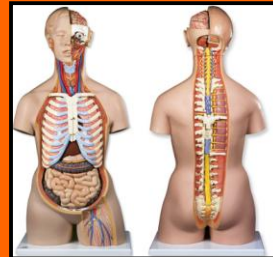


# 'We want patient safety education'

User-driven innovation in postgraduate medical education in the European Union: differences in user involvement, education systems and health care quality



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# We want patient safety education

Trends and innovation in patient safety in the postgraduate education in the European Union

Groningen, July 2012

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## **Preface**

The report in front of you is my master thesis, which is titled as ‘We want patient safety innovation: user-driven innovation in postgraduate medical education in the European Union’. In this thesis, the influence of user-driven innovation in the healthcare education is investigated. This research is accomplished in the University Medical Center of Groningen and is produced for the Wenkebach Instituut, a department of the UMCG. The thesis is written as part of the master Business Administration – Strategy and Innovation at the University of Groningen.

This research could not have been accomplished without the help of several people. At first, I would like to thank my supervisor Pedro de Faria for all the support he gave me. I had to deal with unexpected, tough personal circumstances during this period, in which he has supported me a lot concerning my choices, needs and wishes. Secondly, I would like to thank my principal Abe Meininger for the data he provided me and his sharing of ideas concerning my thesis. Lastly, I would like to thank all the national experts that collaborated indirectly with this research. Their interviews were of essential value for this report.

Hopefully, this thesis will provide you with new information concerning the postgraduate education and with new insights concerning user-driven innovation. I hope you will enjoy reading it as much as I have enjoyed writing it.

Angelique Reinders



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## ABSTRACT

This thesis is about user-driven innovation in patient safety in postgraduate education. It is undertaken on a European level, where eight countries are analyzed. The relation between user involvement and the degree of innovation in patient safety in postgraduate education is analyzed by linking the degree of consumer awareness with the degree five different patient safety innovation factors are represented. The influence of patient safety innovation on healthcare quality is investigated by comparing the degree of patient safety innovation of the countries with its European quality rank places. It was found that user involvement is leading to more innovation in patient safety. So, user-driven innovation plays an important role in healthcare. Secondly, the environmental attitude is found to be essential for innovation. A transparent culture is leading to more consumer awareness, and consequently to more user-driven innovation. Besides, the amount of errors seem to lead to user involvement. A third finding is the coherency between the degree of innovation and the length of European memberships. The longer the country its membership is, the more patient safety innovation it has had. Expected is that the European Union stimulates transparency, leading to consumer awareness and thus to user-driven innovation. It also indicates that it will be hard to equalize the health care quality, as the age difference of members will persist. However, this research is based on an existing database and has been qualitative. Besides, some countries did not participate fully. This could have reduced the objectivity.



## 1 INTRODUCTION

In the last decades, consumers gained a more and more central role in business (Bar and Riis, 2000). Where change in society is, change in practice takes place. In the 70's, a consumer centered way of innovation was born and is fast upcoming, namely user-driven innovation. In this practice, feedback loops with the consumer exist (Bar and Riis, 2000). So, the drivers of innovation changed. Instead of focusing on the technological side, companies highlight the customer needs in their innovations, being the source and driver of the innovation process (Rosted, 2005).

Since it is a fast upcoming concept, lot of research has been done about it (von Hippel, 2005; Rosted, 2005; Thomke and von Hippel, 2002). Nevertheless, research is mostly focusing on certain, technological industries, like scientific instruments, software, equipment and hardware (Lettl, 2007) User involvement is less investigated in service industries. This can be due to the fact that in product industries, a user of a product is identifiable as a separate actor (Sundbo and Toivonen, 2012). Identifying this user is more complicated in services, making it more difficult to analyze it (Sundbo and Toivonen, 2012). However, because service industries are of different structure concerning the procedures as well as innovations in it, research is needed in this diverse industry as well.

The healthcare industry is defined as 'the prevention, treatment, and management of illness and the preservation of mental and physical well-being through the services offered by the medical and allied health professions' (Medical dictionary, 2007). Health care is thus an industry of essential value. Hence, quality is a vital aspect.

Besides the fact that the health care systems are the basis for healthy customers, it is also an important industry for the economy of a country (Economy watch, 2010). Because of its proportions, the industry is determining for the gross domestic product of any country, for its export status, its employment, its capital investment, etc. (Economy watch, 2010). Therefore, it is an essential industry for every country.

Health care differs a lot from country to country, and no clear overview of innovative developments is available. This

makes it hard for countries to see what would be a successful formula in improving their care.

However, it is mentioned that changes, like increasing consumer awareness, trigger changes in this health care industry. One of the reasons would be an increasing awareness among the customers (Economy watch, 2010). Customers have an influence on the innovations taking place in countries. Nevertheless, due to the lack of research in user-driven innovation in health care, the influence and the effect are not clear. Therefore, this research will go further into this.

One of the most important aspects in health care nowadays is patient safety, which is high on the agenda of the EU (European commission, 2012). This is because it is a serious concern in the European Union (European commission, 2012). It is mentioned that European cooperation is needed to improve patient safety, depending on effective and sustained policies and programs being in place throughout Europe (European commission, 2012).

One category that consists of different programs and policies throughout Europe, is the education system. Health education is stated to improve the health status of states and nations, enhancing the quality of life for all people, and reducing premature deaths (Coalition of National Health Education Organizations, 2012). A good education system would thus be of essential value for the health care quality of a country.

In this research, user-driven innovation will be tested in patient safety in educations. To define a level of education, the postgraduate medical education is chosen. This is because in this stage, specialists are educated for the specialty in which they will work. The postgraduate phase can thus be seen as the most important phase of the medical education. Therefore, the research is set in this area.

To find out the possible influence of user-driven innovation on patient safety in education, and the consequence of this innovation in education with regard to health care quality, the following research questions are developed: 'What is

the effect of consumers' awareness of errors on developments and innovations concerning patient safety in Post Graduate Medical Education? Secondly, 'How is this patient safety influencing the amount of uncertainty in European countries?' By using these questions, the effect of user-driven innovation and the influence of this patient safety innovation on the health care quality of a country will be investigated. The goal of this research is to identify innovation trends and patterns. European-based analyses are not accomplished frequently. This research will expose patterns. This will create an overview, which can be a starting point for further deepening investigations. Possible clarifications of the trends will be made to provide these starting points.

This paper will contribute to the business and management scientific fields. A lot of research has been done in user-driven innovation, which is relative new concept in innovation. However, it was the involvement of users is in the product industry like hardware and equipment (Lettl, 2007), which is very different from the service industry. Therefore, different effects can be expected. This research will contribute by investigating user-driven innovation in a service industry, namely the health care. The effect of the consumers on this industry and its innovations will be analyzed. In this way, it will be studied if there is user-driven innovation in health care. The literature on user-driven innovation in service industries will be expanded with this research, leading to more knowledge on this topic. Moreover, the user-driven innovation will be investigated on a country-wide scale. Most of the time, it is investigated on a smaller level, since it is difficult to obtain national data for several countries. In this research, where eight European countries are investigated, the concept is analyzed at a national scale, contributing to the existing literature. This paper will also contribute on a managerial perspective. A clear overview of innovative developments in the European Union is not available yet. Characterizing these systems, trends and innovations in order to identify and explain differences between countries imply a reduced demarcation of reality. Outlining the system and its influences and effects, it will provide important information. The analysis can be an eye-opener for the politicians of the various countries. Differences and effects will be clarified, on which countries can base their approaches to improve

their systems. This can lead to better health care systems in different countries, as well as to a more uniform health care system in Europe.

The paper will continue with a review of the existing literature, both on user-driven innovation as well as on health care. In the third chapter, the research question, the model, and the hypotheses are developed and explained. The model is divided into three different stages, namely the cause, mean, and result. In the fourth chapter, where each stage is analyzed for each of the eight countries, the three stages are separated and discussed one by one. For each stage, countries are discussed in alphabetical order. Chapter five will report the results and discuss the findings. Hypotheses will be accepted or rejected here, and other trends and patterns this research detected will be provided in this part. In the final chapter, conclusions will be drawn, and limitations and further research options will be addressed.

## 2 LITERATURE REVIEW

It is well-known that innovation is a major driver of economic growth (Grunert et al., 2008). In the conventional neoclassical models, markets are characterized by arm's-length, anonymous relationships between buyers and sellers (Bar and Riis, 2000). Hence, innovation is often characterized as technological innovation, which is defined as 'the iterative process initiated by the perception of a new market and/or new service opportunity for a technology-based invention (Garcia and Calantone, 2002).

However, in later research, it has also been realized that innovation does not always result from new high-tech advances, leading to competitive advantage and increased welfare. It was noted that in practice, user-orientation is just as widespread as this technology-oriented innovation and thus an important driver as well (Erhvervsrad, 2004 cited in Grunert et al., 2008). This means that innovation does not only originate from technological advances, but also from developments based on customer needs.

User-driven innovation was first observed and described a few decades ago by von Hippel (1976, 1978, cited in Grunert et al., 2008). He described a number of cases where customers modified or adapted existing products according to their own needs instead of that they waited for manufacturers to launch new products (1988, cited in Grunert et al., 2008). So, the customer/user gets a more central role in the last decades, leading to user-producer relations within the innovation process where feedback loops exist (Bar and Riis, 2000). After these first descriptions of von Hippel, user-driven innovation got more and more recognition over the years, being fully recognized as an innovation driver nowadays.

### 2.1 USER-DRIVEN INNOVATION

Due to the many literature that has been published concerning this topic, many definitions and statements exist concerning users and user-innovation. In this article, the term 'users' means 'the individual consumers that consume or employ a good or service and expect to benefit from it'

(von Hippel, 2005, Business Dictionary, 2012). An innovation is therefore user-developed if the developer expects to benefit from use (Oliveira and von Hippel, 2011). In this user-driven innovation, the customer needs are the source and driver of the innovation process (Rosted, 2005). As Darborg (2009) states, the main objective of this kind of innovation is to initiate new ideas which take into account realized and non-realized consumer needs and future needs in the market. The innovation is thus driven by the expectation and the desire to fulfill a customer need and hence, a profound understanding of the needs is required (Rosted, 2005).

Research has already been carried out in the field of user-driven innovation. There has been research into the advantages of user-driven innovation, of which one is, according to von Hippel, the lower barrier for the customer. He stated that users do not have to rely on manufacturers as their agents anymore, but can develop exactly what they want, which makes it progressively easier for the users to get what they want (von Hippel, 2005). It would on the other hand also be easier for companies, since trying to understand the customers completely is a costly and inexact process (Thomke and von Hippel, 2002). It is thus stated to be a valuable kind of innovation for both sides. Moreover, innovation by users would appear to increase social welfare, which is indicating the importance of it (von Hippel, 2005). However, the implementation of this innovation type is investigated as well. The shift to this kind of innovation is mentioned to be painful and difficult, since it is attacking a major structure of the social division of labor (von Hippel, 2005). Besides the fact that many firms and industries must make fundamental changes to business models, governmental policy and legislation sometimes have to change as well from the support of innovation by manufacturers to a democratized and user-centric system of innovation (von Hippel, 2005). Nevertheless, based on the advantages, user-driven innovation can have additional value.

However, the degree of user-driven innovation in different industries differs a lot, being influenced by several factors. According to Raasch, Herstatt and Lock (2008), the degree of user-driven innovation is influenced simultaneously by

five factors, namely by technology maturity, technology complexity, market concentration, innovation barriers, and customer satisfaction. These factors are stated to jointly produce the cyclical pattern of innovative activity and progress by users, leading to different degrees of user-driven innovation in markets (Raasch, Herstatt and Lock, 2008).

In user-driven innovation analyses, only lead users are analyzed in most cases. This would be because lead users would experience needs ahead of the market segment (Thomke and Nimgade, 1998; von Hippel, 2005). However, other researchers look behind the lead users. Lundvall mentions that relying exclusively on lead users, relegates the other consumers to passive roles. This can lead to trajectories deviating from end-user needs, and finally to unsatisfactory innovations (Lundvall, 1988, cited in Bar and Riis, 2000). According to Rothwell (1994, cited in Bar and Riis, 2000), both lead and lay users should therefore be used, as both can be of benefit for the innovation process by making distinct contributions. User-driven innovation is thus something that is discussed a lot in research from different points of view.

User-driven innovation is, as described above, first observed in the 70s and hence a relatively new concept in the literature. Although there has been a lot of common research about it, not every industry is investigated in such detail concerning this new driver. Though this concept is investigated a lot concerning technology driven innovations, there is not much literature on it applied to service-driven innovations. The phenomenon is mostly investigated in areas like software, equipment, hardware, and instruments (Lettl, 2007). This is maybe due to the fact that in manufacturing and primary production, a user of the product can be identified as a separate actor, which is far more complicated in the service industry (Sundbo and Toivonen, 2011).

So, there is less literature with regard to user-driven innovation in service industries. Therefore, this research will deepen into the service innovations to get more insight into the user-driven innovation in this area. This will be done by investigating the healthcare, because healthcare is a service sector that is an important for the general health and wellbeing of the population, and thus a sector that has countrywide importance. Nevertheless, in healthcare, there

are relatively few research studies about it and hence, the relation of user-driven innovation with this industry is still relatively unknown. Therefore, this research will apply the user-driven innovation theory to the health care sector, to find the effects of it in this important service industry.

Though there is not much literature about it, some research can be found on user-driven innovation in health care. One research indicates that innovation in the health care sector is specifically essential to meet the challenges of the increasing demand (Nordic innovation centre, 2010). The innovation need would arise due to technological development that make new and expensive treatments available, but also because of the graying of the population, and a more knowledgeable population, leading to changes in consumer needs and wishes (Nordic innovation centre, 2010). There are thus several reasons to be found for health care to innovate, and one of the drivers is the change in the consumers' needs, because of changes in knowledge and/or age. In this case, the organizations and its customers need much iteration before they will get a solution, since the requirements and wishes of the customers change. Some customers complain that the industry has gotten the product wrong or that it is responding too slowly (Thomke and von Hippel, 2002). This is one of the three major signs that an industry migration to a customer-as-innovators approach is needed (Thomke and von Hippel, 2002). As stated by the Nordic innovation centre, implementing a user-driven innovation policy will create a potential for higher quality of health care services, since it will generate a different type of innovations that are more focused on how the work is done and organized (2010). Instead of focusing on new medicines and technology, the user-driven approach takes the users' needs as a starting point and innovate on based on that (Nordic innovation centre, 2010). The potential of user-driven innovation in the healthcare sector is thus recognized. Nevertheless, the literature only talks about this possibility. Although this gap in the literature is recognized, in the view of Darborg (2009) it exists because the evaluation whether it has a real impact on the quality or not was not possible in the research yet. According to the Nordic Innovation Centre, this is due to its short period of existence, because of the until recently domination of research based innovations (2010). Nevertheless, as stated by Herzlinger (2006), the engaged consumers would

be a force to be reckoned with in all three types of health care innovation, namely consumer-focused, technology and business model innovation. Biswas et al. (2008) argue that user-driven innovation means that there is inter individual collaboration between multiple stakeholders, which may allow health professionals to achieve better health outcomes. Thus, user-driven innovation is seen as important and its influence on quality is estimated in prior research. However, proof that this user-driven innovation actually leads to higher quality in healthcare is hard to find in the existing literature. Darborg (2009) claims that the expected impact of the user-driven innovation programs on health care services very much depend on individual projects and their successes. If these projects prove to be innovative, there is a potential for higher quality in services. Hence, it can be of essential value to investigate this revealed gap. For this investigation, I will discuss the important concepts first, namely patient safety, education, culture and quality. These are important because patient safety is one of the most important quality aspects of health care, for which education and a right culture is expected to be needed. So, together these aspects are forming the base for a discussion about user-driven innovation in health care and therefore, these will be discussed in the further literature part.

## 2.2 PATIENT SAFETY

As mentioned above, innovation in health care is found to be essential for meeting the increasing demand of the consumers, which is again needed to ensure quality. The European Observatory on Health Systems and Policies states in the report that central to ensuring health care quality overall are measures to improve patient safety (World health organization, 2008). Hence, there would be an urgent need to innovate in patient safety in ensuring quality in care in the European Union.

Patient safety is defined by many sources. Putting these together, patient safety can be defined as the reduction or prevention of unnecessary or potential errors associated with health care (European commission, World Health Organization, NHS Clinical Governance). These mistakes can occur anywhere in the system and in any part of the treatment process involving wrong medication, improper

treatment, or incorrect or delayed test results (European Commission, 2006).

Patient safety is high on the EU policy agenda for the last years. The World Health Organization launched a world alliance for safer care in 2004, urging the WHO and its member states to pay the closest possible attention to patient safety (World Health Organization, 2012). In the European Union, a working group is set up to facilitate and support the member states in their work and activities to discuss and take forward patient safety issues (European commission, 2012).

