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Cross-border healthcare: A review and applicability to North America during COVID-19

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ABSTRACT

Cross-border healthcare is an international agreement for the provision of out of country healthcare for citizens of partnered countries. The European Union (EU) has established itself as a world leader in cross-border healthcare. During the Coronavirus disease of 2019 (COVID-19) pandemic, the EU used this system to maximize utilization of resources. Countries with capacity accepted critically ill patients from overwhelmed nations, borders remained open to healthcare workers and those seeking medical care in an effort to share the burden of this pandemic. Significant research into the challenges and successes of cross-border healthcare was completed prior to COVID-19, which demonstrated significant benefit for patients.

In North America, the response to the COVID-19 crisis has been more isolationist. The Canada-United States border has been closed and bans placed on healthcare workers crossing the border for work. Prior to COVID-19, cross-border healthcare was rare in North America despite its need. We reviewed the literature surrounding cross-border healthcare in the EU, as well as the need for a similar system in North America. We found the EU cross-border healthcare agreements are generally mutually beneficial for participating countries. The North American literature suggested a cross-border healthcare system is feasible. A number of challenges could be identified based on the EU experience. A prior agreement may have been beneficial during the COVID-19 crisis as many Canadian healthcare institutions-maintained capacity to accept critically ill patients.

1. Introduction

Cross-border healthcare is an international agreement that allows patients to receive healthcare in a country other than their own. Provision of cross-border care may include, movement of patients to a country other than their own, movement of healthcare teams, and international telehealth services [1]. This is best exemplified in the European Union (EU), which has a long-standing history of cross-border care, based on values of free movement of its people and goods. This history and partnership culminated in the establishment of a transcontinental healthcare system. Prior to being codified into EU law, many countries created their own mutually beneficial cross-border agreements. European cross-border cooperation began in the 1950′s and was initiated by neighbouring countries [2–4]. The neighbouring governments of these cross-border regions, termed Euregios (European Region), created their own agreements in order to bolster the typically low economic or geographically isolated areas along the border [2–4]. Over the following decades, many more Euregios would be established with healthcare considerations at the forefront.

Outside of the Euregios, cross-border healthcare was first enacted within the EU through the Regulation on the Coordination of Social Security Systems which aimed to protect EU citizens in emergency situations as a result of travel or work across various member states. It further aimed to protect migrant workers employed in a country other than their own [5,6]. This regulation was enacted thanks to the EU's values of free movement of its people and labor force. This piece of legislation was enacted in the 1970′s and remains in place today to ensure immediately necessary healthcare accessibility to citizens when travelling and working within the EU. Under the Regulation of Coordination of Social Security Systems prior authorization by the individuals home country was required for planned healthcare usage [6].

Stemming from the ideals of the free movement of goods, European cross-border healthcare has further evolved through a series of laws and precedent setting cases, which have helped ensure access to healthcare to all EU citizens throughout the EU as an extension of the original legislation (Dekker and Kohll being the most famous cases) [2,3,5,7–12]. In 2011, the European Parliament incorporated these legal precedents into a unified legislation, which ensured that

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patients could seek healthcare in all EU member-states and that they would be reimbursed if the service fell within the insurable services of their home country, or with prior authorization alongside the Regulation of Social Security Systems [8,12]. Initial efforts by the European Court of Justice (ECJ) worked to create a cross-border system, which largely eliminated the requirement of prior authorization; however, the economic concerns of many EU countries led to this ultimately never being enacted [13–15].

Cross-border healthcare is currently accessed by EU citizens through emergency care, approved services not requiring prior state authorization, or preauthorized services usually through physician referral. Prior authorization for care is not required for care that does not require admission to hospital and that would normally be covered by the home country's health insurance. While cross-border healthcare has been mandated by the EU, it's the member states who are individually responsible for administering healthcare within their domestic borders. As a result, countries have enacted legislation to ensure healthcare dollars are spent domestically when the expertise can be accessed within the patient's home country and will only re-imburse healthcare expenditures that cannot be accessed in a designated time frame based on the service required, or when an insurable service is not available. Due to the variations of rules that exist in the different member states and the difficulties of navigating related healthcare systems, the EU has mandated that national contact points be put in place. These national contact points are responsible for educating and assisting patients on their healthcare rights, options to receive healthcare abroad, and on the various reimbursement processes [8,12]. Despite these rulings cross-border healthcare only accounts for a small proportion of the healthcare provided within Europe, less than was initially anticipated [16]. Recently, in response to the Coronavirus disease of 2019 (COVID-19), the EU has further strengthened its cross-border healthcare to ensure the maximization of transcontinental resources in the spirit of free mobility of goods, services, people, and the sharing of vital resources [17].

