

# A cost-benefit analysis of cross-border healthcare data exchange in the Nordic and Baltic countries

Digital and Population Data Services Agency

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# Contents

<b>Executive Summary</b>	3
<b>Introduction</b>	5
<b>1. Analyzing Cross-border Mobility in the Areas of Close Cross-border Collaboration</b>	11
1.1 Cross-border Mobility as a Phenomenon	12
1.2 Areas of Close Cross-border Collaboration	16
<b>2. Comparing the Costs and Benefits</b>	22
<b>3. Conclusions</b>	29
<b>Appendices</b>	32
Appendix 1: Interview Guide	33
Appendix 2: Reviewed Materials	37



# Executive Summary

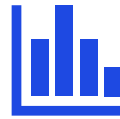
# Executive summary

In this report, we present the results of our cost-benefit analysis.



## Background

Earlier studies conducted within the second work package revealed a need to further analyze the costs and benefits related to cross-border exchange of healthcare information. In the previous studies, certain areas located in the border regions between different Nordic and Baltic countries were found to have an increased amount of both cross-border mobility and collaboration. In order to gain a new perspective on cross-border mobility and identify all potential needs, experienced benefits and barriers related to cross-border data exchange, these areas of close cross-border collaboration were chosen as the focus of this study.



## Methods and Data gathering

In this study, information gathering was performed largely through reviewing existing research and material from public sources. In order to gain further insight into the phenomenon of everyday mobility in the areas of close cross-border collaboration and a more thorough understanding of the healthcare professionals' perspective, additional expert interviews were performed. The cost-benefit analysis was then completed by comparing the identified benefits of cross-border exchange of healthcare-related data to the costs, that is, requirements for future development and potential barriers currently preventing it.



## Key findings

Even though the forms of collaboration vary between the studied areas, there is an increased need for cross-border exchange of healthcare data in areas where cross-border mobility is frequent. As of now, there is very little cross-border healthcare data exchange between the Nordic and Baltic countries, Finland and Estonia being the only two that currently exchange ePrescription information. Other than that, there are no additional forms of healthcare-related data shared between any of the countries included in this study and the only way to transfer patient information between countries is manually through formal requests for information.



## Main conclusions

The most cited benefits to be gained from improved cross-border data exchange included better patient safety and access to care, as well as cost savings. In terms of costs, many of the barriers identified in earlier studies could be better addressed if there was a stronger mandate for the countries to direct resources into the development. Depending on the level of maturity of national information systems, the development required of each country to reach common standards and compatibility demands a lot of resources. Implementing the eHDSI service infrastructure has thus far been based on voluntary action, which may explain its slow adoption across countries, even though the benefits of cross-border data exchange have been clear.

# Introduction

# Background and Objectives



The Presidency project, initiated in 2021 as a part of Finland's Presidency of the Nordic Council of Ministers, **aims to enhance the cross-border data exchange in the Nordic and Baltic countries and to produce a better solution model for data exchange.** The project is divided into three work packages:

1. Studying in another Nordic or Baltic country
2. Use of healthcare services and supporting data exchange
3. Versatile use of the Nordic and Baltic legal databases.



In 2021, KPMG conducted a baseline study examining the current state of data exchange in the different Nordic and Baltic countries involved, focusing on all three work packages. Within the second work package, the current state of health care data exchange was examined with the objective to analyze the capabilities for health care data exchange in the Nordic and Baltic countries, to share knowledge between the participating countries and to find ways and opportunities to strengthen the development of health information exchange. A need for further research was identified within the second work package focusing on health care services, more specifically a cost-benefit analysis related to accessing healthcare information in across borders.



The project team has requested KPMG to assess the costs and benefits of healthcare data exchange between the Nordic and Baltic countries, focusing on specific, high-traffic locations around the Nordic and Baltic countries. The study will be conducted by using qualitative methods to gather and analyze both costs (barriers to and requirements for future development) and user needs (benefits).

