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Calamity efficiency

Disaster medicine in Belgium, Germany and the Netherlands

Bob Post

its
wetenschap
voor beleid
en samenleving

CALAMITY EFFICIENCY

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ITS - Nijmegen

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Foreword

This is the report of a cross-border study into emergency medical assistance around accidents and disasters. The study was carried out during the course of 2001 and was commissioned by the Netherlands Ministry of the Interior and Kingdom Relations (BZK).
The study was led by Messrs. D.Fundter (BZK), A.de Laat (RGF West-Brabant province), Ms M.Martens (BZK), Messrs. J.Petri (BZK) and W.de Vrij (RAV Drenthe). The researcher takes this opportunity to thank the Supervisory Committee for its essential contribution to the report.
Thanks are also due to everyone who was interviewed within the framework of the report. Notwithstanding over-full diaries they were willing - often at short notice – to make appointments and generously give their time. Without their input this report would never have come about. Although the interviewees amply provided the researcher with information, this account is exclusively the responsibility of the author

January 2001
Bob Post

Contents

Foreword

1 Basis and implementation of the study 1
1.1 Reasons for the study 1
1.2 Issues 1
1.3 Detailing the issues 2
1.4 Basis of the study 3
1.5 Construction of the report 3

2 Public Administration 5
2.1 Introduction 5
2.2 Belgium 5
2.2.1 Disasters 5
2.2.2 Governmental responsibility and upscaling 5
2.3 Germany 7
2.3.1 Disasters 7
2.3.2 Governmental responsibility and upscaling 7
2.4 Netherlands 8
2.4.1 Disasters 8
2.4.2 Governmental responsibility and upscaling 9
2.5 Comparison 11
2.5.1 Similarities 11
2.5.2 Differences 13

3 Disaster medicine 15
3.1 Introduction 15
3.2 Belgium 15
3.2.1 Operational units 15
3.2.2 Organisation of disaster medicine 17
3.2.2 Allocation of responsibility 18
3.3 Germany 19
3.3.1 Operational units 19
3.3.2 Organisation of disaster medicine 22
3.3.3 Allocation of responsibility 23
3.4 Netherlands 23
3.4.1 Operational units 23
3.4.2 Organisation of disaster medicine 25
3.4.3 Allocation of responsibility 26

3.5 Comparison 27
3.5.1 Similarities 27
3.5.2 Differences 27

4 Summary, conclusions and recommendations 31
4.1 Introduction 31
4.2 Developments since the previous ITS-report 31
4.3 Summary 32
4.4 Bottlenecks around cross-border GHOR 34
4.4.1 Public administration 34
4.4.2 Operational 35
4.5 Conclusions 37
4.6 Recommendations 38

Literature 41

Interviewees 43

Abbreviations 44

1 Basis and implementation of the study

1.1 Reasons for the study

As a result of the study "*cross border disaster medicine*"[1] the Netherlands Ministry of the Interior and Kingdom Relations (BZK) commissioned a study into Disaster Medicine (GHOR) in the border region between the Netherlands, Belgium and Germany. The previously mentioned ITS report involved emergency medicine (SMH) for smaller-scale disasters, hence, in fact, day-to-day SMH. The follow-up report looks at SMH around larger calamities and disasters in the context of cross-border assistance.

1.2 Issues

The key issue in this study was as follows:

> *How is medical assistance for disasters organised on the Netherlands, Belgium and Germany in governmental, operational, material and legal terms and what are the bottlenecks in and around mutual disaster medicine – and what are the conceivable moves towards solutions for these bottlenecks?*

Central sub-issues for the various elements in the issue will include the following:

Governmental:

A What are the three countries' criteria for a disaster?
B What are the criteria for governmental upscaling in the event of disasters and which governmental body plays a role here?
C Under what circumstances is a given governmental level responsible and which departments are involved at the national/federal level?

Operational/equipment

D Which medical units (equipment) are available in the three countries in the context of combating disasters; in how far do they differ from each other and in how far are they comparable?

1. B. Post and P. Stal, *Grensoverschrijdende spoedeisende medische hulpverlening België – Duitsland – Nederland*. Nijmegen (ITS) 2000.

E What medical personnel are available in the three countries for combating disasters, in how far are they similar/different from each other, and what are their powers?
F What is the pattern of command structures in the event of cooperation?
G How do communications operate with other services (police, fire)?
H How do mutual communications operate (both as regards government, RAV control room, Leitstelle, HC100 and mutual communications between units)[2]?
I How are tasks allocated at the disaster site (scenarios, ad hoc)?

Legal

J What bilateral and other international agreements are there in regard to cross-border emergency medicine for disasters and what is not regulated in these agreements?
K What can and may medical units do in the context of combating disasters, in a neighbouring country's territory?
L Are arrangements in place for remuneration of medical assistance around combating disasters?

1.3 Detailing the issues

The selection of countries – Belgium and Germany - was based on mutual land borders with the Netherlands. Cooperation in disaster management along these borders is crucial in that the impact of a disaster ignores national boundaries. There are several high-risk locations near to the border. These include the Doel nuclear power plant in Belgium, the chemical industry of the Ruhr, and the Lingen nuclear power plant, all in Germany. Moreover, in several places the actual border division has been blurred by urban agglomerations and economic activities expanding/spilling across.
From the efficiency angle cooperation with neighbouring countries is essential. Hence, support units from "abroad" are often able to reach an incident site sooner than local/regional units from the actual country. Moreover, given border regions will often have high-grade medical facilities, which can be called upon in the event of major incident with many casualties.
Formally speaking, from the angle of disaster management, the United Kingdom is also a neighbour of the Netherlands. In the event of disasters at sea the two countries may both be involved in counter-measures. In such an event it would be the responsibility of the ministry of Transport and Public Works to see that military assets are deployed. However, in view of the differing nature of providing assistance for accidents at sea, this category will not be included in the report.

2. RAV-control room is the new term for the previous "Central Ambulance Services Post" (CPA).

Lastly it should be noted here that trauma care was the primary focus of the study. After- care, e.g. psychosocial care and the preventive policy around disasters were not covered in the study.

1.4 Basis of the study

The study was has a two-pronged base: literature and document research plus interviews with those involved.

Literature and documentation research
Relevant literature was investigated around SMH organisation in the three countries, i.e. policy memoranda, legislation texts, bilateral and international agreements, background studies, reports, instruction material etc. A summary of the literature studied is attached as an appendix. In so far as texts of legislation are referred to these are indicated in the footnotes.

Interviews
On the basis of the material from the literature investigation an item list was compiled and used by the researcher as a leitmotif in personal conversations with respondents. The interviews were structured per topic on the basis of a list of questions. Alongside uniformity – with the same topics being raised with every respondent - this method also enables respondents to raise their own views. The appendix contains a list of interviewees.

1.5 Construction of the report

Section 2 of this report describes the organisation of disaster management in the three countries with the emphasis on governmental responsibility from the medical angle. Section 3 sets out the operational deployment of available medical units. The descriptions of the various systems raise a number of differences with a potential to cause bottlenecks around cooperation. These bottlenecks are dealt with in section 4, while there is also a focus on possible routes to solutions.
Lastly, it should be noted that this study can be taken as a follow-up study to the *Grensoverschrijdende spoedeisende medische hulpverlening Belgie-Duitsland-Nederland* report (footnote 1). To avoid repetition much of this report is assumed to be common knowledge. However, with an eye to the readability of the report in some cases repetition is inevitable, all the more so in that disaster medicine forms part of medical assistance for disasters.

2 Public Administration

2.1 Introduction

This sections sketches the relevant governmental organisation in the three countries in terms of medical assistance for disasters. Furthermore in this context the report starts by looking at what each country understands by the term disaster. This is followed by the various governmental levels with a role in disaster management. Lastly, there is a brief comparison of the various governmental levels that play a role in upscaling.

2.2 Belgium

2.2.1 Disasters

In formal terms Belgium has three categories of disaster. A *disaster* is one with a natural cause[3], e.g. floods, severe storms and earthquakes. Accidents due to human agents whereby there is substantial loss of life and significant material damage are designated as *catastrophes*. An accident involving a train, aircraft or serious contamination or pollution also comes under the heading of catastrophe. Lastly, major damage is where it is necessary to deploy special equipment, such as in the case of explosions, subsidence or land slides/shifts.
Belgium has no separate legislation around disasters, catastrophes or major damage. The Civil Protection Act applies to disasters.

2.2.2 Governmental responsibility and upscaling

Government
In the Flemish part of Belgium three levels of government play a role in combating disasters. The municipality is responsible for setting up a municipal disaster plan and bears prime responsibility for supplying assistance in the event of a disaster[4]. The Province is tasked with ensuring that the municipal disaster plans mesh with the

3. Royal Decree of 23 June 1971, relating to tasking of civil protection and operational coordination around disasters, catastrophes and major damage.
4. Circular of 11 July 1990, in regard to disaster plans for emergency aid. Implementation of the Act of 21January 1987 in regard to risks of major accidents with given industrial activities.

provincial disaster plan. Lastly, the Ministry of the Interior sets the rules to be met by the provincial and municipal disasters plans.
Medical assistance for accidents and disasters, including deployment of personnel and equipment falls exclusively under the responsibility of the Federal Ministry of Social Affairs, Public Health and the Environment.

