

POLICY BRIEF 20

How can structured cooperation between countries address health workforce challenges related to highly specialized health care?

Improving access to services through voluntary cooperation in the EU

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A policy brief is a short publication specifically designed to provide policy-makers with evidence on a policy question or priority. Policy briefs:

- Bring together existing evidence and present it in an accessible format
- Use systematic methods and make these transparent so that users can have confidence in the material
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Policy briefs provide evidence for policy-makers not policy advice. They do not seek to explain or advocate a policy position but to set out clearly what is known about it. They may outline the evidence on different prospective policy options and on implementation issues, but they do not promote a particular option or act as a manual for implementation.

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ACRONYMS

CME	continuing medical education
CNAO	National Centre of Oncological Hadrontherapy [Centro Nazionale di Adroterapia Oncologica]
CPD	continuous professional development
CTF	Common Training Framework
DBS	deep brain stimulation
DOPS	direct observation of practical skills
EAHP	European Association of Hospital Pharmacists
ECAMSQ®	European Council for Accreditation of Medical Specialist Qualifications
EEIG	European Economic Interest Grouping
EHA	European Hematology Association
ENERCA	European Network for Rare and Congenital Anaemias
EQF	European Qualifications Framework
ERN	European Reference Network
EU	European Union
EURON	European Graduate School of Neuroscience
HSHC	highly specialized health care
HSTC	haematopoietic stem cell transplantation
KNAW	Koninklijke Nederlandse Akademie van Wetenschappen [Royal Dutch Academy of Arts and Sciences]
MCQ	multiple-choice question
PCD	primary ciliary dyskinesia
PIP	Pacific Islands Program
RACS	Royal Australasian College of Surgeons
RHD	rare haematological disease
UEMS	Union Européenne des Médecins Spécialistes [European Union of Medical Specialists]
UN	United Nations

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How do Policy Briefs bring the evidence together?

There is no one single way of collecting evidence to inform policy-making. Different approaches are appropriate for different policy issues so the Observatory briefs draw on a mix of methodologies (see Figure A) and explain transparently the different methods used and how they have been combined. This allows users to understand the nature and limits of the evidence.

There are two main ‘categories’ of briefs that can be distinguished by method and further ‘sub-sets’ of briefs that can be mapped along a spectrum:

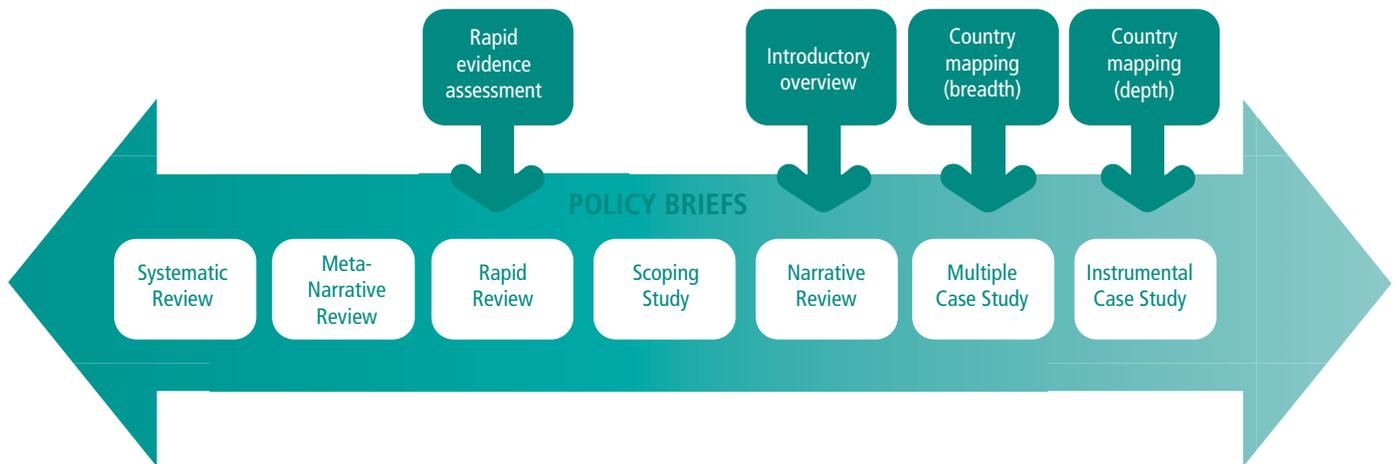
- **A rapid evidence assessment:** This is a targeted review of the available literature and requires authors to define key terms, set out explicit search strategies and be clear about what is excluded.

- **Comparative country mapping:** These use a case study approach and combine document reviews and consultation with appropriate technical and country experts. These fall into two groups depending on whether they prioritize depth or breadth.

- **Introductory overview:** These briefs have a different objective to the rapid evidence assessments but use a similar methodological approach. Literature is targeted and reviewed with the aim of explaining a subject to ‘beginners’.

Most briefs however, will draw on a mix of methods and it is for this reason that a ‘methods’ box is included in the introduction to each brief signalling transparently that methods are explicit, robust and replicable and showing how they are appropriate to the policy question.

Figure A: The policy brief spectrum



Source: Erica Richardson

KEY TERMS

Highly specialized health care (HSHC): means care involving a high complexity of diagnosis, treatment and/or management of a specific condition. It is associated with high costs and often can only be provided by limited numbers of appropriately trained professionals or specialist facilities, which creates specific health workforce challenges.

Health workforce challenges: here includes issues of skills shortage (or distribution), training and knowledge transfer.

Structured cooperation: here means a voluntary and organized cross-border activity between health care sector actors (often governments and health agencies, providers, professional bodies, funders, educational institutions and others) that is designed to improve patient access to highly specialized, high-quality diagnosis and care in their own country.

KEY MESSAGES

- Resolving health workforce challenges and improving cooperation between health professionals makes it more likely that patients will receive high-quality specialized care in their own country.
- Voluntary structured cross-border cooperation can help address the health workforce challenges that currently force patients to travel to find appropriate care.
- Structured cooperation works at different levels (linking countries; health care or training bodies; and/or clusters of organizations and individuals) but is always influenced by the institutional framework in which it takes place and the underlying European and national legal and policy frameworks.
- Evaluation of different models of structured cooperation is still scarce but policy-makers can enhance the chances of structured cooperation succeeding by reviewing the five main groups of factors that can enable or block success, specifically:
 - *legal factors* including differences between jurisdictions on eligibility or licensing of products and medicines;
 - *political factors* and the commitment to making exchanges work;
 - *economic factors* including price and wage differences and the availability of EU funding;
 - *sociocultural factors* and issues like trust, communication and language barriers which influence patient preferences and impact the level and quality of knowledge and information exchange that can be achieved; and
 - *organizational factors* including context, the type of delivery system and any existing (informal) networks and relations.
- Policy-makers at a European and national level can support structured cooperation and address health workforce challenges in highly specialized care by:
 - Building highly specialized care capacity throughout the EU through structured postgraduate training exchanges as a cross-border cooperation activity;
 - Tailoring all structured cooperation to the context in which it takes place;
 - Supporting successful initiatives on a structural basis, with political and financial support from domestic authorities and/or the EU;
 - Using the grassroots experience of structured cooperation in highly specialized health care to inform macro-level policies when appropriate;
 - Promoting the exchange of good practices in cross-border cooperation in (highly specialized) health care, not least as a way of inspiring health system actors to overcome health workforce challenges to the benefit of patients and health professionals.

EXECUTIVE SUMMARY

The policy issue: the added value of structured cooperation to address health workforce challenges related to highly specialized health care

Physical and mental disorders requiring complex procedures need highly specialized health care. Because of its complexity and specificity, such care can often only be provided by a limited number of health professionals and services, and often requires a multidisciplinary team approach. This means that patients often have to travel large distances or go abroad to receive the required care. Especially where patients have to travel abroad, there are barriers to patient mobility related to referral pathways, language barriers, administrative burdens, etc. Highly specialized health care also faces specific health workforce challenges, including:

- health workforce and skills shortages
- smaller overall size of the health workforce
- uneven geographic distribution of the health workforce
- inadequate training and education capacity
- inadequate knowledge transfer capacity.

Because of these specific health workforce challenges, intra- and intercountry collaboration can add value in highly specialized care. Structured cooperation (a voluntary but organized cross-border activity between governments and health agencies, health care providers, professional bodies, funding organizations, education institutions or other health care sector actors) offers various options to respond to this. Where the health workforce challenges can be resolved, this can help ensure that patients in need of highly specialized care have access to diagnosis and high-quality care in their own country.

Structured cooperation in highly specialized care

Structured cooperation to address health workforce challenges in highly specialized care is influenced by the institutional framework within which it takes place, including the underlying European and national legal frameworks and policy instruments. As stipulated in the Treaty on the Functioning of the European Union, the organization and delivery of health services and medical care are the responsibility of each European Union (EU) Member State, while the freedom of establishment and the freedom to provide services guarantee the mobility of health professionals within the EU. Other key legal instruments, such as European Reference Networks (ERNs), also serve as enablers for structured cooperation in highly specialized health care across Europe.

There are various forms of cross-border structured cooperation, including structured cooperation linking:

- countries (European, cross-border regions or third countries);

- health care or training institutions;
- clusters of organizations and/or individuals.

Facilitators and barriers

The facilitators and barriers for structured cooperation addressing health workforce challenges in highly specialized health care often mirror each other. Structured cooperation is most efficiently facilitated where all factors are being addressed simultaneously and are well aligned. The five main groups of factors that influence the success of structured cooperation are:

- *Legal factors*: these mainly relate to the institutional framework surrounding structured cooperation in highly specialized care, but also to legislative differences between jurisdictions; for example, regarding eligibility for services and the licensing of products and medicines.
- *Political factors*: these can create an enabling framework or favourable conditions for structured cooperation to take place and obtain funding; for example, bilateral agreements that have strong political support.
- *Economic factors*: cross-border structured cooperation in highly specialized health care is influenced by economic factors and can sometimes have considerable financial implications. Often, initiatives are dependent on (EU) funding. Also, differences in price and wage levels (and general conditions of employment) between countries or regions may influence the extent to which cross-border cooperation in highly specialized care is feasible.
- *Sociocultural factors*: cultural differences and a lack of trust may influence patient preferences for health care and in this way affect the success of cross-border collaborations in health care. Language barriers can have a strong influence as well. First of all, communication with patients should be possible, but the communication between health care providers is also of crucial importance, as this can have a substantial impact on the level and quality of knowledge and information exchange that can be achieved.
- *Organizational factors*: the organizational context influences the way in which structured cooperation in cross-border health care can take place. This is related to the health service delivery system and structural arrangements in place, but also to existing (informal) networks and relations at the organizational level.

Policy implications: supporting structured cooperation

Structured cooperation addressing health workforce challenges in highly specialized health care is varied, important and can be supported in the following ways:

- Further developing structured cross-border postgraduate training exchange focused on specialist training – including continuing medical education (CME) and continuous professional development (CPD) – to build specialized care capacity throughout the EU.