# Scope

## Areas of close cross-border collaboration

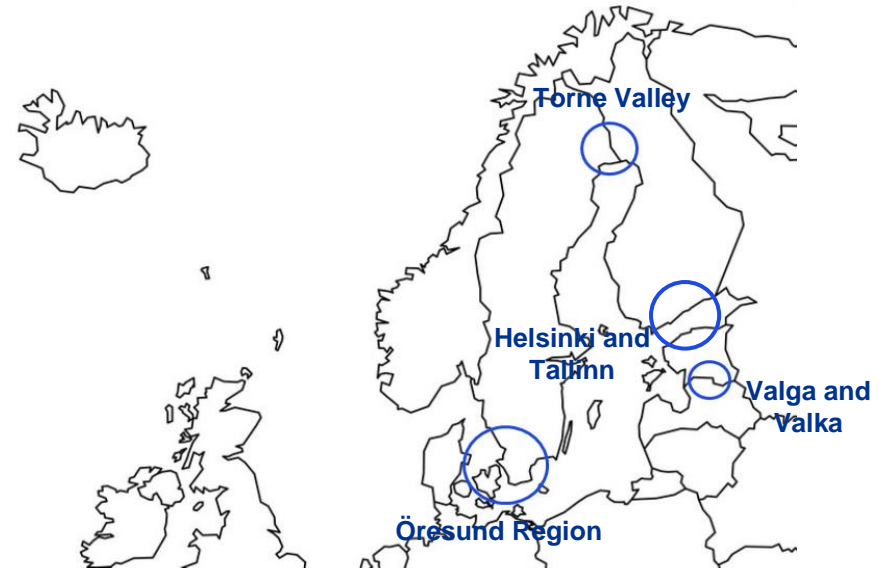
In the 2021 KPMG baseline study, certain border regions in the Nordic and Baltic countries were identified as **areas of close cross-border cooperation**, where everyday life revolves around working, living and consuming services on both sides of the border. While the degree of integration varies depending on the region, they are all characterized by close collaboration between the countries and economical, cultural and linguistic ties to each other, often formed through a long, mutual history.

As cross-border data exchange is especially vital in these border regions where the nearest health care facility may be located on the other side of the border, there is often an increased amount of collaboration between the two countries clinical groups and hospitals. The current practices and needs for sharing healthcare data in these areas have been identified as a key topic for further research within the second work package, which is why these areas of close cross-border collaboration have been chosen as the focus of this study.

## Use cases

In the baseline study, the scope was divided into two use cases, defined on an EU-level as especially important to secure health care continuity, quality and safety in cross-border situations: **electronic Patient Summaries** and **medical ePrescriptions**. The cases where cross-border access to Patient Summaries or ePrescriptions could be needed were divided into instances of **planned healthcare** and **unplanned healthcare**. Planned care could refer to, for example, intentionally traveling to access cheaper healthcare services in another country and unplanned care to an emergency or sudden need for healthcare during a stay in another country. In terms of both planned and unplanned care, capability to reliably transfer data on medication, allergies or other vital information to other countries would enhance the safety and continuity of healthcare for the patient.

Since this study focuses on the identified areas of close cooperation, both use cases of **planned care** and **unplanned care** have been examined. These could be either in the context of needing healthcare when working across the border, or when living close to the border results in the nearest healthcare facility being on the other side of the border. However, since the focus of this analysis is limited to the areas of close cross-border collaboration and **daily life in these areas**, use cases clearly related to tourism were not examined in any greater detail.



**Picture 1: The areas for close collaboration examined in this study are presented on the map**



# Our Approach

01

## Analyzing Cross-border Mobility in the Areas of Close Cross-border Collaboration

In the first phase of the analysis, the volume and nature of cross-border mobility in the areas of close cross-border collaboration were analyzed. Both existing research and material from public sources, as well as expert interviews were utilized in the information gathering.

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## Comparing the costs and benefits

In the second phase of the analysis, the identified benefits related to cross-border exchange of healthcare data were compared to the costs, that is, requirements for future development and potential barriers currently preventing it.

