerud. It constructed a workshop with the aim of answering all the questions above which will be presented. Did they make it? The plan can be downloaded at www.ovre-eiker.kommune.no.

Keywords: disasters; health emergencies; plan; war; workshop

Braaten E: How to make a local plan functional. ***Prehosp Disast Med*** **2004;19(S1):s6.**

Cross-Professional Incident Collaboration (TAS)

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Background: The cross-professional incident collaboration (TAS) project includes seminars in emergency medicine, first aid, and special courses designed to promote cooperation between municipality resources, such as physicians, nurses, ambulance staff, firefighters, and police officers.
Methods: The whole course lasts four days: three days for health professionals and two days for firefighters and police officers. A project group with representation from Norwegian Air Ambulance (NLA) and the target group have worked out the program for the course. The purpose is for better EMS and better on-scene cooperation. TAS courses were offered to all Norwegian municipalities for free. One hundred, ninety of 435 municipalities have applied, and all applicants have been given a course in 1999–2003. The schedule currently is being revised to oblige the need for training local resources in a larger scale including the administrative machinery.

TAS2 – A New Approach to Extrication
For the patient injured and trapped in a motor vehicle, every minute can be important. To shorten the on-scene time, supervisor Trond Boye Hansen,[3] in cooperation with the fire department, has developed a new method for rapid extrication.[2] The wreck is quickly pulled back toward its original shape using wire, chain, winch, and hydraulic rescue tools. The goal is to minimize the time to extricate the critically injured patient, to a maximum of 10 minutes. A project group in NLA, together with emergency professionals from Oslo, has developed a two-day course to implement this method for local emergency resources. The course also focuses on better cooperation on-scene.

Courses currently are offered to municipalities dealing with a large number of serious traffic crashes. Thirty courses have been accomplished.
Results: The participants were asked to evaluate their personal benefit through a questionnaire. More than 75% scored 4 or 5 on a scale from 1–5 (1 being "no benefits" and 5 being a "very large" benefit).[1]

References

1. Erik Ravne: "Kursevalueringer TAS 2000".
2. Wik L, Hansen TB, Kjensli K, Steen PA: "Rapid extrication from a car wreck." Oslo, 2004.
3. Supervisor, Division of Prehospital Emergency Medicine, Ullevål University Hospital, Oslo, Norway.

Keywords: crashes; cooperation; education; emergency medicine; emergency medical services; extrication; firefighters; municipalities; police

Barstein J: Cross-professional incident collaboration (TAS). ***Prehosp Disast Med*** **2004;19(S1):s6.**

Gas Poisonings—An Overview

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In the war against international terrorism, civilian preparedness for toxic terrorism and gas attacks must have high priority. This preparedness consists of theoretical knowledge within clinical toxicology and experience from work with chemical accidents. Here, the role of proper out-of-hospital decontamination of the victims cannot be overestimated—and in Norway, this has resulted in the introduction of several mobile decontamination units/wagons distributed throughout the country.

Healthcare professionals working in gas/chemical-contaminated areas also illustrate another important problem: The safety of the rescuer. This is best illustrated by the phrase "use your head and not your heart" during fieldwork, while trying to help gas-poisoned victims. The typical (and potentially fatal) error by untrained personnel is to run into a gas exposed area with a filter gas mask only—forgetting the fact that oxygen may not be present—and that some gases are easily absorbed through the skin (e.g., the nerve gases).

Toxic gases may be classified in many ways according to their chemistry, toxicity, or clinical features of the exposed victims. From a pedagogic point of view, the original classification of gases according to their mechanisms of action originally proposed by the Joint Military Service of our armed forces still is attractive. Based on this classification, an overview of gas poisoning is presented. Special focus is given to nerve gas agents because a minimum of pathophysiology is necessary to understand the rationale for the antidotal treatment, especially the amount of atropine that may be needed for the individual victim. This amount also has implications for the amount of antidotes that must be stocked. Because many antidotes are rarely used, expensive, and have limited shelf lives, regional cooperation often is the best choice in the Nordic region, where rural areas dominate.

Keywords: antidote; chemicals; civilian; decontamination; gas; mobile; nerve gas; poisoning; preparedness; regional cooperation; safety; terrorism; toxicology; toxins; war

Jacobsen D: Gas poisonings—An overview. *Prehosp Disast Med* 2004;19(S1):s7.

Disastrous Fire in a Clubhouse in Gothenburg in 1998

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Introduction: In 1998, about 400 teenagers gathered in a clubhouse for a private party. Around 23:00 hours, four teenagers who had been rejected to the party some hours before set fire to some furnishings behind the stage exit door. Within approximately 10 minutes, the fire accelerated aggressively and the main dance floor was in flames. There was only one narrow door for emergency exit (120 cm wide) and about 200 people were stuck inside. The rescue action was cleared within two hours.

Results: Two-hundred thirteen injured people were brought to four different hospitals within two hours. Sixty-three people died in the accident, of these, 61 had died at the scene of the accident. Of the two who died in the hospital, one had developed cardiac arrest at the scene, while the other developed irreversible brain damage. Of the 213 brought to the hospital, 150 remained and 74 were admitted into intensive care.