Patients access healthcare services beyond their own borders for a number of reasons. Health tourism is the concept that patients seek healthcare in other countries to access non-insured services, avoid longer wait times, or seek less costly healthcare [2,12,18]. Although there is extensive literature surrounding the topic of health tourism, this review will focus on exploring patient access to their nearest healthcare system, and shared resources.

Although, North America is not similar to the EU with respect to geography or demographics, North American countries may benefit from similar EU cross-border agreements that allow patients to access the nearest healthcare system from their residence as well as improved the care of vulnerable populations, and those residing in resource poor areas. The objective of this review is to evaluate the benefits and challenges of a North American cross-border healthcare agreement based on the European experience and available literature in both the response to COVID-19 and outside of this crisis.

2. Methods

Given the broad spectrum of this topic a general overview of the topic was our primary goal. We completed a directed search of the literature to review any studies which pertained to cross-border healthcare during the response to the COVID-19 pandemic. A thorough review of Embase and OVID Medline was completed on December 15, 2020. This search strategy was developed with the assistance of a librarian, and included the following terms: healthcare, cross-border, healthcare agreement, international agreement, and COVID-19. All search terms used were expanded to include the corresponding MESH terms. This returned 1242 titles after duplicates were removed. The search was limited to publications which were available in English. We did not restrict the date of publication. It is possible that not all relevant literature was fully assessed, as the search strategy was difficult to determine due to the variety of terms that are used to describe cross-border healthcare. Additionally, our search was limited to English publications, which may not be comprehensive enough given that the majority of available research originated in Europe. During screening we included any title related to cross-border healthcare and COVID-19, however when reviewing general literature pertaining to cross-border healthcare we reviewed only European and North American literature, excluding: health tourism, and literature from other regions of the world. Once the papers were screened and reviewed other relevant articles were identified through cross referencing of the cited works of relevant papers. One area that was consistently included in our search, but not examined, was cross-border assisted reproduction. This is due to the large inter-regional variability in access, caused by differences in religion and ethics. Therefore, this area of research was not applicable to our discussion of general cross-border healthcare.

3. COVID-19 and cross-border healthcare

Coronavirus disease of 2019 (COVID-19) is an evolving public health crisis which has strained even the most robust and modern healthcare systems. The speed at which the global community has responded in exchange of medical knowledge and the development of a safe and effective vaccine has been unprecedented, which has been a shining example of a global response to a global problem. However, national and regional approaches to international relationships during this time has been varied and have threatened long standing partnerships. Early evidence from a Cochrane review has demonstrated that the travel related restrictions implemented throughout the globe have had some positive impact on the rate of spread of the disease within a country and impacted the mortality rate [19]. However the response to border control in the movement of medical teams and shared patient care has been vastly different when comparing the US Canada Border and the European Union.