- Ensuring all actors involved take an approach tailored to the context in which highly specialized health care is provided.
- Conducting an effective situation analysis of the workforce component of specialist services in order to identify appropriate solutions to tackle health workforce challenges in highly specialized health care.
- Sustaining successful structured cooperation initiatives in highly specialized health care on a more permanent basis, where possible with political and financial support from domestic authorities and/or the EU, so that the benefits for patients, health professionals and the regions, countries and/or organizations involved can be retained.
- Realizing the full potential of the current health workforce and using the grassroots experience in structured cooperation to inform macro-level policies.
- Promoting the use of evaluation designs so that they become an integral part of structured cooperation in order to inform policy and practice.
- Ensuring the challenges faced by the health workforce providing highly specialized health care are an integrated part of health policies and planned from the start.
- Promoting the exchange of good practices in cross-border cooperation, to inspire various actors in the health system to help seek solutions to health workforce problems.

Introduction

Physical and mental disorders requiring complex procedures need highly specialized health care. The specialized knowledge and skills needed to provide such care can often only be provided by a limited number of health professionals and services, often requiring a multidisciplinary team approach, including the participation and coordination of many specialized disciplines [1]. This creates specific health workforce challenges in terms of availability of appropriate staff, education capacity and knowledge transfer. In view of the current and expected health workforce shortages in Europe [2], these challenges will only become more important in the years to come. Moreover, these challenges negatively affect patients, who have to travel long distances and/or seek cross-border care when the required multidisciplinary health care teams or knowledge are not available in their own region or country. Hence, intra- and intercountry collaboration can be of high added value in highly specialized care. Structured cooperation – a voluntary but organized cross-border activity between governments and health agencies, health care providers, professional bodies, funding organizations, education institutions or other health care sector actors – can help address health workforce challenges. Once these challenges have been tackled and better cooperation takes place between health professionals, patients are more likely to receive the high-quality specialized care they require in their own country, reducing the need for burdensome travel across Europe.

This policy brief aims to present an overview of voluntary structured cooperation options and work in progress within and between EU Member States. This may inspire those seeking solutions for their health workforce challenges in highly specialized health care. Because of the learning potential offered by countries with decentralized health systems on how structured cooperation can be organized or encouraged, we studied both cross-border initiatives as well as within-country collaborations in decentralized health systems.

Policy questions

This policy brief focuses on the question:

“How can voluntary structured cooperation between EU Member States address health workforce challenges associated with the provision of highly specialized health care services?”

The brief discusses successful practices that have the potential to be adapted and transferred to other contexts; presents ideas for tackling the challenges which face the health workforce in highly specialized service delivery; and provides ideas for implementation. The following sub-questions are posed and addressed:

1. What is the institutional framework surrounding voluntary structured cooperation in highly specialized health care in Europe?

2. What forms of voluntary structured cooperation are available to address health workforce challenges in highly specialized health care?
 - a. What forms of voluntary structured cooperation are available that link countries?
 - b. What forms of voluntary structured cooperation are available that link health care or training institutions?
 - c. What forms of voluntary structured cooperation are available that link clusters of organizations and/or individuals?

Box 1: Methods

This policy brief combines a literature review, taking a meta-narrative approach [3,4], with qualitative analysis of in-depth interviews. The literature review focused on identifying scientific and grey literature that could provide an answer to the central research question. In addition, semi-structured interviews were conducted to gain a more in-depth understanding of the health workforce challenges in structured cooperation in highly specialized services. Interviews were conducted with European policy-makers, representatives of professional associations and health care professionals at Member State level. The interviews were conducted in English by phone and email. A topic guide was used to guide and direct the interviews, focusing on the form of structured cooperation itself, as well as on facilitators and barriers in the implementation process. Data were thematically analysed and results were reported along the main themes identified. A full description of the methods is included in Appendix 1.

Highly specialized health care

Highly specialized health care refers to health care that involves high complexity of diagnosis, treatment and/or management of a specific condition and associated high costs [5] (see Box 2). Highly specialized health care can thus be considered an umbrella term, which covers a variety of disparate and complex services, ranging from patients with rare diseases to patients with common diseases that require complex procedures, such as transplantations. Due to the rarity or complexity of some conditions, it is often difficult for patients and their carers to access, and for service providers to offer, the best care and support when needed. Some services, including those for very rare diseases, may only be provided by a small number of centres within a country or cannot be provided at all. This negatively affects patients. Even though the cross-border health care Directive (2011/24/EU) was introduced to ease the process of seeking cross-border health care for patients, a recent evaluation found that the number of patients using cross-border care under the Directive is still very low, mainly due to the administrative burden concerning prior authorization and procedures [6].

While some specialized services provide the majority of a patient's care for these conditions once diagnosed, most specialized interventions only form a small part of the patient's care and treatment pathway, requiring strong collaboration between the various providers and often necessitating a multidisciplinary team approach [1,7].

Box 2: What are highly specialized health care services?

There is no common definition of highly specialized health care services across Europe [9]. In 2014, an extensive literature review concluded that “there are currently no clear operationalizations or specific cut-off values” to identify medical equipment or infrastructure as highly specialized [10]. Moreover, in some countries, other terms are (also) used to refer to the same phenomenon, such as ‘top referent care’ (in Dutch: *topreferente zorg*) in the Netherlands, referring to care for patients with: a rare or complex disorder or treatment; a simple disorder which becomes complex because of combinations of (chronic) illness; or an exceptional course of a common condition [11]. In this policy brief, we use the definition of highly specialized health care provided in the delegated decision on ERNs [5]:

“Highly specialized health care means health care that involves high complexity of a particular disease or condition in its diagnosis or treatment or management and high cost of the treatment and resources involved.”

A complex disease or condition is defined as a particular disease or disorder which combines a number of factors, symptoms or signs, requiring a multidisciplinary approach and well-planned organization of services over time because it implies one or several of the following circumstances [5]:

- a large number of possible diagnoses or management options and comorbidity
- clinical and diagnostic test data that are difficult to interpret
- a high risk of complications, morbidity or mortality related to either the problem, the diagnostic procedure or the management.

Examples of highly specialized services:

Service	About the condition
Craniofacial surgery	In the field of rare craniofacial anomalies, craniosynostosis, either the isolated or the syndromic form, is the most significant diagnosis with an overall prevalence of 1 in 2100 births [12].
Liver transplantation services	Liver transplantation is considered a highly specialized service [7].
Diagnosis of primary ciliary dyskinesia (especially through tissue) and its treatment	Primary ciliary dyskinesia (PCD) is a rare inherited disorder in which the function of the cilia is disturbed [13].
Severe obsessive compulsive disorder	Approximately 1% of the European population suffers from clinically relevant obsessive compulsive disorder [14].

These characteristics make service provision for highly specialized care a unique domain in health care with a high added value of intra- and intercountry collaboration, between various actors in the health system, not least all the health professionals involved [8].

Health workforce challenges in highly specialized health care

To ensure that patients in need of highly specialized health care have access to diagnosis and the provision of high-quality health care, having the right staff with the right skills in the right place at the right time is one of the most important prerequisites. Yet there are a number of challenges surrounding the health workforce providing highly specialized health care including:

Health workforce and skills shortages

While all EU countries are confronted with health workforce challenges (primarily due to demographic changes in the population, increasing demand for health care and an ageing workforce), some countries are faced with critical shortages in particular professions or specialties [15–18]. For example, in the United Kingdom, there is a severe shortage of specialist epilepsy nurses [19], while in Romania, France, Hungary and Austria, unfilled specialist training places have been reported [20]. This creates a lack of required skills and expertise to treat certain diseases or conditions, and limits the national or regional capacity to provide highly specialized health care services. However, this situation can be mitigated to some extent by ensuring that sufficient generalist health care providers, who are trained to care, for example, for those with epilepsy or other specific conditions, are in place.

Limited size of the health workforce

In some countries, the small size of the health workforce and the health system, as well as the small size of the patient population, may limit the scope for specialization. It has been estimated, for example, that one quarter of European countries may be too small to offer highly specialized health care within their national health systems to children with rare and complex diseases. For example, a specialized hospital in Sofia, Bulgaria has an agreement with Macedonia to treat children needing specialized open-heart surgery for congenital heart malformations [21], while the Malta–UK cross-border specialized care collaboration for rare childhood diseases gives Maltese patients access to highly specialized care in the UK that is not available locally [22].

Uneven geographic distribution of the health workforce

High-quality highly specialized health care can only be provided when the right staff are available *in the right place*. Where this is not the case, results for patient access and quality of care can be severe. In Lithuania, for example, cardiology care was a problematic area for a long time. One of the reasons for this was that specialist cardiology centres were overstaffed while regional hospitals were understaffed, particularly in rural areas. As a result, patients typically sought out specialists, even for routine matters. However, Lithuania has transformed the system of cardiology services and increased the availability of providers by 45%. The biggest increase has taken place at understaffed secondary-level health care facilities outside the capital city of Vilnius, with a resulting drop in mortality from cardiovascular diseases [23]. This example shows how the geographical spread of the health workforce may affect access to highly specialized care and how better coordination between regions may solve this problem. Geographical maldistribution can also be a problem at European level, with one country having an oversupply of certain specialties and another country experiencing shortages. Bilateral recruitment agreements and border-region arrangements between neighbouring countries may help to achieve a better balance in the distribution of relatively scarce specialized staff and/or better access to specialized services.

Inadequate training and education capacity

To deliver high-quality highly specialized health care, professionals need to have the right knowledge, skills and competences. Yet the delivery of health care has become increasingly complex [24] due to rapid changes in technology, delivery models, demographics and the epidemiology of disease. These developments have contributed to a trend towards (over)specialization in some countries, with increasing numbers of 'specialist' and 'sub-specialist' categories. However, the very nature of specialist knowledge and skills means that training can often only be provided in large centres, usually located in metropolitan areas, which are big enough to have the critical mass of teachers and cases, physical resources and clinical material available to provide the necessary training [25]. This means that in countries with limited training capacities, either due to the size of the country or limited financial resources, it is not always possible to provide the required training to deliver highly specialized health care.

Inadequate knowledge transfer capacity

Finally, in many modern health systems, highly specialized health care is centralized and only provided by a small number of centres within a country [26]. Yet, most specialized services form only a small part of the patient's care and treatment pathway, and non-specialist providers often take care of the more routine and non-complex conditions a patient may be suffering from simultaneously, as well as the after-care following highly specialized procedures. Large physical distances between the various providers may hamper knowledge transfer between them

as knowledge transfer from a highly specialized (inpatient) provider to other (outpatient) providers may only occur if they are in close proximity and interact regularly [27]. Moreover, where a fee-for-service system applies, a non-specialist professional may take longer to refer the patient and this may have an unintended negative impact on knowledge transfer. All of these factors hamper the diffusion of good practices nationally and across the EU, and impede improvements in access to care and equity between health systems.

These challenges are faced by many of the health workforces involved in highly specialized health care across EU countries and they are, by their nature, hard to solve on a national basis. The challenges result from the high level of complexity and specificity of highly specialized care, meaning that intercountry collaboration is of high added value. This added value can be most effectively achieved through bringing together the national and regional specialized knowledge and expertise that is scattered across the EU Member States [8]. By doing so, professional isolation can be overcome while the value and advantages of peer networking are optimally used. Structured cooperation offers various options to accomplish this. After a general introduction of the concept, we will present the main findings on how structured cooperation can be used to address health workforce challenges in highly specialized health care.