Cyanide levels in venous blood and carboxyhemoglobin (CO-Hb) levels were determined in the 61 victims who died at the scene. Mean levels of cyanide were 0.76 microgram/g (0-2.1) and CO-Hb was 57% (17-80%).

Discussion: The level of cyanide increased with the level of CO-Hb indicating a longer duration of exposure to toxic gases for those with high levels. Thus, a longer duration of exposure increases the risk of cyanide and carbon monoxide toxicity.

The levels of cyanide were fairly low in most cases. Several cases had such low levels of CO-Hb and cyanide that other factors must have contributed to the death. Such factors could have been asphyxia with hypoxemia and hypercapnia. Also body-packing and hyperthermia may have contributed to the deaths.

Keywords: carbon monoxide; cyanide; escape; exposure; fire; mortality

Knudsen K: Disastrous fire in a clubhouse in Gothenburg in 1998. *Prehosp Disast Med* 2004;19(S1):s7.

Gas Poisoning in Historical Perspective

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Gas poisoning that affects a great number of people has occurred throughout the years. In 1944, a chlorine bottle leaked close to the fresh air inlet of an underground station in New York, resulting in the hospitalization of more than 200 persons. At an uncontrolled release of dioxines (an impurity) from a plant in northern Italy in 1976, a large number of people were exposed in an area of 4–5 km^2. No immediate effects were noted, but after several days, acute symptoms appeared, and much later, general symptoms such as chloracne and liver impairment developed. In 1979, a train carrying chlorine derailed in Canada leading to the evacuation of one hospital with 1,250 patients and 250,000 persons from their homes for two to five days. In 1984, a release of methylisocyanate from a plant in Bhopal, India exposed 150,000–200,000 persons. More than 2,500 persons died during the first week mainly due to lung damage, and thousands of people developed chronic pulmonary damage. The fire in King´s Cross underground station in 1987, the fire on the passenger ship, Scandinavian Star, in 1990, and the discotheque fire in Gothenburg in 1998, all revealed a number of deaths from inhalation of hydrogen cyanide (and carbon monoxide). The terrorist attack in the Tokyo subway in 1995, where the nerve agent, sarin, was spread, forced more than 3,000 persons to seek medical attention and about 500 persons were admitted to hospitals with symptoms typical of cholinergic poisoning. In 1998, more than 100 persons in Sweden were exposed to nitrogen oxides in an ice hockey arena and 62 were treated in hospitals. The examples presented here illustrate that these events have different dimensions and characteristics.

Keywords: chlorine; cyanide; dioxines; gas; history; methylisocyanate; nitrogen oxides; poisoning; sarin

Kulling P: Gas poisoning in a historical perspective. *Prehosp Disast Med* 2004;19(S1):s7–s8.

Food-Borne Disaster: A Case Report

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Background: Botulism is a neuro-toxic disease caused by the toxin produced by *Clostridium botulinum*. This is a report of an outbreak of food-borne botulism involving eight individuals and the experience during the initial management of these cases.
Case Report: Six family members presented to different healthcare facilities with a one-day history of vomiting and general fatigue. They initially were thought to have a viral syndrome. Significant physical examination findings included bilateral ptosis, diplopia, tongue weakness, and respiratory muscle weakness. All involved family members had ingested canned meat three days prior. The regional poison center, local health department, and the Center for Disease Control and Prevention (CDC) were contacted immediately. It took eight hours for a supply of botulinum antitoxin to be flown to the site and administered to the patients. Over the next five days, two additional patients were diagnosed with botulism toxicity linked to the same source. Six patients required intubation for respiratory failure. The length of intubation ranged from 19 to 54 days, and the length of hospital stay ranged from five to 72 days. No deaths were reported.
Conclusions: The process of identifying uncommon diseases can be a challenge and requires education and training for the rapid recognition of these diseases. This case exemplifies how even a small outbreak of a known disease can overwhelm resources and cause a significant public health emergency. Emergency plans must be in place and functional in all healthcare facilities. Contact numbers for pertinent agencies must be available and tested for accuracy before such an event occurs. Knowing the procedures for procuring rare antitoxins is essential to decrease delays in treatment and the morbidity associated with those delays.

Keywords: antitoxin; botulism; diagnosis; food poisoning; treatment

Woody J, Rivera W, Velez L, *et al*: Food-borne disaster: A case report. *Prehosp Disast Med* 2004;19(S1):s8.

Psychological Impact of Terrorism

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Introduction: While conventional, chemical, biological, and nuclear terrorism can kill or maim, the most profound burden of all such disasters is psychological. Terrorism and its psychological impact represent a major public health threat.
Methods: A literature review was done focusing on the psychological impacts of the 11 September 2001 terrorist attacks on the World Trade Center towers.
Results: Development of post-traumatic stress is directly proportional to both the geographic and emotional proximity of the traumatic event. Secondly, the larger degree of exposure and the higher frequency of viewing images of a terrorist attack, either real or via the media, both increased the chances for developing the post-traumatic stress disorder and other co-morbid psychopathology. Young children may be particularly susceptible to the effects of violence in the media, and terrorism is no exception. Several specific protective factors are suggested in the literature, but never have been adequately proven in well-designed studies. A systematic review of the literature and the Cochrane database suggests that few modalities have been tested or proven effective to prevent the development of post-traumatic stress or depression.
Conclusion: Terrorism is a public health threat and methods of treating its impact on psychological well-being must be elucidated further with new research. The current literature suggests that limiting exposure to the trauma is helpful for both immediate and vicarious victims. In the wake of a terrorist attack, it not always is possible to normalize daily routine and generalize emotional responses. Thus, the physician treating these victims must be versatile and ready to respond with situation-specific and person-specific interventions that are compassionate and appropriate to the circumstance.