In response to the first wave of the crisis the European Union enacted new legislation pertaining to cross-border healthcare to maximize the utilization of resources. Most notably this legislation calls on countries with capacity to accept critically ill patients from over extended systems. The EU has waived the requirement of prior authorization of cross-border healthcare to critically ill patients, and ensured borders remain open to those requiring emergency care [17]. Early in the pandemic hard hit areas such as Italy, France, and the Netherlands were reaching capacity within their ICUs. Patients were quickly accepted by Germany, Luxembourg, Switzerland and Austria. Based on an analysis of the European COVID-19 Health Systems Monitor completed in April 2020, nearly 300 COVID-19 positive patients have been transported across international borders. Military and health networks worked closely to utilize their infrastructure and transportation vehicles to help coordinate these efforts. Helicopters, ambulances and specialized medical transport vehicles were used [20]. As the second wave began to place new global pressures on the EU member-states, the European Commission pledged €220 million to help cover the costs of transporting critically ill patients to help facilitate ongoing efforts to maximize the utilization of resources [21]. The ongoing feasibility of this method of sharing resources in the second wave remains to be seen. Early in the second wave, which is proving to be more severe than the first, Germany continued to have the capacity to accept critically ill patients; however, as the pandemic accelerates their capacity may diminish [22,23]. Regardless, this is an enormous demonstration of solidarity between member states of the EU. Data regarding the response and patient outcomes is forthcoming, including a full analysis of nationality of those transferred, equitable accessibility to transcontinental care, and the impact on domestic patient care for countries receiving critically ill patients.

Across the globe the burden of the pandemic has fallen heavily on the shoulders of frontline healthcare workers. Universally these

individuals have been called upon to take on more hours, cancel or eliminate vacation time, and be redeployed to areas of need [24]. The EU has enacted legislation in response to personnel shortages, to ensure healthcare teams are freely able to cross-borders and to expedite the credentialing of medical professionals to work in other countries [17]. Further measures have been put in place by member states to help bolster their healthcare workforces in response to the pandemic. Some strategies have been put in place to ease the burden placed on the workforce present at the beginning of the pandemic; for example, delaying administrative tasks such as re-registration with regulatory bodies. Other measures include increasing the number of workers available through early graduation of nurses and medical students, recalling retired professionals, and utilizing volunteers in related professions to assist in basic support roles. Countries such as the UK have enacted legislation to allow the government use of private healthcare institutions and its personnel in response to patient surges throughout the pandemic [24].

A recent paper reviewed ICU accessibility regionally throughout the Europe. In the 14 countries analyzed there were 53 555 ICU beds, Germany holds more than half of these with 28 031. These authors demonstrated a negative correlation between COVID-19 case fatality rate and ICU bed accessibility, based on a composite score between number of ICU beds per 100 000 and travel time to hospitals with critical care capacity [25]. The European Union's approach to effectively increase ICU capacity through cross-border transport and to increase the available workforce may have a positive impact on the mortality rates as a result of COVID-19 in the first wave. Further data is required to investigate the efficacy of these strategies.

North America has taken a more isolationist approach from the beginning in an attempt to reduce cross-border spread. Closure of the Canadian and American border to non-essential travel was an agreed upon action between the two federal governments. While the border remains open for work related travel, public health authorities have disallowed cross border commuting by healthcare workers [26–28]. This has created strain in communities situated on the Canada-US border. To date there are no formal agreements between any of the North American countries as it relates to shared or cross-border care for COVID-19 patients. In response to COVID-19 related personnel shortages, Canada has recalled retired healthcare professionals, and has recruited students into the workforce [24]. In the US similar efforts have been observed in response to the pandemic. In New York, nearly 1000 retired physicians and nurses returned to the workforce in response to the devastating first wave. In both the US and Canada health insurance companies have broadened their coverage to include telephone follow-ups. This has helped decrease the burden and volume of in person visits [29]. The long-term impact of cross-border healthcare created by this pandemic remains to be seen, the different approaches taken by various regions of the world will be important to study.

4. Success of cross border healthcare in Europe

There are many examples of successful cross-border healthcare initiatives in Europe. These successes long predate the emergence of COVID-19 and have been possible largely due to Europe's shared history and longstanding partnerships. This history of success extends prior to the enacting of the ECJ rulings, many countries had agreements with neighbouring countries that allowed for cross-border healthcare. Transcontinental compliance provided multiple benefits to the overall health of EU citizens, regardless of the country they received healthcare in. Through the ECJ rulings, healthcare quality was better standardized [9,13,30–32]. This was further bolstered by European Reference Networks (ERNs) which are the result of a project of concentrated networks or centres which are specialized in certain aspects of care or in the care of uncommon diseases. ERNs were created in an effort to improve the access and management of rare diseases, to share specialized care throughout the EU and to help in the dissemination of knowledge among specialists [6,12,32–34].