Nevertheless, patient safety is still an emerging process for many European countries, only slowly being recognized. According to Legido-Quigley, McKee, Nolte, and Glinos (2008), this is because although there is a European Union which is supporting for efforts in this area, national commitment is also vital in order to ensure patient safety. But Jansma, Wagner and Bijnen (2011) argue that residents are not fully aware of their own role in patient safety, which is leading to differences in the presence of patient safety. A major barrier in improving patient safety is thus this lack of awareness of the problem, which the Joint Commission on Accreditation of Healthcare Organizations (JCAHO, 1999) owes to e.g. inadequate reporting of errors and the inability to accurately measure the occurrence of them. This lack, originating from reporting problems, will influence the cultural attitude. In the view of Hogler and Henle (2011), the cultural bias that arises here will shape the response to important public policy issues, leading to differences between countries.

## 2.3 EDUCATION

However, according to the literature, it is not only the (lack of) awareness of the consumers that leads to differences in patient safety and quality between countries. As Jansma, Wagner and Bijnen (2011) point out, to improve safety, not only these consumers but also the health care workers who contribute to the care process have to be educated. Another study (Jansma, Wagner and Bijnen, 2010) states that patient safety education aims to create awareness of risks and to induce changes in behavior to deliver safer care, thus increasing the quality of health care. Therefore, implementation of patient safety in education would be

essential. Implementation of this patient safety in health care education can be seen as an innovation, as innovation in health care is defined in literature as a medical technology, structure, administrative system, or service that is relatively new to the overall industry and newly adopted by hospitals in a particular market area (Damanpour, 1991 cited in Goes and Park, 1997). Moreover, West and Farr defined innovation as 'the introduction and application within a role, group or organization of ideas, processes, products or procedures, new to the relevant unit of adoption, designed to significantly benefit the individual, the group, the organization or wider society (West and Farr, 1990 cited in Piening, 2011). Implementing patient safety in postgraduate education would therefore be innovation, as it is the introduction and application within processes and procedures, new to the relevant unit, and designed to benefit the individual, the organization and the wider society. Hence, implementing patient safety is defined as innovation in the education, which is mentioned in the literature (Jansma, Wagner and Bijnen, 2010) to be of essential value. Innovation in education can be expected to be mostly user-driven, because educational requirements in a country are normally set by a national or even broader, regional union, like the European Union. With regard to the European Union, it regulates the minimum standards for the medical education in Europe. The division is made between basic medical training, existing of the undergraduate and graduate education, and the specialist medical training, which is named postgraduate education in this research. A clear overview of the differences in postgraduate education and patient safety innovation in each country is not available. However, it is mentioned that the EU must strive towards the EU countries' health care systems offering the same level of care, although they are found to be still different from each other (Doctors of the world, 2007). To investigate where these differences come from and, maybe even more importantly, how they can be overcome, an overview of all the systems is needed for comparisons. This overview per country is not available for the postgraduate education. Nevertheless, a broad outline applying to the countries is available by the European Law.

Article 25 of Directive 2005/36/EC of the European Parliament and of the council outlines the requirements of specialist medical training, stating that admission to specialist medical training shall be contingent upon completion and

validation of at least six years of study of the basic medical training. It shall comprise theoretical and practical training and the member states shall ensure that the minimum duration of the specialist courses is not less than the duration provided for by the European Union (European Commission, 2011). For every medical specialty, a minimum period of training is given, which may only be adapted by the Commission (European Commission, 2011). Besides, it is mentioned that training shall be given on a full-time basis at specific establishments which are recognized by the competent authorities. It shall entail participation in the full range of medical activities (European Commission, 2011). This directive concerning the postgraduate education is applying to the whole European Union, which would be expected to lead to equivalent systems.

However, the requirements are relatively broad, as the Directive only mentions the necessity of a combination of theoretical and practical training, but does not outline the needed extent of each type or the content of it. Themes like patient safety are not specifically mentioned as requirements and hence specific programs can be fulfilled by the countries themselves. Hence, national unions play a big role. Postgraduate Medical Education undergoes changes recommended or required by educators, medical professionals, policy decision-makers, medical students, hospitals and society, thus by many national forces, which is according to Mamam-Dogma et al. (2011) influencing the length and content. Different categories of people are thus influencing the education. Policy decision-makers are representing the society, and society is a force by itself. Hospitals are influenced by the users as well, since complaints are a driver for changes. Thus, society, or the users of health care, have a fair influence on the changes in education, like the introduction, improvements and removal of certain processes, systems or procedures. Their needs are the drivers for change. Therefore, the innovation of patient safety can be expected to be user-driven. As mentioned before, the support of the European Union is there, but the differences are arising from differences in national commitment, which is mentioned to be the second vital point before patient safety will arise. The national commitment consists of the attitude of the user. Hence, a pattern could be expected between the population's commitment, of the user, and the presence of patient safety in the education program. To say it differently, based on previous literature,



it can be expected that there is a pattern between the consumer and the patient safety innovation. Nevertheless, it is not tested yet, though, it can be important to get insight into this relation for analyzing how and why differences exist in the systems of European countries. Understanding where the differences in quality of care arise from will be the first need to equivalence the care. For health care systems can improve their quality to the level of other systems, when it is known what the features are. Therefore, it is important to investigate this relation.

Before possible relations can be analyzed, an investigation of the patient safety level in the postgraduate education program is needed. The level of patient safety shows the amount that patient safety is implemented, which was defined by West and Farr (1990 cited in Piening, 2011) as innovation in hospitals. Thus, the degree to which patient safety is implemented, can be seen as innovation in the education. The term patient safety innovation will be used in the further report for this implementation in the postgraduate education. Determining the degree to which patient safety innovation is present in a program cannot be done in a dichotomous way. It is something that can be represented in certain degrees, from only a low level of patient safety innovation to a high level of patient safety covered by the program. Hence, different aspects have to be reviewed. Together, these different categories will create a representative model for determining the degree to which patient safety innovation has taken place in that specific country. Kirch and Boysen (2010) pointed out that to innovate care optimally, i.e. to be more conducive to patient safety, five points have to be represented in the medical education program, namely

- Making patient safety top priority: first, leaders have to think and show patient safety is important before it can be passed on to the students/trainees. Another study (Sally and Donaldson, 1998) supported this, pointing out that managerial commitment is needed before actual action will be taken. Leadership and commitment from the top of the organization are by Sally and Donaldson (1998) argued to be important to have an overall commitment to deliver high quality care at the heart of the everyday clinical practice.
- Morbidity and mortality conferences: joining the teachable moments out of poor medical outcomes will

decrease the same kind of mistakes and thus increase patient safety. Other study (Thomson, Mary and Prior, 1992) also claimed that these conferences are found to be an important component of a quality assurance program. However, it is for example also stated here that although it has had a central role in training for many years, there is only a belief instead of proof concerning its effectiveness (Thomas and Petersen, 2003). This research will contribute by looking for patterns and thus delivering more tangible proof. This point is also represented by the term reciprocity introduced by Heineman (2011), who identified it as one of the condition for success in changing the education to more patient safety. With reciprocity, learning to share knowledge is meant, since this will lead to more knowledge and thus to more (chance for) improvement.

- Safety elective: a course/program covering topics about safety creates more knowledge and thus an increase in patient safety. Patey et al. (2007) also did research about patient safety courses and claims that after attending a module about patient safety, knowledge and the perceived personal control over safety had improved, which would make the module valuable (Patey et al., 2007).
- Use of high-tech simulation: simulation scenarios, including discussions about care processes, lead to more practice/routine and thus to higher safety. Another study (Weller, 2004) also suggests that simulation would allow for the application of theoretical knowledge to practice, which is a challenge concerning education. Simulation-based medical education is defined by Ziv, Wope, Small and Glick (2003) as an education system combining the need to use live patients to hone the skills of health professionals, with the obligation to provide optimal treatment and insure patients' safety and well-being, and is therefore mentioned to be an important and useful tool in improving the safe delivery of medical care. Though its effectiveness is clearly described in research, it is acknowledged that medicine has lagged behind other professions in the use of simulations because of financial outlays, demand for effectiveness and resistance to change from a strong professional culture (Ziv, Wolpe, Small and Glick, 2003). This research will look at the presence of it and the possible influences of it on quality.

- Use of teamstepps: working in multidisciplinary and multiprofessional teams (Kirch and Boysen, 2010) leads to exchange of information between 'categories' of groups, e.g. orthopaedics and neurology, which will increase the knowledge about the total picture and thus the patient safety. Other research (Gilbert et al., 2000) investigated this point too. They suggest that it is providing students with demonstrable interprofessional skills and thus seen as an effective learning mechanism, though further research is mentioned to be required in this area (Gilbert et al., 2000). This research will contribute by looking if this is really leading to a higher quality in healthcare.

The final two points are also represented by Heineman (2011), also looked at the conditions of success in implementing patient safety in education system. He identified the need of creating an environment with teamwork and responsible autonomy and the need to stop the 'fragmentation' in case of implementing patient safety in an education program. Effective teamwork is also indicated by Epstein (2007) as a determinant for quality and patient safety and is linked to the simulation centers, where the medical personnel will learn to work together, and the stepps, which is about working in teams (Kirch and Boysen, 2010). The teamstepps, or working in multidisciplinary and multiprofessional teams, also leads to more information between the different groups and is thus limiting the fragmentation. The five factors specified above by Kirch and Boysen (2010) are thus claimed conditions concerning implementing patient safety in education, and testing the presence of each could show the degree of representativeness of patient safety innovation in a country.

## 2.4 CULTURE

As stated in the section above, the implementation of patient safety aspects, like a simulation centre, in an education program, is hindered by several factors. These hindrances can also be causes of the differences in patient safety in postgraduate education and thus essential to discuss. One important factor that is hampering the implementation of patient safety in the education programs, is claimed by Ziv, Wolpe, Small and Glick (2003) to be the resistance to change from a strong professional culture. According to

Waddeel and Sohal (1998), resistance is something that should be defeated if change is to be successful. Study (Vogus, Sutcliffe and Weick, 2010) namely argues that to embed safer practice is to enable, enact and elaborate a coherent culture that sustains the salience and further development of the patient safety practices. As stated by Nieva and Sorra (2003), healthcare organizations are aware of the transformation of organizational culture that has to take place to improve patient safety. Thus, cultural change, which is also described by Kirch and Boysen (2010) and Heineman (2011) as a necessary condition for implementing patient safety, would be something unavoidable but difficult, especially in this profession. Ziv, Wolpe, Small and Glick (2003) present evidence for this, showing that this profession its use of e.g. simulation is lower due to its higher barriers. According to Wagner and Struben (2007), there are five levels in this changing process of the patient safety culture, ranging from denying till a progressive approach concerning patient safety, namely denial, reactive, bureaucratic, proactive, and progressive. GAO (2005) claims that to achieve cultural change in an organization, at least five years is needed. This knowledge combined with the different levels could explain why changing the culture to patient safety is a long and timely process and why differences exist between organizations and so countries.

## 2.5 QUALITY

Besides the differences in program composition and in cultural attitude concerning patient safety, there are also differences in health care quality between the EU countries. A relation between these variables can be expected, but cannot be accepted without any research. There are factors that can hinder a relation between these two variables, e.g. the difficulty to apply the learned competences of the postgraduate education. As a result, it is not clear if representativeness of patient safety in the programs leads to higher quality necessarily, since it can also be that other factors influence quality besides or instead of patient safety. Nevertheless, health care quality is something important for every country. According to Chassin and Galvin (1998), problems in this kind of quality are besides serious also expensive for the organization. It would lead to a burden of harm, where the burden is covered by lost lives, reduced

functioning, and wasted resources (Chassin and Galvin, 1998). Thus, there is an urgent need to ensure a high-quality health care, which is in the view of Parker, Ratzan and Lurie (2003) characterized by appropriate use of drugs and services, not misuse, overuse or underuse. The World Health Organisation already mentioned a long time ago in their report about quality assurance (World Health Organisation, 1983) that one important strategy to assure quality would be to teach the specifics of quality assurance methods and the responsibility of health professionals. It already identified the need for effective educational programs, which would contribute to the professional realm (World Health Organisation, 1983). This research will contribute by looking for patterns between the presence of patient safety in a national PGME program and the quality of a nation's health care.



### 3 MODEL AND HYPOTHESES

#### 3.1 MODELING THE INFLUENCES

Based on the discussion above, a framework is created, which can be found below.

The first step will consist of investigating the user involvement. This is needed for the overview of a country its process, which is used to see if there is indeed user-driven innovation in health care.

The degree of user involvement will be identified, which will be done by applying the five factors that are influencing the user activity according to Raasch, Herstatt and Lock (2008) to a country. The one that will be focused on, is customer satisfaction. The customer satisfaction here is examined by the experience and perception of customers concerning medical errors. In the analysis of the European Commission (2006), these two different categories together are represented by the term consumer awareness. Since this analysis is used for the analysis of this paper, the term consumer awareness will be used to present both the experience and perception of medical errors by consumers.

To analyze the presence of user-driven innovation, innovation in postgraduate education will be needed as a second variable and will therefore be analyzed in the second phase.

This is because innovation in this specializing educational phase could be expected to lead to changes in health care methods and approaches mostly, as mentioned above. In the education, patient safety is chosen as a focus for this research. This is because it is stated to be of essential value, since it would improve the health care overall (World health organization, 2008). The availability of patient safety in the program will reflect the degree of implementation of patient safety. This introduction and implementation in these postgraduate processes and programs can be seen as innovation according to the definitions of innovation in health care (Damanpour, 1991 cited in Goes and Park, 1997; West and Farr (1990 cited in Piening, 2011). Hence, to estimate the degree of patient safety innovation, the implementation degree of innovation has to be analyzed.

For analyzing this innovation, the discussed five points of Kirch and Boysen (2010), which are supported by the literature above (Thompon, Mary and Prior, 1992; Scally and Donaldson, 1998; Patey et al. , 2007; Ziv, Wolpe, Small

and Glick, 2003; Gilbert et al., 2000) will be used. Thus, innovation in patient safety in PGME is represented by the priority of patient safety as a topic in a country, the presence of electives in patient safety in PGME, the use of simulation centers in PGME, training in teamstepps in PGME, and the participation in conferences with regard to this topic. Innovation is tested by the (degree of) presence of the five points, that are mentioned to be (needed to) innovate a program optimally (Kirch and Boysen, 2010) Based on the literature (Damanpour, 1991 cited in Goes and Park, 1997; West and Farr, 1999), the more kinds of patient safety implementation, the more innovation there will be.

To complete this research, the result of the innovation will be tested. According to the World health organization (2008), patient safety innovation will improve the health care quality overall. Hence, the third stage that will be analyzed is the health care quality of a country. By inserting this third phase, it can be checked if the health care quality level of a country is indeed a result of the innovation in patient safety in postgraduate programs.

As stated before, this research will investigate if there is user-driven innovation in health care. For determining this, the pattern between the degree of consumer awareness and the level of patient safety innovation in education will be analyzed. This means that it will be checked if countries with a high degree of awareness will also have a high degree of patient safety in education, which would be an indication that user-driven innovation takes place. Secondly, it will be researched if there is a pattern between the patient safety innovation level in education and the health care rank of a country, which will be analyzed to determine if this kind of innovation is leading to higher health care quality. The process will be accomplished by analyzing if countries with a high degree of patient safety in their education system also have a high place in the health care rank of Europe. This research is thus about a possible cause, namely the awareness of consumers, and a means, by which I mean the degree of patient safety innovation in education. The third point, namely the place in the health care rank, is the result that will be tested. Nevertheless, it has to be emphasized that this is only one of the many possible relations that will

be tested. This research is not about causality, but about patterns. The reason for this is that there could be many different factors that have an influence on these aspects which cannot be controlled or excluded, e.g. financial or political situations of countries. Since these interfering variables cannot be controlled, causality cannot be guaranteed.

### 3.2 SAMPLE

In order to analyze these different stages and patterns, several countries have to be investigated. For this research, a sample of European countries is chosen because of the accessibility of the countries and the European demand for an overview of postgraduate innovation in this region.

Since analyzing all the 25 member countries is too extensive, a selection is made based on the four different regions of Europe, namely (North-)West Europe, North-Europe (Scandinavia), Southern Europe and Eastern Europe. To keep the research conveniently arranged, but also due to limited resources like time and cooperation issues, the research will be accomplished for eight European countries in these four regions. These will be: Belgium, England, Germany, Netherlands, Denmark, Sweden, Portugal, and Hungary. The analysis will be held for each of these eight countries in order to discover patterns.

### 3.3 THE MODEL

The model is representing the two trends that will be tested with regard to PGME. The first point is to find if there is user-driven innovation in postgraduate innovation. To say it in terms of this research, the first goal is to see if the awareness of consumers about medical errors is causing patient safety innovation in Europe. The second stage analyzes if the postgraduate innovation is leading to health care quality. To speak in terms of the research again, this stage represents the dilemma if innovation in patient safety in education influences the amount of mistakes in a hospital again and hence the quality level of hospitals in Europe. The arrows in the model represent these one-way relations. Based on the literature discussed before, the awareness of consumers of medical errors is expected to lead to more user-driven innovation in this area, so to more patient safety innovation in that specific country. Patient safety innovation, so developments in patient safety, in education is expected to lead to less mistakes in health care and thus to a higher place in the health care rank. Therefore, the signs in the figure are positive. The model is depicted as a three-stage model. However, it has to be emphasized that this model is not implying that stage one directly leads to stage three. The relation between the consumer awareness and the patient safety innovation, and the relation between this innovation and the health care quality, are two isolated relations that are investigated here.