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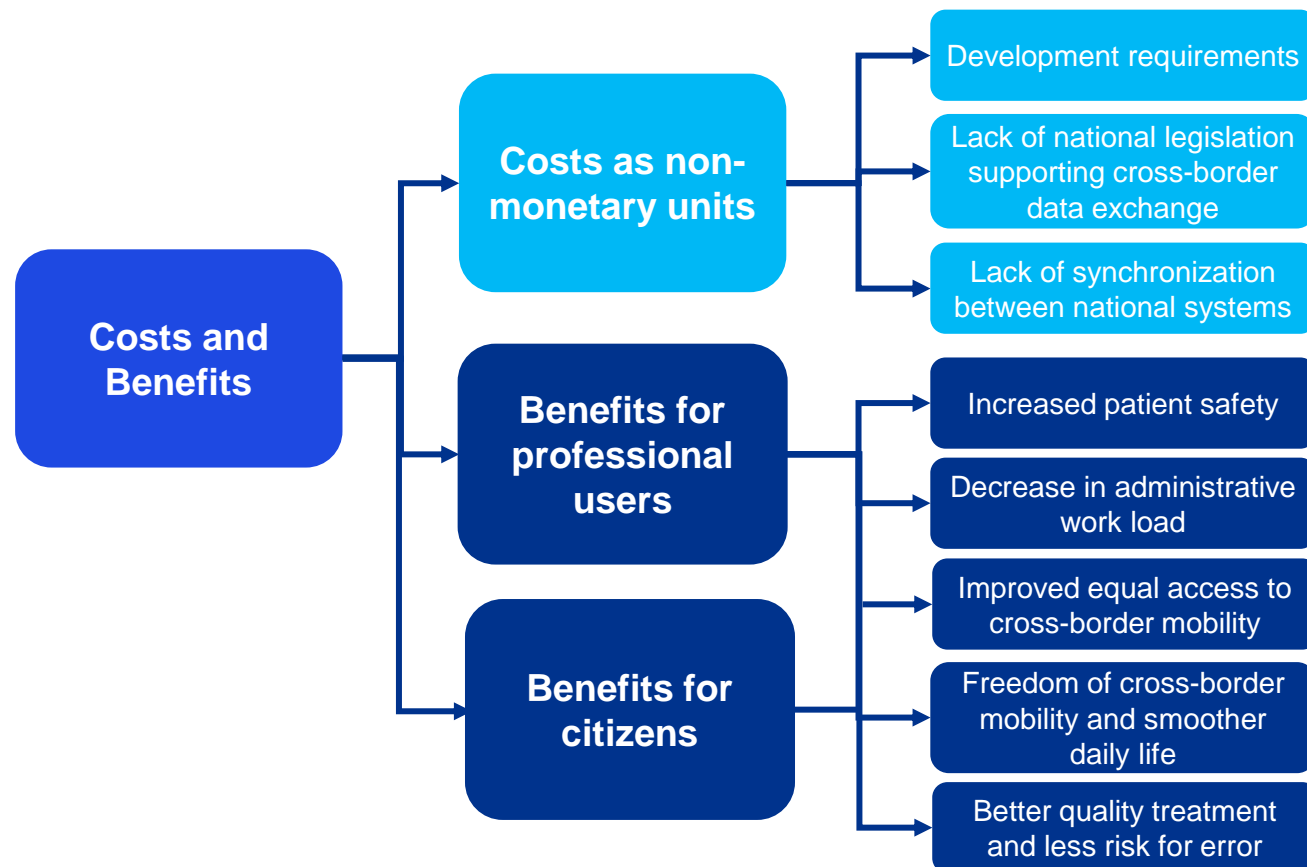
## Conclusions

In the third phase of the analysis, the key findings gathered from the analysis, as well as conclusions were presented.



# Identifying and Comparing Costs and Benefits

In the context of this study, the costs and benefits are expressed in non-monetary units: **costs** are represented as barriers to future development and the **benefits** are expressed as user needs and existing experienced benefits.



# Information Gathering Methods



## Review of source materials

In this study, information gathering was performed firsthand through reviewing existing research and material from public sources.

## Interviews

In order to gain further insight into the phenomenon of everyday mobility in the areas of close cross-border collaboration and a more thorough understanding of the healthcare professionals' perspective, additional expert interviews were performed. The interviews were performed in two of the chosen areas of close cross-border collaboration: Torne Valley between Northern Finland and Northern Sweden and Öresund area between Eastern Denmark and Southern Sweden. The interview participants were all from either Finland or Sweden and their backgrounds varied from senior physicians to different manager and coordinator roles related to cross-border collaboration.

## Key themes and research questions utilized in the information gathering were the following

- The phenomenon of everyday mobility in areas of close cross-border collaboration, characteristics unique to these areas and potential differences between areas
- Volume and nature of cross-border mobility in each area
- Access to and use of healthcare services across the borders and whether a higher demand results in better availability of services and/or increased collaboration between countries within the healthcare sector
- Any locally developed best practices for collaboration or information sharing
- Experienced or perceived benefits from improved cross-border exchange of medical information
- Key obstacles and barriers slowing down, limiting or preventing data exchange

**A full list of sources, as well as the interview guide and a list of interview participants are available in the appendix of this report.**

# **1. Analyzing Cross-border Mobility in the Areas of Close Cross-border Collaboration**

# **1.1 Cross-border Mobility as a Phenomenon**

# Types of Mobility in the Areas of Close Cross-border Collaboration

Living, working and consuming goods and services on both sides of the border are a part of everyday life for the residents in the areas of close cross-border collaboration. The levels of integration and reasons behind mobility vary between the examined areas, but due to high volumes of cross-border mobility and often numerous historical linguistic, economic and cultural ties, close cross-border collaboration between the countries is a characteristic shared by all areas.