Prior to COVID-19 patients within the EU travelled for healthcare for a number of reasons. Based on a 2018 report by the European Commission, between the years 2015–2017 approximately 50% of patient mobility was a result of proximity, meaning patients utilized healthcare services in neighbouring countries as it is was geographically more accessible than domestic care [16]. Shining examples of cross-border healthcare were identified throughout the literature ranging from larger internationally targeted programs such as the ERNs to small scale successes, several examples of which will be detailed here. On a smaller scale, several case studies have been completed which show the benefits of cross-border care in patient outcomes particularly in the case critically ill patients due to the distribution of adequate resources. A case report which highlights the benefits of small-scale cross-border healthcare occurred in a remote region of Sweden. In this case study three Swedish males capsized in a canoe, and two of the three individuals were critical injured. The closest healthcare centre with the necessary resuscitative capabilities was located in Norway. Rapid transport of the two critical patients to the closer Norwegian centre reduced the delay in treatment, and as a result both patients survived with minimal sequelae which may not have been the case without rapid international transport [35]. As previously discussed, telehealth has been used as a tool to provide specialized healthcare between countries [1]. Germany, the Netherlands, and Switzerland have developed cross-border telemedicine for intraoperative neurophysiology monitoring during Thoracoabdominal Aortic Aneurism repairs. Neuromonitoring must be completed by a highly specialized neuro-physicist, which is costly for surgical centres. A cross-border agreement was created between a neuromonitoring centre in the Netherlands and hospitals in Switzerland and Germany, which allowed a neuro-physicist to monitor patients remotely [36]. This is a cost-effective strategy which helps ensure that patients in multiple centres, from several different countries, receive the highest standard of care.

Studies have investigated factors that promote successful cross-border care in larger scale projects, ranging from Euregios to cooperation within the setting of the EU directives. In the case of Euregio projects, authors identified these factors to include: commitment to the project, geographic proximity, tangible benefits of the program, and the level of political support [2]. Other authors have cited the importance of Pan-European agreements as being crucial in helping to ensure access to care for citizens of smaller countries and remote regions [32,33]. For example, many countries are not large enough to support robust specialized programs, which forces them to rely on cross-border care [33,37]. Similar to the original Euregios projects, citizens of remote locations may have easier access to healthcare in a neighbouring country. Authors examining the long-standing agreement in joint pediatric care between Malta and the UK have identified a number of factors which enhanced the relationship. The authors found that joint training and longstanding referral programs helped foster a climate of trust between practitioners. This program continues to be successful through standardized communication between physicians, support programs for travelling families, and established translation services [37].

5. Challenges to cross-border healthcare in Europe

Several previous studies have explored the various challenges that face healthcare providers and institutions involved in cross-border healthcare. In fact, during the development of the EU agreement, Portugal, Romania, Poland, and Austria all voted against cross-border healthcare [13,15]. There were several challenges with this agreement from a healthcare provider perspective. A frequently cited issue was the difficulty of transfer of patient information leading to the need for an interoperable electronic medical record (EMR). This would allow patient data to be easily and securely accessible to healthcare

practitioners across the EU [38–44]. Healthcare providers also described concerns about the risk of denying services based on administrative authorization or travel constraints as opposed to medical necessity (e.g. discharges hastened due to pre-booked travel arrangements) [41]. The difficulties in coordinating patient follow up between primary care providers and out of country specialists was also highlighted [32,42,43,45]. Finally, the standardization of prescriptions was often described as a challenge in providing care to patients across the border, including differences in standard dosages or first line medications between countries [38,41,42]. The indirect challenges of cross-border healthcare for patients includes differences in culture, language, and financial situations (e.g. the loss of employment or income) [37,41]. For example Maltese families accessing pediatric healthcare in the United Kingdom described the culture have healthcare delivery as different from their own. This at times caused conflict between the healthcare team and families [37].

