

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

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**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](http://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.