Cross-border Trauma Care Cooperation along the Western border of Germany: Through a stakeholder’s perspective

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<td>Resource Dependence Institutional Cooperation model</td>
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<td>MS</td>
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<td>Emric+</td>
<td>Euregio Maas-Rijn Interventie in geval van Crisis (Euregio Meuse-Rhine crisis intervention)</td>
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<td>BTCCE</td>
<td>Boundless Trauma Care Central Europe</td>
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<td>EMR</td>
<td>Euregio Meuse-Rhine</td>
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<td>EU</td>
<td>European Union</td>
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<td>DGU</td>
<td>Deutsche Gesellschaft für Unfallchirurgie (German association for trauma surgery)</td>
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<td>Bundesanstalt für Straßenwesen (German Federal Highway Research Institute)</td>
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Abstract

**Background:** Intentional and unintentional accidents have far reaching consequences for people all over the world. Trauma care in general can affect many aspects of society. The biggest impact is of course on health, but ill health also contributes to lost work force, which on the other hand, corresponds to the economy of a country. For better trauma patient outcomes regionalized trauma care systems have been implemented in some countries. The current study aims at researching the need for cross-border trauma care cooperation in the territorial area of the western border of Germany, ranging from the North Sea to Luxembourg, with its neighboring country.

**Method:** Four types of methodologies were applied to the study, namely, literature review, policy analysis, stakeholder analysis and interviews. The interviews were among trauma surgeons and similar stakeholders in the regions of interest.

**Results:** There are no laws on routine cross-border trauma care between Member States on an EU or national level, besides air rescue. Although, there is no legal basis, cross-border cooperation does take place in many areas on a regional level. Also, previous studies have shown the effectiveness of trauma care networks and how this improves patient outcome.

**Conclusion:** All interview partners have asked for the creation of a fundamental jurisdictional basis of cross-border trauma care. Also, in line with the interviews, there should be greater involvement of stakeholders in this project, such as politicians on national and EU level or health insurance companies.
**Introduction**

Intentional and unintentional accidents have far reaching consequences for people all over the world. More than 100 million people sustain injuries and more than five million people die from violence or injury worldwide each year (World Health Assembly, 2007). In case of an emergency, good care is essential. Different types of injuries also require certain types of care. Emergency care is defined as “[m]edical or other health treatment, services, products or accommodations provided to an injured or ill person for a sudden onset of a medical condition of such nature that failure to render immediate care would reasonably result in deterioration of the injured person's medical condition” (Segen, 2006). Trauma care, on the other hand, is only one part of emergency care. While emergency is concerned with a broad range of ill health, trauma care only deals with acute injury care. Trauma, caused by an injury, is defined as “the physical damage that results when a human body is suddenly or briefly subjected to intolerable levels of energy. It can be a bodily lesion resulting from acute exposure to energy in amounts that exceed the threshold of physiological tolerance, or it can be an impairment of function resulting from a lack of one or more vital elements (i.e. air, water, warmth), as in drowning, strangulation or freezing” (Holder, Pedem, Krug, Lund, Gururaj, & Kobusingye, 2001). The main focus of this paper will be on the latter, namely trauma caused by injuries.

The major focus of trauma care is preventing deaths caused by an accident. Figure 1 is a chronological example of when mortality can occur in the event of an accident. This can occur in three different stages. The first peak shows immediate mortality, while the second peak takes place within several hours after the event, and the third peak shows mortality in the in-hospital settings (Sasser, Varghese, Kellermann, & Lormand, 2005). Trauma care is directed towards the patients affected by mortality just when the second peak sets in and the ultimate goal of trauma treatment is keeping morbidity and mortality associated with the insult as low as possible (Hamilton & Hodge, 2011). Other studies have divided the events of an accident into three phases, namely, pre-crash, crash and post-crash. Trauma care deals with the latter, namely post-crash time in the event of an accident.
Casualties from trauma are the highest factors that contribute to healthy life years lost in Germany (Boillon, Flohe, Kuehne, Lendermans, Rucholtz & Siebert, 2012). For all of the world “injury has become one of the leading causes of death and disability throughout the developing world […] it is estimated that the various forms of injury combined account for 12% of the disability adjusted life years lost” (Joshipura, Mock, Goosen & Peden, 2003). The health impact of trauma is both short and long lived, ranging from immediate mortality to long-term disability.

A study by Gitelman, Auerbach, and Doveh (2012) has shown that “better organized TM [post-crash trauma care] is associated with mortality reduction in various trauma types”. The fact that trauma care has shown to be effective in preventing mortality and dealing more proficiently with morbidity is why there should be more profound systems in place that encourage it. The best way to guarantee a trauma victim best care is by bringing him or her as fast as possible to an appropriate hospital. The Deutsche Gesellschaft für Unfallchirurgie has clustered all German hospitals into three categories, according to their treatment level (Boillon, Flohe, Kuehne, Lendermans, Rucholtz, & Siebert, 2012). Level 1 is a fully equipped trauma level able to offer care 24/7, while Level 3 should be used for less severe cases. The aim of this was to cluster good care throughout the territorial area of Germany and offer trauma Level 1 care to anybody within 30 minutes. Another way of managing this is by implementing well-structured and functioning “regionalised trauma centres [which diminish] the rate of preventable mortality in the treatment of severe injuries by 50% […] mortality after severe trauma can be reduced by 15 – 20 %” (Ruchholtz, Mand, Lewan, Debus, Dankowski, AKUT Steering Committee, Kuehne & Siebert, 2011).

The purpose of the following study is to research the mechanisms of cross-border trauma care along the western border of Germany, ranging from Luxembourg to the North
Sea. The research is conducted under the ‘Euregio Maas-Rijn Interventie in geval van Crisis’\(^2\) (Emric+) project in Maastricht, the Netherlands. Emric+ is hosting the Boundless Trauma Care Central Europe (BTCCE) project, a research study of several project partners, comprised of mainly trauma surgeons and stakeholders of trauma care. The desired findings are proposed to be used for establishing an overview of cross-border trauma care cooperation projects taking place between Germany and its western bordering neighboring countries. Ultimately, the desired need of an uniform cross-border trauma mechanism should be determined. The interest of BTCCE is to establish an understanding of which areas along the western border of Germany would be willing or able to participate in the establishment of a central European trauma network in the future. As some regions might not be interested or see no need of such an establishment, it is best to start by providing an overview of the stakeholder’s interests.

**Background**

Trauma care in general can affect many aspects of society. The main focus is of course directed towards health, but ill health also contributes to lost work force, which on the other hand, corresponds to the economy of a country. Therefore, the impact of trauma on an individual person can have far reaching consequences on the well-being of a whole society as many factors are dependent on each other, similar to the stone-in-the-pond principle. For example, data shows that 1.24 million people were killed on the world’s roads in 2010 (World Health Organization, 2013). As an example, “[r]oad traffic injuries are the eighth leading cause of death globally, and the leading cause of death for young people aged 15–29 […] and the cost of dealing with the consequences of these road traffic crashes runs to billions of dollars” (World Health Organization, 2013). The ages 15 – 29 are one the most important working groups of a country. These ages are the working generation of a country’s future and the main source of reproduction. Therefore, it is in a country’s future interest to decrease the burden of mortality among all age groups, but more importantly the ones most affected. Additionally, the consequences of an accident can lead to a decreased life quality, including monetary costs and human costs such as pain, decreased mobility, impact on social contacts, reduced leisure time or unemployment (Hausler, Zimmermann, Tobler, Arnet & Huesler, 2001). The World Bank has therefore included emergency care as “one of 6 basic interventions in its minimum package of recommended cost-effective health services” (Anderson, Suter, Mulligan, Bodiwala, Razzak & Mock, 2012).

\(^2\) Euregio Meuse-Rhine crisis intervention
In Europe 21.7 people per 100,000 died due to accidents in 2010 in Europe (Eurostat, 2012), while “trauma currently ranks among the leading causes of death and disability globally, with more than 5 million trauma-related deaths and 100 million disabilities occurring annually, the majority of which (90%) occur in low- and middle-income countries” (Anderson et al., 2012). Road accidents contribute a high share towards these findings. Unless urgent action is taken current trends suggest that road traffic deaths will become the fifth leading cause of death by 2030 (WHO, 2013). As a reaction, the United Nations General Assembly named the years 2011 to 2020 as the ‘Decade of Action for Road Safety’ (WHO, 2013). The participation and interest of the Member States “indicate a growing awareness that the devastating scale of road traffic injuries is a global public health and development concern” (WHO, 2013).

In order to reduce the consequences of these accidents they need to be dealt with in an appropriate manner. Trauma injuries require quick response and the uncertainty of when and where an accident may occur makes policy making a challenge, but nonetheless, highly necessary. Therefore, policies for trauma care should thrive towards removing any burden that might hinder the speedy and high quality care for all citizens.

**Regionalization**

Europe, and also other parts of the world, is moving more towards regionalization of trauma care. Regionalization is a term used to describe a situation when “all institutions and agencies in a given geographical area are organized under a single board and administration; it may involve the integration of some or all of the service providers in the region” (Miller-Keane, 2006). In the area of trauma care this can also mean collaborations between trauma centers or different levels of trauma care chain, which include the dispatch center, ambulance services, pre-hospital care, and rehabilitation. Also, differences in treatment concepts and equipment of the trauma hospitals lead to the variation in mortality rates. These differences, especially geographical differences can be improved if managed through regionalization of care, such as resource sharing across borders.