Authors have further investigated the early challenges that occurred during the establishment of cross-border healthcare system. The EU members who voted against cross border healthcare frequently cited concern for the negative economic impact from the anticipated exodus of patients leaving to seek healthcare in other EU member states [13,30]. During the development phase of the current cross-border legislation, Poland and Portugal were two of the countries who opposed the proposed system. They argued that their healthcare systems would lose money along with a significant number of healthcare practitioners, a result of their citizens seeking care elsewhere [13,15]. They anticipated a situation of unsustainable healthcare funding, which would divert resources away from their own practitioners [13]. The enactment of the EJC rulings came at a time of financial difficulty and uncertainty, in addition to the concerns voiced by some countries. Authors have criticized the EU's decision for the implementation of cross border healthcare in a time when some member states were cutting essential services to their own citizen as a result of austerity measures [46]. Another group of authors utilized mathematical modelling to demonstrate the concerns of cross border healthcare. They argued that cross-border healthcare would benefit the larger and more wealthy countries, and that it would cause the quality of the care to fall in the smaller and poorer countries [47]. Despite these concerns, movement of patients between healthcare systems has been less than anticipated by these countries, which ultimately reduced the overall anticipated negative impacts. When quantified in a 2009 study of 200 hospitals across 8 countries foreign patients accounted for less than 1% of hospital admissions [9,13,30,32,45,48–52]. Many citizens living abroad chose to return home for healthcare and those who travelled for care tended to be younger patients. The most commonly treated conditions were heart disease and fractures [9,51–53]. In a 2018 report by the European Commission, member states reported that the number of patients who travelled for care annually in 2016 and 2017 was approximately 200 000 patients. In 2016 cross border healthcare cost the EU €65 000 000. It is estimated that this healthcare expenditure makes up 10% of the EU's GDP (€ 15.3 trillion), and it is therefore estimated that the cost of cross border healthcare accounts for only 0.004% of the EU's GDP [16]. Furthermore, the countries that account for the greatest movement are France, Germany, and Spain. Typically these patients sought care from healthcare facilities that were closest to them in terms of proximity to their residence, or they sought care closer to a relative who would be able to care for them [16].

Medical liability is an area within the European experience that requires ongoing attention, given the additional complexity and needs for EMRs [16,32,43,54]. In the Euregios system, liability agreements were often vague and improvised as no prior precedents had been established. In the Meuse-Rhine cross-border emergency response system, patients are sent to either Belgium, the Netherlands, or Germany. In the event of medicolegal cases, the discretionary jurisdiction laws not set or regulated, thereby creating a significant legal void. In the EU directive, providers are required to hold liability coverage through their own state, while the liability framework is based on the legal system of the country where health services are rendered. Unfortunately, there is lack of patient information surrounding this aspect of care and little governance or legal framework around these procedures [43].

Clinical challenges to cross-border care have been recognized, especially surrounding the communication of patient information between cross border practitioners, due to geography and language. A survey of health practitioners across multiple EU countries found that there was little infrastructure in place to assist with ensuring documentation of their care is returned to the patients primary care physician [55]. Electronic health has been identified as a crucial aspect in the implementation of a transcontinental healthcare system, an action plan was put in place to encourage development of these project by the European Commission [56]. In response to this dilemma and pressure, large scale electronic health projects were initiated. One such project the European Patient Smart Open Services (epSOS), which included software programs organizing basic health information for pilot populations [57]. This project utilized feedback from healthcare professionals such as physicians and pharmacists [38]. One success of this project improves safety and standardization of prescriptions. An aspect of this large project entailed an electronic prescription services with coding of patient conditions allowing translation of the patient condition and prescribed medication This was in an effort to overcome language barriers and difficulty in communication between international prescribers and the domestica pharmacists. Formal diagnosis attached to each prescription allowed pharmacists were generally able to fill medications with more confidence and improved continuity of care in the patients home country [38,39]. Other proposed systems are electronic health cards, which can be used throughout the EU to access insured services, and is linked the patient's health records ensuring vital patient information is available to any provider and the coverage of the service. While these solutions work to address difficulties encountered in the implementation of cross border healthcare, they carry their own challengers including cost of replacing hardware, and agreement content of the health record [38,58].

