

Ambulance care in Europe

Organization and practices of ambulance services in 14 European countries





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Nanne Bos
Maarten Krol
Charlotte Veenvliet
Anne Marie Plass

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<http://www.nivel.nl>

nivel@nivel.nl

Telefoon 030 2 729 700

Fax 030 2 729 729

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Foreword

The organization and practice of ambulance care in the Netherlands and other European countries is of interest of Ambulancezorg Nederland (AZN). AZN is the national sector organization for ambulance care in The Netherlands, and initiated and funded this investigation among ambulance care services in Europe.

AZN likes to thank all persons who participated in this research. Participants held different positions and had various backgrounds. The total number of respondents was limited. In most countries only one person participated. In this respect, the results give a general impression of the organization of ambulance care in the European countries.

AZN aims to build an international network with stakeholders in ambulance care. According to AZN international discussion about ambulance care adds value to the development of professionalism of ambulance care.

The investigation was a repetition of a previous study in 2010. AZN has received several/ multiple request for the report. AZN welcomes all comments to this report.

Hans Simons, chair, AZN

Summary

Ambulancezorg Nederland (AZN) is the national sector organization for ambulance care in The Netherlands. AZN is interested in the organization and practice of ambulance care in the Netherlands and other European countries. Therefore it initiated and funded an investigation among ambulance care services in Europe. The investigation was partly a repetition of a previous study in 2010. The fourteen countries that participated in this survey were Belgium, Croatia, Czech Republic, Estonia, Germany, Hungary, Ireland, Latvia, Lithuania, the Netherlands, Norway, Spain, Turkey, the UK.

The questionnaire addressed nine important topics in ambulance care such as organization and personnel, legislation and regulations, quality and safety and the patients' perspective on quality of ambulance care. The results provide an overview of the organization of ambulance care in fourteen European countries and are presented in this report.

In general, the organization of ambulance care in countries is much alike. Most countries regulate ambulance care at a national level. All countries have separate ambulance care for emergency and non-emergency ambulance transportations. Response times can differ between countries from five to twenty minutes for life-threatening events. Ambulance services collaborate with various other service-types, e.g. hospitals, general practices, mental healthcare institutions, fire brigades, and police departments. Ambulance crews vary with type of transport and can include a range of medical staff, such as emergency care assistants and paramedics. In the case of life-threatening events usually a physician is part of the crew.

Patient safety is considered an important topic in ambulance care all over Europe. The survey results show that patient safety programs and national regulations regarding quality of ambulance care exist in the majority of the participating countries (9). In eight of these countries official quality ratification is required. Quality indicators of ambulance care are being defined and recognized in ten countries. Further, patient complaints about the care received or about adverse events are registered in most countries. However, only few countries have national regulations on adverse events. In eight countries patients' experiences are measured. In three countries these measurements are part of a national survey program. Still, patient involvement is only limited in ambulance care.

It appears that the organization of ambulance care is broadly stable over time (e.g. emergency levels, response times). The national budgets increased over the past five years. Due to extended budgets ambulance care services were able to respond to the growing number of emergency calls and other types of transportation. Consequently, ambulance staff increased in volume and functions. New positions such as nurse assistant, care ambulance assistant or care ambulance driver are introduced.

Healthcare professionals in ambulance care would welcome and join an international platform or forum to discuss and exchange information about ambulance care. An international forum could eventually lead to an international research agenda, comparable to the recently developed research agenda in the Netherlands. The development of a research strategy in the European Union strategic paper was one of the long-term conditions for quality of emergency care in the WHO report (2008).

The initiative of AZN for this investigation among 14 European countries resulted in an overview of the organization and practice of ambulance care. Further in-depth exploration of ambulance care could occur by setting up an international discussion platform, and building an international network of healthcare professionals. Sharing knowledge can be useful in anticipating to changes and challenges in ambulance care.

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1 Introduction

1.1 Ambulance care in the Netherlands

Ambulance care in the Netherlands is organized in 25 regions. The Regional Ambulance Service (or RAV) is responsible for providing ambulance care in the region. Within this organization, the ambulance service(s) and the ambulance care dispatch centre work closely together. The RAV can be a public or privately organized, or can be a combination of public and private organizations

Ambulance services provide a range of both urgent and planned healthcare and transport services. Transport encompasses a wide range of vehicle types and levels of care consistent with the patients' medical needs. In the Netherlands, 725 ambulances are available 24 hours a day, 7 days a week. The ambulance care dispatch centres annually process more than a million calls that result in the deployment of an ambulance. Two thirds of these deployments concerns emergency care (A-level). Emergency transport is subdivided into type A1 urgency and type A2 urgency. A1 urgency applies to life-threatening situations, and in such cases, the ambulance must be on site within 15 minutes of the emergency call coming in. A2 urgency applies to cases that are not life-threatening, but call for a rapid response. The ambulance must be on site as soon as possible, but no later than 30 minutes after the emergency call. The other type of transportation concerns non-emergency patient transport services, or B-transport. During these rides no sound signals or flashing lights are used. They may involve low complex and regular complex care, such as transporting a patient to a radiotherapy center for treatment, or transporting an elderly patient with a broken hip from the hospital to a nursing home. It may also involve highly complex care, such as the transport from a general hospital to a specialized hospital.

The ambulance care sector employs 5,040 people, 4,430 of whom work as specialised nurses and drivers or as staff at the ambulance care dispatch centres. The ambulance care system is a nurse-based system. Ambulance nurses are licensed to administer medical treatment independently at Advanced Life Support (ALS) level. Ambulance drivers are qualified to provide medical assistance to the ambulance nurses. Quality levels in ambulance care are also safeguarded by means of national guidelines and protocols. Protocols represent the professional standard for the content and the process of ambulance care. In other words, care in accordance with protocols is the national standardization of quality during the total process.

In the Netherlands, ambulance care is financed through premiums. That means every Dutch citizen is insured for ambulance care services by the premiums they pay for their health insurance. Financing is the domain of the insurance companies.

The sector's macro budget is more than 431 million euros. The Regional Ambulance Services conclude production agreements with health insurers.

1.2 Ambulancezorg Nederland

Ambulancezorg Nederland (AZN) is the national sector organization for ambulance care in The Netherlands, offering support to the Regional Ambulance Services (RAVs) in the Netherlands.

It also promotes the collective interests of the sector, on topics such as legislation, financing, human resources, and quality of care.

1.3 Quality of care

European health care policy strongly focuses on quality improvement and quality assurance. Another aim of this policy is to establish a more patient-centered health care system in which patients should take matters regarding their own health more actively into their own hands (HSR-Europe, 2011). AZN recognizes and addresses these policy dimensions for instance through measuring patients' experiences (Rozeboom et al., 2015; Krol et al., 2013; Sixma et al., 2010).

