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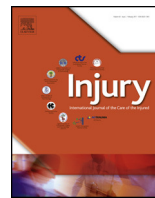


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Editorial

Agreements and practical experience of trauma care cooperation in Central Europe: The “Boundless Trauma Care Central Europe” (BTCCE) project



Introduction

More than 100 million people sustain injuries worldwide [1], and in many civilised countries, these continue to represent the highest contributor to healthy life years lost [2]. Several studies have demonstrated a decrease in mortality if trauma care is organised well [3]. This applies especially for those occurring next to borders. It is well recognised that major limitations occur in cross-border trauma care are due to insufficient communication and regulation [4], and Central Europe is one of the focus areas.

For this reason, a cross border cooperation has been established for trauma care chain along the borders of The Netherlands, Belgium and Germany. It is based on previous experience: Ramakers looked at the euregional setting of the Meuse-Rhine Euroregion (EMR) [4] and gathered important information on the regional level (Euregio Meuse-Rhine in Crisis (Emric+)). The follow-up project was named “Boundless Trauma Care: Central Europe” and was undertaken between 2011 and 2014 [5,6]. The current study, supports and includes underlined the ideas of EMRIC+ and overlooks a broader geographical area along the western border of Germany (Fig. 1).

In 2011, the letter of intent was signed by ten hospital trauma care experts from trauma regions on both sides of the West German border in the study region [7]. Recently, the letter of intent was expanded with the signatures of trauma care providers from the pre-hospital setting. Since January 2014, BTCCE was supervised by the Netwerk “Acute Zorg Limburg”.

Regionalisation

Europe, as well as other parts of the world, is moving towards regionalisation of trauma care [8–11]. Differences in treatment concepts and equipment at the trauma care hospitals contribute to the variation in mortality rates. The consequences resulting from these differences, especially geographically, can be improved upon when managed through regionalisation of care. With regionalisation, collaboration may exist between trauma centers and at different levels of the trauma care chain (dispatch center, pre-hospital care and rehabilitation). This collaboration can take place at the regional, national or international level.

Abbreviations: EMR, Meuse-Rhine Euroregion; BTCCE, Boundless Trauma Care Central Europe; Emric+, Euregio Meuse-Rhine in Crisis; WHA, World Health Assembly; EU, European Union.

The severity of injury mortality and morbidity has been addressed many times through international authorities, such as the World Health Assembly (WHA). That improved organisation and planning for provision of trauma and emergency care is an essential part of “integrated health-care delivery” [1]. Moreover, the European Commission reinforced that first aid, emergency services, and rehabilitation are crucial in reducing injury-related mortality and morbidity. It therefore recommends “cross-border cooperation within the health sector” [12]. The WHA has also recommended collaboration between countries in terms of research, capacity sharing or designing strategies on working together [1].

Euregional cross border rescue setting

Cross-border regulations are important because in some situations in the European Union, the most appropriate or the most accessible health care happens to be in another Member State [13].

The EMR, which is a region at the edge of Belgium, Germany and the Netherlands, has established cooperative agreements between various emergency care units, including ambulance services, fire departments and police services [4]. Throughout Europe a number of cross-border cooperation systems have been developed and have been adapted and adjusted specifically to the settings and challenges of each regional territory [14]. However, no complete up-to-date overview of all current cooperation projects exists for Central European border regions.

Goals and research objectives

The overall goal of the BTCCE project is to improve safety, quality and efficiency in acute trauma care in Europe.

This article presents first results of the current situation of trauma care cooperation between the Netherlands, Germany, Luxembourg, and France [5,6]. It focuses on the following research objectives:

First, the differences in laws and regulations at the EU level, the national level, and at the regional border level (Netherlands, Luxembourg, France, and in the German bordering federal states of Lower Saxony, North Rhine-Westphalia, Rhineland-Palatinate, Saarland, and Baden-Württemberg).

Second, the current state of trauma care cooperation, the project partners’ estimation on the need for trauma care



Fig. 1. Study region Boundless Trauma Care Central Europe.

cooperation and regionalisation in their region, as well as their perception of possible benefits and drawbacks of such cooperation.