Figure 1 Conceptual model.

### 3.3.1 RESEARCH QUESTIONS

Since two relating, but in this research isolated relations are investigated, the analysis can be represented by two questions: What is the effect of consumer awareness of medical errors on the innovations in patient safety in Postgraduate Medical Education? And how is this educational patient safety innovation influencing the quality of the health care in European Countries? By the first question, the user-driven innovation in health care will be studied. By the second question, the effect of educational innovation will be analyzed to determine the strength of this kind of innovation.

### 3.3.2 CAUSING FACTOR

In this first section, a possible type of innovation in health care is investigated, namely the user-driven innovation. This means that it will be analyzed if there is a pattern between the degree this factor, which is the consumer awareness, is represented in a country, and the degree of patient safety innovation that took place in postgraduate education. The goal is to estimate if user-innovation plays a role in patient safety innovation, which could have lead to differences in the degree of patient safety in countries.

So, the potential cause analyzed in this research is user-driven innovation. The amount of user-driven innovation is determined by analyzing the awareness of medical errors of consumers at first, since informed users will demand more innovation. The degree of consumer awareness is studied here by investigating the familiarity of the consumers with medical mistakes. The term medical mistakes consists of wrong medication, improper treatment, or incorrect or delayed test results (European Commission, 2006). Dividing this consumer awareness in smaller categories, a distinction can be made between the perception and the experience of medical errors. The first category, the perception of medical errors, is about the perceived severity of the problem and the level of concern about encountering a medical error in the health care system (European Commission, 2006). The second category, namely the experience users have with medical errors, is in terms of reading or hearing about them. It is about how common it is to have personally, or in the family, experienced an incident of medical misconduct (European Commission, 2006). Together, these measures will define the degree of consumer awareness,

which is one of the two factors needed for determining if user-driven innovation is represented in healthcare.

### 3.3.3 MEANS FACTORS

In this second stage, a means will be analyzed. This will be the second factor that is needed for determining if user-driven innovation is taking place in healthcare. This second phase consists of the country's education system being investigated. It is a means, since it is tested as a consequence of the first stage, namely the consumer awareness. Moreover, the next stage in the model is healthcare quality, which is the end that could be attained by it, thus a result. So, it is the middle phase of the model, determining for both other factors, and therefore called the means.

The means factor is about the degree of patient safety innovation in postgraduate medical education. The degree of patient safety innovation will be defined based on the presence of the points Kirch and Boysen (2010) mentioned, and other literature (Sally and Donaldson, Heineman, Patey et al., etc.) discussed as well. These points will be used as determinants for establishing the degree of patient safety innovation that took place in a country. The degree of patient safety innovation will thus be based on the (degree of) presence of (1) The priority of patient safety innovation in the countries, (2) The presence of countries at morbidity and mortality conferences, (3) The safety electives/courses in the PGME program, (4) The use of high-tech simulation in the PGME program, and (5) The use of teamstepps (multiprofessional and multidisciplinary teams) in the PGME program. Together, these factors will determine the degree of innovation in patient safety in the postgraduate education that has taken place.

### 3.3.4 RESULTING FACTOR

To complete the research, the result of patient safety innovation will be checked. This resulting factor will be analyzed by relating the degree of patient safety innovation, which is explained above, with the quality level of the health care of a specific country. By doing this, it will be tested if there is a pattern between patient safety innovation and healthcare quality. The (determining) influence of patient safety innovation will be tried to be identified with this settlement. Because this paper is about patient safety, or the consumer side of the healthcare systems, quality will be determined

based on the patient view as well. Therefore, the degree of quality is defined here as the extent the national healthcare systems are 'user-friendly' (Health Consumer Powerhouse, 2009). European countries are compared by a total ranking of health care systems of Europe. This total ranking is determined by a user-focused, performance-related comparison of the national healthcare systems of the European countries (Health Consumer Powerhouse, 2009).

### 3.4 HYPOTHESES

#### 3.4.1 CONSUMER AWARENESS

The first factor that is investigated is the consumer awareness, or the perception of and experience with medical errors. This analysis is based on the patient view. This is because fulfilling the consumer needs is the central point of user-driven innovation. User-driven innovation is based on a consumer knowing exactly what he wants, and these objectives mostly originate from a consumer possessing a certain level of awareness. The experience and perception of errors will determine the level of customer satisfaction. This satisfaction is of determining influence, since it is according to the literature one of the five factors leading to user-driven innovation (Raasch, Herstatt and Lock, 2008). Therefore, it can be expected that the higher the degree of awareness of medical errors in a country, the higher the user-driven innovation. Or, to say it differently, higher user-driven innovation means that the degree of innovation concerning patient safety in PGME would be higher as well. Innovation in patient safety is in this research represented by the (degree of) presence of the five points of Kirch and Boysen (2010). Hence, rephrasing it, hypothesis 1 will be

**Hypothesis #1** The higher the degree of awareness of consumers of medical errors, the higher the level of patient safety innovation in PGME will be of that country.

#### 3.4.2 DEGREE OF PATIENT SAFETY INNOVATION IN PGME

With regard to the second factor, which is the degree of patient safety innovation in PGME in the European countries, no extensive literature is provided yet. This makes it hard to create hypotheses based on scientific literature. Therefore, no hypotheses are made about the recent statuses of countries, but it is investigated and tested by hypo-

thesis 1 and 2. The statuses are analyzed by the (degree of) presence of the five points discussed above, which presence would indicate that a program is innovated optimally (Kirch and Boysen, 2010).

#### 3.4.3 QUALITY

This third factor is about the quality of the countries' health care systems. Because the total analysis is from the patient view, the quality will be determined from this view as well. The research is about patient safety, which was defined as the reduction or prevention of unnecessary or potential errors associated with health care. Less or no unnecessary/potential errors will mean that there is a high quality of health care in a country. In the previous literature, the need for education concerning patient safety is discussed for improving patient safety in health care. Therefore, it can be expected that the higher the level of patient safety innovation in PGME is, the more is known about it. This will lead to less mistakes and so to higher quality. Or, to say it differently

**Hypothesis #2** The higher the degree of patient safety innovation in PGME of a specific country, the higher the quality of its health care.



## 4 METHOD

### 4.1 DESIGN DATA GATHERING

#### 4.1.1 CONSUMER AWARENESS

For analyzing the consumers' perception of and experience with medical errors, the extensive research of the European Commission of 2006 on medical errors will be used. The organization did research on medical errors to carry out the first analysis. The results were supposed to be used for the aims of improving the safety of care for patients in all EU member states (European Commission, 2006) and is therefore suitable for this research. In the survey, the Commission firstly investigated the general perception of medical errors, which was divided into two sections. Each consist of one or more statements, which the consumers had to rank from very important to not at all important.

1. Importance of the problem
  - How important a problem do you think medical errors are in your country today?
2. Respondents are fairly confident of not to personally encounter a serious medical errors
  - All in all, how worried are you to suffer a serious medical error?
  - How worried should hospitals patients be about serious medical errors?

Secondly, the survey deepens into the experiences of medical errors. The survey is again divided into 2 subsections, each consisting of one question.

1. Visibility of medical errors
  - How often have you read or heard about medical errors in your country?
2. Personal experiences of medical errors
  - Have you or a family member suffered...
    - ..serious medical error in a local hospital?
    - ..a serious medical error from a medicine that was prescribed by a doctor?

The survey was taken in 25 European countries and answered by 24642, so almost 25000 European citizens in total. In all of the 8 countries this research will analyze, at least

thousand residents were asked, which makes it a representative sample.

#### 4.1.2 PATIENT SAFETY INNOVATION

Concerning the degree of patient safety innovation in PGME, no surveys or reports are available yet. So, to analyze the degree to which patient safety is represented in the PGME of the countries, raw data has to be gathered. A questionnaire will be used for this. The questionnaire is already existing and consists of many different questions with regard to the different factors of education. The questions concerning patient safety are selected and used for this research (Appendix 1). It is held with a highly qualified expert concerning the medical education in that country, either a Senior Policy Officer or a Director of an umbrella organization. This selection ensures that the interviewee has knowledge of the specific topics. The persons are contacted and interviewed by an employee of the UMCG, which is because of existing relationships the UMCG has with other countries. Thirdly, it will be tried to complement the data by reviewing national websites about the PGME. The subjectivity and dependency that arises because of the indirect relations is recognized. The questionnaire is established by the UMCG before this thesis was started and thus contribution in it is not possible, leading to the condition that questions and answers are not perfectly shaped for this research. Nevertheless, the questionnaire will certainly provide lots of new information of which this research will try to get new insights concerning the user-driven innovation in service innovations.

The questions will be with regard to the factors, e.g. if there is continued training, which are indicated on a dichotomous and/or a 5-point Likert Scale. They are more extensively explained by the interviewee in a second, going into deep question and/or in the face-to-face conversation. This one is recorded and can therefore be used. The planning is that the conversation takes place after the survey is filled in by the expert of a country, which can therefore be analyzed before. In the conversation, more clarification can be asked where needed. The information provided on the websites, the questionnaires, and the videotapes on which the inter-

views are recorded, are all used for the analysis of this research. In this way, it is tried to create objectivity.

#### 4.1.3 QUALITY

In this third factor, it is important to determine quality. To compare the quality of the eight European countries, the total ranking of health care systems of Europe can be analyzed. This index is offering a user-focused, performance-related comparison from 2005 to 2009. The index of 2009 is the most recent one and therefore, this one is used in this research.

The health care is scored based on 6 different disciplines, namely 1. Patient rights and information, 2. E-health, 3. Waiting time for treatment, 4. Outcomes, 5. Range and reach of services provided and 6. Pharmaceuticals. Each of these disciplines consists of several indicators, which are scored by the data provisioned by ministries and agencies in the Index Countries (Health Consumer Powerhouse, 2009) and counted up to determine the total score of each country. Based on these total scores, a rank is made, where the country with the highest score is mentioned to have the best health care and the country with the lowest score the worst.

#### 4.2 DESIGN ANALYSIS

The aim of this paper is to identify patterns between one status, namely the awareness of consumers, and another, namely the innovations and trends of patient safety in PGME. Then, it will be checked if this is influencing the quality (rank) of health care. Eight countries are analyzed, which is not enough for quantitative research. Hence, qualitative research will be applied. The research will figure out the differences in awareness of errors between the countries, the differences in innovations and trends in PGME in the countries, and the differences in the countries' quality of health care. It will devise patterns of one-way relationships between these three variables. Hence, the design of this qualitative research will be descriptive.

The first analysis chapter will be about the differences in awareness of medical errors. As explained above, this is based on the survey of the European Commission. An

overview of each country will be given based on scores. These scores will help in making comparisons objectively.

Secondly, the factors representing patient safety in the education are investigated. It will be checked for each of the eight countries if all the five factors are represented and if so, to which degree. These different factors and possible different degrees can be reported in tables. Due to this, a pattern concerning the innovations and trends can be identified for each country and an average can be made based on these results.

The third analysis consists of the discussion of health care quality. This is done by using the health care rank of the Health Consumer Powerhouse, as explained above. It will be based on total scores as well. In this way, the paper consists of a convenient approach, where objective comparisons are made based on scores of each category.

After this, each separate analysis will be linked with another. Thus, it will consist of linking the first and second with each other to see if there are patterns to be identified. Degrees will be linked and compared, so it can be seen if a higher awareness of errors by the population seems to be linked to a higher level of patient safety innovation in PGME. Thus, it will be analyzed if consumer awareness can be a possible reason for it.

The degree of patient safety innovation in PGME is also linked with the health care quality rank scores. By doing this, it will be investigated if there are patterns between the patient safety in PGME and user-focused comparisons of health care systems. It has to be emphasized here that the comparisons cannot be made by statistical analysis, because of the small sample size. Qualitative research will thus be used to investigate the patterns.

Finally, conclusions with regard to patterns will be made based on these comparisons. The European issue of equalizing the level health care will be discussed here based on these new findings. Moreover, recommendations and implications will be based on these conclusions to provide the reader with clear, useful further information and/or instructions.

## 5 ANALYSIS

### 5.1 CONSUMER AWARENESS

Consumer awareness is analyzed by numbers. To arrange this, tables are created, which are publishing each country its score next to the European score. In this way, each country can be compared with the same, average values. Outstanding numbers are marked red, emphasizing the findings. In the following part, the outstanding scores and remarkable findings are discussed for each country. The actual tables can be found in Appendix 2.

#### 5.1.1 BELGIUM

The results of the questionnaire are published in a table, which can be found in Appendix 2.1. In Belgium, the percentage of respondents that perceive medical errors as an important issue is smaller than the European average. The Belgian respondents are less worried about medical errors and think less people should be worried about experiencing it in their country than the average of Europe, which would mean that medical errors are perceived as less important in Belgium than in Europe. Looking at the experiences, it can be seen that less people heard of read about medical errors often than in Europe. Nevertheless, the actual experience is the same as the European average. The population of Belgium has far more confidence in doctors and medical staff than the European population, but think it is 44% likely that a patient in a national hospital would suffer a serious medical error, which is almost equal to the European average. Summarizing this, the Belgians are not really concerned about medical errors, which could be caused by the fact that only a small group has often read or heard about medical errors. The trust in medical staff and doctors is high, although the amount that actually experienced a serious medical error is equal to the European average. This could be indicating that consumer awareness is lacking.

#### 5.1.2 DENMARK

In Denmark, the problem of medical errors is seen as far less important than in Europe, which can be seen in the table in Appendix 2.2. Of the respondents, only a small

percentage is worried or thinks patients should be worried to experience a serious medical error in a local

hospital. The amount of respondents that heard and read about it is about the same as the European average. However, what is outstanding is the percentage of people that actually experienced a serious medical error. In Denmark, about a quarter of the respondents suffered a serious error, which is the second highest of the 25 European countries that were investigated. Hence, the respondents have less confidence in doctors and medical staff maintaining their safety than the average European resident. It is remarkable, because out of the experience numbers it can be seen that it is indeed a big problem in Denmark, though it is not recognized like that.

Since the Danish respondents do not see medical errors as an important problem, less than the European average is well up in it, trust is high but medical errors is high too, it can be stated that consumers are totally not aware of the issue in Denmark. Consumer awareness is missing here.

#### 5.1.3 GERMANY

In Germany (Appendix 2.3), the problem is valued less important than in average. The respondents that mentioned to worry about personally experiencing a serious medical error is below average, though the percentage that state that patients should be worried about medical errors in their country is almost equal to the European mean. The respondents are less abreast of medical errors than the average European resident, but this can probably be declared by the fact that a smaller amount has actually experienced a medical error.

The German residents feel relatively safe, with almost the same percentage having confidence in doctors and medical staff as the European population in average. The respondents also think it is not that likely that a patient would suffer a serious error in a national hospital. Thus, the German respondents are not valuing the problem of national medical errors as serious as the European residents do, though this can be declared by the small amounts of respondents and their family members that have experienced a serious

medical error. This can stimulate the confidence in hospitals and thus decrease the amount of people that are afraid or think you should be afraid for it.

But, based on the provided data with its low amount of people well up in medical errors, but a lot of trust in the doctors, it can be said that the consumers are not aware of the issue in Germany. Therefore, consumer awareness is stated to be low.

#### 5.1.4 HUNGARY

In Hungary, the same status can be seen as in Germany. As shown in Appendix 2.4, the Hungarian respondents perceive the problem as a bit more important, like the average European resident, but are also not worried about suffering medical errors. One notable point is the amount of respondents that heard or read about medical errors often, which is more than half of them and so far more than the European average. That would mean that the consumer awareness is relatively high in this country. Medical errors are not happening a lot, which creates trust in doctors and medical staff. So, the Hungarians see medical errors as an important problem and is aware of the issue, but it is happening below average. Hence, it can be said that the consumer awareness is high.

#### 5.1.5 NETHERLANDS

In the Netherlands, the numbers concerning people that should be worried about serious medical errors are remarkable. As can be seen in Appendix 2.5, only 20% of the persons says to worry to experience a medical error themselves, which is far below the European average. Then number of people saying that other people should be worried that it will happen to them in the Netherlands, is also below average. The respondents that actually experienced a medical error is nevertheless just below the average amount. However, the percentages show that the Dutch residents are informed relatively well about medical errors. So, the respondents believe that people should not be worried about serious medical errors in the Netherlands, and their trust in doctors and medical staff is above average, though the amount of mistakes is not relatively low. All in all, it can be said that consumer awareness is high in the Netherlands. The amount of respondents that has knowledge about it is above the average number. Besides,

medical errors are seen as an important issue. Hence, consumers are aware of health care issues.