Structured cooperation

Structured cooperation is understood in this policy brief to be a voluntary cross-border activity between governments and health agencies, health care providers, professional bodies, funding organizations or other health care sector actors. It covers a broad variety of modalities, ranging from training cycles abroad and cross-border recognition of credits for CME, to meaningful professional mobility, ERNs and medical emergency cooperation. Choosing which form of structured cooperation is most appropriate must be based on the particular challenges faced by a country, health care organization or health professional(s) in providing highly specialized care (see Table 1 for some examples).

In this brief, we focus on structured cooperation forms that create a 'triple-win' situation, in which patients, health professionals and the countries, regions or organizations involved can all benefit. While our emphasis is on cross-border activities, we also take into account structured cooperation taking place in countries with decentralized or devolved health systems, such as Germany, Italy, Spain, Sweden and the UK [28], which are facing largely the same health workforce challenges. Finally, when examining the problematic issues related to the health workforce in highly specialized care, we find that these are mainly related to service provision and education and training. Hence, the policy brief has a primary focus on structured cooperation in these two areas.

Table 1. Overview of health workforce challenges and possible solutions through structured cooperation

Health workforce challenge	Examples of structured cooperation solutions
<i>Challenges related to service provision</i>	
Limited size of the health workforce	Bilateral and multilateral recruitment agreements
Skill shortages in certain specializations	Professional exchange programmes (training and service delivery)
Geographic maldistribution of the health workforce	<ul style="list-style-type: none"> • Service transformation and integration of services [23] • Bilateral recruitment agreements
<i>Challenges related to education, training and knowledge transfer</i>	
Inadequate or misaligned training and education capacity	<ul style="list-style-type: none"> • Standardization of training programmes and harmonization of professional standards [29]; curriculum revision to orientate education to priority health needs • Bilateral training and specialization educational agreements
Inadequate knowledge transfer capacity	Participation of health professionals from different services or countries in each other's interdisciplinary networks or specialist societies [28]

Findings

As cross-border structured cooperation in highly specialized health care, whatever its specific form, takes place within an institutional framework, this framework forms the natural starting point for presenting our findings. It influences structured cooperation and explains some of the barriers and facilitators that can be identified; for example, by providing certain legal tools, such as ERNs, an enabling platform can be created through which structured cooperation in highly specialized care can be developed. Therefore, this section starts with a description of the institutional framework surrounding cross-border care initiatives, including the underlying European and national legal frameworks [30].

Subsequently, the main forms of voluntary structured cooperation taking place between EU Member States and third countries, and between regions within decentralized countries, to address health workforce challenges in highly specialized health care, will be discussed. Good practice examples – in which patients, health professionals and the countries, regions or organizations involved all benefit from the cooperation – are included. However, there is no 'gold standard' or single form of structured cooperation that would be successful for all services, countries, organizations or health professionals; existing forms of structured cooperation need to be tailored to the specific needs to be met.

Institutional framework for structured cooperation in highly specialized health care in Europe

Structured cooperation in highly specialized health care is shaped by the institutional framework within which it takes place, including the underlying European and national legal frameworks and policy instruments [30]. As stipulated in the Treaty on the Functioning of the European Union, the organization and delivery of health services and medical care are the responsibility of each EU Member State, while the freedom of establishment and the freedom to provide services guarantee the mobility of health professionals within the EU. In line with these principles, in 2012 the European Commission adopted the *Action Plan for the EU Health Workforce*. The Action Plan focuses on the added value of EU action and European collaboration in assisting Member States to tackle the key challenges facing the health workforce in the medium to long term, including the areas of: recruitment and retention of health workers; health workforce planning and forecasting; anticipating future skills needs; and improving CPD [16].

WHO Europe, in its 2015 report *Making progress towards health workforce sustainability in the WHO European region*, also emphasizes the importance of facilitating collaboration and networking between countries, as well as communication and information exchange within the European region [31]. Various laws are in place to support these policy initiatives and to facilitate cooperation between countries. An overview of key European legislation relevant to voluntary structured cooperation in highly specialized health care, both intra-European and with relevance for third countries, is provided in Box 3.

European Reference Networks and Common Training Frameworks

Two legal instruments that can form enabling platforms for structured cooperation to address health workforce challenges in highly specialized health care are European Reference Networks and Common Training Frameworks. Both are relatively new instruments, with the former focused mainly on increasing cross-country collaboration to improve access to health care and the latter facilitating the mobility of professionals. In this way, these EU instruments can contribute to solving health workforce challenges related to the limited size of a country's health workforce, lack of required skills and misaligned education capacity. Both tools are explained in more detail below. Because of their novelty, no official ERN or CTF is in existence yet. However, the first call for applications to establish an ERN closed in July 2016 and 24 Network proposals were received, involving 370 hospitals and almost 1000 highly specialized units located in 25 EU Member States and Norway [35]. There is also significant interest in developing CTFs, with more than 25 organizations already having had an informative talk about this with the European Commission. This shows that there is a high level of interest and demand for these policy instruments and it is likely that their importance will grow in the years to come.

Box 3. Key European legislation relevant to voluntary structured cooperation in highly specialized health care**Intra-European legislation:**

- **Directive 2005/36/EC** on the recognition of professional qualifications sets out the rules concerning recognition by any Member State of professional qualifications acquired in other Member States. This directive has been amended by Directive 2013/55/EU.
- **Directive 2013/55/EU amending Directive 2005/36/EC** modernized the original Professional Qualifications Directive by, among other things, calling for the introduction of a European Professional Card (introduced in 2016) and the introduction of Common Training Frameworks (CTFs) (a legal tool that introduces a new way of automatic professional qualification recognition across EU countries) subject to a delegated act.
- **Council Recommendation (2009/C 151/02)** on an action in the field of rare diseases outlines necessary national and collaborative measures to alleviate the burden posed by rare diseases to patients, professionals and health and social systems.
- **Directive 2011/24/EU** on patients' rights in cross-border health care [32], apart from its focus on cross-border health care, also aims to promote cooperation between EU countries [33]. Member States are called upon to "facilitate cooperation in cross-border health care provision at regional and local level" (Article 10.2), while the European Commission "shall encourage Member States, particularly neighbouring countries, to conclude agreements" and "to cooperate in cross-border health care provision in border regions" (Article 10.3). The Directive also requires the European Commission to support Member States in the development of ERNs [34].
- **Commission delegated decision (2014/286/EU)** lists the criteria and conditions that health care providers and the ERNs should fulfil.
- **Commission implementing decision (2015/287/EU)** contains criteria for establishing and evaluating ERNs, including the exchange and dissemination of information about the ERNs.

Legislation with relevance for third countries:

- **Directive 2009/50/EC** ("EU Blue Card" Directive) introduced common rules of entry and residence for highly qualified non-EU nationals who request admission to a Member State for the purposes of highly qualified employment.
- **Article 3.3 of Directive 2005/36/EC:** Evidence of formal qualifications issued by a third country shall be regarded as evidence of formal qualifications if the holder has three years' professional experience in the profession concerned on the territory of the Member State which recognized that evidence of formal qualifications in accordance with Article 2(2), certified by that Member State.

Examples of existing networks on rare diseases (potential European Reference Networks)

ERNs are clinical networks based on the voluntary participation of health care providers throughout Europe. Their general concept and implementation are set out in Directive 2011/24/EU (Article 12). ERNs are intended to: help patients gain easier access to highly specialized care; encourage European cooperation on highly specialized health care; and improve diagnosis and care in medical fields

where expertise is rare. The networks are also expected to help Member States with too few patients to provide highly specialized care, help speed up the diffusion of innovations in medical science and health technologies, and serve as focal points for medical training and research, information dissemination and evaluation [36]. Because of the importance of knowledge exchange in enabling ERNs to function well, it is believed that digital innovations play an important role. It is expected that the first recognized ERNs will be established at the start of 2017.

Even though officially recognized ERNs are not yet established, networks on rare diseases are already in existence, many of which have applied to become a legal ERN. To gain insight into the current workings of these networks and the added value ERNs may have for this structured cooperation, we conducted online and telephone interviews with representatives of networks on rare diseases. It was found that many of the barriers these existing networks experience centre around practical and administrative issues, including different legal regulations between EU countries; for example, patient data sharing, ethical procedures, and so on. In addition, time management and a lack of financial resources are sometimes problematic. Facilitators for the networks are the level of expertise available and the exchange of knowledge, education and the development of improved harmonized guidelines. Boxes 4 and 5 provide case study examples of networks on rare diseases already successfully running and the expected added value of becoming an ERN.

Snapshot of Common Training Framework processes

CTFs are part of the modernization of the Professional Qualifications Directive (Directive 2013/55/EU amending Directive 2005/36/EC). A CTF is a legal tool that introduces a new way of achieving automatic professional qualification recognition across EU countries. It consists of a common set of minimum knowledge, skills and competences that are necessary for the pursuit of a specific profession. Representative professional organizations at EU level, as well as national professional organizations or competent authorities from at least a third of the Member States, may submit suggestions for CTFs to the European Commission. The following conditions must be fulfilled for a CTF to come into existence:

- The CTF enables more professionals to move between Member States.
- The profession or training is regulated in at least one third of the Member States.
- The CTF combines the knowledge, skills and competences required in at least one third of the Member States.
- The CTF shall be based on levels of the European Qualifications Framework (EQF).
- The profession concerned is neither covered by another CTF nor subject to automatic recognition (under Chapter III of Directive 2005/36/EC).

Box 4: Transplantation (solid organ and HSTC) in Children (TRANSCHILD)

The TRANSCHILD network recently applied to become an official ERN. TRANSCHILD focuses on low-prevalence and complex clinical conditions in children, transplants and the pre-transplant and post-transplant phases. It aims to improve life expectancy and quality of life for EU paediatric patients who require solid organ or haematopoietic stem cell transplantation (HSTC). TRANSCHILD currently consists of a consortium of 18 tertiary hospitals from 11 EU Member States: Spain, UK, France, Germany, Sweden, Poland, Portugal, Lithuania, Italy, Belgium and the Netherlands [37].

Added value of becoming an European Reference Network

The goal of becoming an ERN is to ensure that every patient receives the same high-quality treatment (including both clinical and non-clinical aspects) no matter what their country of origin. This optimal treatment will be established by cooperation through the Network, among other things by developing guidelines and protocols on both clinical procedures and non-clinical aspects, such as education, ethics, patient participation, etc. These guidelines are currently (August 2016) being developed and suitable centres identified to write the specific sets of guidelines. These guidelines will in turn be the result of the knowledge exchange that will take place through the Network. So, instead of transferring patients, the aim is to transfer knowledge, resulting in the best patient care and outcomes. Becoming an ERN will help centres to facilitate the exchange of knowledge by offering a strong communication structure [38].

No barriers are expected at this moment in functioning as an ERN. During the application process, a number of administrative burdens had to be overcome and this took considerable time, but it is hoped that these have now been solved.