Governmental upgrading
Upscaling (in Belgium: phasing) proceeds along the same lines. In the first instance the mayor of the municipality is responsible for acting during a disaster within his/her area. If the disaster spills across municipal boundaries or the municipalities' resources are inadequate so that outside help must be summoned, the situation is upscaled (phased-up) to the provincial governor. In this event the mayor of the given municipality requests the governor to upscale to the provincial level. The governor may grant this request, but, in the event that he/she sees no need for this, the request can also be declined. Where disasters spill across provincial borders matters are up-scaled to the Minister of the Interior. This upscaling is also based on a request from the governor.
The Belgian system differentiates the following phases:
1 Limited action and coordination by the fire service.
2 Reinforcement phase and coordination at municipal level by the mayor. The request to the mayor to upscale to phase 2 comes from the senior fire officer. The mayor is free to grant or refuse this request. There are no strict criteria set out for this.
3 Coordination by the provincial governor in the event that a disaster spills over municipal borders or where outside assistance is required. The request to go to phase 3 is made by the mayor to the governor who can grant or refuse the request. In managing/combating the disaster the governor is also backed-up by a coordination committee.
4 Coordination by the Interior Minister. Where the disaster spills over into several Provinces or requires deployment of emergency services from more than one province, the governor may request the minister to move to phase 4. Coordination occurs at a national level. In principle requests for assistance from abroad are exclusively made by the minister.

The responsible authorities are supported by a Coordination committee that assists the mayor or governor in evaluating the disaster situation, on deployment of the required resources and the choice of methods. A Coordination committee can comprise five specialities: the fire service, health and sanitary assistance, police/gendarmerie, logistics support and public information.

2.3 Germany

2.3.1 Disasters

Germany uses two definitions for disaster management and these differentiate between a *Grossschandensereignis* and *Katastrophe*. No precise definition is given for a *Grossschadensereignis*. It relates to a major accident with a large number of casualties and considerable material damage. However, the accident can be contained within a short space of time by local or regional personnel and equipment.
The concept of a *Katastrophe* is defined in both Nordrhein-Westfalen and in Niedersachsen. In Niedersachsen it is an "emergency situation where the threat and/or damage to the life, health or primary care of the population or valuable goods is such that the management of this situation by the appropriate authorities and necessary emergency workers requires centralised leadership"[5]. Nordrhein-Westfalen has a similar definition whereby the cooperation with and a centralised command over the various emergency services also forms the criterion for a disaster.[6]

2.3.2 Governmental responsibility and upscaling

Policy
Up to the 1990s disaster management in the Federal Republic of Germany was largely organised at a national level in the form of the *Zivilschutz*. After the fall of the Berlin Wall and the unification of the former DDR with the Federal Republic, and the ending of the threat from the east, the *Bundesamt für Zivilschutz* was ended in 1999 and disaster management was delegated to federal state level. However, this decision is being reconsidered in the light of recent developments in the wake of the attack on the World Trade Center in New York.

Governmental responsibility
In Germany three governmental levels play a role in preparing and organising for disaster management The federal states are responsible for legislation around disaster management[7]. The *Kreise*, *Kreisfreie Städte* and the *Gemeinde* are responsible for operational disaster management[8].

5. Niedersächsisches Katastrophenschutzgesetz (NKatSG), par. 1, art.1. translation from Hertoghs, 1997, p.445-446.
6. Gesetz über den Feuerschutz und die Hilfeleistung (FSHG), par. 1, art. 1 and 3.
7. As per art. 30 and 70 of the Constitution of the Federal Republic..
8. NKatSG (Niedersachsen) and FSHG (Nordrheinland-Westfalen).

Governmental upscaling
In the event of an accident, in the first instance it is the task of the municipality to manage the impact (of the accident). In the event that municipality lacks sufficient personnel and equipment to get the accident under control and requests assistance from other municipalities, the law defines this situation as a disaster. Coordination then passes automatically to the Kreis level where it is exercised by a Command and Coordination Group/LuK (Leitungs- und Koördinierungsgruppe) comprising representatives of the various emergency services.
Whether or not a disaster occurs will depend on the scale of the municipality. Municipalities in Kreis Borken, bordering on the Dutch Achterhoek region, include Ramsdorf (pop. 7,000) and Bocholt (pop. 80,000). Differences in scale also mean a pro-rata difference in resource availability per municipality. Confronted with a resource-shortfall, Ramsdorf is more likely to seek outside assistance than Bocholt. Given that the criterion for a disaster is seeking outside assistance, Ramsdorf is more likely than Bocholt to have a disaster coordinated by the Kreis.
In the event that the scale of the disaster is so large that the Kreis also lacks adequate equipment and human resources and requests back up from the neighbouring Kreise, coordination passes to the *Regierungsbezirk*. Furthermore the Bezirk is involved in disaster management in the sense that it supervises disaster management planning (*Gefahrenabwehrplan*) in the various Kreise, organisation of disaster management and training of relevant personnel.
In due course, if the scale of the disaster requires deployment of equipment and manpower from more Bezirken, the situation will be upscaled to the federal state level. In formal terms the interior minister of the state is exclusively empowered to seek help from abroad.

2.4 Netherlands

2.4.1 Disasters

The Netherlands Disaster Act defines a disaster or major accidents as follows:

1. An event whereby there is severe disruption of public safety so that the lives and health of a large number of persons, or major material interests are severely threatened or damaged, and

2. Whereby coordinated deployment of services and organisations from several specialities is required to remove the threat or to limit dangerous consequences[9].

9. Disasters and major accidents act (30 January 1985), art. 1.

Hence, the Dutch and German definitions of a disaster are virtually the same, whereby the Germans use the term *Katastrophe*.

2.4.2 Governmental responsibility and upscaling

Policy

Over the past several years disaster medicine (GHOR) has been thoroughly reorganised in the Netherlands. This was prompted by two reports from the Inspectorates of Healthcare and of the Fire Service and Disaster Management, dated 1995. Both reports identified a serious lack of cooperation between the various medical services. Indeed, up to the 1990s there were two sorts of disaster medicine. The ordinary emergency medical assistance for accidents came in the form of the SMH. And, for larger-scale accidents and disasters medical assistance was provided as the GHR (Medical Assistance for Disasters).

Partly based on the criticism, the "Met zorg verbonden"[10] memorandum ("Combined with care") proposed another medical assistance organisation. The key objectives of the reorganisation were seamless upscaling of emergency medicine to disaster medicine and enhanced cooperation among the medical services involved.

In this framework a reorganisation is currently underway where the Netherlands is divided into regions for Disaster Medicine (GHOR). SMH and GHR are de facto merged. This enhances cooperation between the relevant organisations and enables smooth upscaling in the event of larger scale accidents or disasters.

Public administration

Based on the joint cooperation format a number of municipalities form a GHOR; hence they are involved with the GHOR at the local level. The municipalities are also responsible for drafting a disaster plan and a disaster management plan for the entire area of the municipality.[11]

Provinces play an important role on a regional basis as they bear responsibility for establishing Regional Ambulance plans (RAP)[12]. They are also responsible for determining a provincial coordination plan.[13]

At the national level two ministries are involved with GHOR. The Ministry of the Interior and Kingdom Relations (BZK) is responsible for organisation of disaster management and the Ministry of Public Health, Welfare and Sport (VWS) is responsible for the quality of medical assistance.

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10. Second Chamber Dutch Parliament, 1996-1997, 25 387, Nos. 1 and 2
11. Disasters and serious accidents Act, par. 2, art. 3.; par. 3, art. 7.
12. The Province's role will cease in the near future and the RAPs will from then on be determined by the care-providers, health insurers and the ministry of public health, welfare and sport.
13. Ibid. par. 4, art.10.

Governmental upscaling

Governmental upscaling chiefly runs along the lines described above. In the event of a disaster within municipal boundaries the mayor of the municipality bears chief responsibility for the disaster. He/she is supported by a municipal disaster staff comprising representatives of at least the three emergency services (police, fire and medical).

Where the disaster spills over municipal boundaries the given municipalities cooperate in disaster management. Representatives of the various municipalities sit on the disaster staff, which is chaired by a coordinating mayor. In practice this is invariably the mayor of the municipality where the disaster occurs.

At the next level of upscaling the mayor may request assistance from the Provincial Governor. The Governor may take over operational leadership of disaster management whereby he/she will be supported by a provincial disaster staff[14]. If the scale of the disaster requires back up from national services, the governor may apply accordingly to the Minister of the Interior. In Provinces bordering Germany the governor can request assistance from the Minister of the Interior of the relevant federal state (Niedersachsen or Nordrhein-Westfalen). In all other cases only the (Dutch) Minister of the Interior may request assistance from abroad[15].

GHOR and RAV

Compared with Belgium and Germany the Netherlands has a unique position given its separate administrative framework for disaster medicine. However, the authorities of a GHOR-region only have a virtual organisation. When an incident occurs and a response is required, the GHOR can deploy units 'belonging' to other organisations, including medical staff and volunteers. These are called the 'chain-partners'.