#### 5.1.6 PORTUGAL

The residents of Portugal reported their distrust concerning medical actions, which can be seen in Appendix 2.6. Half of the people that were asked, is worried to personally experience a serious medical error. 55% of the respondents thinks patients should be worried that serious medical errors will happen to them when they are in a hospital in Portugal. This is clearly above the European average. The Portuguese people are not perfectly informed, but compared to the mean, it can be said that Portugal is regularly informed. They estimate the chance that a patient would suffer a serious medical error in a national hospital pretty high. Thus, it can be said that their trust in the national care is low. However, the numbers of people that experienced medical errors are not outstanding. They are even lower than the European average. Based on this, it can be said that the distrust is higher than would be expected concerning the actual, slightly low numbers of medical errors. Concerning consumer awareness, this means that there is an average to high amount of consumer awareness. People are educated, emphasize the problem and do not trust the health care, though the amount of errors taking place are not stated to be high, which could indicate distrust instead of consumers being aware of the situation. Nevertheless, in total, consumers are aware of the issue.

#### 5.1.7 SWEDEN

In Sweden, the numbers of people that are worried to personally experience a medical error or think patients should be worried about experiencing it, are the lowest from all the 25 countries asked. Moreover, in Appendix 2.7 it can be found that the percentage that often heard or read about it is not high, just below the average of Europe, but the trust in doctors and medical staff is relatively high. This outstanding trust is also represented by the percentage of likelihood that a patient would suffer a serious medical error, which is with its 25% the second lowest score of Europe. However, even more remarkable is that the amount of respondents that have actually experienced a serious medical error is not specifically low. It is even above the average of the European countries that were asked in this

research. Thus, the high trust is not in one line with the relatively high amount of mistakes, which could be an indication for a lack of consumer awareness concerning medical issues.

#### 5.1.8 UNITED KINGDOM

The number of people thinking they will personally experience a medical error, is relatively low in the UK compared to the mean, which is shown by Appendix 2.8. However, the percentage of people that should be worried it will happen to them when visiting a hospital in the UK is higher, just above average. The residents of the UK perceive medical problems as important and are well informed about it, even above the average of Europe. Their trust in doctors and medical staff is relatively high, especially when linked with the numbers of respondents that experienced a serious medical error, which is the same as the European mean. However, there are no real outstanding details, since in this research, the UK its scores lie around the European average. Based on these findings, it can be concluded that consumer awareness is high. The respondents are well informed and estimating the chances of errors around the European average, which is matching with the average amount of errors. Therefore, consumers are aware of the medical issue.

## 5.2 PATIENT SAFETY IN EDUCATION

The recent statuses of the eight countries are investigated by questionnaires and interviews. The countries will be discussed one by one, which will take place in alphabetical order. The discussion of one country will be divided in five parts, which are the five categories of Kirch and Boysen (2010). The information of the questionnaires and interviews will be complemented with curricula and other national documents of the countries published online. This will help to ensure accuracy concerning the framing of attitudes of the national educational systems towards patient safety.

#### 5.2.1 BELGIUM

**Priority.** The statement “patients must be safe, and receive excellent medical care in teaching settings” got a 5 on a 5 point Likert scale, meaning that Belgium fully supports this.

However, in the ranking of all the 13 topics, patient safety is ranked at 5th, so attaining this would have a medium importance for Belgium. Thus, Patient safety is an important topic for Belgium, though other topics have priority above patient safety.

**Conferences.** Joining morbidity and mortality conferences indicates the need for mobility for training and educational purposes, which is represented by the statement “Mobility for training and educational purposes of medical specialists is essential for harmonization of the quality of the medical care provided” in the questionnaire. Unfortunately, Belgium did not answer this question. The statements concerning lifelong learning, namely “In my country we have a special policy for lifelong learning of medical specialists” and “we have structured forms of continued training for medical professionals (continuing professional development)”, Belgium fully agrees. Moreover, the interviewee mentioned that graduated specialists have to keep their accreditation current by updating it every three years. They have to collect points for this by following seminars, conferences and so on. Based on this system, it can be expected that Belgian trainees and cotors join morbidity and mortality conferences, which is good for the patient safety.

**Electives.** No question in the established questionnaire relates to this subtopic. The interviewee mentioned in the interview that there are no criterions concerning the curriculum by the EU. The only standard that is given by the European Union is said to be the fact that the study takes around 6 years. In Belgium, a trainee has one day of training according to the Interviewee. He stated that putting study and profession together, a Belgian trainee works 64 hours per week. This is a relatively high amount of hours, especially compared to the other countries. Nevertheless, there are no patient safety courses to be found in the curricula of the postgraduate education. However, the interviewee claimed that trainees must have at least one or two scientific publications to continue/graduate. This would leave room for the residents to address patient safety, which has the same effect as an elective. Hence, it can be said that trainees have the opportunity to choose this topic as an intensification.

**Simulation.** The expert of Belgium fully agreed with the statement “competent performance (medical-technical and

general skills) are first mastered by residents in a clinical skills centre”, ranking it with a 5. So, skills first have to be mastered in simulation centers by trainees, before they are allowed to operate in practice. This would contribute to patient safety, since making mistakes is welcome in simulation centers and the trainees will learn from this, creating a safer environment.

**Teamstepps.** The statement concerning teamstepps, namely “The necessity of interprofessional medical education and collaborative learning will increase”, is ranked with a 5. So, Belgium fully agrees with the statement that there will be more interprofessional medical education. The interviewee claimed that this is already the case nowadays, so interprofessional medical education and collaborative learning already play a big role in Postgraduate medical education in Belgium. Hence, it can be argued that the attitude towards teamstepps is positive and progressively developing.

**Belgium in short.** For Belgium, patient safety is important, though other topics have more priority concerning the attainability. Nevertheless, Belgium stimulates their physicians to join conferences by the points they have to earn every year to keep their accreditation current. Electives concerning patient safety are not found, but the obligation to publish in academic article leaves room for developing the knowledge and awareness of patient safety. Belgium uses the simulation centers a lot, training the trainees in their competences before they will apply it in progress, ensuring safety. Finally, the Belgian experts claims that teamstepps will be important, since it is already an essential element in the education. All in all, the education system of Belgium can be said to be supportive with regard to patient safety. Especially in comparison with the other countries, Belgium its postgraduate education is very well positioned concerning patient safety.

#### 5.2.2 DENMARK

**Priority.** The statement “patients must be safe, and receive excellent medical care in teaching settings” got a 5 on a scale from 1 to 5, meaning that Denmark fully agrees with this statement. Besides, in the ranking of all the 13 health-care-related topics covered by the questionnaire, attaining

patient safety innovations is ranked with a 1 and thus as the most important innovation to attain by Denmark. The interviewee also mentioned that patient safety is a very important topic in Denmark. Hence, it can be stated that patient safety has a high priority for Denmark.

**Conferences.** Denmark ranked the essence of mobility as a 5 and thus fully agrees with the statement that “Mobility for training and educational purposes of medical specialists is essential for harmonization of the quality of the medical care provided,” indicating that Denmark’s attitude is positive towards joining conferences. However, Denmark fully disagrees both on ‘In my country we have a special policy for lifelong learning of medical specialists” and “we have structured forms of continued training for medical professionals (continuing professional development)”, which indicates that it is not obligatory. In the interview, it is mentioned that there is no funding for lifelong learning. It is stated that the five regions, who are paying the PGME and salaries in Denmark, do not want lifelong training because of its high costs. Unfortunately, no lists are available concerning the visits of morbidity and mortality conferences. So, based on the findings, it can be presumed that the value of conferences is recognized, though it is not clear if these are visited due to the voluntary instead of obligatory lifelong learning and the related high costs for employers.

**Electives.** As mentioned before, no question of the questionnaire relates to this point. However, the interviewee mentioned that the amount of courses depends on the specialty, but the average of courses in classrooms would be around one month in those six years of PGME. In the summary of PGME made by the National Board of Health, it is mentioned that training in skill laboratories is expected to increase because of the increased focus on patient safety. However, patient safety is not mentioned in the theoretical courses. Based on these findings, it can be expected that there are no specific, theoretical patient safety courses in PGME, but Denmark expects that more practical courses will take place to increase patient safety.

**Simulation.** In the questionnaire the statement “competent performance (medical-technical and general skills) are first mastered by residents in a clinical skills centre” is ranked with a 2 on a 5 point Likert scale. So, Denmark disa-

grees with the statement, meaning that performances are in general not firstly mastered in skills centers, which is a critical point. Trainees are entering practice without (surely) being able to operate.

The national Board of health of Denmark mentions in a summary of Post graduate medical training (2012) that about one-third of all trainees' postgraduate medical training takes place in skills laboratories. Especially anesthesiology and surgical specialties use the simulators, practice training etc. Nevertheless, the general consensus is stated to be that training in competencies of even more specialties could benefit from training in skill laboratory (National Board of Health, 2012). Simulation centers are thus recognized in Denmark as important, but the implementation of it seems to stagnate.

**Teamstepps.** "The necessity of interprofessional medical education and collaborative learning will increase" is ranked with a 5, indicating that Denmark fully agrees with the statement that there will be more interprofessional medical education. Moreover, the National Board of Health recommends to strengthen and incorporate interdisciplinary collaboration further into PGME. It also argues that managers and teachers are enables to strengthen the educational skills through increased collaboration with specialists. Collaboration is also covered by the general theoretical courses of Denmark that are mandatory for all trainees (National Board of Health, 2012). Hence, the attitude towards teamstepps can be seen as supportive.

**Denmark in short.** Patient safety has a high priority in Denmark, since it was ranked as the most important topic. However, it is not sure if conferences are visited, since life-long learning is not obligatory. Moreover, there are no theoretical courses to be found in PGME concerning patient safety, though Denmark expects an increase in skill laboratories to train this due to the increased focus on it in the last years. Moreover, simulation centers are valued in theory, but less in practice, since Denmark indicates skills are not mastered in simulation at first. Many trainees enter practice without mastering the skills, which is probably also why Denmark indicates that more competencies of specialties could benefit from this training. Finally, Denmark supports inter- and intraprofessional education by indicating

the need for it and having theoretical courses about collaboration.

All in all, it can be said Denmark recognizes much, but its implementation is, compared to the recognition and support, lacking. The interviewee stated: 'patient safety is very important for us, but it is already good. We already perform well, so we can look to the next problem.' This can probably declare why Denmark is not pushing it that hard.

### 5.2.3 GERMANY

Unfortunately, Germany did not answer the questionnaire. Hence, the first thought here would be to delete Germany from the analysis because of this missing data. However, the interview with an expert is executed and gave declaring information. The first thing that was emphasized in the interview was the fact that Germany does not have any postgraduate education. This indicates that other, complementing documents concerning postgraduate education are hard to find. It is explained by the expert that there is no structure in PGME in Germany. The responsibility for the performance of six years of PGME training is exclusively with the chief department, who writes a letter the trainee fulfills and what he/she has done. After these six years, the trainees get an oral examination, after which they get their certificate. There is no performance assessment, only a letter of your chief that matters. Both the universities and the government are not involved. It thus depends on the institution how and how well a doctor is educated. The interviewee mentioned teaching is seen as disturbing in Germany and is therefore struggling. Hence, it could be that it was impossible for Germany to fill in this nationally applying questionnaire. It shows that there is no patient safety in the postgraduate medical education, since no national education program exists at first, and secondly, tasks differ between institutions. The national points priority, conferences, patient safety electives, simulation and teamstepps can thus all be ranked with a zero, as a program, and thus patient safety in the program, is missing.

### 5.2.4 HUNGARY

**Priority.** Hungary ranked the statement 'patients must be safe, and receive excellent medical care in teaching settings' with a 5 in the questionnaire, meaning that it fully agrees

with it. This indicates that patient safety is important in Hungary. In the questionnaire, countries rank the importance of attaining a certain topic, and patient safety is ranked second in the list of 13 topics. This means that for the healthcare in Hungary, patient safety has a high priority.

**Conferences.** The statement concerning mobility, “Mobility for training and educational purposes of medical specialists is essential for harmonization of the quality of the medical care,” is fully supported by Hungary, who ranked it with a 5. The statements concerning lifelong learning, namely “In my country we have a special policy for lifelong learning of medical specialists” and “we have structured forms of continued training for medical professionals (continuing professional development)” are also classified with a 5. Thus, it can be argued that the attitude of Hungary concerning visiting conferences is positive. However, the interviewee is mentioning that when young doctors visit events, their work keeps piling up. Nobody is doing the work for them, and therefore the doctors don’t like to go outside for a short period. This can have a negative influence on joining morbidity and mortality conferences. Nevertheless, the expert mentioned that lifelong learning is obligatory in Hungary. If a doctor doesn’t do it, he will lose his license to practice. The interviewee claims that there are strict forms for this. Thus, even though there are issues concerning the execution, the attitude of Hungary is positive towards joining conferences to learn more.

**Electives.** No question of the questionnaire is related to this section. However, in the interview, the expert argued that there is no extra education in Hungary. The education is not separated from the working line, but integrated, indicating that there are no courses or electives in patient safety. Moreover, residents are paid by the government and relatively cheap, which is, as stated by the interviewee, maybe arising from the fact that no money has to be paid for teachers, since there are no real teachers in PGME. This statement would indicate that generally, electives are not available for PGME.

**Simulation.** In the questionnaire the statement “competent performance (medical-technical and general skills) are first mastered by residents in a clinical skills centre” is ranked with a 1 on a 5 point Likert scale. Hungary argues

that skills are not first mastered in simulation centers, which is of essence. Trainees are thus entering practice without experience in those operations. As stated before, the education in Hungary is not separated. According to the interviewee, the curriculum of residents consists of periods of working in separate departments, e.g. six weeks as internist, six weeks in ambulance, etc. Besides, he mentioned that the trainees are working 47 weeks per year. Based on these statements, it can be expected that Hungary has a situation where (most of the) experience of postgraduate medical education is acquired by operating instead of training or in simulation centers.

**Teamstepps.** The statement related to “The necessity of interprofessional medical education and collaborative learning will increase” is ranked with a 4, indicating that Hungary agrees with the statement that teamstepps will increase, but is not fully supporting it. Besides, the interviewee mentioned that there is no delegation of specialist tasks. A resident has to choose at the beginning between the specialties, and the fracture is strict. Based on these statements, it can be argued that Hungary has no interprofessional and intraprofessional work, though it is indicating that it will be implemented/developed in the next years and so it will take place more.

**Hungary in short.** Patient safety has a high priority in the PGME in Hungary and attaining it is mentioned to be very important for the country. Joining conferences is probably supported by the obligation to score points and the positive attitude towards mobility, though the work of young doctors keeps piling up, which is not stimulating. Electives are not found to be offered due to the fact that education and work is not separated in PGME in Hungary, but combined. The same applies to simulation. Residents in Hungary are working 47 weeks per year and it is indicated that there are no teachers for PGME. Based on this, it can be claimed that electives and simulation centers are not taking place (much). Moreover, Hungary’s education system is fractioned, indicating that teamstepps are not represented by the Hungarian PGME, though the expert thinks it will increase. Thus, the attitude is towards patient safety, but the execution is lacking, while courses, simulations and other kinds of trainings are mostly not taking place in Hungary.



## 5.2.5 NETHERLANDS

Unfortunately, the interview with the Dutch interviewee was not recorded. Therefore, the discussion could not be reviewed. However, questionnaires are filled in extensively and a lot of informational, deepening websites are provided. This wide provision of information resources substitutes the lack of the interview, since all the needed information is provided on the websites.

**Priority.** The statement “patients must be safe, and receive excellent medical care in teaching settings” got a 5 on a scale from 1 to 5, meaning that the Dutch system is fully supporting this statement. It is thus a priority for the Netherlands. Besides, in the ranking of all the 13 healthcare-related topics covered by the questionnaire, attaining patient safety innovations is ranked with a 1. This means that it is put forward by the Netherlands as the most important and desired innovation to attain.

Hence, it can be stated that patient safety innovation has a very high priority in the Netherlands, where it is fully supported.

**Conferences.** The statement “Mobility for training and educational purposes of medical specialists is essential for harmonization of the quality of the medical care,” got a 4 on a scale from 1 to 5. This indicates that in the Netherlands, it is seen as important to have mobility. The statements with regard to lifelong learning, namely “In my country we have a special policy for lifelong learning of medical specialists” and “we have structured forms of continued training for medical professionals (continuing professional development)” are classified with a 3 and 4 respectively. Based on these findings, it would be expected that the Netherlands has a neutral position concerning visiting of mortality and morbidity conferences in PGME. However, in the most recent framework decision (January 2011), it is emphasized that the trainee is required to attend clinical conferences (KNMG, 2011). Nevertheless, this requirement is only stating that the trainee has to attend these conferences in its own specialism. Other conferences only have to be attended in consultation with his tutor, indicating that this is happening less. Thus, it is possible that the mobility and lifelong learning has a neutral position in the Netherlands due to the fact that the obligation is only

applying to the one specialism the trainee is in. Patient safety is a broader topic and therefore maybe seen as less essential.