Expected added value and impact of the Network for health care providers and multi-professional teams:

- Making available guidelines for standardized, safe and validated clinical practices.

- Collecting sound findings due to the larger number of transplantation cases.
- Identifying common topics for all types of transplantation.
- Developing harmonized research lines.
- Providing access to clinical excellence as well as support and training through different levels of health care.

Expected added value and impact of the ERN for health systems:

- Facilitating access to the most specialized centres and fields of research.
- Making available harmonized clinical guidelines to be used across health care services.
- Reduced costs associated with transplantation, retransplantation and pharmacological treatments.
- Improved health outcomes and patient and family satisfaction.
- Professionals specialized in highly complex procedures, which in turn provide support services to professionals at different levels of health care, in particular primary care professionals.

Effects and evaluation

As TRANSCHILD is not yet operating as an ERN, no effects can be established so far. The results of the network will be evaluated in the future. Indicators have already been developed, including clinical and non-clinical outcomes, such as patient satisfaction. The same data will be collected in each centre to monitor the effects of becoming an official ERN and data will be periodically reviewed [38].

Source: Dr José María Muñoz y Ramón (TRANSCHILD).

- The CTF has been prepared following a transparent due process.
- The CTF can be applied to any EU national without their first being required to be a member of any professional organization or to be registered with such an organization.

CTFs are of relevance for voluntary structured cooperation between EU Member States in highly specialized health care as they can ease the process of (temporary) work or migration for health professionals engaged in providing highly specialized health care services. While medical specializations are already covered by the Professional Qualifications Directive (listed in Annex V), and hence excluded from introducing CTFs, specializations in other health professional areas, such as nursing, may benefit from the introduction of CTFs. Many of the CTFs that are currently being developed are aimed at (highly) specialized health care professions for which there is no over-arching European education or quality assurance body in existence, including specialist nurses (through the European Specialist Nurses Organisation) and the specialization of hospital pharmacy (see Box 6).

Because of the novelty of the instrument, no CTF is in existence yet and there is no agreed pathway for how to develop one. However, many parties have started the process of developing a CTF proposal to be submitted to the European Commission, which will assess proposals to see if they fulfil the criteria of the Directive. Box 6 describes the experiences of a CTF development process, focusing on hospital pharmacists. This example was chosen based on the maturity of the CTF development process as well as its link with (highly) specialized care.

Although there is a considerable institutional framework already in place in Europe, and new legal instruments such as ERNs and CTFs are continuously being added, this is not fully sufficient in helping countries and health care providers to engage in structured cooperation in cross-border highly specialized care. For example, Directive 2005/36/EC provides for the mutual recognition of medical qualifications gained in EU Member States. This Directive assumes that all doctors sharing the same qualifications also share the same competencies and meet the same professional standards. However, the diversity in training and registration procedures suggests that this is unlikely to be the case [29]. For example, the length and content of medical and specialist training programmes vary greatly between countries, with

Box 5: EuroBloodNet: a joint effort of the European Network for Rare and Congenital Anaemias (ENERCA) and the European Hematology Association (EHA)

The ENERCA network and EHA recently joined efforts to apply for an official ERN. The project has received very high grading from the EU evaluation committee and should be created, pending official approval by the EU Board of Member States, in mid-December 2016. The current ENERCA network intends to promote a multidisciplinary care approach to address the complex and diverse conditions called rare anaemias. To become an ERN, it expanded its working plan to include, with EHA participation, malignant haematological disorders (lymphoid and myeloid) and also haemostasis disorders. In fact, almost all haematological disorders fall into the 'rare disease' category based on their incidence [39].

Added value of becoming a European Reference Network

Gathering expertise at European level is considered paramount to ensuring equal access to accurate information, appropriate and timely diagnosis, and high-quality care for patients, independent of their country of origin. The consolidation of an ERN of Expert Centres is a crucial step to improving the services for clinical management of these diseases as well as education and social care [40]. EuroBloodNet will include 65 health care providers from 15 different European countries [39], but new centres and countries may apply each year.

The added value of becoming an ERN is particularly high for rare haematological diseases (RHD) through facilitating best practice sharing, enabling safe and high-quality cross-border health care, and helping to develop more evidence-based clinical tools and cost-effective treatments. EuroBloodNet will aim to decrease the current cross-border health barriers. EuroBloodNet puts together highly skilled and multidisciplinary health care teams, advanced specialized medical equipment and infrastructure that concentrates resources in all Member States for the design, validation and implementation of high-quality and cost-effective services to face the challenges of RHD.

Effects and evaluation

As EuroBloodNet is not yet operating as an ERN, no effects can be established so far. However, some results of the original ENERCA network can be identified. Over the last decade, ENERCA has promoted two pivotal aspects for rare anaemias: 1) a specific framework for cross-border health care; and 2) European cooperation in providing health services such as diagnostic help, training, information, dissemination and evaluation. ENERCA has wide geographic coverage and has had an efficient impact as a large number of health professionals and patients have been involved. One concrete example of the European impact is the publication of the ENERCA White Book [41]. Also, for sickle cell diseases, ENERCA has taken an active role in improving the situation through: a) the identification of Centres of Expertise in Europe according to recommendations of the ENERCA White Book; b) the promotion of best clinical and laboratory practices; and c) the improvement of CME, by organizing topic-specific training courses, workshops and symposia [40].

Sources: Professor Joan-Lluís Vives Corrons (EuroBloodNet Coordination Team) and Professor Pierre Fenaux (EuroBloodNet/EuroHôpital St Louis/Université Paris).

Box 6: A Common Training Framework for Hospital Pharmacists

The European Association of Hospital Pharmacists (EAHP) and its 35 member country platforms are creating a CTF for hospital pharmacy education in Europe. The overriding motivation for creating the CTF is to enhance the quality, safety and equity of access to patient care in every European country. But there are also other identifiable benefits [42].

Expected added value of a CTF for hospital pharmacy specialization

Although the undergraduate pharmacy degree is automatically recognized across Europe under the Professional Qualifications Directive, there are not currently in use any facilities for the automatic recognition of pharmacy specialties between countries. This marks a real and obvious obstacle and barrier to hospital pharmacists being able to share their expertise in other European countries. A CTF may overcome this barrier. Moreover, creating a single framework for hospital pharmacy specialization can provide a boost to both smaller and less resource-rich countries when approaching the specialization question. A single framework can improve the prospect of cross-country cooperation in specialization education provision. Finally, a CTF can provide the educational background to fulfil tasks that go above and beyond that provided for in the initial MPharm qualification. These include areas such as rare diseases, advanced therapies and the conduct of clinical trials [42].

A CTF for hospital pharmacists as enabler for cross-country collaboration

As an organization with a strong sense of mission in respect to professional development, EAHP is engaged in a range of activities aimed at both articulating and achieving a shared vision for hospital pharmacy in Europe. The vision is represented in the 44 European Statements of Hospital Pharmacy, which were created in 2014 in close collaboration with European patient and health care professional organizations. With the shared vision in place, the focus now turns to implementation. One of the challenges for implementation is ensuring hospital pharmacists have the competencies required to deliver the statements (e.g. in respect to clinical trials and advanced areas of practice). The CTF is therefore seen as a key pan-European tool for achieving the shared vision for hospital pharmacy.

In the longer term, if hospital pharmacists across Europe are striving towards the same goals in respect to service provision and adopting a common framework in respect to postgraduate education and training, then a strong platform for bottom-up cross-country collaboration initiatives is provided. Many pre-existing barriers to collaboration (e.g. pursuing different aspirations for service development; conducting separately developed education and training) will have been reduced.

Source: Richard Price (EAHP).

differing emphases on practical versus theoretical training, plus there is great variation in the skills and competencies medical specialists are expected to demonstrate following graduation. The consequence of these disparities is that doctors may easily cross borders and work in different countries within the EU but subsequently face challenges in terms of professional standards and regulatory processes. Hence, while the institutional framework in place provides the necessary preconditions for structured cooperation in cross-border highly specialized health care, it does not automatically lead to smooth cross-border structured cooperation. Therefore, this policy brief will now discuss the various forms of structured cooperation that can help to further improve cross-border structured collaboration in highly specialized health care, more specifically where the health workforce is concerned.

Box 7: A successful functional neurosurgery service through cross-border collaboration between highly specialized services in London and a tertiary centre in Malta

The number of patients likely to benefit from functional neurosurgery in Malta is small (around 5–10 per year) and this number is insufficient to reach or maintain the requisite local neurosurgical expertise. Functional neurosurgery involves the surgical management of patients with chronic neurological disorders that affect the function of the brain – the most commonly used technique is deep brain stimulation.

The options available to the Maltese health care service included:

1. Not providing this therapy to Maltese patients.
2. Transferring patients abroad for assessment, surgery and follow-up.
3. Providing a framework for parts of the therapy to be provided in Malta.
4. Providing a framework for all of the therapy to be provided in Malta.

Implementation

From the patient perspective, option 4 was most desirable since these patients have a significant disease burden prior to surgery, making their transfer abroad difficult. The twice-yearly follow-up advised after deep brain stimulation (DBS) surgery also places a significant burden on patients and their families. From the health care provision perspective, option 4 was also the most cost-effective and was therefore selected.

Implementation required:

1. Purchasing of equipment.
2. Recruitment of a visiting consultant neurosurgeon from a specialist Functional Neurosurgery centre in the UK (National Hospital for Neurology and Neurosurgery, UCLH, London).
3. Further training of existing Maltese staff in DBS selection and after care. This involved:
 - a. a 2-week visit by the consultant neurologist from Malta to the London centre
 - b. Malta theatre staff visiting the London centre to observe DBS procedures
 - c. the transfer of knowledge from London to Malta (e.g. specific MRI sequences; anaesthetic techniques).
4. Injecting further resources into extra clinics/theatre time in Malta.

Structured cooperation linking countries

Various initiatives have been taken to foster inter-country collaboration to alleviate the health workforce challenges in providing highly specialized health care. Some of these forms of structured cooperation have been specifically focused at highly specialized health care, but most of them have a broader and more general scope. Nonetheless, because of their relevance for highly specialized care, these more general options are also discussed. Furthermore, we discuss initiatives from both inside Europe and from other countries, as this can provide important learning material. However, a clear distinction is made between structured cooperation linking European countries and cross-border structured cooperation taking place with or in non-EU countries, as these are covered by different institutional frameworks.

Results at patient level

Since 2011, around 50 patients have undergone DBS successfully in Malta. The majority of these patients suffer from Parkinson's disease. Patients being considered for DBS surgery are referred by Maltese neurologists and are seen in multidisciplinary clinics held by the Maltese neurology team and the visiting neurosurgeon in Malta once a year. Surgery is scheduled for a few months later for suitable patients. Initially, less than 50% of patients reviewed in clinic were deemed suitable for surgery. More recently, close to 80% of patients reviewed have been offered surgery, indicating that the Maltese team has become familiar with patient selection for DBS surgery and illustrating effective skill acquisition.