Keywords: exposure; media; post-traumatic stress disorder; psychological effects; terrorism; trauma; violence

Woody J, Larkin G: Psychological impact of terrorism. *Prehosp Disast Med* 2004;19(S1):s8.

Technology for Information Gathering and Sharing in Large-Scale Emergencies

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Introduction: Information gathering and sharing in crisis situations are the focus of several SINTEF IKT projects. Emergency teams dealing with major crises today rely almost entirely on voice communications to exchange information and direct resources. Our vision for the future is that emergency teams, both military and civilian, will augment voice communications with data communication using small, mobile computers linked together in wireless networks. These networks would be set up rapidly in response to incidents.
Method: Discussions with potential users have been used to identify the types of technological support that would be useful in crisis situations. Prototypes have been developed and field trials conducted in order to provide a solid basis for gathering more detailed requirements, verifying technical concepts, identifying important usability factors, and identifying areas for further research.
Results: A prototype called FieldCare has been developed to demonstrate data gathering and information sharing at the site of an accident using an *ad hoc* WLAN network, handheld computers, and medical information tags attached to the casualties. In a joint US-NORWAY military project, field trials of a similar prototype, tailored to military standards, have been carried out satisfactorily in a medical evacuation exercise at Setermoen in December 2003.

Some important issues identified through this work are: (1) hands-free operation of mobile terminals in rough and noisy field conditions; (2) the need for robust replication of data without the need of a central server; and (3) the use of tags attached to patients for storage of key information and tracking of patient location.
Conclusion: The research and field trials carried out so far show that handheld computers and wireless networks offer significant potential for improving information quality and operational efficiency in crises situations.

Keywords: communication; computers; crisis; data; efficiency; information; medical information tags; technology

Svagård I, Gorman J: Technology for information gathering and sharing in large-scale emergencies. *Prehosp Disast Med* 2004;19(S1):s8.

US-Norway Military Telemedicine Collaboration—Evacuation Support System

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3. Joint Medical Forces, Norway

Introduction: There are many concerns to attend to in a military battlefield situation. A wounded soldier will need immediate treatment and transport to the nearest medical facility. The receiving medical facility should have information about the patient's medical history. The Command and Control (C2) units need to be aware of the overall situation. The soldier's commanding officer wants to know his medical status. Accurate medical records are essential for epidemiological research—many actors need information about the patient.

The US-Norway Telemedicine collaboration project has developed and tested a prototype solution called Evacuation Support System (ESS) that investigated:
1. Patient tracking using electronic "dog-tags";
2. Digital mobile documentation, providing "early warning medical information" to the medical treatment facility and "medical tracking" information to C2 units; and
3. Exporting standardized patient documentation to SANDOK EHR to ensure complete patient records

Method: The system was designed by SINTEF ICT in close cooperation with both Norwegian and US military medical personnel, and implemented by Cardiac AS. It was tested at Setermoen during exercise Interaction in December 2003. The system was evaluated using the Technology Acceptance Model, which includes observation logs, structured interviews, and questionnaires.

Results: The results from the evaluation showed that portable computing devices, electronic "dog-tags", and wireless communication can support and improve the work in a military evacuation scenario. The system must be: (1) robust and easy to use; (2) compatible with medical drills; (3) integrated with biosensors; and (4) integrated with existing communication infrastructures.

Conclusion: A system with electronic computing and communication devices will improve patient management in field environments and provide important information for C2 units if it is carefully designed.

References

1. Forsvarsnett "Dødsmerke er dødsdømt" http://www.mil.no/haren/6div/start/article.jhtml?articleID=62094.

Keywords: collaboration; command and control; communications; documentation; dog tags; evacuation; information; medical records; military; telemedicine; support

Walderhaug S, Jensen A, Brevik JI: US-Norway Military Telemedicine Collaboration—Evacuation Support System. *Prehosp Disast Med* 2004;19(S1):s9.

Terror—Psychological Aspects

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The target group for terrorists is not the victims, those who are injured or killed, but the population itself. The modern media play a key role by conveying dramatic impressions to the public. How much terror would there be without modern mass media?

The success criteria for anti-terror accomplishments not only should be the capacity to prevent terrorist attacks, but, rather, a decisive criterion should be that the population develops attitudes and coping strategies that make it psychologically resilient to effects of terrorism. There is no guarantee that any nation will succeed 100% in prevention of all terrorist attacks.

Results from Norwegian studies on different forms of terror will be presented. On the one hand, the Nacht und Nebel (NN) or Night and Fog Terror, such as against Televåg, resistance fighters and their families, consisted of methods to create maximum uncertainty about the fate of the victim. On the other hand, the effects of state-terrorism against the crews of Norwegian ships who were exposed in the Arab Gulf (1980–1988) were that the media conveyed impacts that caused significant stress reactions in the families at home in Norway. The findings show that both the NN-created uncertainty and the dramatic frightening events conveyed by the mass media, have an effect on families.