**Electives.** No statement in the questionnaire is related to patient safety courses. In the framework decisions and other PGME regulations, specific information about patient safety courses cannot be found. This would indicate that it does not take place. However, it can be found that University hospitals offer a wide range of patient safety trainings (UMC Utrecht, 2011). These trainings are mostly offered in-company (UMC Utrecht, 2011). This means that the trainees probably can choose from a wide range of patient safety electives, though they are not required by the PGME program, but by the employer. Nevertheless, there are patient safety courses offered to the trainees.

**Simulation.** The matching statement, “competent performance (medical-technical and general skills) are first mastered by residents in a clinical skills centre”, is ranked with a 4 by the Netherlands, indicating that most skills are first mastered in simulation centers before the trainees will execute them in practice. In documents, it can be found that a few years ago, educational simulation for trainees was recognized and adopted by certain curricula, but not by all yet (VMSzorg, 2009). Besides, it is mentioned that the Netherlands is behind other countries in this use (VMSzorg, 2009). Nevertheless, in the last years, this has been developing. Based on these findings, it can be said that nowadays, the Netherlands does work with simulation centers in the postgraduate phase, though it can be implemented more.

**Teamstepps.** The relating statement “The necessity of interprofessional medical education and collaborative learning will increase” is classified with a 5, meaning that the respondents of the Netherlands fully support it. Moreover, in the framework decision, it can be found that a specialist has to acquire certain competences in its PGME. One of these required competences is that the specialist provides effective interprofessional consultation (KNMG, 2011). A second competence that is obligatory is the requirement to contribute to effective interdisciplinary collaboration and the so called ‘chain care’ (KNMG, 2011). Thus, it can be said that teamstepps are indeed compulsory for

the PGME trainees to acquire. Hence, it can be expected that it is fully accomplished by Dutch trainees.

**The Netherlands in short.** Patient safety has a very high priority in the Netherlands, ranked at 1st position in the ranking of desired innovations. The importance is classified with a 5, indicating that it is the utmost priority of the Dutch system. Based on the findings with regard to conferences, it can be expected that trainees visit conferences, though attending morbidity and mortality conferences is not a high condition in PGME. Although patient safety electives do not seem to be offered by the program, they are offered by the University hospitals, requiring their employees to follow (some of) these trainings. This can also be a reason that it is not covered by the program itself, since work is complementing the educational part. Trainees have to follow these as an employee, and therefore it can be said that electives are represented to a certain degree. Simulation centers are used, though it is an upcoming trend of the last years. Nevertheless, it can be said that the Dutch system uses simulation centers. The last point, teamstepps, is fully covered by the PGME program, since it is one of the competences that has to be acquired by the trainee. All in all, PGME system of the Netherlands can be said to be supportive with regard to patient safety. Especially in comparison with the other countries, the postgraduate education of the Netherlands has been innovated a lot and is well positioned.

#### 5.2.6 PORTUGAL

Portugal did not respond to the interview, which is an unfortunate situation. Nevertheless, it filled in the questionnaire. Based on this, the patient safety in different points will be estimated.

**Priority.** 'Patients must be safe, and receive excellent medical care in teaching settings' is very important for Portugal, of which the expert ranked it with a 5 in the questionnaire. This indicates it is a priority for Portugal. Moreover, in the ranking of importance of attaining a topic, patient safety is ranked at 1st position. So, the expert argues it is the most important aspect to attain in the next period. Based on these remarks, it can be claimed that patient safety has a very high priority in Portugal, where leaders support it.

**Conferences.** The statement "Mobility for training and educational purposes of medical specialists is essential for harmonization of the quality of the medical care," is classified with a 4. So, Portugal thinks it is important to have mobility. The statements relating to lifelong learning, namely "In my country we have a special policy for lifelong learning of medical specialists" and "we have structured forms of continued training for medical professionals (continuing professional development)" are both answered with a 3, which is a neutral position. Based on these rankings, it can be expected that Portugal is not really stimulating the visits of morbidity and mortality conferences in PGME, though it cannot be said for sure because of the missing interview.

**Electives.** Because there no statement in the questionnaire related to courses and since no opportunity was given to take an interview, it is difficult to judge about the patient safety courses. Documents about the content of postgraduate medical education in Portugal are not published in English, leading to problems in estimating the situation in Portugal concerning courses and electives. Conclusions will be speculations and therefore, claims will not be made.

**Simulation.** The statement "competent performance (medical-technical and general skills) are first mastered by residents in a clinical skills centre" is ranked with a 4 by Portugal, meaning that it agrees that trainees first master their skills in skills centers before entering practice. In the research of Reynolds, Campos and Bernardes (2011), it was found that in PGME, simulation was only used in a small number of cases in Portugal. They mentioned that there is a large potential for expansion of simulation-based teaching methodologies. Built on this, a statement can be made that Portugal is using simulation centers, but relatively little in the postgraduate phase.

**Teamstepps.** The relating statement "The necessity of interprofessional medical education and collaborative learning will increase" is answered with a 5. Besides, in a document of a Portuguese medical school, namely the Lisbon Academic Medical Center (2011), it is mentioned that the Faculty of Medicine facilitates the creation of interdisciplinary teams by vicinity and articulation between hospitals and the school, and by exposing students to research activities that are indispensable to foster lifelong learning.

Relying on these findings, it can be expected that interdisciplinary education takes place in Portugal, which is positive concerning patient safety.

**Portugal in short.** Unfortunately, experts of Portugal did not give an opportunity for an interview. The questionnaire however was collected, which has been, together with national documents, the basis for this research.

Portugal indicated that patient safety has a very high priority, ranked at 1st place of most important aspects to attain. Based on the data related to conferences, it can be expected the trainees are not supported to visit morbidity and mortality conferences during their PGME. Concerning electives, or courses, no questions are related to it and documents are available in English. Therefore, no claims are made about this section. Simulation centers are found to be used in Portugal, though the amount of use in PGME is minimal. Nevertheless, trainees are trained to work in multidisciplinary teams, of which the importance will increase in the next period according to the Portuguese experts. All in all, the attitude of Portugal is positive, but the execution is limited. Portugal can be listed as a country that recognized the necessity of patient safety in PGME, but did not really implement it (yet).

#### 5.2.7 SWEDEN

**Priority.** The statement 'patients must be safe, and receive excellent medical care in teaching settings' is ranked with a 5 by Sweden, meaning that it fully agrees with it. This indicates the importance of patient safety. In the total ranking of all the 13 topics questioned, patients safety got the fourth place. For Sweden, it would thus be a relative important topic, though e.g. working conditions/hours and quality assurance are seen as more importantly nowadays. Nevertheless, the interviewee mentioned that patient safety is the most important thing of all. Based on this, it can be said patient safety has high priority in Sweden.

**Conferences.** The statement relating to joining conferences, "Mobility for training and educational purposes of medical specialists is essential for harmonization of the quality of the medical care," is answered by Sweden with a 5 on a scale from 1 to 5. So, Sweden is arguing that mobility is really important for quality. The statement related to lifelong learning, namely "In my country we have a special pol-

icy for lifelong learning of medical specialists", is classified with a 3 by Sweden, meaning that it is neutral in this statement. The second statement "we have structured forms of continued training for medical professionals (continuing professional development)" is answered with a 1, meaning that Sweden fully disagrees with it. Thus, there are no real special policies for lifelong learning, thus for joining conferences, and there are surely no structured forms for this continuing training form. Besides, the interviewee claimed that there is no portion of the government's money placed at the disposal of joining conferences. According to her, the employer has to pay for it. This fact combined with the statement that there are no structured forms for it, will probably decrease the amount of trainees joining morbidity and mortality conferences. The attitude of Sweden concerning these conferences is thus not found to be stimulating.

**Electives.** This point is not represented by the questionnaire. In the interview, the expert mentioned that there are also some courses you have to attend as trainee, but it depends on the specialty how much. She explicitly stated that in Sweden, a trainee learns by production. However, as stated before, there are some courses to be followed. According to the expert, a trainee has 100% education, of which 80% consists of practice. However, patient safety appears to be covered a lot by special studies, but, as stated by the interviewee, not in relation with education. It is investigated in relation to health care policy. Based on these quotes, it can be expected that there are no specific courses in PGME concerning patient safety.

**Simulation.** The statement covering this aspect, namely "competent performance (medical-technical and general skills) are first mastered by residents in a clinical skills centre", is classified with a 1 on the Likert scale by Sweden. In Sweden, skills are thus not firstly covered by the trainees before they operate in practice, which is an essential detail. Moreover, it is mentioned by the interviewee that a trainee does his specialist training in his employment. With the exception of the courses, you learn by production. She states that employers want the trainees to be productive all the time, so it is difficult to get education in the 40-hour production time you have to deliver at the moment. Based on these statements, it can be expected that Sweden does

not (primarily) educate skills by simulation centers, but trainees ‘train’ in practice, which is not supportive for patient safety.

**Teamstepps.** The relating statement, “The necessity of interprofessional medical education and collaborative learning will increase”, is classified by Sweden with a 4, indicating that it agrees with the statement that teamstepps will increase, but is not fully supporting it. The interviewee argued that in 2008, there was a third kind of curriculum concept, focused on communication skills, leadership skills, and collaboration. Specialties would like to cooperate with the medical association and with medical family etc. However, she stated, interprofessional activities is not trained by these values, though the interprofessional collaboration is learned in the PGME in Sweden. She claims the trainee learns to collaborate and delegate in PGME, because he has to do so much during its training. According to her, it is nevertheless only implicitly. It is not accessed and thus not represented explicitly. Thus, the attitude in teamstepps is positive and progressive, but not executed in a controlled way yet.

**Sweden in short.** In short, patient safety has a high priority for Sweden. It is ranked as 4th, but indicated to be very important/the most important thing of all in health care education. The attitude is thus supporting. However, this support is not founded in the attitude concerning conferences, where employers have to pay for it. The same situation applies to the case of the courses or simulation centers. The employer wants 40 hours of productivity, making it hard for the trainee to learn or practice outside the practical environment. Trainees are learning by doing, only following courses on a few subjects and not training in simulation centers. However, it is mentioned that the teamsstepps, or interprofessional and intraprofessional activities, are practiced due to the high workload of the Swedish trainee. Although it is stated to be practiced, it is not assessed. Hence, in all, the attitude of Sweden is positive, but regulations and checkpoints seem to miss, leading to possible forsaking of patient safety in education.

## 5.2.8 UNITED KINGDOM

**Priority.** The statement ‘patients must be safe, and receive excellent medical care in teaching settings’ is answered with a 5 by the United Kingdom, indicating the topic as really important. Nevertheless, in the attainability ranking, patient safety is ranked at 7th position, meaning that there are six other topics of the 13 more important than patient safety. However, a notification made by the expert here is that the United Kingdom has several bodies to ensure patient safety, probably (partly) taking over the effort in attaining it. In the interview, it was mentioned by the expert that specialists duplicate the issues of the general medical council, telling how doctors should operate, which is the overall patient safety message of hospitals. So, patient safety has some priority in England. Moreover, the United Kingdom possesses a set of standards for all postgraduate medical education and training published in one document, ‘The Trainee Doctor’, made by the General Medical Council (2011). In this document, the GMC obliges trainees to make patient safety their first concern. Based on this, it can be expected patient safety has a high priority in the United Kingdom, though the task of ensuring it is farmed out to several, independent bodies.

**Conferences.** The statement “Mobility for training and educational purposes of medical specialists is essential for harmonization of the quality of the medical care,” is answered by United Kingdom with a 3, which is a neutral answer. Additional comments in the questionnaire are made by the interviewee, claiming that mobility should not be encouraged during the Foundation Years training. Thus, during the Postgraduate medical education, mobility is not encouraged. The expert nevertheless mentioned that they acknowledge that mobility is needed to demonstrate new ways of working to doctors. This is also represented by the statements concerning lifelong learning, namely “In my country we have a special policy for lifelong learning of medical specialists” and “we have structured forms of continued training for medical professionals (continuing professional development)”, which are both ranked with a 5, fully agreeing with it. In the interview, the expert argued that mobility is not discouraged, but it is difficult. Therefore, it happens much more frequently with trained doctors. Based on these remarks, it can be expected that the

United Kingdom is not supportive towards trainees concerning joining morbidity and mortality conferences.

**Electives.** The interviewee claimed that a trainee has to train clinical governance, so patient safety, at least every year. If it is a course or not, depends on the training level and where the trainee is in his career. In the 'standards for curricula and assessment systems' (2010), the GMC points out that the learning, teaching and supervision must be designed to encourage professional conduct of the safety of the patient. Patient safety is thus something taught in PGME in England, but there is no proof that it is taught in courses.

**Simulation.** The statement "competent performance (medical-technical and general skills) are first mastered by residents in a clinical skills centre" is answered with a 3 by England. This indicated a neutral attitude, not agreeing but also not disagreeing that trainees first master their skills in simulation centers. However, in the document about the duties of the trainee, (General Medical Council, 2011), mandatory requirement 8.7 obliges that trainees must be enabled to develop and improve their skills through skills laboratories and simulated patient environments, before using these skills in clinical situations. Thus, it has to be enabled, though it is not ranked by the expert as it is really happening. The attitude of England concerning the use simulation centers before operating in practice is thus positive, but based on the ranking not accomplished completely.

**Teamstepps.** The United Kingdom ranked the statement "The necessity of interprofessional medical education and collaborative learning will increase" with a 5 on the five-point Likert scale, so the expert fully agreed with the statement that it will increase. In mandatory requirement 6.1 (General Medical Council, 2011), the GMC states that every trainee starting a post or program must be able to access a departmental induction to ensure they understand their role in the inter-professional and inter-disciplinary team. The interviewee argued that more cooperation between the programs just starts to happen. So, teamstepps are recognized and implemented as obligatory points of PGME, and hence it can be argued that based on the teamstepps section, the attitude of England towards patient safety is positive.

**United Kingdom in short.** In the United Kingdom, patient safety has priority, though it is probably not of high priority for the hospitals due to the leaders farming it out to independent bodies. Mobility is not encouraged in the United Kingdom and hence it can be expected that joining morbidity and mortality conferences as a trainee is not supported and therefore not happening much. Patient safety is something that is taught in the United Kingdom, which is positive, but it is not clear if this is taught in the shape of courses or in other ways encouraged. Simulation centers are recognized as necessary before operating, though it is not executed that strict in real life. Nevertheless, the attitude is right. Lastly, teamstepps are required in PGME, where interprofessional and inter-disciplinary activities are compulsory. All in all, the PGME of England is representing patient safety to a certain degree, which is a positive fact.

### 5.3 HEALTH CARE QUALITY

The healthcare quality is determined by using the last official health care rank that has been published by the Health Consumer Powerhouse, which is originating from 2009. The healthcare rank gives a rank of the healthcare system of the 33 European countries. To provide more insight into the differences of each sub-discipline, the means are calculated first, which can be found in the table below.

Subdiscipline	Average sub-discipline weighted scores
Patient rights and information	121,2
E-health	42,8
Waiting time for treatment	131,5
Outcomes	169,1
Range and reach of service provided	101,7
Pharmaceuticals	96,4

**Figure 2** Discipline and its average scores.

Comparisons will be based on the total rank, but also on these sub-disciplines. This will lead to more pointers and hence it will make it easier to identify certain patterns or notable, influencing points.

The individual scores of the countries will be compared to the average European score, which is in the tables displayed secondly. Remarkable scores and outstanding findings are again marked red. The scores are discussed below, whereas the tables can be found in Appendix 3. The countries will be discussed in alphabetical order.

#### 5.3.1 BELGIUM

As can be seen in the table in Appendix 3.1, the healthcare system of Belgium is ranked 11th in the Consumer Index of 2009. Most sub-disciplines scores of Belgium are around the average of the 33 countries. However, the score for waiting time for treatment is far above average. With this, the access to a medically educated person or to a treatment is meant. The high score indicates that in Belgium, you have relatively fast access. Another outstanding score is the range and reach of service provided. The Belgium score of 136 is relatively high compared to the mean of 101,7. In Belgium, there are relatively many services provided to the residents, like infant vaccinations, kidney transplants and dental care.

#### 5.3.2 DENMARK

Denmark is ranked at 2nd position and so ranked as a country with very high quality, which is depicted by the table in Appendix 3.2. Denmark got the highest score of all the investigated countries for patient rights and information, by which the involvement of and open information for patients is meant. Examples of these are the patient organizations involved in decision making, the right to a second opinion, the access to the own medical record, and having a catalogue with quality ranking. The patient is thus an important factor in the healthcare of Denmark. Besides this, Denmark has a high score on E-health, meaning that there are relatively many e-transfers and online accesses for the Danish doctors and patients.

Another sub-discipline that scored notably above average is the outcomes discipline. Even while Denmark scored below average of the waiting time for treatment, they don't have

high infection numbers or death rates. A third, remarkable score is the one of pharmaceuticals, where Denmark is first in rank together with the Netherlands. This means that Denmark has a significant high amount of subsidy, development of drugs and fast access to new drugs in comparison with the average European country.