**Euregios**

The Member States of the European Union share large parts of border territory. Along the borders of the Member States unique geographical structures, namely Euregios have been created; Euregio being short for ‘European Region’ (Brand, Hollederer, Wolf & Brand, 2008). As health and health treats are not restricted to territory it has always been difficult for countries and regions to create policies and regulations that adhere to the challenges of cross-
border care. Although many trauma systems thrive towards removing territorial borders from health, the structure of a country’s health care system is still challenging in some circumstances. Cross-border regulations are important in border regions, as “in some situations in the European Union, the most appropriate or the most accessible health care happens to be in another Member State” (Legido-Quigley, Glinos, Baeten, McKee & Busse, 2012). This concept also relates to the field of trauma and emergency care, since these can affect any EU citizen at any geographical location, at any given time and is not dependent on borders.

**EU level**
In many euregional settings cross-border care has become a norm since the release of the Patient’s Rights Directive in 2011 (European Union, 2011) that has influenced EU wide laws and regulations on cross-border health care. In general, this directive allows EU citizens to receive treatment in Member States other than their home Member State and receive reimbursement up to the level of their home Member State (European Commission, 2008). This directive is based on the European Free Trade Association’s and the European Community’s policies that aim at free exchange of goods and people (Allgoewer, 1991).

The severity of injury mortality and morbidity has also impacted the Member States through higher authorities, namely the World Health Assembly (WHA). They strongly encourage “strengthen[ed] emergency and rehabilitation services, and requested the Director-General to provide technical support for strengthening systems of prehospital and trauma care for victims of road-traffic injuries […] recognizing that improved organization and planning for provision of trauma and emergency care is an essential part of integrated health-care delivery” (World Health Assembly, 2007). The WHA (2007) has also recommended collaborating between Member States in terms of research, capacity sharing or designing strategies on working together.

**Eurogional setting**
A longstanding Euregio cooperation system in the field of emergency care is the region of Euregio Meuse-Rhine (EMR), a central European region along the German-Dutch-Belgian border (Fig. 2) that has established cooperative agreements between various types of emergency care units, including ambulance services, fire departments and police services (Ramakers, Bindels & Wellding, 2006). Also, the EUREGIO can serve as a great model for 

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3 2011/24/EC
future cross-border cooperation because it is “considered to be the cross-border association with the longest cross-border experience [and] it has developed a special form of cross-border governance over the years” (Winsen, 2009). The EUREGIO, similar to the EMR, is a more northern cross-border cooperation along the German-Dutch border. The successful political structure that was achieved in the EUREGIO has made it a “pioneer […] in the cohesion policy of the European Commission in the context of multi-level governance” (Winsen, 2009). Throughout all of Europe a number of cross-border cooperation systems have been developed over the years, while being adapted and adjusted specifically to the settings and challenges of each regional territory. The euregional examples mentioned deal with a broad range of topics such as health, education or infrastructural cooperation. The EMR and EUREGIO put a large emphasis on health cooperation for all types of emergency care. The process of standardizing trauma care specifically is still in the beginning process in most euregios elsewhere.

Figure 2. Euregio Meuse-Rhine (EMR)

As previous studies in the EMR have shown, highlighting the uniqueness of the geographical tri-border area, there is high potential for cooperative measures that can have a beneficiary outcome for a large number of people, as “about 32% of the population live on about 46%” (Brand, Hollederer, Wolf, & Brand, 2007) of border regions.

Success of trauma systems
Throughout the years, trauma care has seen quite some improvements. Jurkovich (2012) sees the two world wars as an improvement in the way trauma care has been dealt with. Time plays a crucial role in trauma care. It has been noted that the mortality rate has dropped from 25% during the American Civil War to 1.7% during the Iraq and Afghanistan conflicts. This has
mainly to do with decreasing transportation times, motorized vehicles, improvements in medicines, and expertise. Also, “literature in the 1960s and 1970s […] consistently demonstrated remarkable 50% to 70% drops in mortality after a hospital became a designated trauma center” (Jurkovich, 2012).

Mullins and associates (Jurkovich, 2012) made a comparison study between the two states of Oregon and Washington State, while Oregon had a trauma center implemented and Washington State did not. The results show a lower injury-related mortality in Oregon as compared to Washington State. Although, these results show the effectiveness of a trauma center in Oregon, trauma centers usually need about eight to nine years of experience to be most effective. Jurkovich sees the increased volume for patients and improve in critical care as the reason for increasing effectiveness. A further study with motor vehicle crash fatalities has also shown the positive effects of states that have implemented trauma centers versus those that have not (Jurkovich, 2012).

Furthermore, studies in Australia and Quebec, Canada have shown similar results (Jurkovich, 2012). Moreover, a study by Celso, Tepas, Langland-Orban, Pracht, Papa, Lottenberg, & Flint, (2006) on treatment outcome in regions with trauma centers has shown 15% reduction in mortality after the implementation of a trauma system and that regionalized trauma systems also save lives. Lastly, a Finnish study has suggested that helicopter emergency medical services are very important for pre-hospital pediatric emergency treatment (Kristiansen, Soreide, Ringdal, Rehn, Kruger, Reite, Meling, Naess & Lossius, 2010). All these example share a well-functioning system of trauma care, as “the greatest chance of survival for a trauma victim is rapid treatment in an appropriate facility that can manage his or injuries” (Hamilton & Hodge, 2011).

Right to health
The right to health, and therefore also sufficient treatment of trauma injuries, is a basic human right (United Nations, 1948), as enshrined by the WHO Constitution, the majority of UN treaties and more recently by the Charter of Fundamental Rights of the Union (European Union, 2000). Article 11-95 recognizes the right of each person to access health care and medical treatment. All Member States must respect and implement this right in their health system. Also, the World Health Assembly annual meeting which was held in May 2007 has dealt with this issue and has decided “that improved organization and planning for provision
of trauma and emergency care is an essential part of integrated health care delivery [and it] plays an important role in preparedness for, and response to, mass-casualty incidents, and can lower mortality, reduce disability and prevent other adverse health outcomes arising from the burden of everyday injuries” (World Health Assembly, 2007).

**Obstacles**
The differences in organizational structures of the health care systems in the Netherlands, Belgium, Luxembourg, and Germany (distinguishing between Niedersachen and Rheinland-Pfalz, as trauma care is regulated at federal level and not national level in Germany) need to be considered when conducting the analysis of cross-border regulations for trauma care. Therefore, many factors of the organizational structure, such as

“differences in tariff-setting [...] differences in payment mechanisms of providers[...] whether the system reimburses expenses or provides benefits in-kind; the presence of over- or under-supply of services; the role of commercial actors in the system; differences in the organization of after-care; and whether health care has been devolved to lower tiers” (Legido-Quigley et al., 2012)

will need to be deliberated in the analysis. Problems can arise if two countries’ health care systems differ in regulation. An example of such an obstacle can be observed in tariff setting of ambulance services in the Netherlands and Belgium. With Dutch ambulance services being more expensive Belgian patients do not receive reimbursement of costs that override the ambulance services costs in Belgium (Legido-Quigley et al., 2012). To a degree, the above mentioned obstacles influence personal willingness and institutions ability to participate in a cross-border trauma care project.

Other obstacles that might need to be overcome and make this research important are difficulties in laws and regulations of health care systems of the individual countries that could have potential drawbacks on some areas of the health sector, such as trauma care. There are many cases of cities or regions that, while being close to the border of their own Member State, will be forwarded to a hospital further away in their own country in case of an emergency, although an emergency care unit in another country might be closer. Since trauma care is a field that requires quick reactions laws and regulations need to be dealt with before an accident occurs, in order to ensure high quality and efficiency. Although “in border regions, a crucial factor in the development of health care projects is whether there is sufficient will from local and regional actors for these initiatives to take place” (Legido-Quigley et al., 2012), also national authorities are important when it comes to decision
making processes. The developments of health care projects, such as compatible cross-border regulations for trauma care are most important on the regional level, as the citizens are directly affected by regional regulations which are usually dictated by national authorities. Nevertheless, regulating euregional cross-border trauma care also needs to be considered from the EU perspective. Therefore, the regional levels need to place more emphasize on their problem and try to put it onto the political agenda. Well established cooperation systems between trauma networks create a foundation for knowledge exchange between border regions. This exchange of best practice can help policy makers create cooperation practices on the EU level and in many other regions of the EU. It is the purpose of this research to examine the will of local and regional actors in getting involved in cooperation mechanisms to ensure more sufficient health care practices for trauma care in euregional settings in the future.

Theory
The theoretical background that will be used as a tool for analysis and evaluating cooperation throughout this entire research will be the Resource Dependence Institutional Cooperation (RDIC) Model, which was developed by de Rijk, van Raak and van der Made (2007). The RDIC Model derived from analyzing four different theories, namely, network theory, organizational behavior theory, resource dependence theory, and new institutional theory (de Rijk et al., 2007). Each theory has influenced the development and structure of the RDIC model (Figure 3).