1.4 Comparisons with other European countries

Another way to highlight possibilities to improving quality of care is by investigating the organization and practices of ambulance services in other countries. Insights into the processes of other ambulance care services, for example in Europe, may help to identify opportunities for improvements in Dutch ambulance care. In 2008, the WHO investigated the organization and financing systems of ambulance services and the training of their staff in the EU (WHO, 2008). The results of another European study, the EED (European Emergency Data) project, showed that there are some important differences in Europe, which might have consequences for patient safety (Krafft et al., 2003; Fischer et al., 2011). For example, despite the European recommendation to adopt a single emergency telephone number in each country (e.g. 999 in the UK, 112 in the Netherlands), in several European countries more than one such number was used. This may affect the rapidity of possible action.

In 2010, AZN sent a detailed questionnaire about the organization of ambulance services to European stakeholders in ambulance care (AZN, 2010). Apart from the Netherlands nine countries participated. This included Austria, Bulgaria, the United Kingdom, Estonia, Finland, Italy, Lithuania, Poland and Turkey. The questionnaire covered the system of financing and legislation regarding ambulance services, ambulance availability, organization, cooperation with other professional institutions, and national guidelines and protocols. Another question was whether countries made a distinction between emergency and non-emergency transportation services. In addition, the survey included questions about the composition of the ambulance crew for each transportation type, and their (required) training. Last, respondents were asked whether there was a national umbrella organization for ambulance services, similar to AZN in The Netherlands. An updated study of the organization of ambulance care in other European countries can provide new insights for improving ambulance care.

1.5 Goal

The goal of this study is to investigate ambulance care services in European countries by updating the previously used questionnaire, and to include more European countries. In addition, it is investigated in what way the patient's perspective and patient safety regarding ambulance care is

assessed in the participating countries. The results of this study may provide opportunities to (further) improve the quality of ambulance care in the European Union (EU).

1.6 Research questions

The following research questions were investigated:

- *“How is ambulance care being organized in various European countries?”*
- *“How is quality of ambulance care assessed, and to what extent are patients’ experiences and patient safety included in this?”*
- *“Are there any changes in the way ambulance care services are being organized over the past four years in the European countries that participated in the 2010 AZN survey as well?”*

2 Research design and methods

The study started by updating the English questionnaire from 2010, by adding new aspects of interest, e.g. patient's perspective and patient safety. The questionnaire had more closed than open questions in order to facilitate comparisons between countries. Next, the survey was converted into a digital version.

AZN contacted the various EU bodies on ambulance care to identify individuals who could best fill in the questionnaire for their country. In addition, invitations for participation in the survey were sent to contacts of researchers of NIVEL. Initially, 72 persons were identified from over 22 European countries.

The initial invitation to participate in the digital questionnaire was e-mailed to these contacts, by including an individual URL-link to the survey. These invitations were sent on March 12th 2015. Contacts who had not responded in the first week of the survey, received an e-mail with a reminder on March 19th. If applicable, a second reminder was sent to non-respondents on March 26th. Respondents were asked to provide information based on the year 2014. In the survey, these contacts were able to provide e-mail addresses of additional stakeholders who could also participate. Subsequently, these additional contacts were invited to fill in the survey. The data collection was closed after four weeks, on April 2nd. After this date, responding to the survey was no longer possible.

2.1 Questionnaire

The questionnaire (appendix A) consisted of the following topics:

- Ambulance care organization.
- Types of ambulance transportation.
- Ambulance care personnel.
- Medical dispatch centre.
- Protocols and standards.
- Quality and safety, including the patients' perspective.
- Patient files.
- Scientific research.
- International platform.

3 Results

3.1 Participants

14 countries, 21 respondents, participated in this study, in some countries two or three respondents completed the survey. The participating countries and number of respondents are: Belgium, Croatia, Czech Republic, Estonia (2x), Germany (2x), Hungary, Ireland (2x), Latvia, Lithuania, the Netherlands, Norway (3x), Spain, Turkey (2x), United Kingdom (2x). The respondents held the following positions: director (6x), medical doctor/director (2x), lead of department (4x), manager (5x) (program, project, education), senior advisor (1x), executive officer (1x), position in academic faculty (1x), emergency medicine technician (1x). In appendix B an overview of the respondents' functions and organizations is provided.

The results describe outcomes for countries. In some cases the answers of respondents from the same country completed each other. In other cases respondents of the same country disagreed. In that case other resources e.g. publications, results of the 2010 survey and internet were used to check the results. In case resources did not provide a definite answer no results are described.

3.2 Organization of Ambulance Services

3.2.1 Level of organization

Services are mainly regional or national organized (table 3.1). Two countries state that the emergency service is organized at a local level (Croatia, Lithuania). In Belgium, Czech republic and Germany ambulance services are organized at both a regional and national level, whereas in Norway it is organized at both regional and local level. In Turkey it is organized at both a national and local level. Ireland has organized the ambulance services nationally except for Dublin city where the Dublin Fire Brigade provides ambulance service.

Table 3.1 Organization of ambulance care

Country	Organization of ambulance care			
	Locally	Regionally	Nationwide	Other
Belgium	no	yes	yes	no
Croatia	yes	no	no	no
Czech Republic	no	yes	yes	no
Estonia	no	yes	no	no
Germany	no	yes	yes	no
Hungary	no	no	yes	no
Ireland	no	no	yes	yes
Latvia	no	no	yes	no
Lithuania	yes	no	no	no
The Netherlands	no	yes	yes	no
Norway	yes	yes	no	no
Spain	no	yes	no	no
Turkey	yes	no	yes	no
United Kingdom	no	yes	no	yes

3.2.2 Public or private

In most countries (8) both public and private ambulance services provide services. In four countries the organization of ambulances is completely public (Croatia, Czech Republic, Latvia, UK). In Ireland, besides public and private, also voluntary ambulance services exist. In Lithuania and Norway there are a few private services.

3.2.3 Type of organization: dependent or independent

The majority of the ambulance services in the various countries are independent organizations. Ambulance services in Belgium and Germany and in Dublin (Ireland) are part of the fire brigade, or in Belgium, they might form a subdivision of hospitals, as in Estonia and Norway. In Lithuania some ambulance services might be part of primary health care centers. Private ambulance services, or the voluntary services in Ireland, are independent organizations.

Collaboration

In most countries ambulance services collaborate with three partners. Ambulance services in the Netherlands and Norway work together with (at least) six partners, whilst those in Hungary and Spain operate with one partner. Fire brigades and hospitals are favorable collaboration partners. In table 3.2 the collaboration of ambulance services with the most common partners are presented. Other collaboration partners are home care organizations and midwives (the Netherlands) or civil defense (Spain and Turkey), army and coast guard (Latvia and Turkey). In Latvia, additional collaborating partners are the border guard, air rescue coordination centre, Latvian Coast Guard Maritime Rescue Coordination Centre, Estonian Emergency call centre 112 and NHS Latvia.