As with fire and police service regions, the Netherlands is also divided into a number of regions for disaster medicine. The GHOR region matches with the current police regions. This policy was implemented at the same time as the GHOR Act (WGHOR). A GHOR region is a cooperative link-up of municipalities in the form of a shared arrangement, with a GHOR board. Every GHOR board appoints a Regional Medical Officer (RGF). Within the GHOR region the RGF is responsible for implementing policy as formulated, and in a disaster he/she has an advisory role vis-à-vis the municipal staff. Hence, the function of the RGF is comparable to that of the fire service commander or chief commissioner of a police force.

Responsibility for ambulance services in a GHOR region falls under the Regional Ambulance Service (RAV). In principle the area from which the RAV provides ambulance services is the same as the GHOR region. In organisational terms a RAV 'belongs' to the RAV central control room and the relevant ambulance services. The

14. Disasters and major accidents Act, par. 4, art. 12.
15. Dutch/German agreement in regard to mutual assistance in combating disasters, including major accidents, art. 3.

RAV will act as budget holder for ambulance services in its region and is responsible for overall operations. The RAV is also responsible for the Regional Ambulance Plan.

2.5 Comparison

2.5.1 Similarities

Definition of disasters
All three countries have a strongly similar definition of a disaster. Crucial to this definition in all three countries is the request for assistance from neighbouring administrative regions and that central coordination is required for management.

Upscaling
There are also strong similarities between the criteria for and manner of upscaling. The most important criterion for upscaling in all three countries is that management of the incident requires equipment and manpower support from neighbouring administrative regions. Within the upscaling coordination occurs at a higher level of public administration. Figure 2.1 below shows the governmental levels and centres of policy responsibility.

Figure 2.1 - Type of incident, level of public administration, centres of policy responsibility in Belgium, Germany and the Netherlands

Type of incident	**Belgium**		**Germany**		**Netherlands**	
	Public administrative level	*Centre of policy responsibility*	*Public administrative level*	*Centre of policy responsibility*	*Public administrative level*	*Centre of policy responsibility*
Accident		Operational services		Operational services		Operational services
Disaster	Municipality	Mayor (Phase 2)	Kreis	Katastrophenschutzbehörde (KSB) of the Kreis	Municipality	Mayor
Disaster exceeding regional scope	Province	Governor (Phase 3)	Bezirksregierung	KSB of the Bezirk	Relevant municipalities Province	Coordinating mayor Provincial Governor[16]
	Federal	Minister of the Interior (Phase 4)	Federal state govt.	Federal state Interior Ministry	National	Minister of the Interior

Internal orientation

In all three countries the organisational procedures for upscaling are predominantly national and hierarchically oriented. Upscaling takes virtually no account of a request for assistance from abroad at one of the lower levels. A request of this type can only be made – at ministerial level – at the last stage of upscaling, if and when the disaster is national in scale.

Coordination

Each of the three countries covered has a group of experts who advise the responsible public administrator on how the disaster should be dealt with. In Belgium it is the municipal or provincial coordination committee, in Germany it is the command and

16. The Provincial Governor has formal powers to take over coordination of a disaster. In practice this almost never happens. In most cases the mayor of the municipality where the disaster happens is responsible for coordinating assistance.

coordination group at Kreis-, Bezirks- and Federal state level, and in the Netherlands it is the municipal or provincial disaster staff. At least three advisor groupings have representatives from all three emergency services, i.e. police, fire and medical.

2.5.2 Differences

Germany: levels of public administration
One of the most important differences concerns the configuration of levels of public administrations. In Germany the municipality plays absolutely no role in disaster management. An accident at the municipal level is combated by the emergency services and where the accident requires equipment or human resources from outside the municipality there is an automatic upscaling to the Kreis level. However, neither Belgium nor the Netherlands has an administrative level equivalent to the Kreis. It terms of size it is best comparable to a cooperative alliance of Dutch municipalities - however, a Kreis has far greater governmental powers.
Similarly, the Bezirk level of public administration is also unknown in Belgium and the Netherlands. Positioned between the Kreis and the Federal state it has no elected representation.

Netherlands: joint cooperation between municipalities
Another difference with the Netherlands is that in the event of a disaster spilling across municipal borders, there is a formal joint cooperation arrangement between the municipalities, chaired by one of the mayors. There is no such organisation in Belgium or Germany. In Belgium the situation is immediately upscaled to the provincial level with the governor as coordinator. In Germany the situation is upscaled to the Bezirk if and when the disaster requires deployment of human and material resources from more than one Kreis.

Germany: federal states
The last important difference comes from the fact that Germany is a federation. The federal states have far-reaching powers around disaster management. In principle, they are the highest level of upscaling. While Belgium is also a federation, upscaling for major disasters that goes beyond the capacity of the provinces is upscaled to the federal (national) level.

3 Disaster medicine

3.1 Introduction

This section starts with a short description of the operational units available to each country as support in the form of disaster medicine/disaster management. Next comes a short description of the manner of organisation of disaster medicine. Lastly, there are per-country descriptions of the various medical functions that play a role in disaster management. The section closes with a short summary of the most important similarities and differences.
The writer has aimed to review the same topics per country and per paragraph.

3.2 Belgium

3.2.1 Operational units

Emergency phone number 100
Accidents can be reported by phone to the emergency control room (HC-100) of the ambulance service on telephone number 100. This is known as HC-100. The name of the control room is derived from the Belgian fire service's emergency telephone, which is 100. The HC-100 acts as a control room for both fire and ambulance services and the Mobile Emergency Group (MUG). The police have their own control room and number for alarm calls. In Belgium any calls to the European alarm number 1-1-2 are automatically connected with the HC-100. The emergency control room also acts as a coordination centre for assistance around accidents and disasters, determines the type of help to be deployed and informs hospitals which will receive casualties.
The automated system at HC-100s shows the location of the accident, the nearest ambulance unit and the nearest hospital with a dedicated emergency unit. In routine emergency case the ambulances are required to take the casualty to the nearest "100 hospital".
However, the "nearest 100 hospital rule" lapses for accidents where the Medical Intervention Plan (MIP) comes into operation. Based on practical experience, the casualties are actually spread around hospitals, which are further away. This is because "walking wounded" often make their way to the hospital nearest to the accident location. Hence, to avoid swamping these hospitals the casualties are often ambulanced to other hospitals.
Ambulances are deployed in a strict sequence based on the criterion of which ambulance unit is nearest. This sequence is very emphatically laid down at the HC-100s in

Belgium. Hence, for example, if there is an accident at location A, the ambulance from A should respond first. However, if it is already occupied, the ambulance from location B will respond. And if this is occupied – the ambulance from location C, and so on. To diverge from this set order of response requires the permission of the Minister for Social Affairs, Public Health and the Environment.

Ambulances

As in the Netherlands, ambulance services in Belgium may be run by private companies. However, ambulance services recognised by the Federal Ministry of Social Affairs, Public Health and the Environment are required to comply with certain regulations[17].

Unlike their Dutch counterparts Belgian ambulances remain stationary at their posts, waiting to respond to an alarm. In the case of an incident the ambulance is called out via the control room. Ambulance crews provide emergency assistance at the level of Basic Life Support. The ambulance crew usually comprises two people, a driver and a first-aider. The latter may be a nurse, but also a volunteer. Around half of Belgian ambulance crews are volunteers (Pohl-Meuthen 1999: 21). Ambulance crews must have an "ambulance medical aid worker" licence and be trained up to the level of Basic Life Support[18].

Mobile Emergency Group (MUG)

In addition, Belgian has its Mobile Emergency Groups (MUGs). Alongside a nurse specialised in intensive and emergency, the MUG includes a doctor qualified in acute medicine[19]. MUGs are deployed to provide direct assistance at the level of Advanced Life Support at the incident site. The MUG is deployed as a supplement to the ambulance and travels in an ordinary car.

In the event of large accidents or disasters the MUG team organises the further provision of assistance. They diagnose, determine treatment and establish priorities (triage). They also determine the hospital to which the victims should be taken. In Brugge the MUG can call on a helicopter from the Emergency Medical Institute.

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17. There are no legal requirement vis-à-vis equipping ambulances. However, to be recognised within the 100-system the ambulances must meet regulations, determined by the Ministry of Social Affairs, Public Health and the Environment.
18. Royal Decree of 13 February 1998 regarding training and qualification criteria for care-workers and ambulance crews.
    Royal Decree of 19 March 1998 amending the Royal Decree of 13 February 1998 regarding training and qualification criteria for care-workers and ambulance crews.
19. Royal Decree of 10 August 1998 determining programme criteria for application as to the function 'mobile emergency group'.
    Royal Decree of 10 August 1998 in regard to determination of recognition standards for 'mobile emergency group' (MUG) functions.

Red Cross
Red Cross volunteers can also be deployed in the event of a major disaster. The tasks of the Red Cross at the disaster site include logistic support, nursing support and deployment of medical assistance services such as ambulances and care workers. Red Cross ambulance crews only have 60 hours training on Basic Life Support compared with 120 hours for crews of ambulances in the 100-system.
Moreover, the Red Cross is now increasingly deployed as part of Emergency Social Intervention (DSI). This involves looking after persons from the disaster area who are not wounded, information to families and Disaster Victim Identification.