The resilience in a population appears to be dependent upon four conditions: (1) capacity for a realistic, statistical evaluation of the risk of a single person to become a victim of an act of terrorism; (2) a full understanding of what terror and terrorism is, its methods and goals; (3) society's capacity to prevent/handle acts of terrorism; and (4) the meaningfulness and acceptance of the risk in facing terror and terror threats.

Keywords: acceptance; attitudes; coping strategies; media; resilience; risk; terror; terrorists; uncertainty; victims

Weisæth L: Terror—Psychological aspects. *Prehosp Disast Med* 2004;19(S1):s9.

A Global Infection—SARS: What Actually Happened in China?

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In November 2002, an outbreak of atypical pneumonia with unknown etiology started in South China, but took several months before being reported to the WHO and appropriate action was taken. The outbreak was unusual in having a very high attack rate among healthcare workers. A doctor from Guangdong Province, who stayed at a hotel in Hong Kong, was the source of an international spread of SARS. The global epidemic eventually affected more than 8,098 patients and caused 774 deaths in 26 countries. After the WHO's global alert on 12 March 2003, concerted efforts by the global scientific community led to the discovery of a new pathogen, the SARS coronavirus, within weeks. Diagnostic tools also soon became available. Traditional control measures including travel restrictions, increased surveillance, rapid identification, and isolation of cases were effective in containing the epidemic, and on 05 July 2003, the WHO declared that all chains of transmission had been broken. An animal reservoir of the virus is likely, and a crossing of the species barrier likely prompted the epidemic. The WHO warned of the danger of resurgence early in the post-outbreak period and four sporadic cases were identified in Guangdong late last year. Since then, laboratory workers have been infected in Taiwan, Singapore, and Beijing. Nine cases of SARS were reported (as of 07 May 2004) as a consequence of the Beijing laboratory outbreak that started in April, this year. Greater attention must be paid to biosafe-

ty in virology laboratories globally. SARS has provided important lessons for future epidemic containment and continued vigilance is essential.

Keywords: control; diagnosis; epidemic; epidemiology; laboratories; restrictions; severe acute respiratory syndrome (SARS); surveillance; testing; World Health Organization (WHO)

Brantsaeter AB: A global infection—SARS: What actually happened in China? ***Prehosp Disast Med*** **2004;19(S1):s9–s10.**

Quality Assurance for Red Cross Volunteers in Finland

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A member of the Red Cross first-aid group can be participating in the activities for his or her own needs, just wanting to practice, or to maintain first-aid skills. A member also can assign himself to different tasks when needed. When a volunteer is hoping to practice or maintain his/her first-aid skills, the Red Cross cannot make demands on the quality; however, when the volunteer is bound for different tasks, the Red Cross demands an assurance of high quality.

An important element is that volunteers should be able to deal with a situation when something happens and provide help by using correct first aid, thus ensuring that a victim gets helped effectively.

Tasks can differ in different parts of Finland. Mainly, the tasks for the groups are: (1) first aid at large events; (2) first response as a part of the local emergency medical system; or (3) searches for missing people. In bigger accidents and catastrophes, volunteers can provide primary care (e.g., food, shelter, and psychosocial support).

Different tasks require different training. To ensure high quality when volunteers perform different tasks, the following recommendations must be considered: (1) all courses are valid for three years, and the instructors have to update their competencies every three years; (2) training courses have a competence-based approach: skills, behaviors, knowledge, and attitudes to perform a job effectively all are important parts of the courses; (3) all volunteers get continual monitoring, evaluation of their competencies, and assessment of practical skills; and (4) to get the certificate, the volunteer must perform skills in a competent manner that follow the guidelines.

As an example of the efforts of ensuring high performance quality among the volunteers, a study done last year will be described. The quality of basic life support was tested in recently trained volunteers and in volunteers in Uusimaa, who trained twice each month. Objective Structured Clinical Examination (OSCE), introduced by Harden and Gleeson,[1] has been proven to be both a valid and reliable method to test the practical skills of the students.[2] It was used in two different scenario-based training modes. The first scenario was a patient with ventricular fibrillation as the initial mode and the second scenario was a patient with asystole. A skills checklist was used to grade each pair. All together, 49 points were registered during both scenarios.

The important keys are to start action without hesitation and to build up the confidence of the performer during the training. The effects of frequent training of CPR-Defibrillator skills by lay persons could be seen when comparing the recently trained volunteers with a group of professional first aiders practicing every two weeks. The first aiders performed almost 100% correctly, which indicates the vital importance of continuous training and exercise of resuscitation skills.

The Red Cross requirements for volunteers who provide first-aid at big events are: (1) passing basic and advanced first-aid courses (16 + 16 hours); (2) passing a special first-aid course (12 hours) for the provision of first-aid at public events; and (3) being at least 18 years of age.

There are special courses for those who are planning the events, including risk management, communication, cooperation, etc. There are forms to ensure high performance quality among first-aid givers that provide information on how to make an agreement, what to monitor in the patients and that require all first-aid actions and observations of the patient be written down. Afterwards, the instructors provide feedback on how they performed and a plan on how to develop the skills further is produced. Continuous work for finding ways of better performances and better quality assurance is carried out, not only by the instructors, but by the whole organization in Finland.