Table 3.2 Partners of ambulance services

	Hospitals	General Practitioners	Mental health care institutions	Police departments	Fire brigades	Other	Number of partners
Belgium	yes	no	no	no	yes	no	2
Croatia	yes	no	no	yes	yes	no	3
Czech Republic	yes	yes	no	no	yes	no	3
Estonia	yes	yes	yes	yes	yes	no	5
Germany	yes	no	yes	no	yes	no	3
Hungary	no	yes	no	no	no	no	1
Ireland	yes	yes	no	no	yes	no	3
Latvia	yes	yes	no	yes	yes	yes	5
Lithuania	yes	no	no	yes	yes	no	3
The Netherlands	yes	yes	yes	yes	yes	yes	6
Norway	yes	yes	yes	yes	yes	yes	6
Spain	no	no	no	no	no	yes	1
Turkey	yes	no	no	yes	yes	yes	4
United Kingdom	yes	yes	yes	no	no	yes	4
Total	12	8	5	7	11	6	

3.2.4 National regulations and legislations

Except for Croatia and Lithuania, national regulations exist for ambulance services. National laws regarding ambulance care are presented in table 3.3.

Table 3.3 Legislation per country

Country	National law
Belgium	Law on Emergency Medical Services, except for non Emergency Medical Service ambulance care
Croatia	No
Czech Republic	Law on Emergency Medical Services (system 374/2012 Sb)
Estonia	Health Services Organisation Act
Germany	No
Hungary	Regulated by the Health Law
Ireland	A national regulator set-up under statutory instrument (SI 109 of 2000 and SI 575 of 2004)
Latvia	Regulations of Cabinet of Ministers Nr.1529, regulation of Cabinet of Ministers Nr.60
Lithuania	No
The Netherlands	Temporary Ambulance Care Act
Norway	National law on Emergency Medical Service outside hospitals
Spain	A national law with some regional applications
Turkey	Emergency Medical Services Regulation
United Kingdom	Statutory providers responsible for all emergency (999) calls & Civil Contingencies

3.2.5 Financial Basis

Ambulance services are financed on the basis of public money, most of the time through health insurances (Belgium; Croatia; Czech Republic; Germany; Ireland; Lithuania; the Netherlands; Turkey; UK), and sometimes through public donations (Belgium and Ireland). Further, ambulance services in Belgium, Germany, and Turkey make use of private money as well. The total budget (2014) of countries for ambulance services varies between 25 million (Belgium) and 5 billion (Norway) (table 3.4). Some budgets are exclusively allocated to the organization of ambulance care in emergency situations whilst other budgets are allocated for ambulance care in case of emergency and non-emergency ambulance transport.

Table 3.4 National financial budget for ambulance care

	Budget for ambulance care (2014) (EUR)		Population (2014)
	Total	Per inhabitant	
Belgium	25,000,000	2.4	10,449,361
Croatia	-		
Czech Republic	-		
Estonia	36,000,000*	28.6	1,257,921
Germany	-		
Hungary	100,000,000*	10.1	9,919,128
Ireland	-		
Latvia	48,000,000	22.1	2,165,165
Lithuania	44,000,000	12.6	3,505,738
The Netherlands	500,000,000	29.7	16,829,289
Norway	5,000,000,000	971.3	5,147,792
Spain	-		
Turkey	-		
United Kingdom	2,780,000,000*	43.6	63,742,977

* Numbers are estimated values

3.3 Ambulance transportation

3.3.1 Distinction between emergency and non-emergency transportation services

In all participating countries a difference is made between emergency and non-emergency transportation services, except for Croatia and the Netherlands. For some countries emergency and non-emergency services are provided by different organizations, e.g. in Belgium the emergency service is organized at a federal level, whereas non-emergency transportations are organized at a regional level. Non-emergency services may also be delivered by private organizations, such as in Czech Republic, or by commercial providers, as is the case in Hungary and the UK.

3.3.2 Emergency levels

In all countries distinctions are being made between levels of emergency, except for Croatia. In Ireland and the UK five levels of emergency status are being recognized. In Estonia and Latvia four levels are distinguished. In Belgium, Czech Republic, Germany, Hungary, Lithuania, Norway, Spain, and Turkey, there are three levels of emergency for transportation. In the Netherlands two levels of emergency for transportation are used. In table 3.5 emergency levels and response times are presented. For some countries the non-emergency level is part of the categorization, and therefore presented in the table.

3.3.3 Non-emergency levels

In most of the countries (9) there are different levels for non-emergency ambulance transportations. In Germany, Hungary and the Netherlands, a difference is made between intensive/high care unit (ICU) transportations and other transportations. Further, Germany distinguishes between long and shorter distance transportations. In Ireland there are different levels for transportation of patients in need of critical care during transportation, subcategorized in adults, neonates and children. In addition, there is a separate category for inter-facilities transportations. The latter category was also found in the Czech Republic and Latvia. In Spain non-emergency ambulance transportations are categorized as individual or collective transportations.

3.3.4 Emergency transportation

Response times were given for Czech Republic, Estonia, Germany, Hungary, Ireland, Latvia, Lithuania, the Netherlands, Norway, Spain, Turkey, and the UK (table 3.5). In case of life threatening situations, response time in most countries is 15 minutes or less, except for the Czech Republic with a response time of 20 minutes. In Latvia arrival time is set between 8-10 minutes. In Ireland in case of cardiac arrest, respiratory arrest or other life threatening situations this is 8 minutes, in all other cases of serious but not life-threatening events this is 19 minutes. In Estonia, response times for urgent care (potentially life-threatening) is 20 minutes at most. For non-critical care the response time is 30 minutes, which is the same for the Netherlands in case of non-life threatening events.

3.3.5 Non-emergency transportation

In case of less urgent or inter-hospital transportations, arrival times differ between countries ranging from 60 minutes to four hours.

Table 3.5 Emergency levels and response times

	Level I	RT (min)	Level II	RT (min)	Level III	RT (min)	Level IV	RT (min)	Level V	RT (min)
Belgium	Urgent medical group (nurse + physician)		Paramedical intervention team (nurse + ambulance personnel)		Ambulance staff (ambulance personnel)					
Czech Republic	Priority 1 and 2: teams with physicians	20	Priority 3 and 4: paramedic teams	20	Helicopter for most severe traumas	20	B			
Estonia	D – Critical: life threatening	15	C – Urgent: potentially life threatening	20	B – Non critical: medical reason	30	A – Non urgent: transport	120		
Germany	Ambulance with alarm: immediately	5	Ambulance without alarm: no rush	10	Ambulance with doctor	5				
Hungary	Doctor level	15	Nurse level	15	EMT level	15				
Ireland	Echo: cardiac or respiratory arrest	8	Delta: life threatening other than cardiac or respiratory arrest	8	Charlie: serious not life threatening; immediate	19	Bravo: serious not life threatening; urgent	19	Alpha and omega: (A) non serious or not life threatening and (O) minor illness or injury	
Latvia	1 – highest priority: life threatening situation	Ambulance has to be dispatched in 1 minute. Arrival time 8-10 minutes	2 – high priority: the situation can become life threatening, immediate transfer	Ambulance has to be dispatched in 2 minutes. Arrival time 10-15 minutes	3 – Low priority: urgent medical care is necessary. Consultation by phone	Visit has to be performed within 2 hours (120 min)	4 – EMS is not necessary. Consultation by phone	Scheduled ambulance transport which has to be performed within 3-4 hours		
Lithuania	Immediate	15	Urgent	25	Delayed	60				