#### 5.3.3 GERMANY

As shown in Appendix 3.3, Germany is ranked at 6th position in the healthcare systems ranking, which is a relatively high position. A remarkable sub-discipline is the waiting time for treatment. In Germany, there is relatively fast access. Another outstanding score is that of outcomes. Germany scored relatively high in this discipline, which is including deaths as result of diseases, infant deaths, infections, preventable years of life lost, and the suicide decline rate. For a population, this discipline is thus of extraordinarily value, since it is based on direct consequences for residents. Fortunately, Germany has a very high score in this, meaning that death rates are relatively low and infections happen at a relatively rare frequency. A third category that scored relatively high is the pharmaceuticals discipline. This comprises the subsidies for medicines, new development of drugs and access to new drugs, meaning that Germany has a relatively good position with regard to drugs development and use.

#### 5.3.4 HUNGARY

The healthcare of Hungary is ranked 20th in the Index, which can be seen in Appendix 3.4. Even though most numbers don't deviate significantly from the European mean, one score is outstanding. This is the score of the outcomes, which is low compared to the average European score. This means that, in comparison with Europe, Hungary has a high number of heart infarct deaths, infant deaths, infections, and a high ratio of cancer deaths and preventable years of life lost. It is a serious issue for Hungary, especially because this discipline is one of the most – if not the most - important sub-disciplines for patients.

#### 5.3.5 NETHERLANDS

As can be seen in Appendix 3.5, The Netherlands is ranked at 1st position and hence qualified as the country with the best health care system of Europe. All the sub-disciplines

scored above average. Outstanding high scores are the scores for patient rights and information, for outcomes and for pharmaceuticals. It has a shared first place in the outcomes rank, meaning that the Netherlands has extremely low death and infection rates compared to other European countries. It shares its first place in rank of pharmaceuticals with Denmark, meaning that the subsidy and the access to and development of new drugs is very well developed. A final point is the high score on E-health, indicating that the Dutch healthcare works relatively much with online systems. The European Commission stated that the Netherlands is a country without any really weak spots.

#### 5.3.6 PORTUGAL

The scores of Portugal are more spread, which can be found in the table in Appendix 3.6. In total, it is ranked 21th, which is the lowest place of these eight countries. However, rather surprisingly is that Portugal has the highest score on the sub-discipline E-health. It has widespread use of electronic patient records, electronic prescriptions and online booking of doctor appointments, leading to Portugal being the European champion on this E-health development. However, the score on waiting time for treatment is really low in comparison with the European mean, indicating that accessing doctors, specialists, scans and therapies takes a relatively long time. The other scores are around the European average. Portugal is thus low in rank mainly because of the relatively long waiting time for treatment.

#### 5.3.7 SWEDEN

As can be seen in Appendix 3.7, Sweden is ranked 9th in the index. The waiting time for Sweden is low compared to the average, meaning that patients have to wait relatively long before they can access doctors, specialists, scans or therapies. Nevertheless, the health system of Sweden is relatively good for patients. This is because Sweden has the highest score on outcomes of all European countries, meaning that Sweden has the lowest amount of infant or cancer deaths, infections, suicide, preventable years of life lost and heart infarct fatality in total. It is unfortunate that the accessibility situation is so poor, since outstanding outcomes together with a short waiting time would be a place patients would prefer to be. Another sub-discipline that scored relatively high is the range and reach of services

provided. This means that the healthcare systems are equal and there are relatively many kidney transplants, infant vaccinations, mammography processes and informal payments to doctors.

#### 5.3.8 UNITED KINGDOM

The United Kingdom is ranked at 14th position of the 33 investigated countries and is with that no distinct country. Looking at the sub-disciplines, which are shown in the table in Appendix 3.8, most scores are around the average European scores. However, the waiting time for treatment is much lower than the mean, meaning that it takes a long time for a patient in an English hospital to access a doctor, specialist or to have a scan or operation. The pharmaceuticals, another discipline, is relatively high compared to the mean. This indicates that the United Kingdom is progressive concerning developments, having relatively much subsidy and drugs development and fast access to new drugs, which is positively influencing the healthcare system.





## 6. FINDINGS

### 6.1 RESULTS

First, the results of each country will be put together to provide the total situation of a country. Based on this, hypotheses can be tested for each country. After this, the countries will be combined, so patterns can be spotted with regard to the hypotheses and other trends. The third step in this approach is to describe the patterns found here and finally, if possible, causes and clarifications will be given for these findings.

#### 6.1.1 BELGIUM

Summarizing the first analysis, it was found that Belgium is not really concerned about medical errors. This could be caused by the fact that only a small group has often read or heard about medical errors. The trust in medical staff and doctors is high, although the amount that actually experienced a serious medical error is equal to the European average. This could be indicating that consumer awareness, so the user involvement, is lacking.

In the second analysis, looking at patient safety innovation in postgraduate education, Belgium scored above average. The priority, electives, and teamstepps were represented slightly, while there were strict requirements leading to trainees joining conferences and training in simulation centers. Hence, it can be said that there has been patient safety innovation in this country.

In the third analysis, Belgium did not perform outstandingly, while it was ranked 11th in the quality ranking of 33 European countries. Waiting time for treatment and range of services were scored above average, but the outcomes, so the amount of deaths etc., was below the European average.

So, in Belgium, consumer awareness seems to lack, but the patient safety innovation in postgraduate education is high. This would mean that there is no relation between the two situations, meaning that user-driven innovation would not have taken place in this area of healthcare and is not an important method for healthcare. Moreover, even though the innovation in postgraduate education is high in Belgium, its quality is not ranked notably high. Of the 8 countries analyzed here, it had the 5th place, which is around the

average. The medium quality would argue that more innovation in patient safety in postgraduate education is not per definition leading to higher quality.

#### 6.1.2 DENMARK

According to analysis 1, a relative small amount of the consumers in Denmark is worried about patient safety, though the percentage of people that actually experienced an error is the second highest of the 25 countries investigated in that research and the highest of this research. This would indicate that consumer awareness and therefore user involvement is seriously lacking in Denmark.

In the second analysis, Denmark obtained relatively low scores either. Patient safety is of very high priority in postgraduate medical education and teamstepps are implemented. But, patient safety electives does not seem to take place, and joining conferences and training in simulation centers is not supported in Denmark. Hence, it can be said innovation in patient safety did not take place in Denmark. This result, in combination with the previous finding, could be a claim that a lack of consumer awareness leads to a lack of patient safety innovation in postgraduate medical education as well. This would mean that user-driven innovation would be an determining method for innovation in healthcare, whereas the lack of user involvement would lead to a lack of innovation.

However, in the third analysis, it appeared that Denmark its health care quality is very high. Especially the outcomes section scores high, which is remarkable because of the high amount of errors reported in analysis 1. Besides, since the patient safety innovation represented in the postgraduate education is relatively low, it is distinct that this quality assessment is so high. It would mean that innovation in patient safety is not determining for health care quality.

#### 6.1.3 GERMANY

With regard to analysis 1, it is found that Germany scored low compared to other countries. The respondents ranked the medical errors as less important than the average European respondent, and the degree of fear concerning these mistakes is lower in Germany. This can be declared by the

relatively small amount of respondents that have experienced a medical error. Confidence in hospitals and its staff is reported as high by the German respondents. On the one hand, this result indicates there is no consumer awareness and hence no user involvement, as people read and heard below average about it. However, the amount of respondents that experienced serious medical errors is also below average, which could declare the fact that the people know less about it.

Analysis 2 concerned, it was not possible to complete this research. Germany repeatedly did not answer the questionnaire. The interview was executed, but the expert clarified that there is not one common program that holds in Germany. Every institution determines the structure for himself, leading to differences between the structures and thus the quality of postgraduate programs. This can also be a reason that the questionnaire is not filled in, since it is mentioned that there is no postgraduate education, and secondly, the program differs per institution. Hence, innovation in this area is unachievable, making it impossible for Germany to answer this questionnaire about the national trends and innovations. Moreover, it is actual proof that patient safety is not covered by the postgraduate education program at all, indicating that there has not been any patient safety innovation. This can be concluded based on the statements that no education exists and on the fact that there is no nationally established, strict program. Combining this rejection with analysis 1, a trend can be identified. In Germany, people are not educated or well up in medical errors. The medical errors mentioned to be experienced are also low, leading to no user involvement in this topic. On the other hand, there is the finding analysis 2, where no patient safety and thus no patient safety innovation can be identified in postgraduate medical education at all. So, both consumer awareness concerning safety issues and patient safety innovation in postgraduate education is low in Germany. Therefore, it can be stated that hypothesis 1 holds, indicating that user-driven innovation has a determining effect on healthcare innovations.

In analysis 3, it was found that Germany got a high place in ranking, as it is placed 6th in the most recent index. Especially waiting time, outcomes and pharmaceuticals scored really high in Germany. This means that patients are treated relatively fast, death rates due to errors are significantly low and Germany is progressive in new medical developments.

Thus, Germany its health care is found to be very good. This is contradicting to the finding in analysis 2. Germany rejected to fill in the questionnaire and mentioned in the interview that no program exists, so patient safety is also not covered by it. Nevertheless, the health care quality of Germany is ranked very well. This finding would reject hypothesis 2, meaning that innovation in patient safety would not (directly) lead to higher quality in health care.

#### 6.1.4 HUNGARY

In analysis 1, it was found that in Hungary, respondents have relatively great knowledge about medical errors. Nevertheless, the failure rate is relatively low and that is why trust in doctors and medical staff is high. Putting these findings together, a high consumer awareness can be identified, indicating that users are involved in the topic.

Concerning the second analysis, results are less positive. In Hungary, patient safety is indeed a very important issue, positioned 2nd in the importance ranking. Conferences are also expected to be joined due to the obligation to lifelong learning and thus to visiting such learning possibilities. However, postgraduate education is found to be integrated with the working line. Education is not separated for trainees here and thus, electives are not offered and simulation centers are not used at all, negatively influencing the patient safety. It was also indicated during the research that Hungary did not delegate specialist tasks to others, so teamstepps are not used and therefore also not practiced. So, the degree of patient safety innovation in education is low in Hungary, though the consumer awareness seemed to be high. This would indicate that user involvement does not lead to innovation in healthcare, meaning that hypothesis 1 would not be true.

In analysis 3, Hungary was ranked 20th in the Index, which is relatively low. Investigating this further, it could be found that most numbers did not deviate significantly from the mean, except for one score, namely the outcomes. This one was really low compared to the average European score. This finding is notable, because in analysis 1, where inhabitants were asked, the number of people familiar with a mistake was, compared to the other countries investigated here, really low. However, in analysis 3, outcomes were poor compared to other European countries. This is remarkable.

With regard to hypothesis 2, Hungary is supporting. The country scored poorly on analysis 2, where patient safety innovation in postgraduate education did not really take place, and poorly on analysis 3, where the quality was analyzed. Hence, based on Hungary, it can be said innovation in patient safety does not (directly) lead to higher health care quality, and thus that hypothesis 2 holds.

#### 6.1.5 NETHERLANDS

Analysis 1 showed that consumer awareness is high in the Netherlands. The amount of respondents that has knowledge about medical errors is above the average number. Besides, the errors are seen as an important issue. Therefore, consumer awareness, and so the involvement of the users, can be ranked as high.

The second analysis covered the patient safety innovation in postgraduate education. In the Netherlands, it was found that patient safety has a very high priority, ranked as the most essential innovation to attain. Therefore, it can be said that support is available. Mobility was classified as a neutral condition. Visiting conferences is required by the program, though it depends on the tutor if the trainee has to attend morbidity and mortality conferences as well. Patient safety is not found to be covered by electives, though trainings are required by the University hospitals as employers. It is thus not required by the program outline, but employers have offer trainings for their staff. Since work is complementing the educational part, it can be said that there are some patient safety electives. Simulation centers have been upcoming in the last years. The Netherlands was behind other countries concerning simulation in PGME, but it has been implemented and developed during the last years. Therefore, it can be said that simulation centers are found to be used. Lastly, the teamstepps are fully covered by the PGME program. Requiring the trainee to attain these as competences, it can be said that the Netherlands has teamstepps in its PGME program. All in all, it can be stated that there has been a high degree of patient safety innovation in this country, since patient safety aspects are found to be relatively high.

Combining these previous analyses, hypothesis 1 would be represented. The degree of patient safety innovation in postgraduate education scored relatively high. Besides, the consumer awareness is found to be high, since the know-

ledge is about average and errors are seen as really important. This could indicate a relation between the user involvement and the innovation, meaning that the innovation in healthcare is user-driven innovation.

In analysis 3, it was found that the health care quality of the Netherlands is really high. It is ranked at 1st position in the Index, and especially its first place in outcomes and pharmaceuticals indicate the outstanding health care the Netherlands has. Patients rights and information and E-health is also ranked high. Based on these findings, it can be concluded that the Netherlands has a very high quality of health care. Combining this result with the outcome of analysis 2, hypothesis 2 is supported. Both the patient safety innovation as well as the health care quality is found to be high in the Netherlands. This would indicate that there is a relational pattern between these two stages, patient safety innovation boosting the healthcare quality.

#### 6.1.6 PORTUGAL

In analysis 1, it was found that the trust in healthcare in Portugal was relatively low. The respondents were afraid of errors and did not trust the medical personnel. However, the amount of people that witnessed a medical error is relatively low compared to other countries. Based on this, it is unclear where the high distrust originates from. Nevertheless, the respondents know a lot about medical errors in this area, indicating a high awareness. Users can be expected to be highly involved in safety topics.

The second analysis was concerned with the patient safety innovation in postgraduate medical education. In Portugal, it was found that patient safety has a high priority in the education. It is ranked as most important to attain and hence it can be said that leaders support patient safety. Mobility and exchange has a neutral position in Portugal, not ranked as important. However, due to the missing interview, it is difficult to estimate if this attitude is comprising the whole country. Data is lacking and therefore, it is also not clear if patient safety is covered by courses or electives or not. Simulation centers are found to be used, though only at a minimum level. Teamstepps are nevertheless applied due to the collaboration between the different centers. Thus, in all, there is relatively few patient safety innovation found to be represented by the postgraduate

program, though the interview is missing and thus data is less complete than in other cases.

Combining these previous analyses, hypothesis 1 would be represented. The degree of patient safety innovation in postgraduate education scored around the average of the countries investigated. This slightly active attitude could be influenced by the surplus of distrust found in analysis 1, which could indicate a relation between the user involvement and innovation. Nevertheless, the amount of medical errors reported in analysis 1 is low, which is a distinct given compared to the other findings.

Concerning analysis 3, Portugal scored relatively low. It is ranked at 21th position in the index and is thus ranked at the lowest place of all the eight countries investigated here. Most topics scored around the European average, but especially the waiting time for treatment in Portugal is significantly longer. Linking this finding with patient safety innovation, hypothesis 2 would not be supported. Compared to the other investigated countries, Portugal its patient safety innovation in postgraduate medical education scored around average, though it has the lowest score in the quality ranking. This would indicate that there is no direct relation between patient safety innovation in postgraduate medical education and health care quality.

#### 6.1.7 SWEDEN

In the first analysis, it was found that in Sweden, relatively few respondents are afraid of medical errors. They perceive their healthcare as one with high quality. Nevertheless, the amount of respondents that actually experienced a medical error is not relatively low: it is even slightly higher than the European average. Besides, it is found that the Swedish respondents are less educated about these errors than the average European respondent. All in all, this would indicate that the users of Sweden are not very involved, meaning that Sweden does not have a high consumer awareness in healthcare.

In analysis 2, it was discovered that Sweden does not really cover patient safety by its postgraduate medical education. It has a kind of priority, but other topics are more important. Conferences are supported to be joined by obligations, but patient safety is not covered by courses in Sweden. Moreover, simulation centers are not used at all. The trainee is working immediately, testing his knowledge

in practice directly. Teamstepps would be used according to the interview, but only implicitly. This is because it is not listed in the checking list, but needed to fulfill the tasks in a certain amount of time. Putting these findings together, it can be said that there is no high consumer awareness in Sweden concerning health care, and secondly, patient safety innovation only took place slightly in the Swedish postgraduate medical education. This would indicate that user-driven innovation is determining for the patient safety situation and so hypothesis 1 holds.

Analysis 3 concerned, Sweden is ranked relatively high, at 9th position in the index. The waiting time is relatively low, meaning that it takes a long time before patients are treated. However, Sweden has the highest score on the outcomes section, indicating that it has the lowest amount of deaths, infections etc., which is an extraordinary achievement. It signals that patients are safe in Sweden. Relating these findings to analysis 2, it would indicate that hypothesis 2 cannot be considered as valid, since the degree of patient safety innovation in postgraduate medical education in Sweden is low, but the healthcare quality is high.