The results obtained through these objectives provide the basis for the development of a European trauma network in line with the BTCCE project in the future.

For data collection interviewees were given a set of 18 questions with 10 sub-questions (Fig. 2). Interviews with 10 trauma care professionals in the border regions were carried out between February and June 2013. The structure given to the interview questions was based on a report by the North Rhine-Westphalia Institute of Health and Work, which conducted similar research in cross-border evaluations in 2008 [14]. The interviewees, all of whom signed the BTCCE letter of intent, were selected based on their expertise and interest in cross-border trauma care cooperation.

Additionally, a policy and literature analysis was conducted to assess the current situation of cross-border trauma care at the EU and national level.

Results

Laws and regulations – comparison between countries

The first step towards a uniform regulation of cross-border health care was the introduction of the EU Patients' Rights Directive [15] implemented on an EU wide basis in October 2013. This directive has been the pioneer in cross-border regulations at the EU level. With the implementation of this directive, political, financial and organizational barriers have been reduced in cross-border health care [15].

To initiate more specific agreements in health care, both bilateral and multilateral agreements, the cooperation of territorial entities and (regional) public bodies is required. France, Germany,

Fundamental questions to cross-border trauma care cooperation

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 across borders?
 - 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. at 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. What was your motivation to participate in the BTCCE-project?
15. Did you read the BTCCE project plan? Do you have any questions or remarks concerning the project plan?
16. Which institutions do you think should we involve in the project?
17. Could you provide us with material or literature on the subject?
18. 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.

Fig. 2. Questionnaire used during the interviews with trauma care experts of the BTCCE region.

Luxembourg and Switzerland all signed the Karlsruhe Convention¹ for that purpose in 1996 [16]. Also, a soft law by the 'Assembly of European Regions' [17] has been passed on cross-border cooperation between Baden-Württemberg and the French region Alsace. There are no agreements explicitly on cross-border healthcare cooperation between the Netherlands, North Rhine-Westphalia and Lower Saxony, although the Agreement of Anholt² (1991) allows public organisations to conclude agreements on a regional level and would therefore serve as a basis for further legal agreements. Furthermore, North Rhine-Westphalia, Rhineland-Palatinate and regions in Belgium are able to base regulations on the Agreement of Mainz.³

While France is governed centrally, the German structure grants federal states their own competencies in health care. Due to the intensive work of the German foreign office and the French government, two agreements on cross-border cooperation in health care⁴ were signed and today serve as a basis for concluding legally binding agreements in regions in both countries.

Laws and regulations on regional and local level

The interviews show that most cooperation happens on a regional level as this level is affected most by the necessity of a smooth day-to-day operation. In most cases these arrangements are without written jurisdiction, but are made on an institutional basis between specific hospitals or working groups that include physicians or ambulance services. In the border regions, patients and health care actors (physicians, hospitals, sickness funds or other health authorities) are the ones who clearly see and experience the benefits and drawbacks of cross-border care cooperation and therefore initiate new projects. An example of such a regional cooperation can be found in the euregional setting (*Euregio*). This program is run by a regional coordinating office and has partners from hospitals, ambulance services, disaster management organizations, public health organizations and regional governments.

Legal regulation and legislation often did not produce the desired cross-border cooperation. In the German federal state laws on rescue services⁵ (just as in the French equivalent⁶ cross-border support was mentioned more or less explicitly, often not indicating whether 'cross-border' refers to national or state/regional borders. However, most bordering regions have additional regional cooperation agreements specifying the extent and spectrum of

their work. The Netherlands, Belgium and Luxembourg do not include cross-border trauma care in their national trauma care legislation, but cooperation is based on individual agreements set by hospitals and air rescue services. A legal support for such agreements can be found in the Dutch law on ambulance care.⁷

Current cooperations

Air rescue

All geographical areas included in the study have a system in place for cross-border cooperation in air rescue. The positioning of helicopters in border areas can be viewed as a trade-off between Germany and neighboring territories. The Dutch helicopters stationed in Groningen and Nijmegen cover the bordering German territory. In exchange, the German helicopters in Rheine and Würselen serve their opposite border territories [16,18]. The latter has been in operation for more than forty years. There is also an agreement for a Luxembourgian helicopter to operate in the German federal states of Rheinland-Pfalz and Saarland. The French helicopter covering regions of interest in Germany is located in Strasbourg [16,18].