	Level I	RT (min)	Level II	RT (min)	Level III	RT (min)	Level IV	RT (min)	Level V	RT (min)
The Netherlands	A1: an acute threat to the patient's vital functions or only to be excluded after an evaluation by the ambulance unit on site	15	A2: a request for care that does not entail an immediate threat to life, but may involve (serious) damage to health	30	B: Planned transport					
Norway	Red - Immediately/ acute	90% within 12 (urban) or 25 (rural) minutes	Yellow - Urgent	None, but should be started within 5 minutes	Green - Usual / planned	None				
Spain	Emergencies: always advanced units	8	Urgencies: basic units	20	Programmed transport: demand generated on advance					
Turkey	Advance Life Support (Red band): emergency response	10	Basic Life Support (Blue Band): interhospital transport	0	Critical Care (Red and Blue Band): Interhospital transport	0				
United Kingdom	Cat A or RED calls - Suspected or actual cardiac arrest	8	Cat A or Red 2 - Serious/life threatening	8	Cat B – Serious/ not life threatening	19	Everything else	30	Healthcare professional emergency calls	60

3.3.6 Number of emergency and non-emergency transportations on an annual basis

In table 3.6 the annual numbers of emergency and non-emergency transportations are presented. For a better understanding and interpretation of these numbers, the number of transportations were computed per hundred persons based on the number of inhabitants in the country. In the Netherlands and Ireland five out of one hundred persons were transported with an ambulance in 2014.

Table 3.6 Number of emergency and non-emergency transportations in 2014

	Transportations (2014)				Population (2014)
	Emergency		Non-emergency		
	Total	Per 100 persons	Total	Per 100 persons	
Czech Republic	840,000	8			10,627,448
Estonia	273,000	22			1,257,921
Ireland	240,695	5	92,494	2	4,832,765
Latvia	433,804	20	436,673	20	2,165,165
The Netherlands	870,000	5	322,000	2	16,829,289
United Kingdom	8,470,000	13			63,742,977

Annual numbers are missing for Belgium, Croatia, Germany, Hungary, Lithuania, Norway, Spain and Turkey.

Number and type of ambulance transport vehicles

In all participating countries the ambulance care services make use of both advanced life support ambulances (ALS) and basic life support (BLS) ambulances, except for Croatia, and the UK where they do not have BLS ambulances. In addition, in Belgium, Czech Republic, Estonia, Germany, Hungary, Ireland, Latvia, the Netherlands, Norway, Turkey and the UK the ambulance care services have mobile ICU ambulances at their disposal. In Belgium, Germany, Hungary, Ireland, Latvia, Lithuania, the Netherlands, Norway, Spain, Turkey and the UK ambulance care services also make use of non-emergency ambulances (transport ambulances). Furthermore, Belgium, Germany and Norway make use of helicopters. Norway also uses boats, airplanes, and bikes. Bicycles and boats are also used in the Netherlands. In table 3.7 the type and number of ambulance transport vehicles are presented.

Table 3.7 Number and type of ambulance transport vehicles

	MICU*	ALS [#]	BLS [§]	Transport ambulance	Other
Belgium	yes	yes	yes	yes	helicopter
Croatia	no	yes	no	no	-
Czech Republic	142	86	369	no	no
Estonia	6	13	76	no	no
Germany	yes	yes	yes	yes	helicopter
Hungary	2	180	550	yes	-
Ireland	yes	-	yes	yes	no
Latvia	3	26	yes	yes	-
Lithuania	no	yes	yes	yes	no
The Netherlands	8	744	yes	yes	motor cycle; bicycle; boat
Norway	yes	yes	yes	yes	helicopter; boat; airplane; bicycle
Spain	no	yes	yes	yes	no
Turkey	yes	yes	-	yes	no
United Kingdom	yes	yes	no	yes	no

* MICU: Mobile Intensive Care Unit ambulance

ALS: Advanced Life Support ambulance

§ BLS: Basic Life Support ambulance

3.4 Ambulance Staff

In most countries emergency care teams consist of a medical doctor, a nurse or ambulance co-worker, besides an ambulance driver. Non-emergency care teams consist of one or two nurses, emergency medical technicians or assistants accompanied by an ambulance driver in most countries. Medical doctors are not part of the ambulance staff in non-emergency ambulance care. In four of the responding countries: Estonia, Germany, the Netherlands and Norway there are specific national regulations for ambulance personnel.

3.4.1 Training

In all countries staffs are being trained. In Croatia, Estonia and Lithuania this training is continuously. In the Czech Republic, Germany, Ireland, Latvia, the Netherlands, and the UK staff has to take courses on a yearly basis. In the Netherlands a national assessment procedure is carried out every three years. Belgium skills are evaluated once in five years. In Hungary competency measurements are established irregular. In some countries the ambulance staff needs re-registration. In Estonia, the Netherlands and Turkey training modules and re-registration are obliged once in respectively two, three/four and five years.

3.5 Medical Dispatch Centre

In Czech Republic and Spain the medical dispatch centres work independently. In Croatia, Germany, Hungary, Ireland, Latvia, Lithuania, the Netherlands, Turkey and the UK, these are part of the ambulance services. In Germany and Ireland these can also be part of the fire brigade. In Norway the medical dispatch centres are part of the hospitals.

The annual number of emergency calls processed by medical dispatch centres are presented in table 3.8. The number of calls are computed per 100 persons based on the number of inhabitants in the country. Annual numbers per 100 persons range between 4 in Turkey and 33 in Belgium in 2014.

Table 3.8 Number of emergency calls in 2014

	Emergency calls annually	Emergency calls daily	Calls / 100 persons	Population (2014)
Belgium	3,500,000	9,589	33	10,449,361
Czech Republic	2,200,000	6,027	21	10,627,448
Hungary	2,000,000	5,479	20	9,919,128
Ireland	333,000	912	7	4,832,765
Latvia	434,000	1,189	20	2,165,165
Lithuania	1,000,000	2,740	29	3,505,738
Norway	850,000	2,334	17	5,147,792
Turkey	3,500,000	9,589	4	81,619,392 [#]
United Kingdom	8,500,000	23,288	13	63,742,977

[#] European and Asian population

* Annual numbers are missing for Croatia, Estonia, Germany, the Netherlands and Spain

In most countries the triage system used in the dispatch centre is identical throughout the country. In Lithuania, the Netherlands, Spain and the UK various triage systems might be used within the

country. Irish medical dispatch centres and some dispatch centres in Lithuania and the Netherlands use the same system (ProQA (Professional Quality Assurance a digital version of Advanced Medical priority Dispatch System (AMPDS)). In Estonia, Hungary and Turkey categorization systems are not organized on the national level.