Results at health workforce and health services levels

The Malta team was able to use the equipment purchased to perform procedures for which patients previously had to be referred abroad. Moreover, the visiting neurosurgeon was available to review patients with other pathologies, enabling these patients to receive neurosurgical treatment in Malta. The success of this partnership led to the introduction of other subspecialist services within neurosurgery, with visiting consultants from the same London centre providing pituitary and base of skull surgery. The introduction of additional new equipment to Malta (neuronavigation) as well as knowledge transfer have allowed increasingly complex surgery to be performed by the Malta team. Finally, the introduction of an easy-to-use image transfer service between Malta and London facilitates immediate review of images, providing the Malta team with direct real-time access to advice from a subspecialized neurosurgical service in London.

Sources: Dr Josanne Aquilina (Mater Dei Hospital, Malta); Dr Natasha Azzopardi Muscat (Department for Policy in Health – Health Information and Research, Ministry for Health Malta); Ludvic Zrinzo (University College London Hospitals, UK).

Structured cooperation linking European countries

Because of the free mobility and mutual recognition of diplomas, the doctors, nurses, midwives, dentists and pharmacists of EU Member States may be considered as forming one EU health workforce [43], but this does not automatically lead to smooth cross-border structured cooperation. Moreover, it has unwanted effects as well, for example, for source countries where health workforce mobility may aggravate existing problems such as shortages, maldistribution and skill-mismatches of health professionals. Structured cooperation between European countries therefore mainly takes place around the issue of mobility and many policy interventions are developed to manage or moderate mobility flows within the EU. One option is the use of bilateral (or multilateral) agreements between countries to facilitate the flow of health workers [44].

Government-negotiated bilateral agreements have diverse styles, contents and reasons for their development. Often, national, cultural, historical or linguistic affinity between countries plays a large role in cross-border mobility of health staff, which is reflected in the bilateral agreements that are concluded; for example, to address nurse shortages in France, a bilateral recruitment agreement to recruit nurses was reached in 2002 with neighbouring Spain. The agreement led to the recruitment of 1364 Spanish nurses and was closed in 2004. Although most bilateral agreements focus on the recruitment of health care staff, predominantly nurses, they also cover a broader array of functions as well, including: regional cooperation and integration; the training of foreign health personnel; systems for mutual recognition of diplomas apart from the ones covered by 2005/36/EC; personnel exchange; and the promotion of ethical principles in recruitment of health workers, at least in theory [44].

There have been few attempts to evaluate bilateral labour agreements. This is partly due to the fact that there are not many to evaluate, and that understanding the role of bilateral agreements is a complex exercise, where the application of a standard set of criteria is not always appropriate. Instead it requires a contextualized policy analysis that pays attention to the specific economic, political and sociocultural settings, the actors involved, their intentions, and the expected and latent consequences of both receiving and source countries [44]. Moreover, the largest labour movement between countries takes place outside the channel of bilateral agreements [44,45] and other modalities are often applied when it comes to cross-border cooperation in highly specialized health care.

As specialist services increasingly rely on subspecialized individuals working within multidisciplinary teams, centralization of services ensures that such teams can develop and acquire sufficient expertise to deliver high-quality health care. However, patients that live hundreds of kilometres away from such centres face significant obstacles in accessing such specialized services. Box 7 presents a case study where collaboration between health care professionals overcame these hurdles to introduce a successful functional neurosurgery service by linking highly specialized services

Box 8: Knowledge transfer in cross-border collaboration: the Serbian Diaspora Medical Conference

For a long time, Serbia produced more doctors than the country could absorb. Other countries such as Germany, the United Kingdom and the Scandinavian countries, but also the USA and Canada, provided plenty of opportunities for well-trained Serbian doctors to find a job. This situation changed during and after the Yugoslav wars from 1991 to 2001 and when the United Nations (UN) imposed sanctions against the Federal Republic of Yugoslavia in May 1992. This led to political isolation and an economic downturn in Serbia. Inevitably, the quality of medical training was affected as well and it fell behind at a time of rapid changes: medical knowledge was expanding; many countries introduced new medical technologies and pharmaceuticals; and new models of service provision were developed.

One way to catch up with the diagnostic and therapeutic developments in medical science was the establishment of the Serbian Diaspora Medical Conference as a knowledge transfer mechanism. The first conference took place in 2009 and a number have been organized since. The objectives of the conference are to promote cooperation between domestic doctors and experts in the field of medical sciences from the Diaspora. The conference aims to foster the linkages between the Diaspora and institutions and individuals in Serbia, and to support networking with the Serbian academic community. Doctors from abroad share their experience and knowledge, while encouraging development and cooperation in supporting Serbia by creating new and wider networks, solidarity and friendships.

The conference covers a wide range of medical sciences, in various fields of medicine, with a focus on endocrinology, cardiology, psychiatry, perinatology, orthopaedics, oncology, paediatric cardiology and paediatric haematology. Many of the topics are related to highly specialized health care as well. The conference is attended by around 500 Serbian doctors.

The 2017 conference will be held in partnership with the Ministry of Health of the Republic of Serbia, the School of Medicine, University of Belgrade, the World Health Organization, the Medical Board of Lifeline Humanitarian Organization in the USA, Canada, the United Kingdom and Greece, under the patronage of the Crown Prince of Serbia [46].

Source: Ivan M Jekic MD MBA.

in London to health care provision in the Maltese islands, a collaboration grounded in the longstanding historical links between the two countries. It shows that structured cooperation between health care professionals in different countries is possible once the need has been identified, political support has been obtained and an adequate infrastructure provided to facilitate highly specialized teamwork across countries.

Structured cooperation linking cross-border regions within the EU

Border regions represent approximately 40% of Europe's territory [47] and are faced with specific problems due to their border position. The consequences of health professional and patient mobility, for example, are particularly felt in these regions. The issue of cross-border cooperation in health care has therefore received considerable political attention and has been encouraged by various developments at European level [48]. The European Territorial Cooperation, better known as the Interreg

Box 9: Healthregio – Regional Network for the Improvement of Healthcare Services

Healthregio – Regional Network for the Improvement of Healthcare Services (2004–2006) was a project implemented under the INTERREG III A programme of the EU. The objective was to optimize the structure of health care provision in the border regions of four countries. The project covered geographical areas of Austria (the Bundesländer Niederösterreich, Wien and Burgenland), the Czech Republic (the regions of Südböhmen, Südmähren and Vysocina), Slovakia (the areas surrounding Trnava and Bratislava) and Hungary (the counties of Győr-Moson-Sopron, Vas and Zala) [52]. *Healthregio* was initiated to identify the challenges that confronted the border regions in these four countries and served to make visible the differences, resources and potentials of the health care systems with a view to reorganizing the health sector jointly, e.g. by cross-border utilization of infrastructure, improved access to health care services and cross-border knowledge transfer.

One of the biggest barriers to cross-border cooperation that *Healthregio* tried to tackle was related to the price and wage differences between the regions. Austria had by far the highest price and wage levels, meaning that many health professionals migrated to this region, while many patients sought cheaper care in the other regions [52]. As an ‘umbrella project’, *Healthregio* sought in the long term to develop a region of high-quality health care services in central Europe through targeted follow-up projects and measures. Priorities were: the mobility of patients and health professionals; education and skills development for health professionals; legislative changes; the need for progress in national systems; and comparable statistical data for the region [18]. While *Healthregio* mapped the cross-border region in terms of socioeconomic and health factors, and made recommendations on possible health policy measures, implementation proved difficult. Whereas the commitment of certain individuals drove the project forward, and a private company was in charge of project management, barriers such as lack of political support, rigidity of health system structures, the different funding capacity in the four countries, delays in obtaining EU grants and in the payment of national cofinancing, and extensive bureaucracy hampered sustainable cooperation.

Source: Renate Burger (formerly *Healthregio* management team).

programme, has been important in providing regional and local actors from different Member States with financial resources to support cross-border cooperation.

Currently, the fifth successive Interreg programme (2014–2020) is running [49]. Many of the cross-border projects that have been established through the programme are active in the health sector. These collaborations are often focused on health professionals, followed by patients and decision-making bodies. Because of this focus, regions mostly collaborate in the education and further training of health professionals and the joint use of resources [48]. Box 9 gives an example of one cross-border health care project, funded under the Interreg programme.

Naturally, there are also regions that cooperate without the financial support of the Interreg programme; for example, in 2006, the Councillors of Health of the Veneto region, the autonomous regions of Friuli and Venezia-Giulia (both Italy) and the Land Carinthia (Austria) established the International Training Academy for Health Professionals Sanicademia based in Villach (Carinthia, Austria). The legal form of Sanicademia is a European Economic Interest

Grouping (EEIG) and, initially, all three regions contributed a membership fee of €20 000 annually. From 2014 onwards, however, this amount was halved due to the need of the Veneto region to make substantial savings at regional level [50]. Sanicademia targeted health care professionals, health care units and hospitals of the regions involved. Sanicademia included activities aimed at the continuous education and training of health professionals; exchange of information, best practices, experiences and staff between hospitals; and the organization of conferences and seminars on health issues of significant interest. In 2016, the Veneto and Friuli Venezia-Giulia regions left Sanicademia because they felt the continuity of cooperation between the regions could be achieved through other initiatives as well [50,51].

Structured cooperation linking cross-border regions within the EU may still require the involvement of national-level governments; for example, in Italy, the regions have legislative power over health care and they can initiate agreements with states and other bodies. In Austria, however, the national government has legislative power and every possible agreement in health care, including those between regions, has to be signed with the central government.

Structured cooperation from a third-country perspective

Structured collaboration within the EU and with third countries takes place within different legal frameworks; the former is based on the Treaties and further specified by secondary legislation (see Box 3) and therefore must not be mixed up with legal provisions destined for third countries. However, individual countries may want to use both legal spheres as complementary instruments to manage health workforce mobility; for example, France cooperates with, among others, Belgium in cross-border health care, but also signed an agreement with a group of African countries under which medical doctors from those countries are allowed to practice in France if they have certain medical degrees [18].

One of the main reasons for engaging in third country collaborations is that recruiting health care workers from countries outside the EU, while respecting the WHO Global Code of Practice on the International Recruitment of Health Personnel, is one strategy to counter the demographic change in Europe that affects both patients and professionals. In Spain, for example, during the economic boom (2000–2007), there was an increased demand for foreign nurses to fill vacancies in private hospitals. Some private hospitals hired nursing staff directly from their countries of origin on the basis of bilateral agreements that the Spanish government had signed for the regulation of migration flows with the Dominican Republic, Colombia, Ecuador, Romania, Poland, Bulgaria, Ukraine, Morocco and Mauritania, as well as a cooperation agreement with Peru [53].

Box 10: Pacific Islands Program

The Pacific Islands Program (PIP), first established in 1995, is managed and delivered by the Royal Australasian College of Surgeons (RACS), which is the professional body for surgeons in Australia and New Zealand. It works in partnership with the Ministries of Health and hospitals in 11 small Pacific countries to support the delivery of specialist clinical services; deliver education, training and capacity development opportunities; and promote international cooperation and exchange. These countries are too small to provide the full range of specialist services [55].