TraumaNetzwerkDGU (German Trauma Network)

The German accident surgery association (DGU) implemented the TraumaNetzwerk[®] [Trauma Network] in 2008 when it established a country-wide trauma system for hospitals. The initiative of providing services of a Level I trauma center to every individual within thirty minutes has also expanded beyond the German border into neighboring countries. Enschede and Maastricht in the Netherlands have been certified as a supra-regional Level I trauma center, while the university hospital in Groningen is currently in the process of being certified. Also, Luxembourg currently has two regional certified hospitals participating in the German TraumaNetzwerk[®] [19].

Interviews

Most interview partners named their involvement in the DGU or cross-border operations in air rescue as the main agreements in their region. The interviewees were not able to provide statistical data on patient flow of cross-border trauma patients. This could be due to data registration incompatibility across borders or the fact that all interview partners are only in direct contact with one patient at a time and fail to have an overview of the whole picture. Nevertheless, all interviewees see benefits in cross-border cooperation and are hence interested in the development of an EU-wide trauma network. The regions hope to eliminate territorial barriers and bring people closer together by adjusting 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. For this, all interviewees agreed on more stakeholder involvement and made clear that they find this to be one of the most important steps in the creation of a European trauma network. More specifically, the interview partners would like to see more involvement at all levels of the trauma care chain by political authorities and insurance companies in order to realise such a project.

Table 1 shows the obstacles to cross-border cooperation as pointed out by the interviewees. Fourteen main obstacles were detected. These have also been mentioned in the EMR although many have been overcome in the past. In Table 1 the EMR was used as a reference region to which problems recognised in other

¹ Original title: Das Karlsruher Abkommen. Übereinkommen zwischen der Regierung der Bundesrepublik Deutschland, der Regierung der Französischen Republik, der Regierung des Großherzogtums Luxemburgs und dem schweizerischen Bundesrat, handelnd im Namen der Kantone Solothurn, Basel-Stadt, Basellandschaft, Aargau und Kanton Jura, über die grenzüberschreitende Zusammenarbeit zwischen Gebietskörperschaften und örtlichen öffentlichen Stellen.

² Original title: Anholter Abkommen, Abkommen zwischen dem Land Nordrhein-Westfalen, dem Land Niedersachsen, der Bundesrepublik Deutschland und dem Königreich der Niederlande über die grenzüberschreitende Zusammenarbeit zwischen Gebietskörperschaften und anderen öffentlichen Stellen vom 23.05.1991 (GV.NRW.S.530, 1991).

³ Original title: Mainzer Abkommen, Abkommen zwischen dem Land Nordrhein-Westfalen, dem Land Rheinland-Pfalz, der wallonischen Region und der Deutschsprachigen Gemeinschaft Belgiens über die grenzüberschreitende Zusammenarbeit zwischen Gebietskörperschaften und anderen öffentlichen Stellen vom 01.03.1996 (GV.NRW.1996, S. 255, GVBl. Rh.-Pf. 1997, S. 3).

⁴ Original title: Rahmenabkommen zwischen der Regierung der Bundesrepublik Deutschland und der Regierung der Französischen Republik über die grenzüberschreitende Zusammenarbeit im Gesundheitsbereich; Verwaltungsvereinbarung zwischen dem Bundesministerium für Gesundheit der Bundesrepublik Deutschland und dem Minister für Gesundheit und Solidarität der Französischen Republik über die Durchführungsmodalitäten des Rahmenabkommens vom 22. Juli 2005 über die grenzüberschreitende Zusammenarbeit im Gesundheitsbereich.

⁵ Rettungsdienstgesetz.

⁶ Original title: Décret n° 2006-576 du 22 mai 2006 relatif à la médecine d'urgence et modifiant le code de la santé publique.