Civil Protection
The Civil Protection is a federal emergency service, which falls under the responsibility of the Ministry of the Interior. It is tasked with providing logistic reinforcements in terms of human and material resources to the various specialised emergency services, including medical assistance. In its official capacity the Civil Protection service responds in cases of disaster, catastrophe and damage/injury. It can also respond when requested by local government – in the event a shortfall in appropriate resources. Such a request may be made by the Minister of the Interior, the Governor, the Mayor or their representatives.
Civil Protection tasks include[20]:
- location and rescue of casualties;
- assistance with stretchering-away victims;
- decontamination of casualties and emergency workers;
- transportation of casualties;
- logistic support;
- supplies (food and drinking water);
- installation and management of a reception centre.

3.2.2 Organisation of disaster medicine

In Belgium the Medical Response Plan (MIP) comes into operation for major accidents, depending on the type of disaster or stage of disaster management. The MIP operates at a provincial level and goes into operation pro rata the number and classification of casualties. In Belgium the classification of casualties (triage) works as follows:

U1 (red)	very urgent
U2 (orange)	less urgent
U3 (green)	not urgent
U4 (black)	dying or dead

20. M. Debacker, *Algemene principes voor rampenplanning*. Basismodule rampengeneeskunde en -management, Katholieke Universiteit Louvain.

The MIP automatically goes into operation if there are at least five U1 casualties or ten U2 or U3 causalities. The MIP can be activated by medical personnel on the spot or by the 100-control room.
Once the MIP is operational the following units are alerted as a minimum:
- five ambulances
- 3 MUG-teams
- Director Medical Assistance (DMH)
- Red Cross
- logistic equipment (tents, beds, etc.).

More units from other regions may be deployed, depending on the volume of the accident. In this event account is taken of minimal manning levels of the medical care services in the region where the disaster occurs (there has to be an ongoing capacity for ongoing emergency care). The MIP works on the principles of 'maximum alert and rapid stand-down, as appropriate'.

3.2.3 Allocation of responsibility

Provincial Medical Inspector
The Provincial Medical Inspector takes responsibility as soon as the MIP goes operational. In principle the Provincial Medical Inspector forms part of the coordination committee. However, with a phase-two disaster (see para 2.2.2), the coordination committee assesses the need for the inspector to be present on a case-by-case basis. With a phase-three disaster the Inspector will almost always form part of the coordination committee.

Director Medical Assistance
The first ambulance or MUG team that arrives at the disaster site is responsible for first line organisation of medical assistance. If and when the emergency service on the spot or the MUG doctor activates the MIP, the Director Medical Assistance (DMH) then assumes command of medical provisions at the disaster site. Until such time as the DMH is not yet in place his duties are carried out by the first MUG doctor on the spot. The DMH is always an experienced MUG doctor. With a disaster in phase two the DMH reports from the site to the inspector, or directly to the mayor if the inspector is not present. With a phase-three incident the DMH reports to the inspector.
The DMH operates from the Medical Command Post (Med CP). This is positioned as near as possible to the operational command post of the general emergency services.

Triage supervisor
The triage supervisor is responsible for triage at the incident site. Responsibility for triage is carried by one of the MUG doctors on the spot. Triage is carried out via the above classification of casualties. Initially casualties are received by the Advanced

Aid Post (VAMP) where they are subject to triage, stabilised where required and made ready for transport. Hence, a VMP is similar to a 'casualty nest' in Dutch parlance. The VMP is the responsibility of a VMP supervisor.

Regulator
The regulator (a doctor on the spot) coordinates evacuation of casualties to hospitals. As soon as the MIP comes into operation the rule of taking casualties to the nearest '100' hospital lapses.
The 100-control room requests all hospitals for their available capacity. After around one hour this gives the regulator an overview of the number of beds available per hospital. The regulator also gets a statement of theoretical intake capacity and an overview of specific pathologies per hospital[21].

3.3 Germany

3.3.1 Operational units

Rettungsleitstelle (control room)
Ambulances are dispatched by the regional control room (*Rettungsleitstelle* or *Leitstelle*). The control rooms can be contacted by phoning the emergency number 1-1-2. Historically this has always been the number for the fire service in the Federal Republic. As ambulance control rooms in the federal states of Niedersachsen and Nordrhein-Westfalen come under the fire service, this same number can also be used for emergency medical assistance. The local fire service commander is head of the control room. The entire Federal Republic has a total of some 330 control rooms.
The control room determines the type of medical assistance to be deployed (*Rettungswagen, Notarzt* or *Rettungshubschrauber*). Available units are dispatched from the nearest garage/post (*Rettungswache*) to the incident location. Where major accidents or disasters are involved the control room also acts as a coordination centre for deployment of other emergency services.
The tasks of the *Leitstelle* include:
- alerting the units required (fire service and medical) and the public administrative authorities;
- coordination of deployment of fire service and medical units;
- communicating to/with hospitals and determining treatment capacity;
- calling in assistance from other regions;
- coordination with other emergency services (police);
- press and public information.

21. The theoretical admission capacity is set at 3% of the total number of beds. Ten percent of this 3% per cent is for casualties in category U1; 30% for U2; and 60% for U3.

Ambulances

In Germany operational command of ambulance services is at the Kreis level. As in Belgium and the Netherlands private organisations are also allowed to operate ambulances on the condition that they meet certain demands[22]. A number of auxiliary aid bodies also operate ambulances, e.g. the German Red Cross, the Arbeiter Samaritaner Bund, the Johanniter Unfallhilfe and the Malteser Hilfsdienst.

As in Belgium, Germany has various types of ambulance service. For non-urgent transport of patents there is the K*rankentransportwagen* (KTW)[23]. De Krankentransportwagen is driven by a *Rettungshelfer* with a *Rettungssanitäter* as nurse/attendant. As Krankentransportwagen are not used for emergency cases, henceforward this report will use the terms Rettungswagen when an ambulance is meant in the German context.

Where emergency medical assistance is required (*Notfalleinsatz*) at the incident site a *Rettungswagen* (RTW) is used – this is comparable to a Dutch ambulance. The crew of a Rettungswagen comprises a first-aider (*Rettungsassistent*) qualified to provide Basic Life Support on the spot, and a driver (*Rettungssanitäter*)[24].

The first RTW is not used to transport casualties in the case of an accident where there are several casualties. In the first instance this is responsible for setting up a 'casualty nest' (in Germany: *Verletztenablage* or *Behandlungsplatz*).

Notarzt

A *Notarzt* is specialised in emergency medical care and is deployed at accidents where there is imminent danger of death or where given injuries have been determined[25]. The whole of Germany has some 1,150 locations for emergency doctors. In some Federal states emergency doctors are required to be specially registered (*Rettungsdienst)*. Emergency doctors are usually linked to a hospital but in less populated areas the local general practitioner may also act in this capacity.

In principle the control room determines when an emergency doctor (Notarzt) is to be deployed or when it will be sufficient to dispatch an ambulance. In most cases in Germany a *rendezvous-system* is used whereby the ambulance and the emergency doctor (with a special emergency vehicle) make their separate ways to the incident site. This system is used in around two-thirds of the places where an emergency doctor is located. Elsewhere they operate the *Kompakt-* or *Parallel* system whereby

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22. To obtain recognition German ambulances must meet DIN standards. For Rettungswagen the relevant standard is DIN 75080, part 1 and 2.
23. For Krankentransportwagen the relevant standard is DIN-75080.
24. The following training standards apply to the various functions in ambulance care/assistance:
    A *Rettungshelfer* is generally required to have a First Aid diploma (approx. 300 hrs).
    A *Rettungssanitäter* must undergo separate training of approx. 520 hrs including theoretical and practical; sections.
    Training for a *Rettungsassistent* is recognised nationwide and lasts approx. two years (2,800 hrs).
    Gesetz über den Beruf der Rettungsassistentin und Rettungsassistenten, 1 September 1989.
25. Unconsciousness, breathing difficulties, broken limbs, internal bleeding, shock, trapped.

the emergency doctor (with a Notarztwagen) heads for the incident site at the same time as the ambulance.
An emergency doctor connected to a hospital has alternating duty rosters. When on duty, he/she is not liable to carry out certain medical activities. So, for example, a medical specialist who has duty as an emergency doctor does not operate (this would mean that he would not be immediately available.

Helicopters
Germany's nationwide/territorial system of emergency helicopters (*Rettungshubschrauber*) operates from 50 locations making some 52,000 flights per year. The operating radius is 50 km whereby a helicopter can serve several emergency doctor locations. The helicopters are deployed in support of the emergency doctor and are often used for major traffic accidents (helicopters can fly over traffic bottlenecks). Helicopter crews comprise a pilot, *Notarzt* and a *Rettungsassistent*.
Most of the helicopters are owned by the ADAC and the military. Helicopter locations along the Dutch border include Sanderbusch (Niedersachsen), Rheine, Duisburg, Würselen and Cologne (Nordrhein-Westfalen).
The disadvantage is that helicopters are relatively expensive systems with limited potential for deployment. Flying is limited to daylight hours and good weather conditions; hence the helicopter can never replace a *Rettungswagen* and is only a supplement in specific situations.