#### 6.1.8 UNITED KINGDOM

In analysis 1, the United Kingdom scored around the European average. The respondents were well informed, estimating the chances of errors around the European average, which is matching with the average amount of errors. These two matching factors are showing consumer awareness. Nevertheless, it is not found to be extreme, since the respondents are only moderately educated. The user involvement can thus be estimated as medium.

In analysis 2, it was found that the United Kingdom prioritized patient safety, but it is not its highest priority. Mobility is not encouraged, but courses are, which creates opportunity for patient safety being covered. The need of simulation centers is recognized, but not used in a strict way, but teamstepps are again covered by the requirements of the postgraduate education. All in all, England had innovation in patient safety to a certain, median degree. It took place, but not in an extreme way. This finding is the same as in analysis 1, where the consumer awareness was at a medium level. Hence, it could indicate that hypothesis 1 holds.

Total healthcare quality concerned, analysis 3 is implemented in this research. England was ranked 14th in the index, which is an average score. Investigating this score further, it could be found that it scored really low on waiting time for treatment, meaning that patients have to wait a long time before they can be treated. However, pharmaceuticals scored high, showing the progressive attitude of England towards research and development.

All in all, the final score of analysis 3 is an average score too, with its 14th position in a ranking of 33 European countries. Since the innovation in patient safety in PGME is found to be represented at a medium level in England, an indication can be found here for a relation between the innovation and the total health care quality, as analysis 3 also scored moderately. This would mean that hypothesis 2 could be true.

## 6.2 DISCUSSION

Based on the analyses of all the eight countries, different conclusions can be made.

First, the user involvement will be discussed, which is represented in this research by the term 'consumer awareness'. By this term, the perception and the experience of medical errors is meant. The first hypothesis was linked to the relation between user involvement and the innovation in patient safety in PGME. By investigating this relation, it could be analyzed if user-driven innovation plays a role in the healthcare. Based on the literature, a positive relation would be expected between these two stages, and therefore the first hypothesis was 'The higher the degree of awareness of consumers of medical errors, the higher the level of patient safety innovation in PGME will be of that country'.

In this research, it appeared that 6 of the 8 countries that are investigated supported this hypothesis, namely Denmark, Germany, the Netherlands, Portugal, Sweden, and the United Kingdom. Only in two countries, namely Belgium and Hungary, there was a high consumer awareness, but a low degree of patient safety innovation in the post-graduate medical education. In the other six countries, the level of consumer awareness and the level of patient safety in postgraduate education were more or less equally high. To arrange these findings, the supporting and rejecting countries of the hypotheses are depicted, which can be

found below.



**Figure 3** Results hypothesis 1 Europe.

As can be seen in the picture, the rejecting countries are not forming a regional trend. Belgium and Hungary are not identifying a European area, so there is no structural division to be found between the supporting and rejecting countries. This emphasizes the statement that Belgium and Hungary are not representing a trend in a certain area of Europe.

Therefore, six of eight countries supporting the hypothesis would be an justified argument to state that hypothesis 1 holds.

Hence, in this research, it can be accepted that the higher the degree of consumer awareness, the higher the level of patient safety innovation in PGME of a specific country. This indicates that the degree of innovation would be related to user involvement. Therefore, it can be stated that user-driven innovation plays a big role in patient safety, so in healthcare. It probably plays a bigger role than most literature expected. The attitude of users would be determining for the degree of innovation that takes place, meaning that the innovation in safety would lie in the hands of the consumers. By this, I mean that the consumers can influence the patient safety in their country, as their seems to be

a clear pattern between their involvement and the innovation in patient safety in Europe.

Secondly, the relation between the innovation in patient safety and the health care quality is reviewed. By health care quality, the quality of a national health care system is meant. Based on previous literature, it could be expected that there was again a positive relation to be found between the two stages. To investigate this expected relation, a second hypothesis was formulated, namely “The higher the degree of patient safety innovation in PGME of a specific country, the higher the quality of its health care. Based on the analyses that have been accomplished in this research, the supporting and rejecting countries can be framed in a map as well.



**Figure 4** Results hypothesis 2 Europe.

Five of the eight countries have a contradicting situation. By this, it is meant that they have either high patient safety innovation in postgraduate medical education and a low quality rank position, or a low degree of patient safety innovation in postgraduate medical education but a high quality rank position. Both these situations are not supporting the hypothesis and hence, it can be stated that five of the eight countries investigated are rejecting hypothesis 2.

Moreover, the countries rejecting or supporting the hypotheses, are not forming areas. The supporting countries are spread over the area that has been investigated. These results mean that a higher degree of patient safety innovation in PGME in a specific country does not seem to lead (directly) to a higher health care quality. So, innovation in patient safety does not seem to be the main driver for health care quality experienced by consumers, indicating that there are other factors that consumers value (more) and determine the level of quality.

Looking for patterns, several trends can be identified as well. In North-Europe, or Scandinavia, a notable point concerning the experienced medical errors can be found. In Sweden, but especially in Denmark, the amount of medical errors that is reported is surprisingly high, especially compared to the high quality ranking of both countries. They were placed at 9th and 2th respectively, and Sweden even got a shared, first place in outcomes with the Netherlands. This would be contradicting to the high amount of errors that is reported.

In Portugal and Hungary on the other hand, so the countries representing Southern Europe and Eastern Europe, very few people mentioned that they had experienced a medical error. Nevertheless, the positions of these countries in the quality ranking where relatively low, respectively 21th and 20th. In Hungary, this was even due to the fact that the outcomes score was so low. This low score would not match with the low amount of people that reported an error. So, In North-Europe, the amount of errors that is experienced is high, though the quality and thus the outcomes are also ranked high, while in Southern and Eastern Europe the amount of errors experienced are relatively low, but the outcomes and so the quality ranking is also ranked low. This is a contradicting finding, which I will try to explain.

At first, this can arise from the image respondents have of medical errors. It is possible that the definition of a ‘serious medical error’ differs between the respondents of Denmark and Sweden and the respondents of Portugal and Hungary. The limit of a ‘serious medical error’ cannot be set in scores or numbers, meaning that answering these questions will always be subjective to a certain degree. Although a broad definition can be given, it is a personal measure that decides if it fits the definition.

Secondly, the difference can originate from differences in medical transparency. It depends on the condition if every serious error is recognized and reported to patients and official boards. The expert of Denmark for example stated in the interview that the residents will report the known errors they made, since a safe environment is created for that. By known errors, it is meant that residents can also make mistakes without being aware of it, which are unknown errors. Since the residents do not know about this, they cannot report them. Besides, he mentioned that in Denmark, it is very easy to complain as a patient if you are mistreated. So, if errors are made but not reported, it can also become known by these complaints. The interviewee stated that the managers will take the doctors from those things and check the complaints. If they are right, the specialist will be stopped and the license to operate will be suspended by the board.

The expert representing Hungary however mentioned that although trainees are set to be free to discuss everything, it is differently in practice. The interviewee stated that Hungary works with the Bismarck system, which is a strict hierarchy. Therefore a resident has to be very good to be free and safe to say anything he or she does not like. Based on this strict hierarchy and thus limitations concerning opinions and statements, it can also be expected that reporting mistakes is valued less. As a trainee, a doctor is very low in the hierarchy of specialists, and the limited freedom concerning opinions also shows that trainees are not valued highly. When the specialists are graduated and older, they are higher in hierarchy and thus feeling better. Nevertheless, this could also have a negative influence. The high position and the matching respect can prevent a specialist from reporting mistakes.

There are thus clear differences in working environment between the areas. This can lead to the more concealing or reporting of errors, depending on the environment. If the specialists in Scandinavia are safer in reporting mistakes and have more chance of trouble when they do not, the percentage of errors that is reported will be much higher. In this case, respondents will more often know they experienced a medical error and thus the numbers of this area will be higher than the scores of the region where mistakes are hidden. Based on this pattern, user involvement does not seem to be determined by the user only, but also by the environment. The environment can influence the user in-

volvement by providing or hiding the knowledge that is needed to create involvement. User involvement is found to be a factor influencing user-driven innovation. However, based on this, it could be said that it is not only originating from the users, but also from the environment. The providing or hiding attitude of the environment influences the opportunities for users to be involved, which is determining for the degree user-driven innovation can or will take place in a country.

Another pattern that can be seen, is the level of consumer awareness compared to the quality ranking. Denmark, Germany, Sweden, and Belgium were placed 2nd, 6th, 9th, and 11th respectively in the quality ranking of Europe. In these countries, the consumer awareness is found to be lacking.

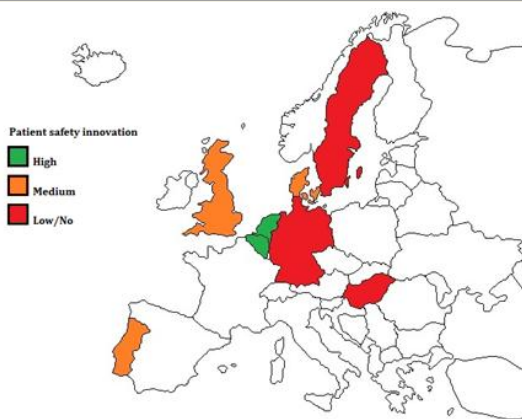
In England, Hungary, and Portugal, respectively positioned 14th, 20th, and 21st, consumer awareness was on the other hand found to be moderate to high, with residents being well up with the medical issues. However, only the Netherlands does not fit in this division. The Netherlands is ranked 1st in the quality ranking, but the residents also reported a relatively great knowledge of mistakes and a high importance of the issue. So, in this research, the trend is found that in case consumer awareness was high, the country its quality was ranked low. The opposite trend was also found, except for the Netherlands. An explanation for this can be the amount of media attention. In case of England, Hungary and Portugal, scores were low because of long waiting times and/or bad outcomes. In these countries, mistakes and serious consequences happen more often. It can be expected that the media adapts to it by doing more research into the topic and publishing more about it, since the subject is more a top-of-mind topic here than in countries where quality is good. By these publications, users will get more involved in the issues. The media attention could thus be a reason that the residents are more aware of the issue in these countries.

Another reason could be the interest of the residents. When people experience medical errors more often, it could be expected that they want to read about it more as well. In case a specific person, or his close friends or family, will have surgery, he would probably deepen more into medical issues and consequences when this surgery takes place in a country where its quality is not that good, compared to a country where quality is ranked high. A high

ranking helps the patients to feel safe, which will likely lead to less need to be fully informed about medical issues. On the other hand, an unsafe environment creates the need to be informed very well about all possible consequences. It is thus possible that the given quality of a country is influencing the willingness of a user to get involved, indicating that there would possibly be a one-way relation between stage 3 and stage 1 as well.

Looking at the quality scores, a third pattern can be seen. The two lowest ranking places are of Portugal and Hungary, the countries representing Southern and Eastern Europe. North-Europe, so Denmark and Sweden, are particularly good. North-West Europe, including the Netherlands, Germany, Belgium and England, are doing great, though Belgium and England are clearly of less quality than the Netherlands and Germany are. Thus, the health care of the countries in North-West and North Europe still seems to be particularly better than the medical care of Southern and Eastern Europe, even though all these countries are united by the same, comprehensive organization, namely the European Union. So, based on this research, the position of a country seems to be a driver of the healthcare quality level.

Fourthly, when framing the amount of patient safety in PGME, a division can be found.



**Figure 5** Different degrees in patient safety innovation.

The amount of patient safety innovation in the Netherlands and Belgium is high, whereas Denmark, England and Portugal only have a certain amount of the aspects covered by their program. Sweden, Germany and Hungary did not have patient safety specifically in their postgraduate programs. Depicting this, a pattern can be seen in the degrees, which can be seen in figure 5.

The Netherlands and Belgium have central positions compared to the countries investigated in this research. They have a high degree of patient safety innovation in their PGME. Denmark, England and Portugal are more or less at the left side of them. Sweden, Germany and Hungary, the countries that do not have any patient safety at all, are positioned at the right of the Netherlands and Belgium. This division is notable. It is not gradually changing, as would be expected.

The difference in degrees can thus not be declared by fellow influences. However, a pattern can be seen in memberships of the European Union and the degree of innovation in patient safety in PGME.

The Netherlands, Belgium, and Germany became a member of the European Union in 1951. The UK and Denmark became a member in 1973. The next one is Portugal, who joined the European Union in 1986. Sweden became a member in 1995, and lastly, Hungary joined the Union in 2004. Except for Germany, these memberships can be seen in relation with the colors. Belgium and the Netherlands were the earliest, and have the highest degree of patient safety in their program. The UK, Denmark, and Portugal, who joined between 1970 and 1990, have a medium degree of patient safety in their program, where some aspects are covered. The last countries of this research that became a member, namely Sweden and Hungary, have a very low degree of patient safety in PGME. Only Germany is an exception, since it joined the Union already in 1951, but it has no patient safety in its program at all.

This pattern would possibly indicate that the degree of patient safety innovation in PGME depends on the length of the membership of the European Union. Combining this finding with the other patterns discussed, a trend can be identified. The countries that are member for a long time, are possibly more open towards the consumers, having a culture of reporting instead of hiding mistakes. This would lead to more user involvement and thus to more innova-



tion in patient safety. Linking this finding with the last observation, it could be expected that the European Union would support to be open and transparent to the customer. The oldest members, who are influenced most by the Union, would be open and transparent. If this is the case, improvement could be expected in the worst countries, since members will automatically become older. However, on the other hand, it would indicate that it is hard to equalize the safety in countries. There will be a difference between the first and last country that became/becomes a member and this difference cannot be removed. Hence, it would be an indication that it would, if it's even possible, be hard to equalize the PGME in the countries.

Nevertheless, details have to be investigated further before these trends can be confirmed. Furthermore, explanations for the patterns have to be investigated further before scientifically-supported statements can be made.



## 7 CONCLUSIONS AND FURTHER

### 7.1 CONCLUSION

This research was executed to investigate user-driven innovation in the healthcare education. To define the analysis, the topic patient safety in the postgraduate educational phase was chosen as the focus. For this research, a three-stage model was tested, for which eight European countries were investigated. Firstly, user involvement was determined, which was done by investigating the consumer awareness of the countries. Four countries were found to lack consumer awareness, namely Belgium, Denmark, Germany, and Sweden. The UK and Portugal had an average degree of consumer awareness, whereas it was found to be high in Hungary and the Netherlands. Secondly, the degree of patient safety innovation in postgraduate education was measured. This was done by reviewing five factors, namely priority of patient safety, conferences in patient safety, electives in the topic, simulation and teamstepps. Together, these factors determine the degree of patient safety innovation in PGME in a certain country. Especially the Netherlands and Belgium were found to have a high degree, since (almost) each factor was represented in the education. In the education program of the United Kingdom, Denmark, and Portugal, a medium degree of patient safety was perceived. For Germany, Hungary, and Sweden, it was found that no particular patient safety factors are implemented in the program. These two stages were analyzed to investigate if user-driven innovation is present in healthcare education. Linking the two analyses together, a pattern can be found. Based on these countries, it can be stated that the higher the degree of consumer awareness, the higher the level innovation in patient safety in a national PGME. The amount of residents that perceive medical problems as important in their country and/or have experienced serious medical issues form the user involvement. According to these findings, the involvement can be expected to determine the level of patient safety innovation in PGME in that country. This means that user-driven innovation would have an urgent role in the healthcare sector. This knowledge can be of essential value for a country and its users, as

they have a bigger influence on healthcare education than was mentioned in literature before. It is the attitude of the users that is of

determining value, which is stressing the role of the consumer. Besides, it is possible that this finding is applying to more national situations. Because it is found that users even have essential influence in nationwide, organizational arrangements, this research indicates that the power of the user would be unlimited nowadays. This high consumer power corresponding to (semi) state bodies has not been explicitly mentioned in the innovation literature before. Nevertheless, it is important for users as well as for the (nationwide) organizations to realize this power, since the users have a determining role concerning change processes.

The third stage in this research was about health care quality. The Netherlands and Denmark were ranked best, with 1st and 2nd place respectively. Germany, Sweden, Belgium, and the United Kingdom got average scores, positioned at 6th, 9th, 11th and 14th respectively. Hungary and Portugal were low in ranking, as the countries were ranked as respectively 20th and 21th.

Combining these results with the second analysis, it was not found to be true that a higher degree of patient safety innovation in PGME is linked to a higher degree of health care quality. Even though education seems to be the basis of a high qualified system, it is not detected as a determining factor. Hence, it can be stated that there are (also) other factors needed to improve the health care quality of a certain country.

Due to this research, several patterns are found. Firstly, it is seen that in North-Europe, the percentage of respondents that experienced a medical error is high. However, the outcomes, and so the health care quality, is ranked highly. In Southern-Europe and Eastern-Europe it is the other way around: a low amount of respondents is reporting errors, but the countries also got a low position in the quality ranking. This contradiction could arise from a difference in the definition of a 'serious medical error' in a country, as the definition cannot be clarified by numbers or clear limits.