⁷ Original title: Tijdelijke Wet Ambulancezorg.

Table 1
Perceived obstacles in the six cross-border regions.

Obstacles	Regions	Ems-Dollart-Region	EUREGIO	Euregio Rhine-Waal	Saar-Lor-Lux-Rhine	Oberrhein-konferenz
Financial regulation		X			X	X*
Language			X	X	X*	X*
Culture			X		X	
System differences		X	X		X	X
Competition				X	X	
Hierarchy					X	
Respect/emotions						
Differences in quality						
Agreements not applied in practice					In part**	In part**
Legal insecurity		X		X		
Political obstacles				X	X	X
Limited resources						
Technical incompatibility					X	
Not knowing each other			X			

X symbolises an obstacle to cross-border cooperation in trauma care in that specific region.

* Mentioned as an obstacle in cross-border cooperation in general, but not to the region specifically.

** To one (part of the other) region, but not to all.

regions were compared. It should be noted that each region experiences these obstacles to a different degree.

As an example, financial problems were mentioned in the Ems-Dollart Region, because the cost of trauma care in the Netherlands is somewhat higher than in Germany due to differences in price calculations. Moreover, tax-based and social healthcare funding schemes might be incompatible as mentioned in the EMR. In the past, the EMR has itself encountered problems with the financial regulations, although these have been resolved.

Language and culture may similarly hamper communication and cooperation between emergency service personnel and patients. Citizens of the EMR speak Dutch, French or German. Whereas the Dutch and German trauma care providers seem to get along well with their languages, the communication with French-speaking Belgians has been reported to be more difficult. Likewise, culture and geographic barriers also inhibit cross-border communication.

In order to overcome language barriers, as discussed at the Rhine conference, English is often used as a common working language. In an alternative approach, police have hired liaison officers who speak French and German in order to mediate between both countries and resolve the language issue.

System differences can be seen in the broader focus of Dutch trauma centers. German centers tend to focus more on one trauma level, as has been reported in the EUREGIO. The prevention of MRSA in hospitals is handled very differently in the Netherlands than in Germany and this has led to procedural misunderstandings particularly by German patients in the Ems-Dollart regions. There were also differences in the decentralised EMR versus the centralised Saar-Lor-Lux-Rhine which were mentioned as a challenge to cross-border cooperation. Differences in insurance procedures were also named at the Oberrheinkonferenz. For instance, referral for secondary treatment or rehabilitation requires collaboration between insurance companies and emergency service providers. This presents a problem not yet resolved in Saar-Lor-Lux-Rhine. Also, the German use of the employer liability insurance association is unknown to its Dutch neighbors in the Ems-Dollart-Region.

Another challenge to cross-border cooperation comes from the use of private versus state-funded insurance. Hospitals earn more when treating privately insured patients. As solely private health insurance exists in Luxembourg compared to predominantly public insurance in Germany, treating Luxembourgish patients seems preferable and patient flows are mostly one-sided. Within Luxembourg, the public emergency service and the citizen-based initiative 'Protection Civile' are in competition and thus this creates

tension. In the EMR, competition between countries exists as the proportion of physicians in Belgium is higher than in other countries.

Along the Dutch–German border, hierarchy and competencies are sensitive factors when one country works based on a paramedic system and the other requires a physician at the scene. Additionally, foreign diplomas may not always be accepted, as mentioned in Saar-Lor-Lux-Rhine. Occasionally, divergent competencies may contribute to a lack of respect between emergency care systems.

Legally, the transportation of drugs across borders is tolerated but problems related to the reimbursement of costs do exist. In the EMR, a lack of formal complaints bodies and unclear handling of medical mistakes were perceived to hinder cross-border trauma care. Legal regulation through agreements or joint standard protocols do not necessarily lead to action as reported in the EMR, Saar-Lor-Lux-Rhine and the Oberrheinkonferenz. Interviewees had the opinion that continuous political commitment is needed on different levels but presently the actions are dealt with on a case by case basis. For instance, a lack of motivation and commitment from the French side at a political level has been mentioned in Saar-Lor-Lux-Rhine.