3.5.1 Dispatch Centre Staff

The training and education of the staff in dispatch centres varies between countries. In the Czech Republic, Estonia and Ireland the complete staff consist of call-takers and/or dispatchers. Doctors are part of the staff in Norway and Turkey. In other countries the staff is mixed; call-takers, dispatchers, nurses and paramedical trained people can take the emergency calls. Table 3.9 provides an overview of various positions in dispatch centres. Management or administrative positions and ambulance staff are not presented in the table.

Table 3.9 Composition of dispatch centre staff

	Call taker/ dispatcher*	Nurse	Medical doctor	Paramedic	Other
Belgium	yes	yes	no	no	-
Croatia	no	yes	yes	no	-
Czech Republic	yes	no	no	no	-
Estonia	yes	no	no	no	medical advisor
Germany	no	no	no	yes	fire fighter
Hungary	yes	no	no	yes	consultant*
Ireland	yes	no	no	no	medical supervisor
Latvia	yes	no	yes	no	consultant*
Lithuania	no	yes	no	yes	-
The Netherlands	yes	yes	no	no	Medical advisor
Norway	no	yes	yes	no	coordinator
Spain	yes	no	no	no	-
Turkey	no	yes	yes	yes	-
United Kingdom	yes	no	no	no	medical advisor

* medical nurses and/or paramedics with additional training for dispatch

Education, training, skills and competencies

In most countries, additional dispatch training is required besides the regular education for the position. Skills and competencies are monitored continuously. In Belgium, Estonia, Lithuania, Ireland, the Netherlands, and the UK, call audits are used to ensure ongoing licensing. In Ireland and the Netherlands a software application supplementary to the triage system enables auditing. In Latvia and Norway the staff has to pass an annual qualification exam. In Croatia re-registrations is carried out every three years. In Turkey re-registrations occurs every 2 to 4 years.

3.6 Protocols and Standards

In all countries protocols and guidelines, mostly nationwide, are being used by the ambulance care services personnel to follow their work (table 3.10). Medical doctors guiding ambulance transportations do follow these guidelines too. In Ireland, Lithuania, Turkey, and the UK there are no medical doctors that are employed by ambulance services.

Table 3.10 Protocols and standards about ambulance care

	Protocol or guideline	
	Ambulance personnel	Emergency physician
Belgium	yes, national	no
Croatia	yes, national	yes, national
Czech Republic	yes, but not national	yes, national
Estonia	yes, national	yes, national
Germany	yes, but not national	yes, but not national
Hungary	yes, national	yes, national
Ireland	yes, national	not applicable
Latvia	yes, national	yes, national
Lithuania	yes, national	not applicable
The Netherlands	Yes, national	Yes, national
Norway	yes, but not national	yes
Spain	yes, but not national	yes, but not national
Turkey	yes, national	not applicable
United Kingdom	yes, but not national	not applicable

3.7 Quality and Safety

Table 3.11 shows the use of quality aspects for ambulance care e.g. patient safety program, national regulation of ambulance care, quality indicators for ambulance care, and measuring patient's perspective. The registration of incidents and complaints are presented in table 3.11 as well.

3.7.1 Quality of ambulance care

In nine countries there exist patient safety programs especially for ambulance care. In Hungary this concerns a regional program, whereas the others speak of national programs. In half of the countries official quality ratification is required. In most countries (10) indicators for quality of ambulance care are being defined and recognized. In Germany this is done on a regional level, the other countries speak of the assessment of quality indicators nationally. Patient satisfaction or patients' experiences are measured in eight countries. In Latvia, Norway and the UK the measurements are part of an national survey program.

3.7.2 Registration of incidents and complaints

In the Czech Republic, Hungary, Lithuania, and Spain no registration of incidents that take place at the ambulance care services are being registered. Belgium, Ireland and Latvia register locally or regionally. In Croatia, Estonia and Germany adverse events are registered national. In the Netherlands, Norway and UK events are escalated to the national level if necessary. Further, official complaints regarding ambulance care are being registered in all countries except for Germany. The way these are being registered differs between countries. Some speak of nationwide registration systems, whilst others register locally. There are both paper and digital registration systems.

Table 3.11 Quality and safety aspects in ambulance care

	Patient safety program	National regulations	Quality of care indicators	Patient satisfaction/ experiences	Registration incidents	Registration complaints
Belgium	no	no	no	no	yes, regional	yes
Croatia	national	yes, ratification	yes	yes	yes, national	yes
Czech Republic	no	yes, ratification	no	no	no	yes
Estonia	national	yes	yes	yes	yes, national	yes
Germany	no	yes	yes	no	yes, national	no
Hungary	regional	no	yes	yes	no	yes
Ireland	national	yes, ratification	yes	no	yes, local	yes
Latvia	national	yes, ratification	yes	yes	yes, regional	yes
Lithuania	no	no	no	no	no	yes
The Netherlands	national	yes, ratification	yes	yes	yes	yes
Norway	national	yes	yes	yes	yes	yes
Spain	no	no	no	yes	no	yes
Turkey	national	yes, ratification	yes	no	yes	yes
United Kingdom	national	yes, ratification	yes	yes	yes	yes

3.8 Patient files

In almost all countries both electronic and paper patient files exist simultaneously. In Latvia only electronic files exist, whereas in Ireland they only have paper files. File exchange takes place mostly through handing paper or electronic copies to each next care provider. In Croatia and Estonia (April 2015) the exchange of patient information is automated.

3.9 Scientific research

In the Czech Republic, Germany, Hungary, Ireland, Latvia, the Netherlands, Norway, Spain, Turkey and the UK, scientific research regarding ambulance care is performed (table 3.12).

Table 3.12 Research and research topics in ambulance care

	Research	Research topic
Belgium	no	-
Croatia	no	-
Czech Republic	yes, local	CPR; dispatch
Estonia	no	-
Germany	yes, regional	-
Hungary	yes, local	airway management
Ireland	yes, national	spinal injury; referral of patients
Latvia	yes, regulated by SEMS*	stroke; resuscitation; coronary syndrome
Lithuania	-	-
The Netherlands	yes, national	cardiology; 9 themes on research agenda
Norway	yes, local	cardiac arrest; trauma
Spain	yes, regional	donations
Turkey	yes, local	safety; accidents; violence towards EMS providers
United Kingdom	yes, local	resuscitation; trauma; stroke

* State Emergency Medical Service

Recently, the Netherlands developed a national ambulance care research agenda 2014-2018. On the agenda are nine research topics e.g. 'treatment without transport', performance measures for quality of care, and triage. In Turkey and the UK some local studies rather than a national research program are conducted. Frequent topics are cardiology (cardiac arrest, resuscitation, coronary syndrome) and trauma.

3.10 International platform

Almost all respondents are interested in international discussions about ambulance care and would join an international platform or forum. Information exchange on topics such as organization and planning of ambulance care (efficiency, equipment), decision making, finance, quality of care (quality indicators, guidelines/ protocols), management (human resources, training and education of staff), research, clinical practice (cardiopulmonary resuscitation) are welcome.