The following countries are included in the programme: the Cook Islands, Fiji, Kiribati, Micronesia, the Marshall Islands, Nauru, Samoa, the Solomon Islands, Tonga, Tuvalu and Vanuatu. Through PIP, visiting RACS clinical teams provide services across a range of medical specialties. In addition to providing services, each team also focuses on providing clinical mentoring and education to local staff to strengthen the capacity of local health services.

PIP works in close alignment with regional training institutes such as the Fiji National University, the Pacific Eye Institute and the Papua New Guinea School of Health and Medical Sciences. The Australian Government has contributed an estimated 30 million Australian dollars over the life of the project, but there are also pro bono contributions by travelling specialist teams from Australia and New Zealand (doctors, nurses, technicians, etc.), project coordinators and directors, which have been estimated to be worth an equivalent amount [56].

Results of the Pacific Islands Program

Since 1995, RACS volunteer teams have provided more than 83 000 patients with specialist consultation and non-surgical treatment and advice, and approximately 22 000 patients have been provided with surgical procedures. PIP also provides training courses, workshops, conferences and training attachments for surgeons, anaesthetists, nurses and other health professionals working in the region. Since 1995, the Program has delivered more than 200 training activities across the Pacific, with recorded attendances by more than 2700 Pacific medical personnel [56]. The professional and institutional relationships developed through PIP have also reportedly enabled health professional graduates from a number of Pacific Island nations to access RACS scholarships to help them further their training in New Zealand or Australia, or to attend international medical conferences. Local support and international assistance for specialist medical education meant that there were 30 Pacific Island national qualified graduates with Masters of Medicine (Surgery) working in Fiji, Kiribati, the Solomon Islands, Vanuatu, Samoa and Tonga in 2015.

Apart from structured cooperation with third countries, EU countries may also learn from the experience and evidence in this area coming from outside the EU. Medical schools in many countries have, for example, benefited from twinning programmes that foster exchange, share resources and undertake collaborative work for mutual advance. Indiana State University (USA), for example, has undertaken a global health elective for its students in Eldoret (Kenya), who are mentored by the local and visiting faculty [54]. Box 10 provides an example of structured cooperation as a means of providing specialist surgical services between Australia, New Zealand and small Pacific Island countries, and Box 11 provides an example from two Canadian provinces on structured cooperation in medical education.

Structured cooperation linking health care or training institutions

While EU Member States and regions may cooperate formally through bilateral agreements, there are also other cross-border frameworks available at the organizational level. Several of these local cross-border initiatives exist, sometimes involving the sharing of highly specialized staff (e.g. a brain surgeon being seconded to a neighbouring hospital when required) and also cross-border training. These forms of structured cooperation involve local actors/ organizations and not necessarily EU Member States or regional authorities. One example is the European Graduate School of Neuroscience (EURON), an international research and training network of nine universities in Belgium, Germany, France, Luxembourg and the Netherlands, with further connections to other universities in the Czech Republic, Germany, Greece, Japan, Portugal, Turkey, Sri Lanka, People's Republic of China and South Korea. EURON partners aim to share expertise, knowledge and infrastructure to allow MSc and PhD students to broaden their research competencies, to encourage their mobility and to enable them to apply for a European Masters in Translational Neuroscience. Another aim is to create PhD positions between partner universities, which would award joint or double PhD doctorates. Set up in 1995, the network was recognized as a Marie Curie Early Training Site under the 5th and 6th Framework Programmes of the European Commission, and was reaccredited by the Royal Dutch Academy of Arts and Sciences (KNAW) for the period 2010–2015 [60]. In the field of rare cancers, the National Centre of Oncological Hadrontherapy (CNAO) in Pavia, Italy, provides training opportunities and seminars in its Hadrontherapy School to international students and oncologists from, for example, France [61].

Structured cooperation linking clusters of organizations and/or individuals

Another form of voluntary structured cooperation is the one taking place between organizations or individuals, for example, at the level of professional networks or professional associations (see Box 12). Informal bilateral agreements have, for example, been signed by associations in Finland and Estonia [45] and the two medical chambers of Tyrol in Austria and South Tyrol in Italy demonstrate a special model of cross-border collaboration. The 'Südtirol Enquête' was established in 1987 in order to ensure that medical doctors from South Tyrol can be trained in South Tyrolean hospitals in accordance with Austrian law and receive the Austrian licence to practice medicine (approbation). Thus, Austrian medical training is secured for South Tyrolean graduates and Austrian medical doctors gain training possibilities in South Tyrol [63]. Another example can be found in Ireland. In the Republic of Ireland, the Royal College of Physicians of Ireland and the Royal College of Surgeons in Ireland are the bodies responsible for organizing medical training within the Republic. Training in Northern Ireland is organized in association with the UK Colleges because they are the bodies responsible for providing accreditation.

Box 11: Structured cooperation in medical education between University of Sherbrooke and University of Moncton

In Canada, a federal country, the provision of health services is the responsibility of each of the 10 provinces and three territories. Users can and do cross provincial borders to seek care; it is a fundamental right (called "portability") enshrined in the *Canada Health Act*. For example, there is a good deal of mobility between the cities of Ottawa in Ontario and Hull/Gatineau in Quebec. Motives to cross the border may be to gain more rapid access to some services or to receive care in one's own language (Ottawa is predominately English-speaking and Hull/Gatineau French-speaking). There are bilateral billing agreements that facilitate the reimbursement by the province of origin of the user to that providing the services.

Only insured services under the public health insurance scheme are covered. Examples of structured collaboration include agreements between two provinces to provide specialized services that are not available in one of them, or which are not sufficient to meet demand. For instance, in 2009, as part of Ontario's strategy to reduce waiting times for access to bariatric surgery, it passed an agreement with a hospital in Quebec to provide that service to eligible Ontario residents [57]. There are other agreements to give access to a broader range of services between the three territories, which have smaller and dispersed populations, and other provinces. This is the case of Nunavut (population of 32 000), which has three health regions but only one hospital. The Government of Nunavut has agreements with the provinces of Alberta, Manitoba and Ontario to provide specialized services to Nunavut residents in 'referral centers' [58]. Yukon, also with a small population, has similar agreements with British Columbia and Alberta.

In the field of medical education, there is an example of structured collaboration, which started in 2006, between the University of Sherbrooke, in the province of Quebec, and the University of Moncton in New Brunswick, a province with a population of about 750 000 residents, predominantly English-speaking, with a minority French-speaking population. New Brunswick has been struggling since the end of the 1960s with a shortage of medical doctors in the Francophone rural areas of the province, partly caused by a shortage of French medical education availability. In 1969, a first partnership agreement was signed with the government of Quebec. Initially, 12 seats, and later 20 seats, were reserved for New Brunswick students in Quebec universities that offered medical education in French. Throughout the years, the partnership has continued and adapted to changing circumstances [59]. Since 2006, the University of Sherbrooke in Quebec works directly with the University of Moncton and offers its own four-year medical curriculum at the University of Moncton in French, admitting 24 students per cohort. In 2010, the first cohort of 23 students graduated successfully.

A specific system of exchange of trainees between the Republic of Ireland and Northern Ireland has been developed in the area of paediatric surgery. Attempts have also been made to construct joint training programmes for other specialties. These attempts have concentrated on specialties where it was difficult to maintain a training programme in one jurisdiction, such as neurosurgery and paediatric surgery. There have been limited successes, despite difficulties in relation to insurance, medical/legal cover and accreditation. Overall however, these cross-border projects have been subject to little external evaluation [64].

Box 12: Sharing staff, equipment and training facilities between two academic hospitals on the German–Dutch border

Aachen University Hospital in Germany and Maastricht University Hospital in The Netherlands are 30km apart [33]. With limited, partly overlapping catchment areas and operating in competitive environments, the two hospitals have been collaborating for years. In the early 1990s they were among the first to obtain European Interreg funding for cross-border health care projects. Since then, collaboration has gradually expanded and in 2004 the two organizations signed an agreement. Collaboration focuses on highly specialized, low-volume procedures and prioritizes health professional mobility over patient mobility. Some health professionals have part-time contracts with both hospitals and commute between them; other staff are regularly seconded (the sending hospital invoices the receiving hospital based on an hourly rate and the hours worked). By mid-2013, collaboration involving professional mobility and/or training included:

- Vascular surgery:
 - One professor is head of the Surgery and Cardiovascular Centre in Maastricht and of vascular surgery in Aachen; a second professor performs surgery at both hospitals.
 - The two hospitals use identical treatment protocols and clinical guidelines.
 - German-resident doctors can train at the Maastricht Surgery and Cardiovascular Centre and obtain points for their degree as the Centre is the first abroad to be accredited by the German Society of Vascular Surgery. Dutch residents however do not have the same option in Aachen as the relevant Dutch body does not recognize experience obtained abroad.
- Nuclear medicine: one professor is head of nuclear medicine at both Aachen and Maastricht.
- Neurology:
 - A surgeon from Maastricht performs deep brain stimulation at Aachen hospital due to the lack of an experienced neurosurgeon.
 - A specialist in mobility disorders from Aachen is detached on demand to Maastricht.
 - Applications for 'extended visiting professorships' for three professors from each hospital to teach at their partner hospital have been made.
- Transplants: German patients are referred to Maastricht for stem cell transplantations accompanied by a specialist from Aachen; Dutch patients are referred to Aachen for liver and kidney transplants accompanied by a Maastricht specialist.
- Clinical neurophysiology: a professor performs teleneuromonitoring from Maastricht during vascular operations at Aachen and travels there for complex interventions. Five neurophysiologic laboratory technicians from Maastricht travel alternately to Aachen to assist. An inter-hospital contract guarantees that one Maastricht technician is permanently on-call for the Aachen hospital [62].

In addition, there are frequent exchanges of PhD students. The sharing of staff is slowed down particularly by the long bureaucratic procedures for getting health professionals' diplomas recognized in the other country.

At European level, few examples can be found of professional associations involved in voluntary structured cooperation to address health workforce challenges. One of the exceptions, however, is the European Union of Medical

Specialists (Union Européenne des Médecins Spécialistes – UEMS), which represents national associations of medical specialists in the EU and in associated countries. To address the harmonization of medical specialists' qualifications, it has developed the European Council for Accreditation of Medical Specialist Qualifications (ECAMSQ®). Box 13 provides more information on this model.

Facilitators and barriers

In several instances, the facilitators and barriers for structured cooperation addressing health workforce challenges in highly specialized health care mirror each other. This is, for example, illustrated by comparing the situation before the adoption of Directive 2005/36/EC with the situation afterwards. The previous sectoral and general directives had several shortcomings that hampered the mobility of health workers [67]. Directive 2005/36/EC, while not perfect, created a more uniform, transparent and flexible regime and in this way facilitated health workforce mobility, also benefiting highly specialized health care [67]. The five main categories of factors that influence the success of structured cooperation are legal factors, political factors, economic factors, sociocultural factors and organizational factors. In many instances, the absence of these should be understood as constituting a barrier for structured cooperation addressing health workforce challenges in highly specialized health care, while their presence should be conceived of as a facilitator. Moreover, it should be noted that, while being separately discussed, many of these factors are related and operate through various levels of the health care system. Structured cooperation in highly specialized health care is most efficiently facilitated where all factors are being addressed simultaneously and are well aligned.