Volunteer organisations
Disaster management in Germany depends very heavily on the deployment of volunteers. Organisations that provide medical assistance for disasters include the German Red Cross (DRK), the Johanniter-Unfall-Hilfe (JUH), the Malteser Hilfsdienst (MHD) and the Arbeiter-Samariter-Bund (ASB).
These organisations are mainly responsible for supporting the provision of medical assistance and have their own logistical material such as beds, field hospitals, ambulances, etc. The volunteer organisations are officially recognised and are required by law to respond to a call from the responsible public authority to provide support for disaster management[26]. Their tasks include:
- setting up and maintenance of a 'casualty nest';
- transport of casualties;
- counselling and caring for persons.

26. Gesetz über den Feuerschutz und die Hilfeleistung (FSHG), NRW, par. 18, art. 1: "über die Leitstelle können sie von der Gemeinde, im falle des par. 1 Abs. 3, Satz 1 vom Kreis *angefordert* werden".

3.3.2 Organisation of disaster medicine

The Leitstelle receives the report of an accident. It coordinates the deployment of ambulances at Kreis level and is responsible for upscaling. The disaster alarm goes into operation as soon as the accident requires the deployment of ambulances from neighbouring municipalities. The Leitstelle consults on this with the *Einsatzleiter vor Ort* who has operational command of the disaster site and is a member of the fire service.
The medical command of the disaster site is in the hands of the *Leitender Notarzt (Chief Emergency Doctor),* comparable to the DMH in Belgium. The Leitender Notarzt works closely together with the Einsatzleiter vor Ort.
In Germany there is a difference between the *Leitungs- und Koördinierungsgruppe* (*LuK*) and the *Einsatzleitung vor Ort*. The Leitungs- und Koördinierungsgruppe (command and coordination group) forms the policy staff for disaster management while the Einsatzleitung vor Ort takes operational command of the disaster site. The Leitender Notarzt is not part of this command structure and in terms of hierarchy falls under the Einsatzleiter vor Ort – which comes from the fire service.
The deployment of medical units in Germany is based on the estimated number of casualties at a disaster. In the medical context a disaster is viewed as *Massenanfall von Verletzten* (*MANV*). There are three categories/levels here. The following medical units are deployed depending on the number of casualties[27]:

Figure 3.1 - Type accident, number casualties and deployment medical units

	Number casualties	Deployment medical units
MANV 1	5-10	OrgL, LNA, 2 NAW, 4 RTW
MANV 2	10-25	OrgL, LNA, 2 NAW, 8 RTW, 4 KTW
MANV 3	Over 25	Same as MANV 2, with required local and non-local units as per the scope of disaster.

Source: Konzept zur Bewältigung eines Massenanfalls von Verletzten und/oder Erkrankten bei der Feuerwehr Düsseldorf.

27. It should be noted here that the concrete detailing of such plans can differ per federal state and per Kreis. Hence, for example, almost every Kreis in Nordrheinland-Westfalen operates with different triage cars.

Triage (in Germany also *Sichtung*) is generally the same as in Belgium:
T1 Patients with priority for treatment (urgent)
T2 Patients with priority for transport (less urgent)
T3 Patients for delayed treatment (non-urgent)
T4 Patients pending treatment (dying or dead)

Based on experience with large-scale incidents the German approach is to marry the percentage spread of casualties across the triage categories with the necessary deployment of medical personnel and equipment. Hence, the spread across triage classes would always be virtually the same, i.e. 20% T1, 20% T2, 40% T3, and 20% T4.

3.3.3 Allocation of responsibility

Leitender Notarzt
The Leitender Notarzt (LNA) is responsible for provision of medical assistance at the disaster site. He/she is responsible for triage, casualty evacuation and the spread of casualties across hospitals. The Leitstelle provides him/her with an updated overview of the number of beds available in nearby hospitals.
A Leitender Notarzt is an experienced emergency doctor with additional training. Every Kreis has Leitender Notarzt groups within which a number of Leitender Notarzten arrange availability. This ensures 24-hour availibity of Leitender Notarzten.
If an LNA is not present at an early stage of an incident the first Notarzt takes on the function of the LNA.

Organisatorischer Leiter Rettungsdienst (organisational commander rescue services)
The Organisatorischer Leiter Rettungsdienst (OrgL) and the Leitender Notarzt make up a team together and determine responses from a medical angle. The LNA is responsible for medical aspects such as triage and casualty evacuation while the OrgL is tasked with logistic organisation.

3.4 Netherlands

3.4.1 Operational units

RAV-control room
In the Netherlands the RAV control rooms (or: Central control room Ambulance services, CPA) take on the same role as the HC-100s in Belgium and the Leitstellen in Germany. In the short term it is intended that all control rooms in the Netherlands will be combined operations for the ambulance, fire and police services. Ambulance deployment is conducted from the RAV control room. The most important difference

with the Belgium system is that the Netherlands does not have a set order of response for ambulances. Under the Dutch system the nearest ambulance is always called out, even if it is not stationery at its permanent location (so-called dynamic ambulance management).
In some regions there are integrated control rooms that coordinate other emergency services, e.g. fire and police.
The RAV control room has a central role in a disaster situation and is responsible for:
- activating the alarm system;
- deployment of ambulances;
- alerting/calling-up officials to the RAV control room, GGD and GHOR;
- alerting MMTs, SIGMAs and GNKs.
- alerting hospitals;
- ambulance assistance from the regions;
- casualties dispersal plan;
- possible requests for international assistance[28].

Ambulances
Unlike Belgium and Germany the Netherlands only has one type of ambulance service. Ambulances are managed by the government or health care bodies (RAV). Privately owned ambulances predominate. Ambulance crews are always specially trained professionals[29].
Based on their training ambulance nurses are permitted to carry out various activities as part of Advanced Life Support, that are usually reserved for doctors – without a doctor being present. Ambulance nurses are also qualified to carry out triage.

Mobile Medical Team (MMT)
Plans are also foreseen to set up ten trauma centres each with its own Mobile Medical Team (MMT). An MMT comprises a doctor and a nurse specially trained and experienced in pre-hospital emergency medicine. For the time being, four of these Trauma centres, including MMTs will be provided with a helicopter.

Rapid reaction medical team (Sigma)
A specially trained group of Red Cross volunteers provides medical assistance around major accidents and calamities. The teams support ambulance personnel and trauma teams (MMT) with the provision of medical assistance. Sigmas are mainly responsible for setting up the working environment and ensuring supplies. There are 49 Sigma teams nationwide.

28. Under the Disaster Act requests for international assistance can only be made by the Minister of the Interior to his/her opposite number in the given country. However, in practice the RAV control room will request assistance from the neighbouring Leitstellen or HC-100.
29. SOSA, Foundation for ambulance training.

Medical Combine (GNK)
A GNK is a joint/cooperative body comprising:
- Two ambulances each crewed by an ambulance nurse plus a driver.
- A Sigma.
- An MMT.
- An Executive Officer of the Medical Service (OvDG) or a Medical Supervisor.

The principle behind a GNK is to enhance the transition from day-to-day, small-scale, emergency assistance to actions around severe accidents or disasters. A GNK is deployed where there are several casualties or severe casualties at an accident. A GNK can be deployed as a whole or the various units can be involved separately.

3.4.2 Organisation of disaster medicine

Unlike Belgium, in the Netherlands the deployment of medical services is not subject to rules based on strict criteria. In the first instance the deployment of human and material resources is based on the judgement of the RAV control room and the medical aid workers on the spot. On receiving an alarm the RAV control room determines the number of ambulances to be dispatched. The first ambulance nurse to arrive at a large scale incident carries out coordination, assesses the situation and commences the set up of a location for treatment of casualties ('nest'). To this end all ambulances are equipped with a green flashing light. This green flashing light shows that ambulance is longer in use for evacuating casualties.
Using the so-called *car-hood consultation* the directly involved emergency services on the spot can decide on upscaling. An Incident Location Coordination Team (CTPI) is formed. Initially, from the medical side, the first ambulance nurse on the spot will be part of the CTPI until the Medical Services Duty Officer (OvDG) arrives and takes over the task of coordination. In the event of the decision for further upscaling the CTPI becomes the Disaster Site HQ (CoRT). Medical coordination shifts to the Executive officer Medical Service (CvDG)[30].
Unlike Belgium the Netherlands does not have a strict, themed, per function classification at the disaster site. The Dutch structure is hierarchical pro rata the phase of upscaling. Hence, to take an example, the Netherlands does not have a separate function for triage - unlike Belgium. Triage in the Netherlands is carried out by medical personnel, ambulance nurses and (MMT) doctors on the spot, as per the following urgency classification: state of Airways (A), Breathing (B) and Circulation (C). There are three classifications of urgency whereby, in principle, '4' can only be applied in a war situation:

30. According to the Basic module memorandum GHOR (Council of RGFs) this is a new term for the Medisch Leider Rampterrein (MLRT) (medical executive officer disaster site) as used in other publications.