References

1. Harden RM, Gleeson FA: Assessment of clinical competence using an objective structured clinical examination (OSCE). *Med Educ* 1979;13:41–54.
2. Wik L, Dorph E, Auested B, Steen PA: Evaluation of a defibrillator-based cardiopulmonary resuscitation program for non-medical personnel. *Resuscitation* 2003;56:167–172.

Keywords: cardiopulmonary resuscitation (CPR); competence; defibrilation; Finland; first aid; mass gatherings; performance; Red Cross; training; volunteers

Castrén M: Quality assurance for the Red Cross volunteers in Finland. ***Prehosp Disast Med*** **2004;19(S1):s10.**

Nordic Cooperation in International Operations: Experiences from the Earthquake in Iran

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The main focus of this presentation was to determine how important well-functioning teamwork was in the field hospital provided by the Norwegian and the Finnish Red Cross following a major earthquake in Iran in December 2003. The area most affected was the ancient city of Bam, where 26,271 people were killed, approximately 30,000 were injured, and up to 75,000 were left homeless.

Given the scale and the scope of the disaster, the Government of the Islamic Republic of Iran and the Iranian Red Crescent Society (IRCS) formally requested international assistance. The IRCS provided a vital immediate response. In support of the IRCS, the International Federation of the Red Cross (IFRC) and Red Crescent Societies coordinated the deployment of an emergency response unit (ERU) field hospital. In addition, three basic healthcare ERUs, four water and sanitation ERUs, a logistic ERU, and a

relief ERU from several Red Cross/Red Crescent National Societies were deployed. The ERUs are an important tool in the Federation's disaster response and part of the Federation's Integrated Disaster Management Program, which deals with emergency response, preparedness, and rehabilitation.

This presentation describes how crucial the teamwork was, but also how important the coordination of the equipment was for the cooperation between the Norwegian and the Finnish Red Cross in Bam. In addition, how essential the cooperation between the different ERUs was for the operation will be emphasized. The data are based on the author's experience as the head nurse in the Norwegian/Finnish referral hospital in Bam, and those collected from 18 Norwegian and Finnish nurses working in the hospital during the first three months of the operation.

Implications for future operations as better coordination before the departure and the standardization of training and set-up will be outlined.

Keywords: Bam; cooperation; coordination; earthquake; field hospital; Finland; international operations; Iran; Norway

Tjoflåt I: Nordic cooperation in international operations: Experiences from the earthquake in Iran. ***Prehosp Disast Med*** **2004;19(S1):s11.**

What Is a Disaster?

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Various organizations use different disaster definitions according to the usefulness. For each particular organization, the medical disaster definition emphasizes the number of persons in immediate need of medical treatment. This definition reflects the operational need of the hospital, in other words, when the hospital needs to alarm its disaster organization, when the immediate/acute needs for treatment exceed the immediately available medical resources.

This somewhat narrow definition sometimes leads to a clash between the needs for professionals to communicate between themselves and common sense. Such an event as the sinking of the ferry in Estonia was defined as "not a disaster" by a leader in the medical rescue organization. Formally, that was correct, but it was not well-received by the public. For most people, an event that costs the lives of >800 people will qualify for the term "disaster".

The narrow medical definition of disaster for many years also was seen as partly responsible for the lack of scientific knowledge we had of families, missing persons, bereaved families, and the effects on personnel working with the deceased.

It is essential to distinguish between disaster medical work and acute/emergency medical care. The first involves working in a situation characterized by a shortage of resources, where the medical or rescue disaster worker will be expected to feel insufficient, but, in spite of this, should know that he is handling the situation correctly and is performing well. This means that the disaster worker must cope with the feeling of relative helplessness. Research indicates that different degrees of personal control, such as real control, perceived control, and cognitive control, are achieved through relevant education/training/real-life experiences, and in a decisive way, contribute to maintaining the functional capacity.

Keywords: communication; coping; definitions; disaster; effects; helplessness; resources

Weisæth L: What is a disaster? ***Prehosp Disast Med*** **2004;19(S1):s11.**

What Is a Disaster? What Is Disaster Economy, and Where Do We Go from Here?

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There are numerous definitions of disasters, as discussed by Al-Madhari and Keller.[1]

However, the core of all modern definitions focus on a mismatch between tasks and resources in such a way that problems that could have been solved if resources where available are not solved unless resources are brought in from outside the affected area. This distinguishes a disaster from a mass-casualty incident. Thus, disaster is a relative term.

In this concept, disaster economy is a term that still must be defined. Who is affected? Who pays the bill? How is it paid? The current paradigm of market economy will probably deprive most disaster projects of their financial support, as they are not cost-effective in any tangible manner. Therefore, disaster economy also must include intangible variables and focus on what promotes health and well-being, both physical and mental. A pure financial approach is inappropriate in this context since it cannot measure these intangible values and also because it confuses finances with actual available resources. In a disaster, in this context, a thorough knowledge of opportunity costs is essential since prioritization is a crucial component of all disaster management.

These basic approaches should be applied to all phases of disasters, their prevention, mitigation, and management, since they constitute essential elements of a well-functioning coordination and control, which is an absolute must in any disaster management.