6. North American experience

The majority of cross border healthcare literature originated in North America is focused along the United States of America and Mexico. Similar to the European experience, the communities along this international border tend to have a lower socio-economic status, with disproportionate rates of poverty and unemployment [54,59–61]. Despite the passage of the North American Free Trade Agreement (NAFTA), cross border agreements pertaining to healthcare remain difficult to form. In a 2003 study completed after the passage of NAFTA, stakeholders on either side of the US Mexico border were interviewed to identify the barriers to regional or binational cross border agreement agreements. This team identified diminished resource allocation, differences in culture, and negative perceptions of medical care and professionals as barriers [62]. Furthermore, the NAFTA agreement did not provide a legal basis for binational healthcare agreements. Despite the lack of formalized agreements many patients cross the border for care [62]. Several studies have demonstrated that many Mexican immigrants in the US return to Mexico for healthcare services [54,60,61,63–66]. Reasons for this include language, the cost of healthcare, and culture [54,60,61,63–68]. American citizens have also utilized healthcare in Mexico [60,69,70]. In a study of 2 560 individuals from El Paso, Texas, it was found that 27% of residents had utilized healthcare services in Mexico for dental care, physician care, and for purchasing of pharmaceuticals [69]. Those who utilized cross-border healthcare from the US to Mexico frequently cited lower cost as a primary motivating factor, along with lack of health insurance [60,65,66,69–71]. In the current climate without a formal agreement, patients crossing the border do face challenges with communication between the healthcare systems on either side [72]. When examining

the Canadian and American border, there is limited data and evidence surrounding border crossing for healthcare purposes. In a study that analyzed Ontario residents travelling to the US, it was found that the majority of care that was sought was for emergency purposes, or for accessing care that was less accessible or unavailable in Ontario [73].

Several small agreements have been established between countries in North America. One successful agreement involves a cross border collaboration in pediatric leukemia, patients from Mexico suffered from lower diagnosis rates, higher mortality and adherence to treatment regiments. A culturally sensitive collaboration between US and Mexican based pediatric hospitals, following implementing this partnership significant improvements were gain in the clinical outcomes of Mexican patients [74]. This program not only highlights a desperately needed collaboration but also the benefits that could arise from this agreement. California is the only state that has allowed reciprocal healthcare insurance between the US and Mexico for patients who wish to access healthcare in Mexico [54,68,69]. A not-for-profit cancer care program between the US and Mexico currently exists, which health experts believe can be used as a framework for future and more formalized agreements [60]. This program has created binational tumor boards and have fostered binational propagation of medical knowledge [59]. In Canada, patients are able to access healthcare in the US or abroad within the confines of stringent pre-approved processes or limited cross-border agreements, emergency care obtained while travelling within another country is not covered by publicly funded healthcare [75,76]. Cross-border public health organizations, working between the United States and Mexico, have long standing collaborative initiatives that began during the second World War. These collaboration initiatives were established independent from the national governments of each nation. With the intended goal of addressing transnational public health concerns, such as communicable diseases, this work has been highly challenging due to the social inequities that exist between the two countries [77].

In Ontario, Canada, the Ontario Health Insurance Plan (OHIP) funds a set number of eligible health services outside of the country. The criteria for this process are strict and includes a physician referral. Treatment and/or diagnostic testing is only approved when it is not available in Canada or in cases where the wait time in Canada would result in irreversible damage or death. Ontario residents may be transferred to a cross-border, American, hospital in emergency cases if there are no Ontario institutions available to accept the patient to provide the appropriate level of care [78]. In the field of bariatric surgery, a provincial review was conducted in 2005 and found it to be an effective treatment for morbid obesity. However, the average wait period for bariatric surgery at the time was approximately 5 years [79,80]. As a result, patients lobbied the Ontario government to include bariatric surgery as an insured out-of-country procedure. Much like the experience in Europe, postoperative care and treatment were complicated by a lack of follow-up when the procedure was completed out-of-country. In fact, out-of-country bariatric surgery increased the utilization of hospital resources in Ontario. Due to the continued and increased demand for bariatric surgery in Ontario, the provincial government funded The Ontario Bariatric Network through OHIP, which places a significant emphasis on the importance of patient follow-up and increased funding for these procedures to be completed in Canada [79]. Other health services in Ontario have been outsourced in the past mainly because of poor domestic accessibility as opposed to achieving higher quality care. Addictions medicine, and fertility services were other treatments that at one point were approved as out-of-country health services due to their demand and limited access [79,81]. These out-of-country programs have become a litmus test and impetus for change within the Ontario Ministry of Health to begin identifying similar programs that may currently lack appropriate funding. Similar to the US - Mexico practitioners, Canadian physicians caring for patients who received care in the US described difficulty with obtaining documentation and results from this care, and therefore support further regulation [76].