Figure 3. Resource Dependence Institutional Cooperation (RDIC) Model

Cite note: data adapted from de Rijk, van Raak & van der Made, 2007
When using this model you read it from left to right, meaning that factors level three will be looked at first. This level was influenced by the resource dependence theory and new institutional theory. This level describes the “goals, resources, dependence, perception, [and] institutions” (de Rijk et al., 2007) of actors within an institutional setting. It deals with resources that are needed to pursue certain goals and how this need makes actors depend on each other, which is also described as the perceived dependence by de Rijk et al. (2007). The factors level three is also determined by human behavior. Next, factors level two describes the willingness and ability to cooperate from the organizational behavior theory’s point of view. De Rijk et al. (2007) describe that willingness or ability to cooperate depends on intrinsic or extrinsic motivation to cooperate. The intrinsic motivation “originates within the actor and is based on the desire to fulfill a need”, while the extrinsic motivation “comes from outside an actor and is derived from the perception that the result of a given action will generate reward or punishment” (de Rijk et al., 2007). Lastly, factors level one ‘cooperation’ was adopted from the network theory, which describes cooperation as actors making agreements about a certain goal. All in all the RDIC model is a collaboration of four theories that deal with cooperation, willingness and ability to cooperate, perceived dependence on each other for resources, and examining institutions on whether they encourage or hinder actor’s behavior with their rules.

De Rijk et al. (2007) describe three different types of interdependences in their article on the RDIC model. These interdependences are the “asymmetric dependence (relationship characterized by power differences between the actors involved), symbiotic dependence (when two actors need each other to achieve their own goals and when goal achievement by one does not disadvantage the other) and competitive interdependence (achievement of a goal is detrimental to the other). For air rescue there are clearly more tendencies towards symbiotic dependence. For example, both the Netherlands and Germany are in need of each other to cover all territory on both sides of the border. By helping each other they can achieve both their goals and there is no disadvantage for either party.

The RDIC model is “a valid evaluation tool that can be used to understand the presence or lack of cooperation between different groups of actors […] and can help policymakers and managers to identify obstacles in the relationship between actors, and explain them […] the RDIC model offers suggestions for the improvement of cooperation” (de Rijk et al., 2007). The reason for choosing this particular model for analyzing the current research is that the circumstances of creating cross-border cooperation systems in central
Europe can be examined through the RDIC model’s viewpoint. First, the third level analysis looks at the stakeholder’s current working situations more thoroughly and focuses on resources and dependence. Situations that call for resource sharing could occur in the field of trauma care in cases of ambulance service sharing when geographical situations demand. Then, the second level looks at the willingness and ability of cooperation between the stakeholders in the different regions, such as the willingness to manage shared ambulance services across borders. The interviews with the stakeholders of the various regions should show the actual willingness or even the ability to create cooperation between health care institutions across the Dutch-German, Luxembourg-German, and the Belgian-German border. In the end, the first level analysis will show if possible future cooperation can and will be created, but this step will not be done until this research has been completed.

**Current Project**
The following paper is overseen by the Emric+ project, a project group that has already successfully accomplished cross-border care arrangements in the region of EMR (Fig. 2). The prior success of this initiative with the EMR project could be used as a starting point or role model for many projects to follow in other European regions as well. Although, it needs to be considered that every euregional setting has its own challenges and arrangements and the work of the EMR may not be easily transferable to every other setting in Europe. The current BTCCE project by Emric+ wants to make an inventory of existing cross-border cooperation along the red lines seen in Figure 3. The red spots show the interview partners and project partners in the study area. The green spots are also interview partners, but located in the geographical area of where the research takes place.
Ultimately Emric+ wants to establish transnational trauma care chains. This can be seen as a regionalization of all stakeholders involved in trauma care. The goal is to guarantee victims and patients to be forwarded to care providers that are specialized in their treatment through cooperation in transnational settings. Lastly, the focus of this study is to make an inventory of “cooperation between national trauma networks […] existing trauma networks […] existing cross-border cooperation arrangements [and] laws and regulation” (Ramakers, Bindels & Wellding, 2006).

Goals and research questions
Through the means of a policy analysis, the cross-border trauma care cooperation, with a special focus on the western federal states of Germany (Niedersachsen and Rheinland-Pfalz), and the countries Luxembourg, the Netherlands, and Belgium (Figure 3), was researched. A special focus to the already existing euregional settings in the area of interest was considered. The euregios from north to south are: Ems Dollart Region, EUREGIO, Euregio Rhein-Waal, and EuRegio SaarLorLuxRhein.
For the purpose of this research a number of research questions have been created to investigate the current state of trauma care and trauma care cooperation projects in the areas of interest.

1. What policies for cross-border trauma care exist?
   a. On EU level?
   b. On national level?
   c. On regional level?

2. What is the current situation of cross-border trauma cooperation in the euregios Ems Dollart Region, EURERGIO, Euregio Rhein-Waal, and EuRegio SaarLorLuxRhein?

3. How do the project partners involved in the current research perceive cross-border trauma care in their region and how do they see the development of a European trauma network in the future?

**Research method**

Data collection was done through several means including literature reviews, policy analysis, stakeholder analysis and interview analysis. This research was part of and also conducted in the settings of Emric+, a European funded project group, coordinated by the Euregiobureau in Maastricht, the Netherlands.

**Literature Review**

For the literature review, the scientific publishers PubMed, Elsevier, Springer Link, Science Direct, JSTOR and Thieme were studied. Statistical databases of EUROSTAT, OECD and the relevant institutions’ websites like the European Commission were used for epidemiological and statistical information. The following search terms were used: “trauma”, “trauma care”, “emergency care”, “cross border cooperation + trauma care, polytrauma”, “regionalization of trauma care”, “Niedersachsen + Netherlands + trauma care”, “Rheinland-Pfalz + Belgium + trauma care”, “Rheinland-Pfalz + Luxembourg + trauma care”, “patient mobility”, “regionalization”, “Traumanetzwerk Niedersachsen”, “Rettungsdienstgesetz”, “Traumanetzwerk + Niedersachsen”, “DGU Traumanetzwerk”. All articles were either in English, German or Dutch. In general, literature reviews are used to “underpin the context and significance of the study [and] to contextualize a study by relating it to other studies, confirming or challenging outcomes, and offering new insights” (Hamilton & Clare 2004).
The literature review provided information on agreements of cross-border trauma care and already existing cooperation projects in the regions of interest.

**Policy Analysis**
Considering the research questions and the methodology of this particular research, the policy analysis was used as a tool for a critical evaluation of the laws and regulations on trauma care and as a mean to study the policies in place for cross-border trauma care cooperation projects. Internet sites from the appropriate Ministry of Health in the specific countries provided information of laws and regulations from the corresponding countries. Also, the website of the European Commission provided information on cross-border regulations on the EU level. When conducting a policy analysis it is of most importance to consider the effects of policies on people (Collins, 2005). There are several steps to undertake in the process of a policy analysis, such as formulating the problem, collecting data, or analyzing alternatives and drawing conclusions” (Walker, 2009).

**Stakeholder Analysis**
Furthermore, a stakeholder analysis, “a tool or set of tools for generating knowledge about actors –individuals and organizations- so as to understand their behavior, intentions, interrelations and interests; and for assessing the influence and resources they bring to bear on decision-making or implementation process” (Varvasovszky & Brugha, 2000) was conducted. Through means of the stakeholder analysis the researcher was able to identify the different stakeholder groups that would be affected by policy changes. This was a great tool for showing the impact of policies on stakeholders in regional settings. The method for conducting a stakeholder analysis was through semi-structured interviews.

Out of a total of nine interview partners (Fig. 3), six were trauma surgeons, two were anesthesiologists and one was with an emergency nurse. Three interviews were situated in the EMR (Professor Brink, Professor Pape and Jochen Jansen), one was situated in the Euregio-Rhein-Waal (Professor Edwards), two were situated in the EUREGIO (Rolf Egebering and Dr. Juhra), one was situated in the Ems Dollart Region (Dr. Wendt) and two were situated in the EuRegio SaarLorLux Rhein (Dr. Gerich and Dr. Ferretti). Although also part of the geographical territory of interest, there were no project partners from the Euregio-Rhein-Maas-Nord present, Belgium and Rheinland-Pfalz. Additionally, the project partner from Oldenburg Germany, who is also a project partner and interested in the study, was unfortunately not able to be interviewed and is therefore not included in this research.
Interview analysis

Interviews served as a tool to generate viewpoints of involved stakeholders and “collect data as to gain knowledge from individuals” (Kajornboon, 2005) in the field of trauma care in order to establish an impression on the policies of trauma care regulations on a regional and possibly national level. As a tool for conducting the interviews a questionnaire was used (Annex). This questionnaire was taken from ‘Hindernisse für grenzüberschreitende Rettungseinsätze’, which was developed by the BAST to research cross-border cooperation between Germany and its neighboring states. The core structure of this questionnaire was used, but some adjustments had been made to fit the setting of this study. Important stakeholders in the trauma care chain were targeted to be interviewed. To obtain valuable results, the structural framework of the interview was semi-structured. Semi-structured interviews are used in order for the researcher to structure or ask the questions in a flexible and adjustable way (Kajornboon, 2005). The advantage of using a semi-structured interview over a structured interview is that the interviewer is possible to be responsive to the interviewee and does not have to follow a prepared list of questions. The method of analysis of the interviews was done through inductive [content] analysis, which “explores the data, to assess what unexpected relationships or issues emerge from the data” (Harrell & Bradley, 2009). First a word find method was done, through means of line-by-line reading, to identify most common topics and themes in the interviews. Through this tool of analyses several key words were determined which focus on the structure of trauma care cooperation. Also, every interview was analyzed through the help of the key words from the RDIC model (Figure 3). The identified themes were used to determining the interviewee’s perception in willingness and ability to participate in cross-border cooperating EU trauma network in the future.