3.11 EU ambulance care in the past five years

Compared to the 2010 survey some other countries participated in 2015. Estonia, Lithuania, the Netherlands, Turkey and the UK were participants in both years. Overall the organization of ambulance care in 2015 was comparable to 2010. Distinctions between emergency and non-emergency transport, emergency levels and response times remained the same.

What did change were the national financial budgets. In the Netherlands the national financial budget increased from 360 million to 486 million euros. In Estonia the budget increased from 27 million to 36 million. In Lithuania the budget was raised from 33 million to 44 million euros.

Overall the number of transportations of emergency calls and emergency and non-emergency transportations has increased. In the UK the number of emergency calls increased by almost 2 million to 9 million. In the Netherlands 870,000 transportations were performed in 2015 versus 600,000 in 2010.

The number and composition of the ambulance staff changed over time. Overall more positions were held, and differentiations in staff development occurred. In Turkey the total ambulance staff increased from 14,144 to 16,950. In Estonia, accordingly to the policy of improving access to care and efficiency of service provision, the number of physicians who provided ambulance care decreased from about 200 to 85. The number of nurses, paramedics and nurse assistants increased from about 1,300 to 1,474. The decrease of physicians who are leading the ambulance crew was also visible in Estonia (from 200 to 90). New positions such as nurse assistant, care ambulance assistant or care ambulance driver are introduced.

In the 2010 survey the UK had the ambition to greater working partnerships specifically in case of vulnerable patients. Nowadays GPs, hospitals and mental health care institutions are partners.

4 Conclusions

This study provides a general overview of the organization of ambulance care services in 14 European countries. In general, the organization of ambulance care is much alike between countries. There are national regulations and laws, and in most countries ambulance care is (partly) financed by the government. Further, a difference is being made between emergency and non-emergency transportation services.

Eleven countries reported performance data on response times. In four countries (Ireland, Latvia, Spain, and the UK) the response time to reach the patient for the most urgent level is eight minutes. In 2008 the WHO recommended to report on the percentage of patients (in the highest coding category) reached within eight minutes of receiving the emergency call. However, the report does not describe the background of introducing this target. Among ambulance service providers and policy makers the target is discussed. There is little evidence to support this target for all conditions, because in general speed is a limited way to measure performance. For conditions such as cardiac arrest or stroke where speed is the most important factor the target is of interest (McClelland, 2013). Whether more countries should adopt the eight minutes target and for which conditions might be interesting to discuss.

Six countries were able to provide data about the annual number of emergency transportations. The number per 100 persons ranged between 5 to 22 transportations. Three countries, Ireland, Latvia, and the Netherlands also provided numbers of non-emergency transportations. Nine countries were able to provide data about the number of emergency calls. The number of calls per 100 persons ranged between 4 to 33 calls. In the UK an average of 23,216 calls per day (16.1 calls per minute) are being processed by the medical dispatch centre (HSCIC, 2014). An international discussion about this topic could provide insight in the growing number of calls in some countries. Therefore, these numbers should be unraveled. Who is calling for an ambulance, a healthcare professional or citizen? For what problem and in which situation calls are being made? What are aspects related to culture? What is the common opinion about calling in case of emergencies? Etc.

The results of this survey show that healthcare professionals would welcome and join an international platform or forum to discuss and exchange information about topics such as growing numbers of calls and ambulance transportations. Also, respondents suggested to discuss about decision making, quality of care and clinical practice. An international forum could eventually lead to an international research agenda, comparable to the recently developed research agenda in the Netherlands. The development of a research strategy in the European Union strategic paper was one of the long-term conditions for quality of emergency care in the WHO report (2008). Also, the report recommended that a recognized and authoritative institution should provide a list of quality indicators concerning out-of-hospital Emergency Medical Services. The results of the 2015 survey show that in nine countries patient safety programs especially for ambulance care exist. In another nine countries national regulations exist concerning the quality of ambulance care. In eight of these countries official quality ratification is required. In ten countries quality indicators of ambulance care are being defined and recognized. Belgium, Lithuania and Spain are falling behind compared to the other countries on these areas.

Another way to monitor patient safety is by recording of incidents and complaints. In the Czech republic, Hungary, Lithuania, and Spain no recording of incidents at the ambulance care services takes place. In other countries adverse events or complaints are recorded and settled locally, regionally or nationally.

Besides the questions addressing patient safety, the questionnaire contained questions about the patient's perspective in ambulance care. In eight countries patients' experiences are being measured. In Latvia, Norway and the UK these measurements are part of a national survey program. In general the patient' perspective should obtain a more prominent position in organizing, regulating and improving ambulance services.

Overall the organization of ambulance care in 2015 was similar to that reported in 2010. Distinctions between emergency and non-emergency transport, emergency levels and response times remained the same. By increasing national budgets ambulance services were able to respond to the growing number of emergency calls and transportations. Consequently ambulance staff increased in volume and functions. This suggests further professionalism of ambulance care.

5 Acknowledgement

We would like to thank all persons who participated in this study and completed the questionnaire. We would like to thank Alexandra Ziemann and Thomas Krafft (Eurogio Acute Care/Maastricht University), who have also been involved in research on (other) EU ambulance services and the EED project. They provided additional stakeholders to invite for participation in the survey study.

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Related NIVEL research

In 2012, along with LNAZ, the NIVEL investigated the indicators for emergency care in the Netherlands. This mainly concerned indicators that are important up to the patient's arrival at the hospital. The ambulance service is one of the major parties in this process. The study showed that the coordination between the various professional organizations and protocols outside the hospital need attention in the case of emergency care. In 2013, the NIVEL completed the development of the CQI patient survey on emergency ambulance, in cooperation with AZN. Patients in emergency ambulance care were found to have good experiences with the ambulance services, as far as they were able to remember it. Also, patients who were not transported by the ambulance reported positively on the care they received from the ambulance staff. Recently, again in cooperation with AZN, the NIVEL has developed the CQI patient survey on scheduled (or ordered) ambulance care. Additionally, the NIVEL has extensive experience in comparing health care and health care systems in other EU countries in general, but also in specific areas. Finally, the NIVEL research group "Quality of care from the patients' perspective", in which the research took place, has specific expertise in the field of survey development and of measuring the patients' perspective in health care.

Appendix A Questionnaire

1. Please provide your details below:

Name:

2. Function:

3. Organisation:

4. County/region, state:

5. Country:

1. Organization of ambulance care

6. 1.1 To what level is ambulance care organized in your country? (multiple answers allowed)

Locally (county, municipality)

Regionally (province, state):

Nationwide

Other:

I don't know

7. 1.2 How are the ambulance services organized in your country?

Public

Private

Both, public and private organizations

Other:

I don't know

8. 1.3 Are the ambulance services independent or part of other organizations (e.g. police, hospital, fire brigade)? (multiple answers allowed)

No, they are all independent

Yes, they are a part of the police department

Yes, they are a part of the fire brigade

Yes, they are a part of hospitals

Otherwise:

I don't know

9. 1.4 In your country, is there a national law regarding the organization of ambulance care and ambulance services?