Therefore, there will always be some subjectivity in the definition, leading to different interpretations. Secondly, it can arise from a difference in transparency: in Northern-Europe, the doctors are supported to tell their mistakes, while for example in Hungary, the environment leaves more room for hiding mistakes. This could make the difference between patients knowing and not knowing they experienced a serious medical error. So, the degree of user involvement is not only influenced by the users themselves, but also by the environment. The transparency of the environment is influencing the user involvement, which is one of the factors leading to user-driven innovation. The attitude of a national environment is thus found to be determining for the degree of innovation that takes place in a certain country. This influence is not specifically mentioned in previous literature, but an important finding. It emphasizes that countries, that want innovation, have to arrange a supportive environment at first. A supportive environment will be the foundation for user-driven innovation. This is because user involvement will evolve on the support, which is one of the factors leading to user-driven innovation.

A second pattern can be found between the awareness and the quality. In the countries where the consumer awareness was found to be high, the quality was found to be low. The contradicting trend was also detected: in case the consumer awareness was found to be low, quality was found to be high. This pattern could be declared by several reasons. First, it could be that the patients need to be more informed to ensure their safety. In a country where health care quality is low, being fully informed about possible consequences etc. is necessary to make a decision. A second explanation can be that in countries where mistakes are high, there is probably more media attention for it. It is happening more and the topic is more on top of mind. The media will adapt to this trend, which can lead to more publications and so more consumer awareness. The high degree of mistakes and the matching media attention will involve the people in the medical issues. Thus, user involvement could be relatively higher in some countries than in others, because of the higher need to be involved or because of the relatively high amount of media attention.

A third trend can be seen in the health care quality. Although all the countries are a member of the European

Union, there are still big differences in quality. The division can be found between North(-west) Europe and Southern and Eastern Europe. The health care of the countries in North and North West Europe is ranked significantly higher than the quality of the countries in Southern and Eastern Europe. So, there are still great differences between different areas in Europe and their health care quality. Hence, it can be stated that although innovations are not found to be determining for the overall healthcare quality level, the position of a country is.

A fourth innovation pattern is found in the level of patient safety innovation in PGME. The level of patient safety innovation in PGME could be divided into three degree categories, namely high, moderate and low. Combining this with the order of becoming a member of the European Union, a pattern can be seen. For this, there are also three time categories made, namely the 'starters' in 1951, the countries that joined between 1970 and 1990, and the countries that joined the EU after 1990. Except for Germany, it is observed that the later countries joined the European Union, the less innovation in patient safety was found in their PGME. Putting this finding together with the other results, it can be expected that the European Union supports the countries to be open and transparent to the customer. This is because the open attitude of a country is found to lead to user involvement, which is one of the factors leading to innovation in patient safety. The oldest members would be most transparent and thus the levels of innovations are highest in these countries. Thus, it is found that innovation in nationwide procedures is not something implemented easily, but is arising from a supportive basis, which is a time-consuming process to create.

If this finding holds, improvement could be expected in less developed countries, since members will become older and time could be used to create this needed basis. However, it would also be an indication that it will be hard to equalize the safety level in the European Union, since the age difference of the member countries will persist. This would mean that it would be very hard to get the same degree of innovation in different countries. Differences in innovation will continue in this case, even though the countries are united. Nevertheless, further investigations are needed to confirm this finding.

## 7.2 LIMITATIONS AND FURTHER RESEARCH

Of course there are some limitations about this research. At first, only eight countries are investigated, where only one country is representing Southern-Europe and one Eastern-Europe. Expanding this amount was not possible for this thesis, though it would be desirable. The conclusions of these areas are now based on only one country, which can lead to a distorted image of an area. Therefore, further research with more countries is necessary to check the findings for a broader region.

Secondly, an existing database was used. Questionnaires of the European Commission and the Health Consumer Powerhouse were utilized for this research. Besides, questionnaires and interviews that were held by the UMCG were applied. The advantage of this approach is the width of the research, as it takes years to collect all these data. However, the disadvantage is that the questionnaire existed before this research started and hence, interviews were taken without personal contribution with regard to the questions. Using this data is meant to be a starting point, an eye-opener, but further, deepening research is needed to check the findings and the reasons behind it.

Furthermore, patterns are tried to be explained, though it is possible that more explanations exist. The goal of this research is to identify trends. Attempted clarifications of these patterns were made, though they are not meant to define the reasons. The clarifications only served as possible starting points for further research. It is impossible at this stage to point out with certainty where the differences arise from. A lot more research is needed to verify these patterns and to define the reasons behind it.

Lastly, this research was set up as a qualitative research. Qualitative research is used to explore issues and understanding phenomena. However, it is not as objective as quantitative research is. Personal influence is tried to avoid by using a lot of information and as much information channels as possible, but complete objectivity cannot be guaranteed. Some assumptions had to be made on little information available, which could have led to subjectivity. Therefore, more research is advised. Qualitative research by other researchers could complement the statements. Besides, it would be complementary to consider a quantitative research, whereas statistical methods can guarantee objectivity.



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## APPENDIX 1 – QUESTIONS

### IMPORTANCE

1. “Patients must be safe, and receive excellent medical care in teaching settings.”
2. Ranking attainability topics: place of “patient safety”.

### CONFERENCES

1. “Mobility and exchange for training and education purposes of medical specialists is essential for the harmonisation of the quality of medical care in the EU.”
2. “In my country we have a special policy for lifelong learning of medical specialists.”
3. “We have structured forms of continued training for medical professionals (continuing professional development).”

### ELECTIVES

No question related

### SIMULATION TRAINING

1. “Competent performance (medical-technical and general skills) are first mastered by the residents in a clinical skills centre.”

### INTERPROFESSIONAL

1. “The necessity of interprofessional medical education and collaborative learning will increase.”

## APPENDIX 2 – TABLES ANALYSIS 1

### A2.1 BELGIUM

Subject		Belgium in %	Europe in %
<b>General perception of medical errors</b>			
1) % perceive medical error as an important problem	yes	72	78
	no	28	20
2) % worried to personally experience a serious medical error	yes	39	40
	no	61	58
3) % 'hospital patients should be worried about serious medical errors when they are in a hospital in my country'	yes	39	47
	no	60	48
<b>Experiences of medical errors</b>			
4) % read/heard about medical errors	often	28	34
	sometimes	54	44
	rarely	15	18
5) % of respondents has experienced a serious medical error	a) in a local hospital	18	18
	b) from a medicine prescribed by a doctor	11	11
<b>Practical implications</b>			
6) % Confident that a group would not make a medical errors that could harm him	a) doctors	85	69
	b) medical staff	86	68
7) % likely that a patient in a national hospital would suffer a serious medical error		44	47

**Figure 6** Consumer awareness results for Belgium.

### A2.2 DENMARK

Subject		Denmark in %	Europe in %
<b>* General perception of medical errors</b>			
1) % perceive medical errors as an important problem	yes	49	78
	no	48	20
2) % worried to personally experience a serious medical error	yes	29	40
	no	69	58
3) % 'hospital patients should be worried about serious medical errors when	yes	33	47
	no	65	48

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they are in a hospital in my country'

**\* Experiences of medical errors**

4) % read/heard about medical errors	often	31	34
	sometimes	52	44
	rarely	14	18
5) % of respondents has experienced a serious medical error			
a) in a local hospital	a)	28	18
b) from a medicine prescribed by a doctor	b)	21	11
<b>* Practical implications</b>			
6) % Confident that a group would not make a medical errors that could harm him			
a) doctors	a)	58	69
b) medical staff	b)	58	68
7) % likely that a patient in a national hospital would suffer a serious medical error		41	47

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**Figure 7** Consumer awareness results for Denmark.

A2.3. GERMANY

Subject		Germany in %	Europe in %
<b>* General perception of medical errors</b>			
1) % perceive medical errors as an important problem	yes	72	78
	no	24	20
2) % worried to personally experience a serious medical error	yes	29	40
	no	69	58
3) % 'hospital patients should be worried about serious medical errors when	yes	42	47
	no	55	48
they are in a hospital in my country'			
<b>* Experiences of medical errors</b>			
4) % read/heard about medical errors	often	22	34
	sometimes	42	44
	rarely	30	18
	never	5	-
5) % of respondents has experienced a serious medical error			
a) in a local hospital	a)	12	18
b) from a medicine prescribed by a doctor	b)	7	11
<b>* Practical implications</b>			

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6) % Confident that a group would not make a medical errors that could harm him			
a) doctors	a)	63	69
b) medical staff	b)	65	68
7) % likely that a patient in a national hospital would suffer a serious medical error			
		38	47

**Figure 8** Results consumer awareness for Germany.

#### A2.4 HUNGARY

Subject		Hungary in %	Europe in %
<b>* General perception of medical errors</b>			
1) % perceive medical errors as an important problem	yes	78	78
	no	20	20
2) % worried to personally experience a serious medical error	yes	37	40
	no	60	58
3) % 'hospital patients should be worried about serious medical errors when they are in a hospital in my country'	yes	42	47
	no	54	48
<b>* Experiences of medical errors</b>			
4) % read/heard about medical errors	often	52	34
	sometimes	34	44
	rarely	13	18
5) % of respondents has experienced a serious medical error			
a) in a local hospital	a)	12	18
b) from a medicine prescribed by a doctor	b)	8	11
<b>* Practical implications</b>			
6) % Confident that a group would not make a medical errors that could harm him			
a) doctors	a)	77	69
b) medical staff	b)	76	68
7) % likely that a patient in a national hospital would suffer a serious medical error			
		45	47

**Figure 9** Results consumer awareness for Hungary.

A2.5 THE NETHERLANDS

Subject		Holland in %	Europe in %
<b>* General perception of medical errors</b>			
1) % perceive medical errors as an important problem	yes	82	78
	no	17	20
2) % worried to personally experience a serious medical error	yes	<b>20</b>	<b>40</b>
	no	79	58
3) % 'hospital patients should be worried about serious medical errors when they are in a hospital in my country'	yes	<b>37</b>	<b>47</b>
	no	61	48
<b>* Experiences of medical errors</b>			
4) % read/heard about medical errors	often	36	34
	sometimes	56	44
	rarely	7	18
5) % of respondents has experienced a serious medical error	a) in a local hospital	17	18
	b) from a medicine prescribed by a doctor	9	11
<b>* Practical implications</b>			
6) % Confident that a group would not make a medical errors that could harm him	a) doctors	72	69
	b) medical staff	72	68
7) % likely that a patient in a national hospital would suffer a serious medical error		34	47

Figure 10 Results consumer awareness for the Netherlands.

A2.6 PORTUGAL

Subject		Portugal in %	Europe in %
<b>* General perception of medical errors</b>			
1) % perceive medical errors as an important problem	yes	77	78
	no	21	20
2) % worried to personally experience a serious medical error	yes	<b>50</b>	<b>40</b>
	no	47	58
3) % 'hospital patients should be worried about serious medical errors when they are in a hospital in my country'	yes	<b>55</b>	<b>47</b>
	no	39	48
<b>* Experiences of medical errors</b>			
4) % read/heard about medical errors	often	27	34
	sometimes	57	44
	rarely	11	18

5) % of respondents has experienced a serious medical error			
a) in a local hospital	a)	16	18
b) from a medicine prescribed by a doctor	b)	10	11
<b>* Practical implications</b>			
6) % Confident that a group would not make a medical errors that could harm him			
a) doctors	a)	68	69
b) medical staff	b)	68	68
7) % likely that a patient in a national hospital would suffer a serious medical error		<b>59</b>	<b>47</b>

**Figure 11** Results consumer awareness Portugal.

A2.7 SWEDEN

Subject		Sweden in %	Europe in %
<b>* General perception of medical errors</b>			
1) % perceive medical errors as an important problem	yes	75	78
	no	24	20
2) % worried to personally experience a serious medical error	yes	<b>13</b>	<b>40</b>
	no	86	58
3) % 'hospital patients should be worried about serious medical errors when they are in a hospital in my country'	yes	<b>20</b>	<b>47</b>
	no	79	48
<b>* Experiences of medical errors</b>			
4) % read/heard about medical errors	often	26	34
	sometimes	45	44
	rarely	27	18
5) % of respondents has experienced a serious medical error			
a) in a local hospital	a)	19	18
b) from a medicine prescribed by a doctor	b)	13	11
<b>* Practical implications</b>			
6) % Confident that a group would not make a medical errors that could harm him			
a) doctors	a)	75	69
b) medical staff	b)	75	68
7) % likely that a patient in a national hospital would suffer a serious medical error		<b>25</b>	<b>47</b>

**Figure 12** Results consumer awareness Sweden.



Subject		UK in %	Europe in %
<b>* General perception of medical errors</b>			
1) % perceive medical errors as an important problem	yes	85	78
	no	13	20
2) % worried to personally experience a serious medical error	yes	<b>33</b>	<b>40</b>
	no	65	58
3) % 'hospital patients should be worried about serious medical errors when they are in a hospital in my country'	yes	49	47
	no	47	48
<b>* Experiences of medical errors</b>			
4) % read/heard about medical errors	often	38	34
	sometimes	47	44
	rarely	11	18
5) % of respondents has experienced a serious medical error	a) in a local hospital	18	18
	b) from a medicine prescribed by a doctor	11	11
<b>* Practical implications</b>			
6) % Confident that a group would not make a medical errors that could harm him	a) doctors	79	69
	b) medical staff	77	68
7) % likely that a patient in a national hospital would suffer a serious medical error		42	47

**Figure 13** Results consumer awareness for UK.

### APPENDIX 3 – TABLES ANALYSIS 3

#### A3.1 BELGIUM

Sub-discipline	Belgium	Average EU score
1. Patient rights and information	130	121,2
2. E-health	38	42,8
2. Waiting time for treatment	<b>187</b>	131,5
4. Outcomes	155	169,1
5. Range and reach of services provided	<b>136</b>	101,7
6. Pharmaceuticals	88	96,4
<i>Rank place of 33 countries</i>	<i>11th</i>	

**Figure 14** Results quality for Belgium.

#### A3.2 DENMARK

Sub-discipline	Denmark	Average EU score
1. Patient rights and information	<b>175</b>	121,2
2. E-health	63	42,8
2. Waiting time for treatment	120	131,5
4. Outcomes	<b>202</b>	169,1
5. Range and reach of services provided	121	101,7
6. Pharmaceuticals	<b>138</b>	96,4
<i>Rank place of 33 countries</i>	<i>2th</i>	

**Figure 15** Results quality for Denmark.

#### A3.3 GERMANY

Sub-discipline	Germany	Average EU score
1. Patient rights and information	123	121,2
2. E-health	38	42,8
2. Waiting time for treatment	<b>187</b>	131,5
4. Outcomes	<b>214</b>	169,1
5. Range and reach of services provided	100	101,7
6. Pharmaceuticals	<b>125</b>	96,4
<i>Rank place of 33 countries</i>	<i>6th</i>	

**Figure 16** Results quality for Germany.

#### A3.4 HUNGARY

Sub-discipline	Hungary	Average EU score
1. Patient rights and information	136	121,2
2. E-health	46	42,8
2. Waiting time for treatment	147	131,5
4. Outcomes	<b>119</b>	169,1
5. Range and reach of services provided	86	101,7
6. Pharmaceuticals	100	96,4
<i>Rank place of 33 countries</i>	<i>20th</i>	

**Figure 17** Results quality for Hungary.

#### A3.5 THE NETHERLANDS

Sub-discipline	The Netherlands	Average EU score
1. Patient rights and information	162	121,2
2. E-health	63	42,8
2. Waiting time for treatment	147	131,5
4. Outcomes	<b>226</b>	169,1
5. Range and reach of services provided	129	101,7
6. Pharmaceuticals	<b>138</b>	96,4
<i>Rank place of 33 countries</i>	<i>1st</i>	

**Figure 18** Results quality for the Netherlands.

#### A3.6 PORTUGAL

Sub-discipline	Portugal	Average EU score
1. Patient rights and information	123	121,2
2. E-health	<b>67</b>	42,8
2. Waiting time for treatment	<b>80</b>	131,5
4. Outcomes	155	169,1
5. Range and reach of services provided	107	101,7
6. Pharmaceuticals	100	96,4
<i>Rank place of 33 countries</i>	<i>21th</i>	

**Figure 19** Results quality for Portugal.

### A3.7 SWEDEN

Sub-discipline	Sweden	Average EU score
1. Patient rights and information	117	121,2
2. E-health	54	42,8
2. Waiting time for treatment	<b>93</b>	131,5
4. Outcomes	<b>250</b>	169,1
5. Range and reach of services provided	136	101,7
6. Pharmaceuticals	113	96,4
<i>Rank place of 33 countries</i>		<i>9th</i>

**Figure 20** Results quality for Sweden.

### A3.8 UNITED KINGDOM

Sub-discipline	Un. Kingdom	Average EU score
1. Patient rights and information	123	121,2
2. E-health	54	42,8
2. Waiting time for treatment	<b>80</b>	131,5
4. Outcomes	179	169,1
5. Range and reach of services provided	121	101,7
6. Pharmaceuticals	<b>125</b>	96,4
<i>Rank place of 33 countries</i>		<i>14th</i>

**Figure 21** Results quality for United Kingdom.