Reference

1. Al-Madhari AF, Keller AZ: Review of disaster definitions. *Prehosp Disast Med* 1997;12(1):17–21.

Keywords: costs; definitions; disaster; economy; intangibles; opportunity costs

Sundnes KO: What is a disaster? What is disaster economy and where do we go from here? ***Prehosp Disast Med*** **2004;19(S1):s11.**

What Is a Disaster?

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The Norwegian Law on Health and Social Preparedness aims to protect the life and health of the population, and to contribute to their quality of life by offering necessary health services to the population during war, at times of crisis and disaster, and in times of peace.

The interpretation of the terms varies according to situation and context. Many healthcare workers believe that during disasters, patients with the best likelihood of survival should be given priority. Others claim that one could give way to emergency justice in disas-

ter situations. One could even plan to set other laws and regulations aside. Furthermore, to some, the term "disaster" is equal to "alarming hospital employees" and the term is not connected directly to treating patients.

I call for a clarification of terms by the authorities that have defined them, and also on what these terms mean during a preparedness situation. This should be done in the form of a regulation.

I envision that, as a starting point, we should describe the normal situation, when the emergency preparedness is tailored to normal needs, and the service level is adequate. The crisis could be defined as a situation in which the demand is increased to a level that implies reorganization of resources and calls for assistance, but where it still is possible to meet the population's need for necessary health services according to normal criteria of adequacy and within the framework of laws and regulations.

The term "disaster" is reserved for situations in which one is unable to give necessary treatment despite reorganization and other efforts within crisis circumstances, and where it is necessary to apply for exceptions from various laws and regulations that secure an adequate health system during normal circumstances.

Keywords: definitions; demand; disaster; health system; justice; laws; Norway; organization; preparedness; regulation; supply

Lindheim NJ: What is a disaster? ***Prehosp Disast Med*** **2004; 19(S1):s12.**

When Do Infections Become Disasters?

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Infections have accompanied humankind forever and have significantly influenced their historical development. Few, if any, other environmental factors have influenced population growth and instigated population migration to the same extent as have infections. The bubonic plague in the early middle ages, the repetitive smallpox epidemics during the 19th and 20th century, and the HIV epidemic today, demonstrate the power and volatility of epidemics in spite of the society's repeated attempts to eradicate them. During a short period in the 1970s, it was believed that infections could be controlled, but soon thereafter, new diseases like HIV, modified diseases like tuberculosis, and diseases in new areas like West Nile in the United States (US) proved otherwise.

Infections with magnitude of a disaster distinguish themselves from traditional disasters in many ways, (e.g., large-scale accidents, earthquakes). During most other disasters,a large number of people are hurt during a very short time period, and thereafter, no new casualties are added; infections, however, produce new cases over a prolonged time span, even months and years. Other disasters are easily recognized, whereas an epidemic can have a slow, creeping start, and consequently, it may be very difficult for society to organize their resources optimally. Infections create significant disturbances in a society since everybody feels threatened, which then, also increases the need for adequate information placing a heavy burden on different authorities. Infections also may change their properties during an ongoing epidemic, which again makes established countermeasures irrelevant and ineffective.

The conditions for new epidemics of disaster proportions are increasing. New infections are emerging at an increasing speed. A population increase and an increase in cross-continental travel promote all the conditions for infections to spread worldwide (e.g., SARS). War and deteriorated economies destroy the public health systems in many countries, which again reduce the possibilities for protection.

On the positive side, an increasing number of authorities, countries, and international organizations are becoming more and more aware of the threat, accentuated by the recognized threat from bioterrorism. This has led to increased international collaboration, which strengthens the possibility of fighting future epidemics.

Keywords: bioterrorism; containment; disaster; economy; epidemics; infections; war

Tegnell A: When do infections become disasters? ***Prehosp Disast Med*** **2004;19(S1):s12.**

Selection and Training of Personnel for Disaster Management

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The largest voluntary organization in Sweden is the National Red Cross comprising 300,000 members and 40,000 active volunteers. The Red Cross movement originated from the need to have dedicated and trained people who were equipped to care for war wounded during and after battle. In several countries, this has extended significantly into programs encompassing training not only on how to handle war wounded, but also in addressing emergency medical problems, accidents, and natural disasters.

In Sweden, the Red Cross carries the main responsibility for promoting first-aid training among the lay people and has, during the last ten years, trained close to one million people, a many of them school children. Additionally, there are approximately 130 permanent first-aid groups throughout the country, each comprising 5–6 persons. The Red Cross also trains people in crisis management. Home guard is another large voluntary organization, which has 4,000 trained healthcare workers. This is complementary to the society's other aid and rescue systems.

Also, internationally, the Red Cross is the largest voluntary organization. Especially with regard to international missions, their prime concern is to identify persons with the relevant education, proficiency, and qualifications enabling them to work under sometimes dire circumstances. Preparations should include general knowledge on material, communication, legal aspects, and also in depth insight on the importance of mutual respect among all fellow human beings and their respective cultures. Therefore, the International Red Cross has developed a "Code of Conduct," which all delegates are committed to following.