T1 A,B,C unstable. Casualties with an immediate threat to life due to an obstruction of the airways and/or disruption of breathing and/or circulation.
T2 A,B,C-stable, to be treated within six hours. Casualties whose lives will be threatened after several hours, by an obstruction of the airways or disruption on breathing and/or circulation or who risk serious infection or disablement unless the injury is treated within six hours.
T3 A,B,C-stable. Casualties that are not in jeopardy from obstruction of the airways, disruption of breathing and/or circulation, serious infection or disability.
T4 A,B,C-unstable. Casualties whereby airways cannot be cleared and kept clear under the given circumstances, breathing cannot be sustained, bleeding cannot be halted and shock cannot be adequately treated[31].

3.4.3 Allocation of responsibility

Regional Medical Officer (RGF)
The RGF has end-responsibility within a GHOR region for medical assistance around accidents and disasters. As such the RGF is part of the municipal disaster staff or policy team and advises the mayor.

Section head GHOR (HS-GHOR)
The HS-GHOR is under the direct command of the head of the RGF and is part of the operational team. He/she acts as operational commander of the GHOR and is in direct command of the CvDG or OvDG. He/she also advises and informs the RGF.

Commander of Medical Services (CvDG)
At such time as the Disaster Site Command is established, Commander of the CvDG forms part of the CoRT. The CoRT is led by the Disaster Site Commander who normally comes from the fire service. The CvDG leads the OvDG and the operational process at the disaster site.

Medical Services Duty Officer/Officier van Dienst Geneeskundig (OvDG)
During the process of upscaling the OvDG forms part of the Incident Site Coordination team (CTPI). He or she fine-tunes medical assistance with other emergency services (e.g. fire and police). Furthermore, he/she is in charge of the GNKs and ambulance services and maintains contact with the Coordinator of Casualty Transport.

31. Source: Health Inspectorate, *Enschede, onderzoek vuurwerkramp*. The Hague (Ministry of Public health, Welfare and Sport) 2001, p. 195-196.

Coordinator Casualty transportation (CGV)
The CGV is appointed by the RAV control room and is responsible for the set up of an Ambulance station. The CCG coordinates casualty evacuation from the Ambulance station to the hospitals. To this end there is a casualty distribution plan based on the medical capacity of the given hospitals.[32]

3.5 Comparison

As the day-to-day SMH forms part of disaster management, it is a fact that the bottlenecks noted in an earlier report on this theme also play a role in disaster management. For a comprehensive listing of these bottlenecks readers are referred to the relevant report.

3.5.1 Similarities

Medical command at the disaster site
All three countries have an official at the site who is responsible for emergency medical assistance. In Belgium this is the Director of Medical Assistance, in Germany the Leitender Notarzt and in the Netherlands the Officer or Commander of Medical Services.

3.5.2 Differences

Authorisation of personnel
One of the most crucial differences between emergency medicine in the three countries is that the Belgian and German systems assume the deployment of doctors for more severe casualties, whereas under the Dutch system the ambulance para-medics can carry out far-reaching interventions – beyond that allowed for their Belgian and German counterparts. The differences in systems are set out in the chart below.

32. Theoretically medical treatment is set at 3% of the total number of beds.

Figure 3.2 - Operational medical units and authorisations in Belgium, Germany and the Netherlands

<table>
<tr><th></th><th>Belgium</th><th>Germany</th><th>Netherlands</th></tr>
<tr><td>Basic Life Support</td><td>Ambulance
Ambulance crewman or nurse</td><td>Rettungswagen
Rettungssanitäter
Rettungsassistent</td><td rowspan="2">Ambulance
Ambulance para-medic</td></tr>
<tr><td>Advanced Life Support and Pre Hospital Trauma Life Support</td><td rowspan="2">Mobile Emergency Group
Doctor
Nurse</td><td rowspan="2">Notarztwagen
Rettungswagen with Notarzt
Notarzteinsatzfahrzeug
Car with Notarzt and additional medical equipment</td></tr>
<tr><td>Advanced Trauma Life Support</td><td>Mobile Medical Team
Doctor
Para-medic</td></tr>
</table>

Medical command at the disaster site

The Dutch organisations are strictly hierarchical with a large number of functions in the hierarchy and a strict distribution of responsibility. In Belgium and Germany – depending on the scale of the disaster - medical command on the site rests with a single official. In Belgium this is the DMH and in Germany the Leitender Notarzt. The chart below sets out the tasks at the disaster site together with the functions bearing responsibility for their implementation.

Figure 3.3 - Per function spread of tasks at the disaster site

	Belgium	**Germany**	**Netherlands**
Issuing alarm	HC-100	Rettungsleitstelle	RAV-control room
Upscaling	HC- 100 DMH	Rettungsleitstelle Einsatzleiter vor Ort	RAV-control room and medical personnel on the spot
Medical commander on the spot	DMH	Leitender Notarzt	OvDG CvDG
Responsible medical person (policy)	Provincial Inspector	KSB for the Kreis	HS-GHOR RGF
Triage	Triage	Leitender Notarzt	(MMT-)Doctors ambulance para-medics
Provision of medical assistance	MUG-doctors	Notarzten	(MMT-)doctors
Coordination casualty evacuation	Regulator	Leitender Notarzt	CGV
Medical logistic support	Red Cross Civil Protection	OrgL Red Cross Johanniter Unfallhilfe Malteser Hilfsdienst Arbeiter Samariter-bund	SIGMA GNK

Protocols

Belgium and Germany work with set protocols describing which material is to be deployed under what circumstances. In Belgium the MIP goes into action where there are five or more serious casualties in category U1 or ten or more casualties in category U2 or U3. Germany has a comparable system albeit they differentiate between the three categories with differing numbers of victims (MANV-1 to MANV-3).
The Dutch do not have protocols on deployment of medical units in relation to casualty numbers. Medical assistance is deployed on the basis of the situation assessment by the medical personnel on the spot.

Policy-based medical responsibility

Belgium and the Netherlands both have a separate function/official with policy-based responsibility for provision of medical assistance within disaster management. In

Belgium this is the Provincial Inspector and in the Netherlands the Regional Medical Officer. However, Germany has no such function and the policy around provision of medical assistance comes under the Kreis, although no separate function/position is linked to this.

Function spread at the disaster site
Belgium and the Netherlands have several functions at the disaster site, for the various medical activities. This spread of functions in clearest in Belgium. In Belgium and the Netherlands triage, treatment and coordination of casualty evacuation are clearly linked to the various functions at the disaster site. Germany does not have this strict division of responsibility. In fact, all these activities, plus command at the disaster site, are part of the function of the LNA. However, in practice these activities are spread among the Emergency doctors who are present.

4 Summary, conclusions and recommendations

4.1 Introduction

This section discusses the most important differences between the medical disaster management organisations. As disaster medicine is a continuation of day-to-day emergency care, the differences and bottlenecks noted in a previous report on cross-border SMH also play a role in medical assistance for disasters. For a detailed description of these bottlenecks readers are referred to this report.
The differences in the manner of organisation of disaster management can result in a number of bottlenecks. The bottlenecks around cooperation in the field of disaster medicine can only partially be derived from system-differences that may play a role in cooperation. In fact, there are scarcely any concrete situations where the new GHOR organisation has actually worked together or exercised with neighbouring countries – with the exception of the Enschede firework disaster.

4.2 Developments since the previous ITS report

Initiatives in regard to SMH-bottlenecks
A previous report issued by the ITS described bottlenecks that play a role in cross-border emergency medicine (SMH). These bottlenecks also play a role around GHOR, as GHOR is an upscaled form of SMH. It is only that the scale of the problems will rise pro rata the greater involvement of medical assistance. Indeed, it makes a difference whether one or twenty ambulances are involved. Certainly, the problems may be the same but the scale could create a more chaotic situation.
For a comprehensive description of the bottlenecks around cross-border SMH readers are referred to the previously mentioned ITS report (see footnote 1). In the meantime, the past several years have seen work towards concrete solutions of these bottlenecks, notably in a bilateral context between Belgium and the Netherlands and based on Benelux initiatives. These are some of the resulting initiatives:
- Inventorisation of Dutch hospitals based on Belgian guidelines for the 100-system whereby Dutch hospitals can be included in this system.
- Detailing of solutions in regard to problems in radio communications between ambulances and control rooms. In the short term ambulances in Zeeland will be equipped with mobile telephones.
- The establishment of a four-language glossary to be issued to control rooms in the border areas.
- Further studies into the civil liability of ambulance personnel.

- Further inventoristion of the extent of the problems of payment due to divergent prices among the various ambulance services.

Concrete solutions have since been realised in regard to the optical and acoustic signals. The German and Belgian signals have now been recognised under Dutch traffic law.

Liability under civil law

One bottleneck in regard to day-to-day SMH – i.e. the liability of ambulance crews under civil law - does not apply in the event of a disaster situation. This is because, under the Dutch/German support agreement and the first supplementary agreement with Belgium, the responsibility for damage resulting from the action or negligence of a support unit shall be borne by the country receiving this support[33].