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4 Obstacles for cross-border rescue operations

5 Bundesanstalt für Straßenwesen = German Federal Highway Research Institute
Results

“I find it important that when we look upon Europe as one country, it should be that you receive the same kind of care and the same level of care if you travel 50 km towards the east or towards the south [...] I think it should be a topic or there should be an incentive for insurance companies to improve care across borders” (M., Edwards, personal communication, April 9th, 2013, appendix)

The information of the first part of the result section is derived mainly from the literature review on current cross-border arrangements in the regions that were studied as well as from the interviews. This also provided the answer to the first research question. The second part of the results displays the outcomes of the interviews that took place. This part is divided into tables illustrating the key themes of the interviews and an interpretation of the interviews through the RDIC model’s perspective. The first part of the interviews display the key themes identified as the main findings describing the current situation of trauma care in the specific regions through the perspective of the interviewees. This part is directed towards the second research question. When applying the RDIC model in the second part, the aim was to cluster the interviewee’s personal motivation behind the creation of a European trauma network. This is also used later on for the discussion.

Laws and regulations on the EU level

The first step towards regulating cross-border health care was the introduction of the EU Patient’s Rights Directive in 2011 (European Union, 2011). There were not many regulations concerning trauma care, the coordination of cross-border healthcare or the uniformity of health care on the EU level before this directive. A reason may be that the national health care system is the responsibility of each Member State. This regulation has made cross-border health care a lot more patient friendly in general. With the implementation of this directive patients are able to get health treatment in any Member State of the EU other than their home Member State with cost reimbursement up to the level of their own country. There is no need for prior authorization, except for some exceptions. The directive also aims at protecting patients by providing “relevant information on safety and quality standards [...] guaranteeing privacy [and] non-discrimination” (European Union, 2011). The Patient’s Rights Directive has been the pioneer in cross-border regulations throughout the EU. With the implementation of this directive political, financial and organizational barriers have been taken away. This
directive is directed towards health care in general, although trauma care belongs within this category. Regulations on trauma care specifically is not found at this level. Taking effect in the research areas of the current study the directive has made cross-border healthcare in general more omnipresent in these regions. The political, financial and organizational barriers of day-to-day practices of trauma care are not part of the directive though.

**Laws and regulations on national level**
The Federal Republic of Germany has made agreements with the Netherlands, Belgium and Luxembourg on joint assistance in case of catastrophes or serious events. The first official agreement between Germany and the Netherlands was decided on June 7th 1988\(^6\) (Bundesgesetzblatt Teil II, 1992). Between Germany and Belgium first arrangements were already conducted on November 6th 1980\(^7\) (Bundesgesetzblatt Teil II, 1982). Lastly, Luxembourg and Germany passed an official agreement on March 2nd 1987\(^8\) (Bundesgesetzblatt Teil II, 1981). All three agreements deal with the regulation of either county’s emergency helpers assisting in the other country in case of emergency. In case of such an emergency the decisions are made by the authoritative figures of the country at stake. All equipment necessary for completion of task, either on ground through ambulances or through air rescue, are permitted to cross the border and do not apply to border customs. All three agreements were overseen by Hans-Dietrich Genscher, the Foreign Minister of Germany at the time.

Although these agreements deal with catastrophes the daily operation of cross-border trauma care are not regulated under these agreements (Bundesgesetzblatt Teil II, 1992; Bundesgesetzblatt Teil II, 1982; Bundesgesetzblatt Teil II, 1981). Specific jurisdictional agreements could not be found between any of the regions on daily operations of ground trauma care.

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\(^7\) Gesetz zu dem Abkommen vom 6. November 1980 zwischen der Bundesrepublik Deutschland und dem Königreich Belgien über die gegenseitige Hilfeleistung bei Katastrophen oder schweren Unglücksfällen, November 30th, 1982; BGBI. 1982II S. 1006

The financial side of health care is regulated through the insurances of each Member State individually. The Patient’s Rights Directive has made the insurance systems more compatible with each other by guaranteeing the patient and also the insurance companies cost reimbursement. This way insurances and patients are financially protected. The problem with non-jurisdictional agreements of trauma care is that you cannot guarantee either party full financial protection, as the health care systems and insurance companies are not compatible with each other and more likely to run into problems, as has been noted in the interviews (appendix).

**Air rescue**

The arrangement of air rescue services is the only arrangement of trauma care on a national level. All areas studied have a system of air rescue in place, including cross-border cooperation. The results of the interviews displayed well-functioning cross-border systems in terms of air rescue.

The level one trauma centre in Groningen, the Netherlands, has a helicopter stationed on sight. This helicopter is used for regions in the Netherlands as well as Germany. “[T]he helicopter from Groningen is primarily used for operations in the German area of Krummhörn [...] in the case of air rescue the Dutch protocol is followed” (Dr. K. W., Wendt, personal communication, April 25th, 2013, appendix). Another helicopter that is stationed at a Dutch Level 1 trauma centre, but also operates across the border into Germany, is the one in Nijmegen. The fact that the two Dutch helicopters are taking care of German territory can be viewed as a trade-off between the two countries. The only other way for a German helicopter to cover the regions close to Groningen and Nijmegen would be by implementing new helicopters in the region which is too small for the radius of one helicopter. As helicopters work in circles and these do not stop at the border, such agreements are made. Since Groningen and Nijmegen cover German territory, the German helicopters stationed close to Münster (Rheine) (Christoph Europa 2, n.d.) and Aachen, which is not part of this study, also cover Dutch territory as a trade-off. The literature review and interviews also showed working agreements between Luxembourg and the German federal state of Rheinland-Pfalz. For this region, a helicopters located within Luxembourg is also used on German territory (rth.info, 2013; Pohl-Meuten & Schaefer, 2006).
TraumaNetzwerkDGU

The Deutsche Gesellschaft für Unfallchirurgie (DGU) is a national operation that deals with regulations concerning trauma patients (Boillon, et al., 2012). They have published a report on the protocols for treating severely injured patients under the project TraumaNetzwerkDGU. The goal of this project is to guarantee nationwide, professional care for trauma patients of all kinds and at all times. This project is also in line with the objectives of the ‘Decade of Action for Road Safety 2011 – 2020’ by the WHO (2013) and other programs that thrive towards cross-border practices. Since the launch of the project, 884 hospitals have become involved (TraumaNetzwerkDGU, 2012).

This initiative by the DGU was implemented in 2004 with the goal to standardize and make uniform regulations for trauma centres in Germany. This was done by creating three levels of trauma centres, Level 1 being a fully equipped, 24h operating trauma level and Level 3 being for less severe cases. In the end, every place in Germany needed to be able to reach an appropriate Level 1 trauma centre within 30 minutes.

Although being in the Netherlands, Enschede is part of the German trauma network as a supra-regional trauma Level 1 hospital. The university hospital in Groningen is currently in the process of being certified a supra-regional Level 1 hospital and Luxembourg currently has two regional certified hospitals participating in the German trauma network DGU (Akademie der Unfallchirurgie, 2013).

Laws and regulations on regional level

The interviews that were conducted in line of this study have shown that most cooperation happens on a regional level, as this level is affected most by the necessity of a smooth daily operation (P. Brink, personal communication, February 28th, 2013). In most cases these arrangements do not underlie written jurisdiction, but are made on an institutional basis between specific hospitals or working groups such as doctors or ambulance services. In the border regions, patients and health care actors (doctors, hospitals, sickness funds or other health authorities) are the ones who clearly see and experience the benefits and chances of cross-border care cooperation and therefore initiate new projects. Actors on the regional level often support these projects with their own funds or by stimulating European funding (like Interreg)” (Brand, Hollederer, Ward & Wolf, 2006).

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9 Trauma network by the German association for accident victims
10 German association for accident victims
Many regional agreements exist in euregional setting, such as in the EMR, the Euregio Rhine-Waal or in the oldest euregional setting the EUREGIO. In the EUREGIO, which Münster and Enschede are part of, a cooperation called the Euregional Service Center for Health Care has been created (Brand et al, 2006). This cooperation deals with coordinating health, education and financial issues. This is just one example of a functioning euregional cooperation system that is directed towards health care in general. Although there are numerous projects only little can be found on trauma specifically.

**Interviews**

The following six tables display the most common themes that were detected during the interviews: general cross-border agreements on trauma care, cross-border patient exchange, being involved in the creation of a European cross-trauma network in the future, what other stakeholders should be involved in the perspective of the interviewee, perceived problems, and lastly, the rehabilitation process. All interviews were re-read and compared in terms of reoccurring themes or keywords. Not all interview partners gave an answer to all themes. When asked about cross-border trauma agreements in their regions (table 1), most interview partners could not name an explicit agreement for their euregional setting, besides the EMR. The other regions named the cross-border agreements by the trauma network by the German association for accident victims and agreements between the countries on air rescue they take part in. Most regions were unsure about the patient flow (table 2) of cross-border trauma patients and could only provide estimates. This could be due to data registration compatibility across borders (R. Egberink, personal communication, April 10th, 2013; appendix) or the fact that all interview partners are only in direct contact with one patient at the time and are therefore not confronted with the whole picture. Never the less, all regions see benefits in cross-border cooperation and are therefore interested in the development of a EU trauma network (table 3). The regions hope to bring down the territorial barrier and bring people closer together, in order to adjust laws to their specific cross-border settings. Through the implementation of such a network uniform measurements of data collection could make practices more comparable in the future. All regions agreed on more stakeholder involvement (table 4) and made clear that they find this to be one of the most important steps in the creation of a European trauma network in the future. The interview partners would like to see all levels of the trauma care chain, more political authorities and insurance companies involved in order to realize such a project and not encounter any problems in cross-border trauma care. Examples of such problems are (table 5) financial, organizational, language or
cultural differences that could lead to incompatibility with other’s systems. Also, some regions might have different priorities which could lead to misunderstandings. Other regions also have a personal fear of patients being taken away from them. Lastly, when asked about rehabilitation as part of the trauma care chain (table 6), most regions saw a division between this and the job they practice.