In my capacity as a surgeon for the International Committee of the Red Cross, I have been active in many armed conflicts, but most recently, I have been active as a teacher. For the last two years, I have been affiliated with the Swedish Defence Forces and contributed to the training of our troops earmarked for international missions. To identify the proper persons for the job and to prepare them properly is a prerequisite to succeeding when presented with challenging missions and will be more extensively discussed during the presentation.

Keywords: code of conduct; conflicts; crisis; disaster management; first aid; management; Red Cross; Sweden; training

Molde Å: Selection and training of personnel for disaster management. ***Prehosp Disast Med*** **2004;19(S1):s12–s13.**

The Response of the Health and Social Welfare System to National and International Challenges

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Today's most severe threats to the health and welfare of society primarily involve potential nuclear, biological, and chemical (NBC) terror, mass casualties, global contamination, and vulnerable infrastructures. The challenges these threats present to the healthcare systems comprise four parts: (1) incidents that are significantly different from our daily medical problems (e.g., NBC events, accidents, or terrorism with unfamiliar types of casualties which demand special treatment); (2) accidents where the number of casualties with "normal" injuries exceeds what is covered in the traditional contingency and preparedness plans (e.g., fire in ferries, train or aircraft crashes, in which a large number of casualties demand enormous healthcare resources); (3) situations in which a complete hospital or significant parts of a hospital is rendered dys- or non-functional (e.g., fire or contamination); and (4) situations in which medical supplies to the country are disturbed or stopped (e.g., production failure or an international crisis that challenges a marginal buffer capacity ("just-in-time" principle)). A combination of these situations/events will challenge the Norwegian Health Care Preparedness significantly.

With regard to the prehospital emergency medical service, there has been a significant increase both in capacity and competence during the last 10–15 years. This has been demonstrated during the large accidents (e.g., the sinking of M/V Sleipner, the train collision at Åstas, and also this year, the capsizing of the ship Rocknes.) Nevertheless, there still is concern regarding the hospital capacities, both intensive care treatment and the overall buffer capacity to deal with larger events and accidents, since hospitals, and especially the intensive care units, are running at full capacity to cover their everyday challenges. With regard to national challenges, this is especially worrisome within contingency and preparedness against terrorism, management of information to relatives and the media, and development and coordination of psychosocial support functions. Of the international challenges, infectious diseases like SARS have demanded much from Health Care Preparedness. Further, uncertainties with regard to guaranteed supplies of drugs and medical commodities, represent a challenge forcing joint response from different countries and activities.

Keywords: accidents; buffering capacity; emergency medical services; healthcare system; nuclear, biological, chemical; prehospital; response; social welfare system; terrorism

Larsen BI: The response of the health and social care to meet national and international challenges. ***Prehosp Disast Med*** **2004;19(S1):s13.**

Local Contingency Preparedness Plan—How to Make It Functional

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This presentation focuses on contingency plans for the Municipality Health Care Preparedness—an algorithm produced under the auspices of The County Senior Representative and the County Department of Health. This contingency plan is a good example of how, through a proper algorithm and structured design combined with administrative and professional content, unwanted events, crises, and disasters can be handled in a rational way. Consequently, the contingency plan can become a tool applicable for healthcare preparedness.

Further, the presentation focuses on the use of risk and vulnerability analyses as a tool to create a platform to facilitate future work to develop well-functioning crisis management and contingency plans.

A proposition to clarify the most commonly used/misused terms and definitions within the planning for crisis management plans also will be presented for the panel discussion.

Keywords: algorithm; contingency plan; disaster; emergency plan; healthcare preparedness; planning

Bjerkaas E: Local contingency preparedness plan—How to make it functional? ***Prehosp Disast Med*** **2004;19(S1):s13.**

Electrical Power Failure Experienced in the Greater Copenhagen Metropolitan Area

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Tuesday, 23 September 2003, at 11:30 hours, eastern Denmark experienced an electrical power outage. It took some time before the full scope of the power outage was acknowledged. The power cut lasted 3–7 hours for different regions. During this time period, eastern Denmark had ample time to identify which of the contingency plans worked and which did not. Especially with regard to the communication and power supply to medico-technical equipment in private homes, the problems could have become very worrisome. People were stuck in elevators and stationary pumps did not work. Fortunately, the time of day and the limited duration of the power outage made it possible to handle the emerging challenges without serious problems. The dispatch center for Greater Copenhagen experienced a very busy period, especially since a significant number of people called to inform them that there was no electricity in their area. Further, several automatic fire alarms were activated to the dispatch center. In the aftermath of the power outage, a report from the Copenhagen Authorities and the Capitals Joint Hospital Organization developed necessary recommendations of actions needed to mitigate the consequences of potential (future) electrical power cuts.

Keywords: communications; Copenhagen; dispatch center; electrical power failure; medical equipment; power supply

Brydholm SV: Electrical power failure experienced in the greater Copenhagen metropolitan area. ***Prehosp Disast Med*** **2004;19(S1): s13.**

Safety and Reliability of the Healthcare System Procurement and Logistics—Can It Be Regulated?