No

Yes:

Regional law

I don't know

Financing of ambulance services

10. 1.5 In what way is ambulance care being financed in your country? (multiple answers allowed)

Publicly (by the national or regional government)

By health insurance or health plans

Privately (by private organizations or companies)

Using public donations

Otherwise:

I don't know

11. 1.6 What is the national financial budget for ambulance care in your country? If you do not know, please fill in '0'

2. Ambulance care

12. 2.1 In your country, is there a distinction between pre-hospital emergency ambulance transport and medically induced scheduled ambulance transport (e.g. interfacility transfers)?

No

Yes:

I don't know

13. 2.2 Are there different emergency levels in pre-hospital emergency ambulance transport according to the severity of the patient's condition?

No → [Ga verder met vraag 16.](#)

I don't know → [Ga verder met vraag 16.](#)

Yes

14. 2.2 Please state the different categories of emergencies that are used in your country.

15. 2.3 Please give a description of each of the different categories of emergencies that are used in your country. If possible, please also include the criteria for response times. If you do not know, please fill in '0'.

	Description	Response time (in minutes)
1	<input type="text"/>	<input type="text"/>
2	<input type="text"/>	<input type="text"/>
3	<input type="text"/>	<input type="text"/>
4	<input type="text"/>	<input type="text"/>
5	<input type="text"/>	<input type="text"/>

16. 2.4 Are there different categories in medically induced scheduled ambulance transport?

- No → [Ga verder met vraag als 2.2 en 2.4 = nee of weet niet dan naar vraag 27](#)
 I don't know → [Ga verder met vraag als 2.2 en 2.4 = nee of weet niet dan naar vraag 27](#)
 Yes

17. 2.4 Please state the different categories of medically induced scheduled ambulance transport that are used in your country.

18. 2.5 Please state the different categories of medically induced scheduled ambulance transport that are used in your country.

	Description
1	<input type="text"/>
2	<input type="text"/>
3	<input type="text"/>
4	<input type="text"/>
5	<input type="text"/>

19. 2.6 Can you give an estimation of the figures about the annual number of responses per category of urgency? If you do not know the exact number, please give an estimation.

- No → [Ga verder met vraag 22.](#)
 Yes

20. 2.6

Number of responses annually (approx.)

1	<input type="text"/>
2	<input type="text"/>
3	<input type="text"/>
4	<input type="text"/>
5	<input type="text"/>

21. 2.6

Number of responses annually (approx.)

1	<input type="text"/>
2	<input type="text"/>
3	<input type="text"/>
4	<input type="text"/>
5	<input type="text"/>

22. 2.7 Which types of transport ambulance vehicles used in your country? If possible, indicate the number of each type of ambulance vehicle that is available in your country.

	yes/ no	#
Mobile ICU ambulance	<input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> I don't know	<input type="text"/>
Advanced Life Support (ALS) ambulance	<input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> I don't know	<input type="text"/>
Basic Life Support (BLS) ambulance	<input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> I don't know	<input type="text"/>

	<input type="checkbox"/> I know	
Medical transport ambulance (non-emergency only)	<input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> I don't know	<input type="text"/>
Otherwise	<input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> I don't know	<input type="text"/>

23. Which type of ambulance do you mean by "otherwise"?

3. Ambulance care personnel

Composition of ambulance staff

24. 3.1 Which categories of ambulance personnel are there in your country?
(Please limit your response to the professional ambulance staff; please do not include administrative, management or staff of medical dispatch centres)

-
-
-
-
-
-
-
-
-
-
- I don't know

25. 3.2 What education or training do the professional staff in the ambulance services have? And how many are there, approximately?

	Description	Number of staff
1	<input type="text"/>	<input type="text"/>
2	<input type="text"/>	<input type="text"/>
3	<input type="text"/>	<input type="text"/>
4	<input type="text"/>	<input type="text"/>
5	<input type="text"/>	<input type="text"/>
6	<input type="text"/>	<input type="text"/>
7	<input type="text"/>	<input type="text"/>
8	<input type="text"/>	<input type="text"/>
9	<input type="text"/>	<input type="text"/>
10	<input type="text"/>	<input type="text"/>
11	<input type="text"/>	<input type="text"/>

26. 3.3 What are the typical compositions of ambulance personnel (teams) for each of the ambulance types?

	Mobile ICU ambulance Number of staff
1	<input type="text"/>
2	<input type="text"/>
3	<input type="text"/>
4	<input type="text"/>
5	<input type="text"/>
6	<input type="text"/>
7	<input type="text"/>
8	<input type="text"/>

9	<input type="text"/>
10	<input type="text"/>
11	<input type="text"/>

27. 3.3 What are the typical compositions of ambulance personnel (teams) for each of the ambulance types?

Advanced Life Support (ALS) ambulance

	Number of staff
1	<input type="text"/>
2	<input type="text"/>
3	<input type="text"/>
4	<input type="text"/>
5	<input type="text"/>
6	<input type="text"/>
7	<input type="text"/>
8	<input type="text"/>
9	<input type="text"/>
10	<input type="text"/>
11	<input type="text"/>

28. 3.3 What are the typical compositions of ambulance personnel (teams) for each of the ambulance types?

Basic Life Support (BLS) ambulance

	Number of staff
1	<input type="text"/>
2	<input type="text"/>
3	<input type="text"/>
4	<input type="text"/>

5	<input type="text"/>
6	<input type="text"/>
7	<input type="text"/>
8	<input type="text"/>
9	<input type="text"/>
10	<input type="text"/>
11	<input type="text"/>

29. 3.3 What are the typical compositions of ambulance personnel (teams) for each of the ambulance types?

Medical transport ambulance (non-emergency only)

	Number of staff
1	<input type="text"/>
2	<input type="text"/>
3	<input type="text"/>
4	<input type="text"/>
5	<input type="text"/>
6	<input type="text"/>
7	<input type="text"/>
8	<input type="text"/>
9	<input type="text"/>
10	<input type="text"/>
11	<input type="text"/>

30. 3.3 What are the typical compositions of ambulance personnel (teams) for each of the ambulance types?

[!nqother!]

	Number of staff
<input type="text"/>	<input type="text"/>

1	<input type="text"/>
2	<input type="text"/>
3	<input type="text"/>
4	<input type="text"/>
5	<input type="text"/>
6	<input type="text"/>
7	<input type="text"/>
8	<input type="text"/>
9	<input type="text"/>
10	<input type="text"/>
11	<input type="text"/>

Skills and competences

31. 3.4 In what way are skills and competences of ambulance staff monitored or assessed? And how often do these assessments take place?

Labour agreement

32. 3.5 In your country, is there a specific national labour agreement for ambulance services? Please describe the labour agreement(s) used.

No:

Yes:

I don't know

4. Medical dispatch centres

33. 4.1 How are the medical dispatch centres organized in your country? (multiple answers allowed)

- They are all independent
- They are a part of the ambulance services
- They are a part of the police department
- They are a part of the fire brigade
- They are a part of hospitals

Other:

I don't know

34. 4.2 In your country, how many calls do the medical dispatch centres process each year? If you do not know the exact number, please give an estimation.