The transferral to a rehabilitation facility is usually very dependent on the willingness of insurance companies to pay. Therefore, most doctors and patients chose a facility that would be covered by their insurance. The transferral process is only possible if there are specific arrangements between a clinic and a rehabilitation center (C. Juhra, personal communication, April 26th, 2013: appendix). This has a lot to do with an organization’s structural differences.
Table 1. Overview of cross-border trauma care agreements

| Dr. Wendt¹¹ | “our Mobil Medisches Team has agreements with the air rescue system with territorial zones in Germany, but other than that there are no cross-border treaties” |
| Rolf Egberink¹² | Twente is part of the German DGU Traumanetzwerk, which is an official agreement on national level. |
| Dr. Juhra¹³ | Agreements on air rescue. The helicopter for this region is stationed in Twente, the Netherlands. |
| Dr. Edwards¹⁴ | “There are no agreements” |
| Dr. Gerich and Dr. Ferretti¹⁵ | Soon there will be a network between two hospitals from Luxembourg and the German DGU. |
| | Agreements on air rescue. The LAR helicopters from Luxembourg operate in Rheinland-Pfalz and Saarland. |
| Professor Pape¹⁶ | “Deutsches Traumanetzwerk [and] internal agreement between the university hospital in Maastricht and Aachen” |
| Jochen Jansen¹⁷ | “Euemed-agreements in the EMR” |


¹³ Münster, EUREGIO

¹⁴ Nijmegen, Euregio-Rhein-Waal

¹⁵ Luxembourg, EuRegio SaarLorLux Rhein

¹⁶ Aachen, EMR

¹⁷ Heerlen, EMR
Table 2. Perceived patient flow in the region

<table>
<thead>
<tr>
<th>Doctor/Group</th>
<th>Perceived Patient Flow</th>
</tr>
</thead>
</table>
| Dr. Wendt    | “I’m unsure, but from around 230 poly-trauma patients maybe around 5% are brought to Groningen from Germany. This means about 10 – 20 patient a year”  
More German patients going to the Netherlands. |
| Rolf Egberink| “The statistics are not registered very well. The German trauma helicopter brings about 75 – 100 patients a year to Twente. There are about 100 -150 trauma patients all together”  
More German patients going to the Netherlands (only small sized hospitals on the German border region). |
| Dr. Juhra    | “non-uniform ways of recoding data”  
In general there are more German patients going to the Netherlands, as the German hospital is further away from the border. |
| Dr. Edwards  | “unsure, but it’s not a very large population, we get approximately 350 major trauma cases and, just an educated guess, somewhere between 30 – 50 are from Germany each year”  
More German patients going to the Netherlands. |
| Dr. Gerich and Dr. Ferretti | “Unsure, maybe about 10 cross-border patients through cross-border care (primary care and transfers)” |
| Jochen Jansen | “there are about 300 cross-border operations throughout the year” |

Table 3. Interest in involvement of future EU trauma network

<table>
<thead>
<tr>
<th></th>
<th>Statement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dr. Wendt</td>
<td>“I would desire to be part of a European trauma network, as this has many</td>
</tr>
<tr>
<td></td>
<td>benefits for cross-border areas”</td>
</tr>
<tr>
<td>Dr. Edwards</td>
<td>“[for] this network [workers] should get into contact with their colleagues</td>
</tr>
<tr>
<td></td>
<td>and on that basis a network should be set up”</td>
</tr>
<tr>
<td>Dr. Gerich and</td>
<td>“from my perspective there is much interest in the participation in a</td>
</tr>
<tr>
<td>Dr. Ferretti</td>
<td>trauma network” (Gerich)</td>
</tr>
<tr>
<td>Professor Brink</td>
<td>“adjust the law of daily life instead of the opposite!”</td>
</tr>
<tr>
<td></td>
<td>“the borders between two regions shouldn’t be a barrier. I think we should</td>
</tr>
<tr>
<td>18</td>
<td>get rid of the borders and maybe make a big region in the end”</td>
</tr>
<tr>
<td>Professor Pape</td>
<td>“if you document the same data in all of the regions you will be able to</td>
</tr>
<tr>
<td></td>
<td>compare the outcomes with each other”</td>
</tr>
</tbody>
</table>


18 Maastricht, EMR
Table 4. Overview of desired involvement in project

Who else should be involved in this project and the development of a European trauma network?

<table>
<thead>
<tr>
<th>Person</th>
<th>Involvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dr. Wendt</td>
<td>-hospitals, pre-hospital services, rehabilitation centers, health insurances, politics, and the political heads of states and countries</td>
</tr>
<tr>
<td>Rolf Egberink</td>
<td>-more administrative workers</td>
</tr>
<tr>
<td></td>
<td>-Politicians should be involved when you have so many people that support this (European parliament)</td>
</tr>
<tr>
<td>Dr. Juhra</td>
<td>-politicians</td>
</tr>
<tr>
<td></td>
<td>-insurance companies (how to manage the finances and reimbursement on an EU wide level)</td>
</tr>
<tr>
<td></td>
<td>-structured foundation of multiple partners</td>
</tr>
<tr>
<td>Dr. Edwards</td>
<td>“include […] trauma centres and region itself […] talk to the dispatch centres that are close to the borders and involve them as well, from both sides”</td>
</tr>
<tr>
<td></td>
<td>-Politics and insurance companies should be involved</td>
</tr>
<tr>
<td>Dr. Gerich and Dr. Ferretti</td>
<td>-Ministry of health would need to be involved in the decision making process; but there should be a high acceptance if you clearly define realistic and achievable goals.</td>
</tr>
<tr>
<td></td>
<td>-(political) involvement also depends on priorities (obstacle)</td>
</tr>
<tr>
<td>Professor Pape</td>
<td>-include insurances, politicians, doctors, ambulance crews</td>
</tr>
</tbody>
</table>

Table 5. Overview of problems the interview partners see

<table>
<thead>
<tr>
<th>Interview Partner</th>
<th>Problems</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dr. Wendt</td>
<td>-financial issues “as the Dutch costs for poly-trauma are more expensive (in the Dutch system the money for building new hospitals in the country is distributed among all tariffs)”&lt;br&gt; -issues with employer’s liability insurance association on the German side</td>
</tr>
<tr>
<td>Rolf Egberink</td>
<td>-language or cultural problems&lt;br&gt;-Dutch trauma centers have their focus more spread out</td>
</tr>
<tr>
<td>Dr. Juhra</td>
<td>“uncertainties on both sides of the border in knowing how the other side operates”</td>
</tr>
<tr>
<td>Dr. Edwards</td>
<td>“the dispatch centres start to integrate more and more because of the helicopter service, but if you talk to ambulance crews, they are more likely to bring patients to which ever hospital is nearest on their side of the border”&lt;br&gt;-division by language and geography</td>
</tr>
<tr>
<td>Dr. Gerich and Dr. Ferretti</td>
<td>-language problems (although not really apparent in Luxembourg)&lt;br&gt;-diploma acceptance and transferal within the EU</td>
</tr>
<tr>
<td>Professor Brink</td>
<td>-feeling of having patients taken away&lt;br&gt;-conflict in leadership (who is in charge of what)&lt;br&gt;-differences in quality&lt;br&gt;-language (including professional language)</td>
</tr>
<tr>
<td>Professor Pape</td>
<td>-language&lt;br&gt;-insurance&lt;br&gt;-legal issues&lt;br&gt;-emotional factors, also of doctors not knowing each other&lt;br&gt;-communication between doctors and ambulance services</td>
</tr>
<tr>
<td>Jochen Jansen</td>
<td>-political and organizational obstacles&lt;br&gt;-problems with technical compatibility</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Name</th>
<th>Quote</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dr. Wendt</td>
<td>“[cooperation] is difficult because the health insurances often do not cover their patients in the Netherlands, for them to be covered they would have to be transferred back to Germany. There is definitely need for action”</td>
</tr>
<tr>
<td>Rolf Egberink</td>
<td>“Not part of the trauma care chain in the Netherlands”</td>
</tr>
<tr>
<td>Dr. Juhra</td>
<td>- Difficulties in transferring patients abroad&lt;br&gt;“There are agreements between some rehabilitation clinics. In this case the transferal works fine”</td>
</tr>
<tr>
<td>Dr. Edwards</td>
<td>“the problem is if we threat the patient and it’s time for him to go home or to a rehabilitation centre, it’s difficult for a physician, because they have their own ways of communication here locally”&lt;br&gt;- “even for me it’s difficult to get a person to a rehabilitation centre in the area of Amsterdam for instance. It’s easier for me to call a physician there and have him make arrangements. And across the border it’s even worse. Some things have to do with finance, insurance and stuff like that”&lt;br&gt;- “if the insurance isn’t arranged properly, it’s really difficult for us to get rid of these patients”</td>
</tr>
<tr>
<td>Dr. Gerich and Dr. Ferretti</td>
<td>- agreements with Orscholz (Saarland)&lt;br&gt;- on request of patients, but usually they stay in Luxembourg</td>
</tr>
<tr>
<td>Professor Brink</td>
<td>- rehabilitation structured differently&lt;br&gt;“we have to send [the patients] to the hospital first, we can never send them directly to a rehab clinic in another country”</td>
</tr>
<tr>
<td>Professor Pape</td>
<td>“it has not come to any cooperation in the rehabilitation operation”</td>
</tr>
</tbody>
</table>