4.3 Summary

Similarities around policy

In policy terms there are strong similarities in the provision of emergency medicine in the three countries covered by the study:

- The definitions of a disaster agree that there must be a request for assistance from neighbouring regions and that a degree of central coordination is required before one can speak in terms of a disaster.
- The three countries also share the same criteria for upscaling. Higher-level coordination starts as soon as support is requested from other administrative regions.
- All three countries differentiate between a policy staff that gives strategic advice to the authorities during a disaster, and an operational staff that is present at the disaster site.
- Official procedures for upscaling and requesting assistance are almost exclusively domestic in orientation. Requesting assistance from abroad is exclusively for the highest level of upscaling i.e. the minister of interior (in Germany equivalent minister of the individual federal state).

Differences at the policy level

The most important differences concern the various governmental layers in the three countries. In particular these differences play a role in the Netherlands and Germany:

33. Dutch/German agreement on mutual provision of assistance/support in combating disasters, including serious accidents, art. 10, para 3.
First Supplementary Dutch/Belgian Agreement in regard to mutual provision of assistance/support in combating disasters, including serious accidents, art. 10, para 3.

- The Dutch GHOR region represents a separate management set up for emergency medicine (for disasters). In Belgium and Germany medical assistance is the responsibility of the 'ordinary' public administration.
- Germany's Kreis level of administration is unknown in the Netherlands or Belgium. In terms of authority the Kreis is best comparable to the Dutch and Belgian municipality. At the public administration level Germany's Gemeinde (municipality) plays virtually no role in disaster management.
- In the event of more than one Dutch municipality being involved in a disaster the country has a joint-cooperation structure of municipalities chaired by a coordinating mayor. Similar situations in Belgium are upscaled to the Province, and in Germany where more than one Kreis is involved in a disaster – to the Bezirk.
- In Belgium and the Netherlands the highest level of upscaling is to federal and central/national governments respectively. In Germany the highest level is the individual federal state (*Land).* In peacetime Germany does not upscale to the federal government level.

Relations SMH to GHOR
At operational levels the bottlenecks noted in the first ITS report also play a role around the GHOR. However, solving the bottlenecks around SMH does not mean flexible cross-border assistance around the GHOR. It is a fact that the three countries have major differences in material deployment and functions for personnel. Without mutual familiarity around personnel, material and procedures, joint action in a disaster situation could produce chaotic scenes.

Communication
Language problems could be a hindrance, notably in border regions with Germany. Personnel who work in the border region are usually able to communicate with the other country and these regions have translated lists of the most common expressions.
Radio communication is another matter. Contact with ambulances that cross the border remains problematic. Work proceeds on short-term solutions such as installing car kits for mobile phones, but in a disaster situation there is good chance that the mobile network will 'go down'. Moreover, in practice in disaster situations RAVcontrol rooms tend to be unavailable for longer periods due to a personnel shortfall and the intensity of incoming telecom transmissions. Similarly, communication with control rooms on the other side of the border will also be non-viable.
The C2000 and Astrid digital networks in the Netherlands and Belgium respectively should improve communications in the future. However, Germany's choice of a network that meshes with one of these is still open.

Planned deployment of units
Belgium's Medical Intervention Plan (MIP) goes operational as soon as there are five or more serious casualties (T1) or ten or more lighter casualties (T2 or T3). Germany

also seeks to impose a protocol for the deployment of resources via categorisation in the Massenanfall von Verletzten (MANV). No such protocol approach exists in the Netherlands. Deployment depends on the situation and the judgement of ambulance personnel, the RAV control room or OvdG.

Distribution of functions
The three countries all have a different approach to the distribution of functions at the disaster site. In Belgium and the Netherlands the allocation of tasks at the disaster site is spread across several, pre-described functions. In Germany, sole responsibility lies with the LNA. In practice tasks are distributed but not on the basis of pre-set functions.

4.4 Bottlenecks around cross-border GHOR

4.4.1 Public administration

GHOR formation
Over the past several years the provision of disaster medicine has been at the centre of a major reorganisation. There have been new organisations, functions, administrative forms and regional configurations. The designing of the new organisation is still very much underway. Hence, the attention and human resources of the GHOR regions have been internally focused on the build up of the new organisation and the reinforcement of links with the various parts of the chain of medical assistance. Despite the build up of the new organisation new initiatives have arisen in various regions in regard to cross-border cooperation, e.g. in the Achterhoek region, the three Brabant regions, Twente, Zeeland and South-Limburg. However, some regions lack the time and human resources to focus adequately on cooperation with 'abroad' on top of designing the GHOR organisation.

Netherlands-Germany
Germany has two levels of public administration that play a role in disaster management. These are the Kreis and the Bezirk – neither of which are exist in the Netherlands. However, the Netherlands does have a separate governmental body for disaster management, namely the GHOR regions which have the same tasks as embodied in Germany's Kreis level.
At the point when a mutual joint support agreement comes about it is unclear which parties should be involved in finalising the agreement: Dutch municipalities, joint cooperative bodies formed of municipalities (regions or joint agreements) or GHOR administrations. In Germany the most obvious administrative level to be involved is the Kreis.

Netherlands-Belgium
The same applies to the agreements with Belgium. The question arises which party on the Dutch side should sign the agreement: municipalities, cooperative alliances of municipalities or GHOR boards. On the Belgian side, the appropriate partner is the Federal Ministry of Social Affairs, Public Health and the Environment.

Upscaling
The structure of upscaling in the three countries is largely the same. The exception is that the Netherlands has a level unknown in Belgium and Germany, arising from a number of municipalities, chaired by a coordinating mayor, that are involved in disaster management. The Belgians upscale to the Province level as soon as a disaster involves several municipalities, in Germany coordination at Bezirk-level happens when more than one Kreis is involved.
Moreover, Germany's highest level of upscaling is the federal state (Land) whereas Belgium upscales to the federal/national level.
In practice lack of awareness with mutual levels of upscaling could mean:
a. that both sides are unaware which level of public administration should be contacted for assistance in disaster management, and
b. that lack of clarity can waste precious time in providing medical assistance.

Official channels
A request from the Netherlands to a foreign country for assistance can only be made by the Provincial Governor or the Minister of the Interior under the Dutch/German Agreement on Mutual Assistance and the First Supplementary Agreement with Belgium. That having been said, taking this official route can, as a last resort, be extremely costly in terms of time, whilst it is a precondition for implementation of the conditions of the agreements. In practice, initial requests for help almost invariably come from the control rooms involved, with the official procedure following later. However, it is questionable in how far this approach could impact on the stipulations of the agreements, e.g. if the Provincial Governor or Minister of the Interior decides that such help from abroad is not required.

4.4.2 Operational

Functional spread of tasks

Each of the three countries takes a different approach to the spread of medical tasks at the disaster site. The Belgians and the Dutch have a certain degree of function spreading whereas in Germany the Leitender Notarzt is in principle responsible for all tasks. Self-evidently when a disaster with more casualties occurs in Germany there is also a

spread of tasks among the Notarzten on the spot. However, this is not as stringently defined as in Belgium and in the Netherlands (see Figure 3.2).
In a cooperation situation this may, in practice, lead to a lack of clarity on functions, tasks and authorisation, and from that angle could hamper efficient cooperation.

Communication
Solving technical communication problems is crucial for getting the cross border cooperation off the ground. Measures are currently underway vis-à-vis the SMH to enable communication with ambulances abroad. One of these measures is to equip ambulances with 'car kits' for mobile telephony. However, this is only a short-term solution as a disaster of any magnitude could well shut down the mobile telephone network.
Three problems play a role in mutual communication, all of which seriously hinder the provision of cross-border assistance:
1. Ambulances that cross the border are out of contact with their own control room.
2. Ambulances operating in another country cannot contact the control room in that country.
3. In practice it has been found that mutual communication between the control rooms is also seriously disturbed, if not made impossible.

In practice it has been found that in a disaster situation (Enschede) the control room will not be reachable for a longer period of time due to a mass of incoming phone traffic and swamping of the duty crew. This also makes it impossible to communicate with control rooms over the border - so that they (the other country) are in the dark for some period as to the nature and scope of the disaster and any need arising for assistance.
With an eye to mutual communication between emergency services the Netherlands will, in the future, switch to a digital network (C2000). Belgium and Germany are also working on a digital network. Belgium's Astrid project can link up with the Dutch system. However, Germany's choice of the Tetra system has not yet been finalised and it remains to be seen whether they will eventually take a system that matches up with the other two countries. It is also important here that all emergency services involved in disaster management move to a digital network in order to enhance communications. This almost sure to happen in the Netherlands and Belgium, but matters are not yet clear in Germany.

Alerting the population
In the context of problematic communication between the control rooms on either side of the border it is debatable whether the neighbouring country's population could actually be alerted in good time, if this were necessary.

Insights into risk locations
In preparing for potential disasters it is important to have insights into activities across the border, which involve a degree of risk. Examples are chemical or nuclear installations. However, charting risk locations on or near the border and the exchange of information has hardly started. There are initiatives between the Netherlands and Germany to exchange information on such locations within the framework of the Seveso II guidelines of March 2001. However, this exchange is not comprehensive. Hence, to take an example, exchange of information on storage of fireworks and hazardous substances and information on institution that fall under the Mining Act (natural gas stations), is only fragmentary.