Legal factors

Legal factors mainly relate to the institutional framework. As in the example of Directive 2005/36/EU, the introduction of new secondary legislation and other legal and policy instruments (such as bilateral agreements or memoranda of understanding) at EU and national level is often aimed at facilitating and easing cross-border cooperation in (highly specialized) health care. The influence of legal factors on structured cooperation is therefore mostly indirect. It represents the context or the enabling factors and environment for structured cooperation to take place, rather than directly influencing the cooperation itself. However, sometimes, legislative differences may hinder the execution of cross-border structured cooperation in highly specialized care, for example, where there are differences in national laws regarding eligibility for services or the licensing of products and medicines. In other instances, legislation may force medical practitioners working across two countries, as in joint appointments, to take separate insurance cover in each legal jurisdiction [64].

Box 13: Cross-border recognition of specialist qualifications including their harmonization and improvement: The European Council for Accreditation of Medical Specialist Qualifications® (European Union of Medical Specialists)

The European Union of Medical Specialists (Union Européenne des Médecins Spécialistes – UEMS) is a non-governmental organization representing national associations of medical specialists in the EU and in associated countries. The UEMS committed itself to addressing the harmonization of medical specialists' qualifications through the creation of the European Council for Accreditation of Medical Specialist Qualifications (ECAMSQ®). In a context of increased cross-border health care, the development of such a model is aimed at guaranteeing the delivery of safe and high-quality health care for all European citizens [65].

The problem

The recognition of professional qualifications laid down in Directive 2005/36/EC enables mobility and access to a professional activity by European citizens in other Member States. But for medical professionals, the provisions on medical training are restricted to the duration of training and do not address either content of courses or competences included. Yet, significant differences in the content of training programmes in the different Member States exist. Therefore, considerable uncertainties remain with regards to the necessary guarantees in the competence of moving doctors [65].

Added value of ECAMSQ®

To address the harmonization of medical specialists' qualifications and ensure effective free movement, each Specialist Section of the UEMS has developed a core curriculum of competences as a recommendation of what each specialist should follow and comply with. When fully implemented, the ECAMSQ® competence-based approach aims to achieve a common background for the assessment and certification of medical specialists' competences all over Europe.

The ECAMSQ® is not intended to supersede the sovereignty of national competent authorities nor to create a new layer of bureaucracy but rather to mobilize the existing initiatives and forces in the field of postgraduate training. Its founding philosophy is based on competence-based learning with periodical formative assessments of Knowledge, Skills and Professionalism, notably by means of multiple-choice questions (MCQs) and direct observation of practical skills (DOPS) [65].

Implementation of ECAMSQ®

ECAMSQ® is currently still at the conceptual stage. However, in 2011, the UEMS instigated pilot tests of knowledge assessment in several specialties, i.e. Anaesthesiology, Intensive Care, Radiology and Cardiology. These tests were supported by an e-platform and real-life tests were successfully organized which paved the way for future developments of competence-based assessments. The UEMS is currently working on the development of a flexible, useful and high-quality e-portfolio supporting the assessment of medical competence [66].

Political factors

These factors are somewhat related to legal factors in that they demonstrate willingness to cooperate and can also create an enabling framework or favourable conditions for structured cooperation to potentially take place. For example, the strong cross-border political cooperation

taking place between the Republic of Ireland and Northern Ireland mainly occurred after the Good Friday Agreement of 1998. This was the first formal governmental commitment to work towards specific objectives in relation to cross-border cooperation [64]. Because of its particular political nature, this enabled the two countries to secure a fair amount of EU funding. For example, the Craigavon Hospital Trust (Northern Ireland) and the North Eastern Health Board (Republic of Ireland) were the first to discuss the potential for working together. Out of those discussions came the Cross Border Acute Services Project, which secured EU Peace and Reconciliation funding. Many other cross-border health projects, including the Primary Care Project have also attracted EU Peace and Reconciliation funding [64]. Hence, the political background of the collaborations influenced their chances of obtaining funding, which is often an important requirement for structured cooperation to be able to take place (see also below).

Economic factors

Cross-border structured cooperation in highly specialized health care is influenced by economic factors and can sometimes have considerable financial implications. In the various examples presented in this policy brief, we have seen that the initiatives are often dependent on (EU) grant funding. The *Healthregio* project, for example, was funded by the Interreg programme, while the cross-border cooperation between the Republic of Ireland and Northern Ireland relied considerably upon EU Peace and Reconciliation funding. On the other hand, Sanicademi, the International Training Academy for Health Professionals, was initially financed through a membership fee (€20 000 annually) paid by the three regions participating in the action. Hence, various financing forms are possible. At the same time, projects may lapse after funding expires, irrespective of their outcomes, and it may not even be possible to carry forward successful elements of a project on a more structured basis [64].

What share of the costs involved in cross-border structured cooperation in highly specialized health care is actually related to the health workforce is hard to determine as few data are available. The most widely used data derive mainly from a study from the year 2000 on the amounts and flows of financial transfers for cross-border care within the EU [68]. While the study does not contain recent data, and hence must be treated with caution when generalizing to the current situation, it showed that pre-authorized care accounted for nearly 60% of the total cost of cross-border care, while the transfers for temporary stay and migrant workers were financially less important, with 25% and 16% respectively of the total expenditure [69]. Hence, health workforce components may not constitute the largest proportions of the associated expenditure.

Finally, there may be differences in pay scales, costs of living and general conditions of employment, which may influence the extent to which cross-border cooperation in highly specialized care is possible [64]. One of the biggest barriers for cross-border cooperation that the *Healthregio* project tried to tackle was the price and wage differences between

the participating regions. Austria had by far the highest price and wage levels, meaning that many health professionals migrated to this region, hampering the possibilities for cross-border cooperation [52]. Differences in pay and costs of living may also hamper possibilities for cross-border training for health professionals, limiting the potential for knowledge exchange.

Sociocultural factors

Sociocultural factors play an important – yet often barely visible – role in cross-border structured cooperation. Cultural, historical or linguistic affinity between countries plays a large role in cross-border mobility of health staff, which is reflected in the bilateral agreements that are being concluded. Apart from that, user preferences can also have an influence on cross-border structured cooperation in health care. For example, while the Spanish Puigcerdà Hospital in the Cerdanya region (with Upper Cerdanya in France and Lower Cerdanya on the Spanish side of the border) was easily accessible for French patients, and health workers were willingly cooperating, at the beginning of the 1990s, visits from French patients were uncommon. It seems that cultural barriers and distrust of the Catalan/Spanish health system meant that only the most urgent French cases sought assistance at the hospital. With time, however, French patients grew more familiar with Puigcerdà Hospital; in 2007–2011, over 7000 French patients were treated as in- and outpatients at the hospital [70].

Related to this, language can also have a strong influence on the success of cross-border collaborations in health care. Communication with patients should be feasible. Equally, communication between health care providers is of crucial importance. Knowledge transfer problems within cross-border collaborations, for example, are often related to language barriers. A case study on Slovakian doctors collaborating with German doctors, for example, showed that language barriers occurred in half of the cases and constrained the learning and knowledge transfer opportunities [71].

Organizational factors

Finally, the organizational context influences the way in which structured cooperation in cross-border health care can take place. This is related to the type of delivery system and structural arrangements in place, but also to existing (informal) networks at organizational level; existing ties or informal staff exchanges may pave the way to more structured cooperation forms. Structured cross-border cooperation may be encouraged by providing health professionals with the necessary resources, including making available dedicated time for collaboration, support for travel and attendance at meetings, as well as an organizational culture which is open to new perspectives.

Discussion

The findings presented in this policy brief suggest that various forms of cross-border structured cooperation can be identified and used to address health workforce challenges related to highly specialized health care. As highly specialized care usually requires a multidisciplinary team approach and can often only be provided by a limited number of health professionals and services within a country, this creates specific health workforce challenges. Also, patients often have to travel large distances, or go abroad, to receive the required care. This policy brief shows that structured cooperation can help address health workforce challenges and ensure that patients in need of highly specialized care can have access to diagnosis and high-quality care in their own country. It does so by facilitating the availability of appropriate staff, education capacity and knowledge transfer through voluntary but organized cross-border activities between governments and health agencies, health care providers, professional bodies, funding organizations, education institutions or other health care sector actors.

Having the right multidisciplinary staff mix available, with the required specialized knowledge and skills, is of key importance in providing high-quality highly specialized health care. The importance of knowledge exchange and collaboration in the education and further training of health professionals therefore runs like a thread through all good practice examples that were included in this policy brief. European Reference Networks constitute one example, as they are intended to help Member States with too few patients to provide highly specialized care help speed up the diffusion of innovations in medical science and health technologies, and serve as focal points for medical training and research, information dissemination and evaluation [36]. But we also encountered various examples at a national level; for example, where the Republic of Ireland and Northern Ireland developed an exchange programme for trainees in the area of paediatric surgery; and at institutional level, between Aachen University Hospital in Germany and Maastricht University Hospital in The Netherlands, where doctors from both facilities can train at both hospitals. Hence, this policy brief shows that structured cooperation between countries can play an important role in facilitating the exchange of knowledge, training and experience between actors at all levels in the health system. Moreover, unlike the informal exchange of knowledge, structured cooperation can ensure that knowledge and experience become *structurally* embedded between health professionals as well as health facilities and systems.

While various forms of cross-border structured cooperation can be identified, the question of what specific form of cooperation is most appropriate is dependent on the health workforce challenge that is being addressed, even though it was found that cooperation often addresses multiple challenges at the same time. For example, the establishment of bilateral recruitment agreements may prove a useful vehicle to address specialized workforce shortages while simultaneously addressing geographical maldistributions of the health workforce. The choice of a particular structured cooperation form may also be driven by the economic, political and sociocultural setting in which it will be implemented and the actors involved. In cross-border regions with significant sociocultural differences, for instance, it may be more beneficial to set up joint training programmes rather than to exchange staff, in order to prevent sociocultural clashes and miscommunication with patients.

Irrespective of the extent to which structured cooperation in highly specialized health care is used, and however great its face validity, little actual evaluation of the effectiveness of the various structured cooperation forms has been conducted. In the few instances where some sort of evaluation is reported to have taken place, the focus was on process outcomes rather than effectiveness or the realization of objectives. For example, in some cases, the number of training activities was reported, but no reference was made to the actual improvement among staff in terms of their knowledge and skills required to provide highly specialized care.

A related and, so far, unresolved issue is what is meant by effectiveness in structured cooperation that addresses health workforce challenges in highly specialized health care. Should the effectiveness of structured cooperation be defined by its effects on health workforce parameters (e.g. an increase in the number of staff to address the limited size of the health workforce) or by its effects on patient outcomes (e.g. improved patient access to services, which is the ultimate rationale for highly specialized health care)? Looking at the potential that structured cooperation in highly specialized health care offers – including benefits for patients in terms of access and quality of care, for health professionals in terms of peer networking and knowledge exchange, and for health systems in terms of performance – evaluations should ideally take a broad perspective and include all these elements. This is reflected in the good practice examples that were included in this policy brief; for example, 50 patients have undergone deep brain stimulation successfully in Malta since the cross-border collaboration with the UK started in 2011 (Box 7), while approximately 500 doctors annually experience the benefits of networking and peer learning through the Serbian Diaspora Medical Conference (Box 8).