**Theory applied on interviews**
The following figures show the application of the theoretical background on the different interviews. The interviews were analyzed using the main keyword from the factors level 3, namely ‘goals’, ‘perception’, ‘dependence’, ‘institutions’, and ‘resources’. Future cooperation depends on the perceived *willingness* and *ability* to do so. The willingness or ability is determined by the following five factors.
Personal perception of others is an important step in the process towards creating cooperation. In general, the regions showed positive perception towards cross-border practices (table 7), such as financial benefits. Although some other regions, such as the EUREGIO, still had some uncertainties in the knowing how the other side operates they still believe you can make things better by getting to know the other side better. The only negative perception the regions described were intrinsic fears, such as having patients taken away from you or solely monetary interest from the other side (T. Gerich, personal communication, Mai 8th, 2013; appendix). The ‘goal’ of stakeholders is also important to consider when trying to start a cooperation with one another, as this is an important determinant for starting a cooperation in the first place. The interviews showed that all regions thrive towards the same direction of goals (table 8). All regions want what is best for the patient, by sharing resources, using time more efficiently, using uniform procedures, making patient transferral easier, and improving communication. All these things can be achieved by cooperation and adjusting the law to the daily difficulties the regions see in practice (P. Brink, personal communication, February 28th, 2013; appendix). Table 9 shows the perceived dependence on each other. The regions located along the Dutch and German border showed the highest degree of symbiotic dependence on each other, as they share their resources for air rescue. Also, the geographical closeness of level 1 trauma centers across the border makes some parts of regions close to the border depend on help from the other side. Resources that are already being shared throughout the regions is mainly air rescue (table 10), although some regions would like to see more expert opinion sharing. As some regions might not have much daily experience with certain types of trauma (J. Jansen, personal communication, March 19th, 2013; appendix), improvements could be made here. The last table (table 11) shows the ‘institutional’ structure of the regions, another important characteristic that determines the compatibility of cooperation. All regions name institutional or organization differences, especially in terms of financial structure, as an important obstacle for cooperation.
### Table 7. Perception

<table>
<thead>
<tr>
<th>Dr. Wendt</th>
<th>No agreement on the protocols, but this has not led to any problems so far.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rolf Egberink</td>
<td>“we can all make things better”</td>
</tr>
<tr>
<td>Dr. Juhra</td>
<td>Still uncertainties in knowing how the other side operates.</td>
</tr>
<tr>
<td>Dr. Edwards</td>
<td>“the problem is when every country should take care of their own inhabitants, it’s going to be a lot more expensive”</td>
</tr>
<tr>
<td>Dr. Gerich and Dr. Ferretti</td>
<td>“might be monetary interests from (Trier) [abroad] to participate, because they can charge patients from Luxembourg as private patients”</td>
</tr>
</tbody>
</table>
| Professor Brink           | “as European countries, working in trauma and acute surgery find that this is one of the most basic things you have to work out in all countries”  
                             | “the feeling that your patients are stolen, that you lose your patients, the quality is poor or there is a conflict in leadership”  
                             | no disadvantages, only fear of working together and not knowing each other |
| Professor Pape            | -Belgium does not have a well-functioning ambulance system with helicopters  
                             | -“10 years ago the Netherlands restricted themselves to ten trauma centres (the more patients in a time unit, the more practice)”  
                             | -“NRW is a massive urban area and would therefore, be a good starting point for a European cross-border network” |
| Jochen Jansen             | -“it can only be in the patients’ benefit if there’s an exchange in expert opinion and systems”  
                             | -most people on the Dutch border are able to speak or at least understand German |

Table 8. Goals

<table>
<thead>
<tr>
<th>Doctor</th>
<th>Statement</th>
<th>Additional Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dr. Wendt</td>
<td>“I would desire to be part of a European trauma network, as this has many benefits for cross-border areas”</td>
<td></td>
</tr>
<tr>
<td>Rolf Egberink</td>
<td>“we also think we could learn from other EU border regions as well”</td>
<td>advantages for patients and professionals</td>
</tr>
<tr>
<td></td>
<td>- share resources</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- use time more efficiently</td>
<td></td>
</tr>
<tr>
<td>Dr. Juhra</td>
<td>- “An EU network could create a knowledge exchange and you get to know the resources of the others”</td>
<td></td>
</tr>
<tr>
<td>Dr. Edwards</td>
<td>- “when we look upon Europe as one country, it should be that you receive the same kind of care and the same level of care if you travel 50km towards the east or towards the south”</td>
<td></td>
</tr>
<tr>
<td>Dr. Gerich and Dr. Ferretti</td>
<td>- “creating uniform procedures, making patient transferal a standard procedures and not a constant struggle or people dependent”</td>
<td>interested in the development of an European wide trauma</td>
</tr>
<tr>
<td>Professor Brink</td>
<td>- “bring down this barrier”</td>
<td></td>
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<tr>
<td></td>
<td>- “adjust the law to daily life instead of the opposite”</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- “I strongly believe that what is good for your patient in your region, should be good for the patients cross the border”</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- “border between two regions shouldn’t be a barrier”</td>
<td></td>
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<tr>
<td>Professor Pape</td>
<td>- “ultimate goals would be if everybody, who has signed this cooperation agreement, would meet on a regular basis and you do not just have a trauma network, but cooperating partners with many other countries”</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- “improve communication and reduce complications of patients”</td>
<td></td>
</tr>
<tr>
<td>Jochen Jansen</td>
<td>- to provide better care for patients</td>
<td></td>
</tr>
</tbody>
</table>

### Table 9. Dependence

<table>
<thead>
<tr>
<th>Participant</th>
<th>Quote</th>
</tr>
</thead>
</table>
| Dr. Wendt              | “from around 230 patients, maybe about 5% of the poly-trauma patients are from Germany”  
                          | -hardly any Dutch get treated on the German side                       |
| Rolf Egberink          | -German helicopter brings about 75-100 patients a year to Twente   
                          | -“very few Dutch patients are brought to the German side, because there are only small sized hospitals there” |
| Dr. Juhra              | In general there are more German patients coming to the Netherlands, as the German hospital is further away from the border. |
| Dr. Edwards            | “I would like to become [a European trauma network], but it’s difficult, I’m not sure if it’s fear, fear of losing patients or stuff like that”   
                          | “it’s not part of my job description to set up such a region”           |
| Dr. Gerich and Dr. Ferretti | -only in terms of medical university education and burn victims        |
| Professor Brink        | “Aachen has the helicopter Christoph Europa”                         
                          | “Belgium usually sticks to themselves; often do not want the help from others but handle their own patients”  
                          | “1. Christoph from Aachen 2. Choice helicopter from Nijmegen. Nijmegen is only second choice, because they tend to steal patients” |
| Jochen Jansen          | -“helicopter called about 45 times a year, either because the patient needs to be transported quickly to a hospital or because the expert opinion of the doctor on board is needed”  
                          | -“help form Germany is needed almost on a daily basis, which has to do with differences in the systems and the capacities in the two countries” |

Table 10. Resources

<table>
<thead>
<tr>
<th>Profile</th>
<th>Statement</th>
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</thead>
<tbody>
<tr>
<td>Dr. Wendt</td>
<td>“the helicopter from Groningen is primarily used for operations in the German area of Krummhörn”</td>
</tr>
<tr>
<td>Dr. Juhra</td>
<td>Resources and knowledge exchange could be beneficial.</td>
</tr>
<tr>
<td>Dr. Edwards</td>
<td>“air rescue is already cooperating across borders”</td>
</tr>
<tr>
<td>Professor Brink</td>
<td>“two German and three Belgian partners”</td>
</tr>
<tr>
<td>Jochen Jansen</td>
<td>“trauma doesn’t occur on a daily basis […] many helpers do not have regular training/experience”</td>
</tr>
</tbody>
</table>

Table 11. Institutions

| Dr. Wendt          | “the university hospital Groningen is the supra-regional trauma center for the trauma region Oldenburg and Ostfriesland”
|                   | -“Dutch costs for poly-trauma patients is more expensive; this could lead to financial difficulties”
| Rolf Egberink     | -language and cultural barriers
|                   | -legal issues and no real written law
| Dr. Juhra         | “the transfer from a German patient back to German can sometimes lead to difficulties in the finances. There is need for policy for back transferal”
| Dr. Edwards       | -organizational differences, financial structure, language
|                   | -“not a large patient forum, because trauma is unpredictable, unlike cancer, cardiology, etc.”
| Dr. Gerich and Dr. Ferretti | -organizational differences, “[t]he history of the Luxembourian ambulance system is deeply rooted within the country, both SAMU and Protection Cevile are used”
| Professor Brink   | -organizational differences
|                   | “tried starting a collaboration with Belgium, but it didn’t work the way it did with Germany […] only possible to cooperate with hospitals individually, but not with regions because they don’t have the regional system”
| Professor Pape    | -“different payment mechanisms in Belgium”
| Jochen Jansen     | -“the Eumed agreements are known on both sides of the border”
|                   | -“the colleagues in Belgium would probably be willing to operate, but the fact that the country is ruled more from a federal level […] they can’t always operate the way they would want”


Discussion

The aim of the study was to research cross-border trauma cooperation projects along the western border of Germany (Fig. 3) and to research the interviewee’s perception on cross-border cooperation and their interest on the creation of a future European trauma network. First, the policies on cross-border trauma care will be discussed and then the current situation on cross-border cooperation in the euregios and the stakeholder’s perceptions will be look at through the RDIC model’s perspective.
What policies for cross-border trauma care exist?