Maintaining border standards
The three countries observe the same standards in determining hazardous concentrations of materials. In view of the technical natures of this issue, this aspect was not dealt with in depth in the study. However, it could be that given concentrations of materials are regarded as critical and an alarm is issued in one country, while no alarm is sounded in the neighbouring country, in the same situation. This issue might, for example, arise with the release of a cloud of chemical materials from a factory.

Quantitative and qualitative knowledge of available units
Almost all regions are unaware of the number of available medical units (on which they could call for assistance) in the neighbouring country. The lack of awareness on numbers aside, there is also a lack of awareness on the type of personnel and material units available and the purposes for which they are equipped.

Knowledge of reception capacity
Several regions have a range of high-grade medical assets situated close together. However, these provisions are separated by the national border. Hence, the lack of awareness of the specific admission capacity and specialities of hospitals that may be just a few kilometres away.

4.5 Conclusions

As far as GHOR is concerned the bottlenecks noted around cross-border SMH also play a role in disaster management. Indeed, in its ideal form the GHOR is an upscaled version of SMH.
However, one has to watch out for the idea that solving of bottlenecks around cross border SMH will also mean problem-free cross-border GHOR. The fact is that emergency medical assistance around disasters is organised differently in all three countries. Moreover there is a lack of mutual knowledge of each other's systems, units and

reception capacity whereby efficient utilisation of the neighbouring country's capacity is minimal.
In the area of cross border assistance the various disaster management organisations are largely nationally and internally focused and to date virtually no account is taken of risk situations abroad and/or assistance from abroad in a disaster situation.
A considerable number of developments are currently underway in the area of cross-border SMH in a Benelux context, bilaterally between Belgium and the Netherlands and between Germany and the Netherlands and in various regions. At the same time intensive activity is underway in the various organs at various levels to solve the bottlenecks from the previous ITS report.
However, solving bottlenecks around SMH is not to say that medical assistance around disasters will also run smoothly. Indeed, cross border GHOR is still in an orientating phase whereby certain regions are working intensively on development (South-Limburg).

From SMH to GHOR
So great is the degree of difference in organisation of disaster medicine that without further mutual awareness of the counterpart's system, any joint deployments could result in chaos. Ideally the Dutch may view the GHOR as an upscaled version of the SMH, but solving bottlenecks in cross border SMH is not enough also to enable cross border GHOR deployment.

National orientation
The three countries take a largely national stance on disaster medicine – this includes the border regions. There is a lack of detailed knowledge of risk locations and activities on or adjacent to the border. The national counterparts more or less lack awareness on each other's material and human resource deployment capabilities in the qualitative or quantitative sense, and insight into medical reception capacity over the border is absent.
Official upscaling procedures also demonstrate a national orientation. In the border regions only a Provincial Governor can request assistance from abroad. In all other regions it is the Minister of the Interior. Bearing in mind the importance of a rapid medical response these procedures mean unnecessary delays.

4.6 Recommendations

Solving bottlenecks around SMH
As problems around SMH play a role with cross border cooperation in the GHOR context, these problems need to be solved.

Communication
One of the most urgent bottlenecks is communication. A structural solution is required as soon as possible for ambulances deployed over the border and which are cut off from contact with their own control room. Moreover, the ambulances should be able to contact the control room of the region in which they are providing assistance.
Moreover, in future, control rooms in border regions should be positioned to ensure their accessibility and communications with control rooms in the neighbouring country.

Making an inventory of risk locations and -activities
To acquire insights into potential incidents and to prepare for these there has to be a mutual exchange of information in the border regions, on risk location and types of risk activities endangering public health. To prepare for an actual emergency response it is advisable to make an inventory of assistance requirements per risk region and the resulting assistance requirements. This already happens in the Netherlands via the Leidraad Maatramp (guideline on disaster scale) and the Leidraad Operationele Prestaties (guideline operational performance).

Inventories of material and human resources
In the border regions there must be a mutual exchange of information on the type and numbers of medical units that can be offered/requested in a disaster situation. At the same time account should be taken of possible threats to emergency medicine needs in one's own regions due to "lending" units.

Inventory of over-capacity
Border regions often have a close concentration of high-grade/highly-specialised medical treatment facilities. Making an inventory of and utilising mutual excess capacity would avoid the unnecessary and excessively long transfers of casualties to "home" locations. In densely populated border areas like South Limburg, cooperation should go further than sharing information and extend into (and create) a cross border network of hospitals. Such a network could utilise the specific over-capacity of the hospitals whereby in a major incident with large number of causalities, those with specific injuries could be channelled to the appropriate treatment centre and make optimal use of each hospital's treatment assets.

Exchange of information on material and human resources
To ensure efficient and effective use of support from abroad it is crucial that parties keep each other up to date on mutual capacities. Sharing information and joint exercises are important tools in this context.

Information centre for cross-border cooperation

To date many projects around cross border cooperation in disaster medicine have been started up on the local level. This generates a wide scale of initiatives, not infrequently with players being unaware of what counterparts are doing. There is a real danger here of tackling the same problem repeatedly, whereas a solution has already been arrived at elsewhere. A nationwide information centre could support the regions in development of cross border initiatives around disaster medicine. An information point of this type could collect data of types of cooperation, bottlenecks and roads to solutions. However, the concrete detailing of such an information centre would require a brief, preliminary market reconnaissance.

Joint exercises

Joint exercises are a method to learn about mutual methodology, equipment and personnel. The GHOR regions on the Belgian border have already agreed to hold a disaster deployment exercise programme with Belgian medical emergency workers. A similar programme could be arranged for regions on the German border.

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Interviewees

Netherlands
- Ambulancezorg Netherlands: Ms. Deijkers
- GHOR Drente/Groningen: Messrs. Tjarks and Jelsma
- GHOR Twente: Mr. Heupers
- GHOR South Limburg: Mr. Klaassen
- RGFs Council: Mr Van Maurik
- GHOR Zeeland: Mr. Slenter
- GHOR Southeast Brabant: Mr. Bleumer
- RAV Drente: Mr. De Vrij
- GHOR Achterhoek: Mr. Bambang Oetomo
- GHOR mid-Limburg: Ms. Meulensteen
- MMT-East: Mr. Smits

Belgium
- National Health Inspectorate, Antwerp and Limburg: Ms. Machiels
- Antwerp University Hospital: Mr. Beaucourt

Germany
- Kreis Borken, Nordrhein-Westfalen: Mr. Schottmann
- Feuerwehr (Fire Brigade) Aachen, Nordrhein-Westfalen Mr. Lausberg

Abbreviations

ALS	Advanced Life Support
ASB	Arbeiter Samariter Bund (D) (voluntary aid workers)
ATLS	Advanced Trauma Life Support
BLS	Basic Life Support
CGV	Coördinator Gewonden Vervoer (coordinator casualty evacuation)
CoRT	Commando Ramp Terrein (command disaster site)
CPA	Centrale Post Ambulancevervoer (ambulance service central control room)
CTPI	Coördinatie Team Plaats Incident (incident site coordination team)
CvdG	Commandant van dienst Geneeskundig (senior officer medical services)
DMH	Directeur Medische Hulp (B) (director medical assistance)
GHOR	Geneeskundige Hulpverlening bij Ongevallen en Rampen (disaster medicine)
GNK	Geneeskundige combinatie (medical combination)
HS-GHOR	Hoofd Sectie GHOR (section head GHOR)
JUH	Johanniter Unfall Hilfe (D) (St.John's voluntary aid workers)
KTW	Krankentransportwagen (D) (ambulance)
LAN	Leitender Notarzt (D) (head emergency doctor)
LuK	Leitungs- und Koördinierungsgruppe (D) (command/coordination group)
MANV	Massenanfall von Verletzten (D) (major incident with large number of casualties)
MHD	Malteser Hilfsdienst (D) (Maltese Cross voluntary aid workers)
MIP	Medisch Interventieplan (B) (medical intervention plan)
MMT	Mobiel Medisch Team (mobile medical team)
MUG	Mobiele Urgentiegroep (B) (mobile emergency group)
NAW	Notarztwagen (D) (emergency doctor's car)
NEF	Notarztfahrzeug (D) (emergency doctor's vehicle)
OrgL	Organisatorischer Leiter Rettungsdienst (D) (head of organisation emergency services)
OvdG	Officier van dienst Geneeskundig (Duty medical officer)
PHTLS	Pre Hospital Trauma Life Support
RAP	Regionaal Ambulanceplan (regional ambulance plan)
RAV	Regionale Ambulancevoorziening (regional ambulance service)
RGF	Regionaal Geneeskundig Functionaris (regional medical officer)
RTW	Rettungswagen (D) (ambulance)
Sigma	Snel inzetbare groep ter medische assistentie (rapid deployment group emergency medicine)
SMH	Spoedeisende Medischel Hulpverlening (emergency medicine)
VMP	Voorwaartse Medische Post (B) (advanced aid post)