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After World War II, the reliability and security of the supplies of medical drugs and equipment was given top priority. Central Healthcare authorities have recommended the establishment of reserve or contingency storage at all existing hospitals focusing on essential supplies and equipment "of the type which is in daily use" as described in a governmental circular from the Board of Contingency and Preparedness for Norwegian Health Care dated 30 November 1950. Due to lack of political and economical oversight, this recommendation was not properly followed. The passage of time combined with a paradigm shift in economic thinking and governing systems, led contingency work to lose its status and importance and what remained of the storage of supplies, was removed.

Globalization creates new and significantly different challenges with respect to contingency preparedness of medical supplies. Even in a global setting, for a large part of the drugs and healthcare supplies, only a limited number of providers of raw material and/or producers exist. A modern hospital depends on a large variety of different supplies and commodities to maintain its production of healthcare services. Procurement and logistics of the healthcare system currently is fragmented and only remotely satisfies the demands for proper preparedness and contingencies.

Well-conducted risks and vulnerability analyses will reveal different needs for different products, depending on providers, place of production, possible replacement drugs/items, potential scenarios, etc. A well-functioning chain of supply, including a professional logistics program within the healthcare system, is crucial to provide correct material and quality at the right place at the right time, both in daily normal function and during crisis. A model that includes defined contingency demands for each item that are built into all contracts and agreements, would be cost-effective and improve the reliability and safety of the healthcare supply systems.

Keywords: contingency; hospitals; logistics; procurement; risk analysis; safety; supplies; vulnerability analysis

Lossius K: Safety and reliability of the healthcare system procurement and logistics—Can it be regulated? ***Prehosp Disast Med*** **2004;19(S2):s14.**

Possibilities for International Health Work within the Framework of Nordic Collaboration, EU, NATO, and UN

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International collaboration to fight infectious diseases has a long tradition as it was recognized early on that infectious diseases know no borders. An epidemic in one country may rapidly, directly or indirectly spread to neighbouring countries and, often, even the whole world. The International Health Regulations (WHO-IHR) has a 100 year history, thereby dating back to long before the WHO was established. That the WHO has more members than the United Nations, signals that health problems are viewed as an important area for international collaboration. For the time being, the IHR is working to provide the WHO with a more powerful instrument for its future work.

The contact between those involved in biological contamination preparedness is well-established within the Nordic countries. It conducts regular meetings between the respective state epidemiologists as well as several joint projects and surveys. Through the Nordic Council and the board of the Baltic States, a large number of projects aiming at improvement for protection against spreading of infectious diseases have been carried out.

Within the EU, health care traditionally has been a national responsibility, but, through the Amsterdam Agreement, this has changed to some degree. According to this Agreement, Decision 2119 was made, which identifies those areas within surveillance and management of infectious disease for which the EU is to take the lead. This has rapidly promoted a large number of different networks, and we now are awaiting a European Centre for Disease Control (CDC) which is to be established year 2005.

As it did with respect to a large number of areas, the 11 September 2001 attacks in the United States (US) caused a kind of shift of paradigm with regard to the international work on infectious diseases. Bioterrorism became high on the agenda, and several new initiatives were launched, among them the Global Health Security Action Group. This was initiated by the G7 countries and has started several new activities.

First and foremost, the SARS epidemic became an example of the importance of international collaboration and how effective it may prove to be for countermeasure threats emerging from new potential global diseases.

Keywords: Amsterdam Agreement; biological contamination; bioterrorism; Center for Disease and Control (CDC); European Union (EU); infectious diseases; international health

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Predoc™—A Quality Information System for the Accident Scene

Trond M. Trondsen

Focusing on quality information systems has become a permanent part of pre hospital services. Systems like AMIS,[a] PHTLS,[b] Paramedic[c] are intended to improve the quality of prehospital medical work. The goal is to ensure optimal treatment and to transport the patient to the hospital as soon as is possible.

Quality information systems facilitate correct decision-making, based on facts, at the accident scene. The tools of assistance that rescue personnel have access to in disaster areas are knowledge, experience, the note pad, and the radio. Predoc™ is a quality assurance tool that provides an immediate overview of the number of injured and their priority scores. The information can be traced and is readable both visually and electronically. This facilitates all decision-making by the respective components of the rescue chain based on documented data.

The qualitative data assembled[1] is formalised in writing by Predoc™. This compensates for random judgment and human errors, and improves the quality of decisions. The personnel face demanding situations, and Predoc™ reduces stress by allowing a change of focus from organizing information to decision-making. This facilitates cooperation and preparedness of the complete rescue chain.

In 2003, the Ministry of Justice, together with the Health Authorities in the counties of Akershus, Østfold, Vestfold, and Tromsø, completed a pilot project whose goal was to define a new national identification and marking system.

Predoc™ was tested in exercises and in daily activities. Several limitations were determined and changes were suggested. Implementing the system into the rescue chain was recommended. In 2004, the system is in its second stage of development, and it is expected to be completed before the end of 2004.

References

1. "End report pilot test of new identification tag" Norway. 2003.

Definitions:

a. Emergency medicine information system—data application for mission management.
b. Prehospital trauma life support—training programme/method for prehospital trauma management
c. Term for education/competence level for ambulance personnel.

Keywords: disaster; information system; pilot exercises; Predoc™; prehospital; quality

Trondsen MD, Predoc AD: Predoc™—A quality information system for the accident scene. *Prehosp Disast Med* 2004; 19(S1):s14–s15.