The results show that there are no jurisdictional policies on cross-border trauma care on any level. The Patient’s Rights Directive on the EU level can be viewed as a foundation for cross-border trauma practices to take place in the future. The only organizational structure that has incorporated cross-border trauma care are air rescue services and the German trauma network. The results show official agreements on air rescue of trauma care taking place (rth.info., 2013). Furthermore, cross-border cooperation can also be found in the German trauma network, to which hospitals in the Netherlands and Luxembourg are part of (Akademie der Unfallchirurgie, 2013).

In 2006, BAST\textsuperscript{19} conducted a study with the objective to research cross-border emergency regulations (Pohl-Meuten & Schaefer, 2006). The study showed that making an inventory of the situation in Germany was more complex as all sixteen German federal states have their own laws and regulations concerning emergency care. This finding is also in accordance with the current study. Ten out of the sixteen federal states border a foreign country, adding up to a total of forty-nine emergency care regions that are located close to the borders (Pohl-Meuten & Schaefer, 2006). Not only the sixteen different types of regulations concerning emergency care make it complex, but also the fact that border regions are a more difficult place to regulate as compared to centrally located areas. For one, major traffic roads usually run along state borders and not into neighbouring countries, affecting the timeliness of ambulance care. Also, borders are often determined by geographical positions such as rivers or mountain ranges, as you can find in Luxembourg. It can be observed from the literature review and the interviews that air rescue currently has cross-border trauma care cooperation taking place on the national level in these regions. A reason for this could have to do with the dependency on each other for timely and expert care that is offered by helicopter care, but also because air rescue is not hindered by any of the observed obstacles in the study.

The study by BAST (2006) has also detected well-functioning cross-border care cooperation between Rheinland-Pfalz and Belgium. Especially the area of Prüm on the German side has offered assistance in care for the German speaking region of Belgium. In this area language is mostly not considered an obstacle. As there were no interview partners from

\textsuperscript{19} German Federal Highway Research Institute
this region the current study does not have any data from stakeholders on cooperation practices in this area.

The same study has shown that there is no cross-border cooperation taking place between ambulance services with Luxembourg, as not all ambulance care services are operated by professional care givers. As the rescue system is part of civil protection in Luxembourg, health professionals are only used in life threatening situations, “next to the ambulance care of SAMU we also have Protection Civile. This is run by lay people, such as farmers or sales persons, that are on call while working their regular job. Also their educational level is restricted to the basic life support measures [...] there also is competition between these two“ (T. Gerich, personal communication, Mai 8th, 2013, appendix). Language is not considered an obstacle, because German is widely spoken. This is also in line with the findings from the current study.

Lastly, the study showed that the Netherlands always shows big interest in cooperating with the German ambulance system. This could have to do with restricted resources in the own country. The Dutch structure in the ambulance system does not allow enough reserve care in case of a big crisis (J. Jansen, personal communication, March 19th, 2013; appendix).

Both, the interviews and the literature review have given the impression that many cooperation projects are only possible because of personal relationships (T. Gerich, personal communication, Mai 8th, 2013; appendix). Although this may be working in practise there are many problems that come along with being person dependent. This problem is most apparent on the regional level, but also notable on others as well. An example from the national level is how political affiliation can determine political agendas and priority topics. The national agreements made in case of catastrophes or serious disasters were overseen by Hans-Dietrich Genscher, the Foreign Minister of Germany at the time (Bundesgesetzblatt Teil II, 1992; Bundesgesetzblatt Teil II, 1982; Bundesgesetzblatt Teil II, 1981). Creating cross-border arrangements and strengthening EU wide cooperation was very high on his political agenda at that time, which was why he put much effort into this topic. If the priorities of political leaders are directed towards different topics, it will always be difficult to place trauma care higher on the political agenda. This people dependency is also very apparent on the regional level. The preferences of work standards of different people or different levels of the trauma care chain can bring changes for the patients on a daily basis, “[contacts are] based on each
individual person. This means the close contact between the dispatch centres can change on a daily basis” (T. Gerich, personal communication, 2013, appendix).

As the results from the study have shown, most cooperation takes place on the regional level. Phol-Meuten and Schaefer (2006) found that around 2/3 (62%) of emergency care regions practice cross-border emergency care. Niedersachsen has shown to have the most cross-border exchange (see Fig. 5), followed by Rheinland-Pfalz and Saarland.

**Figure 5. Cross-border operations to and from Germany**

![](image)

Cite note: Phol-Meuten and Schaefer (2006)

*What is the current situation of cross-border trauma cooperation in the euregios Ems Dollart Region, EUREGIO, Euregio Rhein-Waal, and EuRegio SaarLorLuxRhein?*

**Ems Dollart Region**

Dr. Wendt is generally very interested in the participation of a European trauma network, as this can strengthen cross-border practices (goal) which are already seem to be functioning in this region (perception). As resources are already being shared (air rescue), Dr. Wendt sees no further fear of being dependent.

Oldenburg (Germany) and Groningen (Netherlands) are the level one trauma centers in this euregio. With Groningen being closer to the German border, more German patients are being cared for on the Dutch side on average. One could say that the German side of the border is more dependent on the Dutch institution, also in terms of air rescue, due to
geographical factors. Concluding, there is definitely willingness to cooperate from this region’s point of view. This could also partly have to do with the benefit a larger patient spectrum has for the Dutch hospital. As air rescue is taking place the region has shown a degree of ability, but further implementations on laws and regulations would make the already cooperation taking place more successful and secure working conditions.

**EUREGIO**

Talking to both Rolf Egberink and Dr. Juhra one can detect a mixture between symbiotic and asymmetric dependence. Both sides of the border are trying to pursue the same goals, namely knowledge, resource and professional opinion exchange through the implementation of an EU trauma network. Currently, there are more German patients being brought to the Dutch side of the border, as the German side has no immediate large scare trauma level one center close to the border. Judging only this perspective there is a greater need on the German side and an asymmetric dependence. Considering that the helicopter for this region is on German territory, the resources available for both countries to pursue their goals make the two countries depend on each other, making the dependency symbiotic again.

The willingness to cooperate in this region is derived from the intrinsic motivation to reach their set goal. As willingness is present, the cooperation can take place as soon as the ability is there. Both interviewees, but mostly the German side, feel that this ability will improve through the involvement of political involvement and creation of laws and policies that will create a foundation for the cooperation.

**Euregio-Rhein-Waal**

The goal of this region is to guarantee every patient the same standard of care no matter where. This goal also makes up the high degree of motivation and willingness to get involved in the development of an EU-wide trauma network. Professor Edwards sees financial benefit for both sides of the border through patient sharing, especially in air rescue. Although this is a motivating factor, this aspect also brings forth extrinsic motivation in fear of losing patients. As resources are already shared to some degree in air rescue, the ability to cooperate would also be strengthened through laws and regulations in this region, which is something Professor Edwards would also like to see. Factors that might also hinder the ability to cooperate are institutional or organizational differences. Lastly, the fact that trauma is unpredictable, unlike
some other illnesses, always brings forth fewer patient forums and therefore not such a big voice for the political agenda.

**EuRegio SaarLorLux Rhein**

There is general interest in developing a European trauma network from this regions’ point of view (intrinsic motivation). The interview has also shown fear in terms of neighboring countries wanting to use patient sharing more towards their own benefit. Luxembourgian patients being treated abroad are considered private patients and can therefore be billed more because the hospital is not restricted to agreements with health insurances. This monetary interest from outside is creating an extrinsic fear. All in all, the interviewees were very interested and willing in the establishment of cross-border practices, but were not quite as optimistic as other regions that are already practicing patient exchange.

Although Luxembourg has a well-functioning health care system in place, the small size of the country has made itself somewhat asymmetric dependent on the outside when it comes to medical education, as this is not offered in Luxembourg and there is no burn unit in the country.

Lastly, the ability to cooperate might be hindered by the institutional structure of the country’s medical services SAMU and Protection Cevile. This structure will make cross-border agreements very difficult since Protection Cevile will probably not be accepted for cross-border practices. Several attempts of trying to change this system in the country itself have failed.

**EMR**

All interviewees have the intrinsic motivation to reach their goal of guaranteeing better patient care. The symbiotic dependency on each other in terms of air rescue has made many regions having to count on one another to reach their goals.

The cooperation taking place in the EMR was created especially through the willingness of the German, Dutch and Belgian stakeholders involved. Although Belgium is not always able to participate, as it is restricted by the authority taking place on a national level, there was definitely willingness of some Belgian stakeholders involved at the beginning of the process.
The interviews gave an in depth overview of the regional setting in terms of positive and negative factors affecting cross-border care. By applying the RDIC Model, the interviews showed rather positive willingness towards cooperation, as can be seen in table seven to eleven. The main factors affecting the ability to cooperate were organizational obstacles, especially in the region of Luxembourg (table 11). Some regions have named fear of losing patients or financial issues as a hindering factor (table 5).

How do the project partners involved in the current research perceive cross-border trauma care in their region and how do they see the development of a European trauma network in the future?

All in all, the actors involved on a regional level, such as hospitals or patients, feel the need for cooperation on a daily basis. Therefore, these actors would be the first to react and try to implement an appropriate project to fulfill their needs. The regions most affected by the need of professional exchange along the border usually opt for a bottom-up approach and start cooperation on a personal level. Personal knowledge of the each other is a key factor for starting a cooperation project. Although there are many initiatives on this level of authority, in most cases the authorities on a national level would actually be responsible for the lawful implementation. Also, on the national level the need is not as apparent as it is on the regional level and financial support is usually priorities in other areas of interest. It can be said that the problem lies on the level of competences. Concluding, “[c]haracteristically the situation in the border regions is as follows: needs and chances are explicit; there are a great variety of (single) projects; but too few competencies to realize what is wanted” (Brand, Hollederer, Ward & Wolf, 2006).