The equipment used by various emergency services may differ from country to country. In very rural and low populated areas, emergency service resources are often scarce. Therefore, equal cooperation cannot be guaranteed on both sides of the border, as mentioned in the EMR. Technical incompatibility, for instance radio frequencies, was another concern in the EMR. In Saar-Lor-Lux-Rhine, German ambulances do not have permission to cross quickly across the French border because they are required to pay first.

Lastly, the trauma care cooperation may be limited in practise due to the personal distance existing between the countries' emergency care personnel. When people do not know each other or do not have phone numbers for emergency situations, cooperation is rarely established.

In general, the interviewees showed a positive attitude towards cross-border practices. They foresee improving health outcomes and financial benefits through efficient cost savings. The only negative perception the interviewees described were intrinsic fears such as patients being taken away from them or stakeholders not cooperating due to monetary self-interests.

The 10 interviewees revealed that all regions strive towards the same goal; offering optimal and safe care for the patient. This can be done through various mechanisms such as sharing resources, using time more efficiently, using uniform procedures, making patient

transfer easier and improving communication. All these goals, it is believed, can be achieved by cooperation and adjusting the law to the daily difficulties the regions see presently in practice. However, interviewees were not certain whether sufficient awareness was raised both at the political and operational level. Some regions would like to see more expert opinion sharing, as some regions might not have daily experience with certain types of trauma, and could therefore benefit from more knowledge exchange.

Furthermore, it needs to be considered that the regions might be at different stages of developing and practicing cross-border cooperation. The EMR, for instance, has encountered and overcome many of the mentioned challenges throughout their years of experience. Interviewees have varying perceptions on the relevance of setting up such a cooperation based on their current stage of development. Lastly, when asked about rehabilitation as part of the trauma care, most people interviewed see a division between this and acute care.

Future ideas

All studies have observed similar results on stakeholders' perceptions and implemented laws and regulations over a time span of thirteen years. The studies revealed comparable hurdles, risks and benefits in the eyes of the stakeholders.

The Patients' Rights Directive on the EU level can be seen as a new foundation for future cross-border trauma practices. Both, the interviews as well as the literature review give the impression that many recent cooperation projects are only possible because of personal relationships. Although this may work in practice for some regions, there are many inherent difficulties that come with this procedure. All in all, all those involved with trauma care at a regional level, feel the need for cooperation on a daily basis. The regions most affected by the need of professional exchange along the border usually opt for a bottom-up approach and do start cooperation on a personal level.

Furthermore, willingness to cooperate is often not enough. Both, the studies discussed in this article and the study by the NRW Institute of Health and Work [18], show that there are legal obstacles, which still need to be overcome. All interviewees indicated some level of concern about the lawful ability to cooperate. Next to jurisdictional hurdles, political agendas differ and even the political competences differ, leading to uncertainties on how to draw new jurisdictions. While the cooperation between air rescue services and the German TraumaNetzwerk[®] are high, other cooperation arrangements are not used to their full potential. Differences in protocols and gaps in financial regulation are still seen as obstacles. Although regulations at the EU level, such as the Patient's Rights Directive, provide a jurisdictional platform, there are still areas, especially in trauma care, that suffer from legal uncertainty and are in need of revised regulation.

In conclusion, the process of Europeanisation offers promising opportunities. A wide range of trauma care professionals working in border regions are committed to this idea. However, persistent obstacles must be tackled by responsible authorities along with mediation between different infrastructures and cultures. In order to increase the findings' generalisability, a subsequent study has been initiated to extend the coverage of interviews to pre-hospital services in all study regions.

Limitations

Considering the size of the region, study results might be limited based on the rather small number of interviews. Rhineland-Palatinate and Baden-Württemberg are not represented. Additionally, some perceptions are limited solely to that interviewee and require further research. Moreover, not all levels of the

trauma care chain are represented in the interviews. All interviewees have shown their commitment in cross-border trauma care cooperation by signing a letter of intent and hence, they might be more positive about this issue than other trauma care providers and experts.

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