Currently, only a few agreements exist throughout North America for cross-border clinical services. Beyond these few agreements, individuals may elect to obtain personal healthcare insurance coverage while traveling in North America for emergency coverage. Further agreements would not only improve overall healthcare access for those living near the border, it would further ensure the security of individuals travelling from one country to another in the event of an emergency. Citizens living near a North American border would mutually benefit as it would ensure that they have access to the closest possible healthcare facility as it is in Europe. The benefit of codified agreements would extend beyond border communities as it would also ensure that timely access to healthcare for many who are willing to travel. Patients would be further protected from the financial burdens that currently exist when accessing healthcare outside of their home country.

It would be reasonable to anticipate that issues similar to those voiced by EU member-states opposed to cross-border healthcare (such as Poland), could arise in the context of the US-Mexico border [13–15]. One of these anticipated issues could be the costs associated with an exodus of patients leaving Mexico to seek healthcare in the US. However, similar to the EU experience, current evidence suggests that the majority of first generation Mexican patients living in America seek healthcare in Mexico [67,68]. While the argument could be made to suggest that this trend is based on cost, several studies have cited the familiarity with the Mexican healthcare system and receiving care in-line with one's cultural practices to be persuasive factors, which lead Mexicans living in America to seek healthcare in their home country [67,68]. These conclusions are further supported by the interest, at the California border, to develop binational insurance plans for those living in America who wish to seek healthcare in Mexico [54,67,68,82]. *Salud Megrante* Medicare in Mexico as this would improve the health of Mexican immigrant who do not yet qualify for Medicaid under the affordable care act, allowing them to seek insured health benefits in Mexico and would also ensure affordable care to US citizen living in Mexico [82].

7. Conclusion

As this paper demonstrates, Europe has a long-standing history of cross-border healthcare. This cooperation was present even before the enacted legislation. The European Union lends itself well to cooperative healthcare through its culture, history, and geography. During the COVID-19 crisis, Europe's cooperative approach has continued, while in North America isolationism has prevailed. According to the John Hopkins COVID-19 Dashboard, the US had the most recorded COVID-19 cases and deaths in the world as of January 1, 2021 [83]. A cross-border agreement between Canada and the United States, similar to that of the EU, to provide care for critically ill patients may have been beneficial.

An examination of European cross-border healthcare initiatives found that cooperative programs are likely feasible in North America even outside of the era of the COVID-19 pandemic. Furthermore, the examination revealed that these programs would have mutually beneficial long-term impacts. Many challenges were identified through the analysis of the European experience. These challenges could be proactively addressed by North American countries prior to the any implementation of any future agreements. The adoption of a cross-border healthcare system has the potential to improve outcomes for many residents who live along national borders. Cross-border healthcare in North America warrants serious consideration, during the present COVID-19 crisis and in less tumultuous times.

CRediT authorship contribution statement

Lyndsay T. Glass: Methodology, Investigation, Formal analysis, Data curation, Writing – original draft, Writing – review & editing.

Christopher M. Schlachta: Formal analysis, Writing – review & editing. **Jeff D. Hawel:** Formal analysis, Writing – review & editing. **Ahmad I. Elnahas:** Formal analysis, Writing – review & editing. **Nawar A. Alkhamesi:** Conceptualization, Methodology, Investigation, Formal analysis, Writing – original draft, Writing – review & editing, Supervision.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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