The study Evaluation of Border Regions in the European Union (EUREGIO) initiated by the NRW Institute of Health and Work (2008) has done several large scale studies in the context of euregional settings in the EU. In their research they have found that the willingness and unwillingness of actors make up a big part of cross-border operations. It is important that the will to cooperate needs to derive from all actors, such as health insurances, doctors or politicians (LIGA.NRW, 2008). The current study has also shown different aspects on the willingness of different stakeholders, “if you wait for governments or insurance companies […] insurance companies don’t have to same incentive as well, as they are for-profit and only want to get many patients enrolled with their company. But to actually get the best care for their patient is not in their interest” (P. Brink, personal communication, February 28th, 2013, appendix). Taking Luxembourg as an example, when asked about their perceptions on
cooperation, they believe the motivation from abroad might not necessarily be to their benefit, but rather their own. Such fear or distrust influences especially the willingness of the Luxembourgian project partners. Another form of willingness can be influenced by the dependency of possible cooperation partners. The EMR for example is able to share resources with two border regions. Other areas, such as Groningen or Münster are only able to create close cooperation and resource sharing with one border, making them more dependent on each other as other areas with more possibilities.

Furthermore, not only the factors that make up the willingness to cooperate play a huge role, but also the ability is important. Both, the current study and the one by LIGA.NRW (2008), show that there are legal obstacles which still need to be overcome for cross-border care. The EUREGIO survey by the NRW Institute of Health and Work (2008) showed that 24% of the 122 examined projects said legal problems had occurred. All interview partners stated some level of concern about the lawful ability to cooperate. These findings are in line with the findings of the current study. Based on the findings and the application of the RDIC model, cooperation is expected to take place as soon as all obstacles in the way of ability to cooperate are taken away.

Next to jurisdictional hurdles, there are also other types of obstacles that can hinder cross-border projects. Figure six gives an overview of main issues for cross-border projects that were named in the EUREGIO study (2008). The current study also showed quite a few perceived obstacles for cross-border cooperation, which can be found in Table five. Moreover, a study by Phol-Meuten and Schaefer (2006) found that the most frequently mentioned perceived obstacles in emergency care cooperation are: communication and language (80%), financial factors (36%), and qualifications (25%). A problem example is the radio engineering und radio channels, which hinders the communication between foreign sound systems due to technical differences (J. Jansen, personal communication, March 19\textsuperscript{th}, 2013, appendix). Additionally, the study by Phol-Meuten and Schaefer (2006) also found that political will can affect the establishment of cooperation. Political agendas differ and even the political competences differ, leading to uncertain jurisdictions. Also, differences in protocols and financial aspects are seen as obstacles. Although the regulations on the EU level, such as the Patient’s Rights Directive, provide a jurisdictional platform, there are still areas, especially trauma care, that suffer from legal uncertainty and are in need of regulation.
Study limitations
The most striking limitation of the study was that there was not a stakeholder from all areas of interest involved. Although, a partner of the research project and also interested in the BTCCE objectives, unfortunately no interview could be conducted with the region of Oldenburg, Niedersachsen. Furthermore, there were no project partners from the Belgium and Rheinland-Pfalz, who share a border. Therefore, this research cannot make any remarks about interest in or perceived cross-border practices in this region.

Moreover, as most interviewees were trauma surgeons or directly involved with in-hospital settings of the trauma care chain, this study cannot give any details on the perceptions of other levels at stake. The information obtained from the interview is specifically from one perspective. It was also noted that the in depth knowledge about other levels such as dispatch centers or ambulance services was limited. Additionally, the interviewee’s busy time schedules made setting a date for the interviews very difficult and were therefore very time consuming.

The lack of accessible information concerning cooperation in euregional settings hindered the literature review and the research in finding data. Most websites of the euregios were well maintained, but usually did not include details on trauma care specifically. A reason for this could be that there is no cooperation, there is no written information or the information was not accessible for the public. Another option could be that the euregional setting is not in charge of this. Information on this was very difficult to obtain.
The French language was only an apparent obstacle for research on Luxembourg. The information obtained from euregional settings between the Netherlands and Germany was also available in German. Only legislative or administrative texts available only in Dutch were difficult to the researcher.

**Conclusion and Recommendations**

*“Adjust the law to daily life instead of the opposite!”* (P. Brink, personal communication, February 28th, 2013)

Judging by the interviews, the policy analysis, and the literature review it can be concluded that cross-border trauma care operations are taking place on the regional level, but there is no fundamental jurisdictional basis for this. All interview partners and also many studies state that a well-functioning trauma system across the border is necessary to guarantee the best possible care for trauma patients. The main issues and obstacles the interview partners have raised were legal uncertainties and intrinsic and extrinsic motivation hindering or encouraging cross-border cooperation.

Most findings on promoting factors or actors that should be involved in the study are in line with what was found in the literature review and the interviews. A study has shown that the “most promoting factors […] include the personal commitment of the project actors […] as well as the experiences of the partners in cross-border cooperation” (Brand, Hollederer, Ward & Wolf, 2006). All interview partners stated more stakeholder involvement as a promoting factor, as can be seen in table 4. Both, the study by Brand, *et al.* (2006) and the current study name examples such as political support (on different authority levels), European Parliament involvement, insurance companies or other levels of the trauma care chain.

As it is important to bring the best services to the citizens more knowledge transfer between health facilities and patients is necessary. Therefore, the need for research in the field of trauma care and making it more accessible to people is apparent. A recommendation for the future creation of a European trauma network is to get a broad overview of all stakeholders’ interests. The support of all stakeholders is important when wanting to realize cooperation projects such as this one. Also, presenting the European-added need on an EU level is very important for gaining political support. To improve cross-border trauma care practices, the interviewees and the WHO (2013) see uniform standards on a European level and more
communication between all levels in the trauma care chain, especially improving the connectivity between dispatch centers across borders, as desirable. Data transferal through E-health (P. Brink, personal communication, February 28th, 2013) or the creation of EU-wide accounting settlement systems (H.C. Pape, personal communication, March 14th, 2013, appendix) were also named as improving patient outcomes and more patient friendly in the interviews. With the help of these recommendations the realization of cross-border practices in the field of trauma care can hopefully be made possible for Europe.
Bibliography


Appendix

Fundamental questions to cross border trauma care cooperation

**GENERAL QUESTIONNAIRE TO ALL PROJECT PARTNERS**

1. Is there an agreement on cross-border trauma care cooperation in your region?
2. On which levels of the trauma care chain does cooperation take place?
   a. What does the referral process from hospital care to rehabilitation look like?
3. How did it come to this cooperation?
   a. Which authorities are responsible for the creation of existing and future collaborations
      i. in your region
      ii. national level
      iii. on EU level?
4. What is the legal basis of trauma care regulation in your region? Can you find aspects of cross border cooperation in these legalities?
5. What has been your experience with cross-border trauma care operations?
6. Are there uniform protocols or systems in place in order to improve the quality of trauma care?
   i. in general
   ii. in operations from the emergency services of the BRD with the neighboring country
   iii. in operations of the emergency services of the neighboring country with the BRD
7. How often do cross-border operations take place in your region?
8. How are these operations financed?
9. What could be a disadvantage of cross-border cooperation in the field of trauma care?
10. What barriers exist for cross-border cooperation in the field of trauma care?
    a. Are there difficulties in communication between
       i. Countries
       ii. different levels of the care chain
11. What opportunities could promote the development of cross-border cooperation of trauma care in your opinion?
12. Could you imagine your region being part of a Europe-wide network of trauma care?
13. Would you be interested in the development of a Europe-wide trauma network in the future?
    i. (to improve quality through best practice exchange and uniform/standardized (quality) standards)
14. Could you provide us with material or literature on the subject?
15. What was your motivation to participate in the BTCCE-project?
16. Did you read the BTCCE project plan? Do you have any questions or remarks concerning the project plan?

17. Finally, do you have any other suggestions and recommendations on the subject of "cross-border medical assistance". We are also grateful for constructive criticism of this questionnaire, perhaps we have overlooked an important aspect.

**Specifically aimed at Professor Brink and Professor Pape:**

18. What role do private hospitals play in trauma care?
   - Are there differences between for-profit and not-for-profit hospitals?
   - Is there a legal basis that requires private hospitals to engage in emergency care?
   - Does each hospital have its own ambulance transportation vehicles or are there also arrangements with external providers?

19. What made you engage in the process of developing a European trauma network?

20. Do you think that a European trauma network must arise on the basis of regional cooperation alone (bottom-up approach) or do you think political efforts on a European-level are necessary?

21. When do you expect first practical cooperation between different regions (next to signing the Letter of Intent)? At what point do you consider the introduction of a European trauma network as realistic?

22. What are the advantages/disadvantages of a European trauma network compared to
   a) national networks
   b) regional networks
   c) local (non-cooperating) emergency services?

23. Do you think Europe could serve as an example and help improve other parts of the world?

24. What are the differences between densely and sparsely populated areas?

25. What indicators are used to measure the quality of trauma services?

26. Do you know which countries and regions in Europe already have trauma networks or similar cooperative agreements?

27. Do you see advantages or disadvantages in trauma systems (at national or regional level) that you are already familiar with?