Dispatch system(s)

35. 4.3 Are there medical dispatch systems (or protocols) in place for categorizing the emergency calls?

No [Ga verder met vraag Composition of dispatch centre staff](#)

Yes, there is one system that is used nationwide

Yes, there are different systems used throughout the country

I don't know

36. 4.4 Which medical dispatch system(s) is/are used?

Composition of dispatch centre staff

37. 4.5 Which categories of employees do the medical dispatch centres have? And how many are they, approximately?
(Please limit your response to the professional staff; please do not include administrative, management or ambulance staff)

I don't know

38. 4.6 What education or training do the professional staff members in the medical dispatch centres have? And how many are they, approximately?

	Description
1	<input type="text"/>
2	<input type="text"/>
3	<input type="text"/>
4	<input type="text"/>
5	<input type="text"/>
6	<input type="text"/>
7	<input type="text"/>
8	<input type="text"/>
9	<input type="text"/>
10	<input type="text"/>
11	<input type="text"/>

Skills and competences

39. 4.7 In what way are skills and competences of medical dispatch centre staff monitored or assessed? And how often do these assessments take place?

5. Protocols and standards

40. 5.1 Does the ambulance personnel have protocols or guidelines to follow in their work?

- No → [Ga verder met vraag 43.](#)
 Yes, there are national protocols or guidelines
 Yes, there are different protocols or guidelines used throughout the country
 I don't know

41. 5.2 Do the emergency physicians in the ambulance services have protocols or guidelines to follow in their work?

- No → [Ga verder met vraag 43.](#)
 Yes, there are national protocols or guidelines
 Yes, there are different protocols or guidelines used throughout the country
 I don't know
 Not applicable: ambulance services in our country do not employ emergency physicians

42. 5.3 Can you give some information about the protocols or guidelines for ambulance care in your country?

43. 5.4 Does your country have programme(s) on patient safety in ambulance care?

No

Yes, a nationwide programme:

Yes, regional programmes:

I don't know

6. Patient information

44. 6.1 In your country, how are patient files produced, registered and stored by the ambulance services?

Electronically

On paper

A combination of electronic and paper files

Otherwise:

I don't know

45. 6.2 In what way do ambulance services in your country exchange patient files with other health care providers that are involved?

7. Quality and safety

46. 7.1 In your country, is there legislation available regarding the quality of care provided by ambulance services? Please describe.

No

Yes:

I don't know

47. 7.2 Is there a national (or regional) system for quality assurance of ambulance care? For instance, can (or should) individual ambulance services earn certificates or accreditation regarding quality of care? Please describe.

No

Yes:

I don't know

48. 7.3 In your country, are there indicators available for measuring quality of ambulance care? Please describe.

No

Yes, nationwide:

Yes, regional:

I don't know

49. 7.4 In what way are incidents or accidents regarding ambulance care registered in your country? Please describe.

No

Yes:

I don't know

50. 7.5 How are formal complaints regarding ambulance care registered in your country? Please describe.

No

Yes:

I don't know

51. 7.6 In your country, are there initiatives to measure or monitor patient satisfaction or patient experiences? Please describe.

No

Yes:

I don't know

52. 7.7 Are there other ways in which patients are involved in monitoring or improving quality of ambulance care? Please describe.

No

Yes:

I don't know

53. 7.8 Is quality of ambulance care monitored on a national level in your country? And if so, by whom (e.g. the health care inspectorate or government)? Please describe.

No

Yes:

I don't know

8. Scientific research

54. 8.1 In your country, is there a (scientific) research programme regarding ambulance care or ambulance services?

No

Yes:

I don't know

55. 8.2 In what way is (scientific) research on ambulance care or ambulance services coordinated in your country? (multiple answers allowed)

At national level

At regional level

At the level of the ambulance services

Otherwise:

I don't know

56. 8.3 In your country, what are currently the most important themes or topics in scientific research on ambulance care or ambulance services?

57. 8.4 If possible, please provide additional information on scientific research on ambulance care or ambulance services in your country. For instance, research reports, research papers, etc.

9. Collaboration and integrated care

58. 9.1 Ambulance services usually collaborate with different organizations. For instance, hospital emergency departments and the police department. In your country, which are the most important partners for the ambulance services?

Police departments

Fire brigade

Hospitals

General practitioners

Mental health care institutions

Physical rehabilitation centres

Other:

Other:

Other:

Other:

I don't know

59. 9.2. In what way do the ambulance services usually collaborate with these organizations?

Collaboration

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10. International platform/forum on ambulance care

60. 10.1 Would you be interested in founding an international platform or forum for exchanging information regarding ambulance care?

- No
- Yes

61. 10.2 Would you be willing to participate in such a forum?

- No
- Yes

62. 10.3 Regarding such a forum, which person (or persons) might be willing to act as a contact on behalf of your organization (or country)? Please provide (professional) contact details if possible.

63. 10.4 What kind of information or topics would you like to share or discuss on such a forum?

64. 10.5 Do you perhaps have any additional suggestions regarding such a forum?

- No
- Yes

-
65. Perhaps you know of other professionals in your country who have the information about ambulance care in your country, that we seek in this survey. If so, please fill in their e-mail addresses below. We would like to ask these people to also participate in this survey. Thank you very much.

66. Do you perhaps have additional files or documents about ambulance services in your country? If so, by answering 'yes' below, you will receive an e-mail from us. You can use this e-mail to reply and add relevant documents. Thank you very much.

- No
 Yes

Appendix B Participants

Country	Function	Organization
Belgium	Lead of department	Federal Public Service
Croatia	Medical doctor	The Institute of Emergency medicine
Czech Republic	President of Czech Society for Emergency and Disaster Medicine	Emergency Medical Service
Estonia	Head of Emergency Medical Bureau	Emergency Medical Service
Estonia	Director	Emergency Medical Service
Germany	Director Disaster Management	Emergency Medical Service
Germany	Emergency medical assistant	Emergency Medical Service
Hungary	Lead of Department of Clinical Governance	National Ambulance Service
Ireland	Program Development Officer	Pre-Hospital Emergency Care Council
Ireland	Education manager, assistant chief ambulance officer	National ambulance service college, Ireland
Latvia	Project Manager	State Emergency Medical Service
Lithuania	Head of Planning and Control Division	Health Emergency Situations Centre of the Ministry of Health
The Netherlands	Program manager	Ambulancezorg Nederland
Norway	Head of Department	Oslo University Hospital
Norway	Senior Adviser	Norwegian Health Directorate of Health
Norway	Medical Director	Hospital Trust
Spain	ED Director	NHS
Turkey	President	Emergency Ambulance Physicians Association
Turkey	Academic Faculty	Baskent University
United Kingdom	Clinical Development Manager	South East Coast Ambulance Service NHS Foundation Trust
United Kingdom	Executive Officer	Association of Ambulance Chief Executives