Policy implications: supporting structured cooperation

Structured cooperation addressing health workforce challenges in highly specialized health care is varied, important and can be supported in the following ways:

- To build highly specialized care capacity throughout the EU, exchange best practices and promote innovation, structured postgraduate training exchange should be further developed as a cross-border cooperation activity. Initiatives should focus on specialist training, but also continuing medical education and continuous professional development.
- To tackle health workforce challenges in highly specialized care and increase patient access to high-quality multidisciplinary care within their own country, a specific approach, tailored to the context in which highly specialized health care is provided, is required from all actors involved in the structured cooperation.
- To identify appropriate solutions to tackle health workforce challenges in highly specialized health care, an effective situation analysis of the workforce component of specialist services is needed, i.e. what are the causes of the workforce challenges? The WHO framework for analysis of health worker labour market dynamics [72,73] may be a useful starting point for this.
- Successful structured cooperation initiatives in highly specialized health care should be sustained on a more structural basis, where possible with political and financial support from domestic authorities and/or the EU, if the benefits for patients, health professionals and the regions, countries and/or organizations involved are to be retained.
- There is a wide range of grassroots experience and innovation available in structured cooperation in highly specialized health care, which can be exchanged and may be relied upon to inform and improve macro-level policies. Because many of these local initiatives are not widely known, national- and European-level mapping activities of all initiatives in this area would be beneficial.
- More evidence is urgently needed on the impact of cross-border structured cooperation in highly specialized care on the health workforce involved and on patient outcomes, in order to inform policy and practice. The use of evaluation designs should therefore be stimulated and become an integral part of structured cooperation.
- Many of the challenges faced by the health workforce providing highly specialized health care should not be looked at in isolation. They are the final element of service design and, as such, should be an integral part of health policies.

Conclusions

Complex medical procedures require highly specialized health care, which can often only be provided by appropriately trained health professionals working within a limited number of facilities, usually through a multidisciplinary team approach. This creates health workforce challenges in terms of availability of appropriate staff, education capacity and knowledge transfer. With an increase in health professional mobility impacting on the performance of health systems [18], and a growing interdependence between countries, intra- and intercountry collaboration becomes increasingly important. Structured cooperation offers various options to shape cross-country collaborations, most notably in the areas of health and education policy.

Firstly, cross-country structured cooperation in the area of (postgraduate) training and continuous professional development can play an important role in facilitating the exchange of knowledge, training and experience between actors at all levels in the health system. Unlike the informal exchange of knowledge, structured cooperation activities can ensure that knowledge and experience become *structurally* embedded in health professionals as well as health facilities and systems. Moreover, it can help overcome legal or political barriers, such as the recognition of skills or qualifications obtained in another country, making this a promising avenue for further exploration.

Secondly, more efforts should be placed on maximizing the use of the current health workforce through structured cooperation. Despite the lack of formal evidence, the options and works in progress presented in this policy brief suggest that structured cooperation in (highly specialized) health care has the potential to address health workforce concerns. This potential was recognized by many actors involved in the structured cooperation initiatives that were discussed. This grassroots experience may be used to inform macro-level policies, although issues of rigour and relevance should be taken into account. An interesting way to further explore these possibilities would be by setting up a network of health workforce experts who could provide advice on structured cooperation activities to realize the full potential of the health workforce in highly specialized care, among others through expertise and knowledge sharing. The expected network of experts resulting from the Joint Action on Health Workforce Planning and Forecasting could take up this role.

Thirdly, as health workforce policies span different domains, including most notably the areas of health, education and employment, implementing structured cooperation options will entail in many cases consensus building and strong intersectoral governance. Moreover, as many structured cooperation forms discussed in this policy brief span various levels – from national to regional to organizational – this requires a multidimensional policy framework.

Finally, the exchange of good practices in cross-border cooperation to address health workforce challenges in highly specialized health care seems beneficial. While in many cases a proper evaluation will be required to establish what is actually 'good practice', there is a wealth of knowledge available that can inspire various actors in the health system – from governments and health agencies to health care providers, professional bodies, funding organizations, education institutions and other health care sector actors – seeking solutions to problems of the health workforce in providing highly specialized care.

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Appendix 1. Detailed methods

This policy brief combined a literature study, taking a meta-narrative approach, with semi-structured interviews and desk research.

1. Literature review (meta-narrative approach)

The review was aimed at identifying publications, in both the scientific and grey literature, that could provide an answer to the central research question: how can voluntary structured cooperation between EU Member States address health workforce challenges associated with the provision of highly specialized health care services? In performing the literature study, we took a meta-narrative approach.

The meta-narrative approach was developed by Greenhalgh et al. [3,4] as a way of systematically making sense of complex and heterogeneous bodies of literature. It is therefore well suited to answer the complex and multidisciplinary policy question that was addressed in this policy brief. In general, six phases are distinguished as part of a meta-narrative approach. Table A describes these phases and justifies how they were applied in the literature study underlying this policy brief.

Table A: Phases of a meta-narrative approach and use in policy brief

Phase	Justification
1. Planning phase	
a. Assemble a multidisciplinary research team whose background encompasses the relevant research traditions.	a. The authors of the policy brief come from diverse scientific backgrounds, all with expertise in health workforce research.
b. Outline the initial research question in a broad, open-ended format.	b. The research question was repeatedly reformulated during the process.
c. Define outputs in collaboration with funder or client.	c. Has been done by drafting the Terms of Reference and sharing this with the Maltese government (funder).
d. Set up a series of regular, face-to-face review meetings, including planned input from external peers drawn from the intended audience for the review.	d. Draft was circulated repeatedly among co-authors, editor and Maltese government.
2. Search phase	
a. Lead the initial search by intuition, informal networking and 'browsing' in order to map the diversity of perspectives and approaches.	a. Initial search was conducted based on prior knowledge of authors.
b. Search for seminal conceptual papers in each research tradition by tracking references of references. Evaluate these by the generic criteria of scholarship, comprehensiveness and contribution to subsequent work within the tradition.	b. Seminal papers and reports were identified.
c. Search for empirical papers by electronically searching key databases, hand-searching key journals and 'snowballing' (references of references or electronic citation tracking).	c. Key databases were searched with combinations of the search terms "cooperation", "collaboration", "International Cooperation"[Mesh], "health workforce", "human resources for health", "HRH", "Health Manpower"[Mesh], "specialised health care services", "specialized health care services", ["highly specialised" AND "care"], ["highly specialised" AND "services"], ["highly specialized" AND "care"], ["highly specialized" AND "services"]. There were no restrictions as to date of publication or language, although it should be noted that we only used English search terms.
3. Mapping phase	
a. The key elements of the research paradigm (conceptual, theoretical, methodological and instrumental).	a. Has been done.
b. The key actors and events in the unfolding of the tradition (including the main findings and how they were discovered).	b. Key authors were identified and the institutional framework surrounding structured cooperation in highly specialized health care was sketched.
c. The prevailing language and imagery used by scientists to 'tell the story' of their work.	c. Not applicable.
4. Appraisal phase	
a. Evaluate each primary study for its validity and relevance to the review question.	a. Each publication was reviewed for its relevance to the policy questions addressed and had to fulfil the following criteria:
– concerns voluntary structured cooperation in highly specialized health care	
– addresses the health workforce involved	
– discusses one or more policy options/interventions to optimize voluntary structured cooperation for highly specialized health care.	
b. Extract and collate the key results, grouping together comparable studies.	b. Key results were grouped according to the main structured cooperation form they belonged to (e.g. linking countries).
5. Synthesis phase	
a. Identify all the key dimensions of the problem that have been researched.	a. Health workforce challenges were identified.
b. For each dimension, give a narrative account of the contribution (if any) by each separate research tradition.	b. Not applicable.
c. Treat conflicting findings as higher-order data and explain them in terms of contestation among the different paradigms from which the data were generated.	c. There were no conflicting findings, but attention was paid to the fact that many of the health workforce challenges in highly specialized health care apply to the general health workforce as well.
6. Recommendations phase	
Through reflection, multidisciplinary dialogue and consultation with the intended users of the review:	Through reflection, multidisciplinary dialogue and consultation with the intended users of the review:
a. Summarize the overall messages from the research literature along with other relevant evidence (budget, policy-making priorities, competing or aligning initiatives).	a. The policy brief gives an overview of structured cooperation taking place, summarizes the evidence and provides a discussion on this. This has been discussed with the Maltese government.
b. Distil and discuss recommendations for practice, policy and further research.	b. Has been done.

Analysis and reporting

All relevant data from included publications were extracted. Data were organized and summarized on the basis of the policy questions that guide the policy brief. Findings were described narratively, including the type of structured cooperation, level of cooperation, professionals involved, identified barriers, identified facilitators, effectiveness/evidence, and so on.

Naturally, our approach has several limitations, most notably the fact that we only searched with English search terms. In this way, important publications in other languages (without English key terms applied) may have been missed. However, we hope to have mitigated the risk of skewed conclusions by including publications and examples from a wide geographical range across Europe.

2. Semi-structured interviews

To gain a more in-depth understanding of the health workforce challenges in structured cooperation in highly specialized services, as well as the policy options and good practices that are available, qualitative semi-structured interviews were conducted with:

- European policy-makers to gain more insights into the workings and facilitators of as well as barriers to the legal options available.
- Professional associations to gain more insights into the workings and facilitators of as well as barriers to the policy options available, based on the feedback they receive from their members.
- Managers and health care professionals at Member State level who are involved in (various forms of) structured cooperation/networks.

Approach

Interviews ($n = 8$) were conducted in English by phone and email by the first author. A topic guide was used to guide and direct the semi-structured interviews. The topic guide focused on the structured cooperation form itself, as well as on facilitators and barriers in the implementation process. The topic guide was revised when the analysis of the data evolved.

While the precise topic guide was dependent on the nature of the structured cooperation form that was examined, key items on the guide included:

- Can you explain in detail what the [structured cooperation initiative that is examined] entails?
- Which actors are involved in the [structured cooperation initiative that is examined]?
- What are facilitators for the [structured cooperation initiative that is examined], specifically in terms of:
 - Education, training and knowledge exchange?
 - Service delivery?
 - Funding, governance, quality assurance/regulation?
- What are challenges for the [policy option that is examined]? Are these mostly legal challenges or practical challenges?
- How is communication between service providers arranged (e.g. formal/informal agreements, language issues)? How is communication with patients arranged (e.g. language issues, direct communication or indirect via service provider in home country)?
- Are the experiences from the [policy option that is examined] useful for/transferable to other contexts?

Analysis and reporting

Interviews were summarized by the first author. Afterwards, data were thematically analysed without the help of a software programme and results were reported along the main themes identified. Where boxes were produced based on data obtained through the interviews, the interviewee was sent a draft version of the box for verification and with a request for feedback. Afterwards, the boxes were finalized and included in the policy brief.

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