## 1. Consuming goods and services

One of the most significant differences between the areas of close cross-border collaboration is its geographical location. In the more rural areas, for example in the Torne Valley area in the North, low population density, long distances and low levels of infrastructure have resulted in a need for closer collaboration between the countries to provide all necessary services in the area. Because of the long distances, having to cross the border to reach the nearest grocery store, school, healthcare center or other **necessary services** is much more common than in the more urban areas. For example, in the Öresund region in the South, Swedish citizens often cross the border to Denmark to access **better services** a larger city can offer, since Copenhagen is much easier for them to access than Stockholm. Price of goods and services can be a contributing factor for cross-border mobility in all the examined areas.

## 2. Family ties, relationships and property ownership

All the examined areas are linked together by cultural and economic ties, often as a result of long, mutual history. Therefore, having family or property across the border was mentioned as some of the key reasons for cross-border mobility in all areas.

## 3. Studying across the border

Studying across the border was mentioned as one of the key reasons for cross-border mobility, especially in the Northern areas around the twin cities of Tornio and Haparanda.

## 4. Working across the border

Working across the border was one of the key reasons behind cross-border mobility in all areas examined and thus, the concept of cross-border commuting is a large factor in the collaboration between all countries. **Cross-border commuter** (Your Europe, 2022)<sup>b</sup> is an officially accepted term for a person that works in another EU or EEA country but does not live in there and returns to their country of residence daily or at least once per week. Cross-border commuters are covered by the social security system of the country of employment (Kela, 2023). Therefore, cross-border commuters are entitled to medical treatment in both countries (residency and employment) under the same conditions as persons insured in those countries (Your Europe, 2022)<sup>a</sup>. Because of this, cross-border commuters carry a specific status in terms of public administration, both because their taxation is organized differently and because they have the right to utilize healthcare services in both countries.

# Mobility in the Areas of Close Cross-border Collaboration

## The Covid-19 pandemic and its effect on cross-border mobility

The Covid-19 pandemic had a wide-spread effect on cross-border mobility and especially commuting, since different countries allowed access on different, often very restricted grounds and even the definition of essential worker was often interpreted differently by different countries. Even during the periods when cross-border commuting was allowed, restrictions and required procedures upon entry (such as quarantine periods and Covid-19 testing) caused frustration among the commuters.

In addition to cross-border commuting, several other reasons for mobility were further highlighted by the Covid-19 pandemic, including family ties and property ownership. Countries closing their borders and only allowing access on very restricted grounds that often differed between the countries caused further frustration in these areas, since the tightly integrated way they were built relied strongly on the ability to cross the border to function.

Because of these difficulties during the pandemic, a need for special status or special rights for residents in border areas was brought to wider attention (Norden, 2021). Of the examined areas in this study, Torne Valley, has recently initiated a pilot project with the objective to guarantee free movement rights for the residents in the area even in special circumstances, such as pandemics (Tornionjokilaakson neuvosto, 2023).

## Summary of the key reasons for cross-border mobility in the areas of close cross-border collaboration:



### Rural areas

- Long distances and lack of infrastructure
- Price and availability of goods and services
- Family ties
- Ownership of property
- Better employment possibilities

### Urban areas

- Price of goods and services
- Quality of services and access to specific goods and services
- Better employment possibilities

# Cross-border Use of Healthcare Services

## Unplanned care

In terms of unplanned care within the EU, patients have a right to utilize the closest healthcare provider regardless of their country of residence. According to our expert interviews, in some of the more sparsely populated areas, such as the Torne Valley in the North, there is a high degree of collaboration between the emergency services of the different countries to ensure patient safety and efficient delivery of the services. The collaboration between the ambulance services in the Torne Valley area dates back several decades and the premise of it is, that whichever ambulance unit is closest to the emergency will respond, regardless of country borders. This requires additional collaboration between the emergency centers of both countries, since if there are no units to respond on the side of the border where the call originated from, it needs to be transferred to the neighboring country. In practice this means that Finnish ambulances will often drive across the border to Sweden and vice versa and bring the patient to the nearest hospital, whether on the Swedish or Finnish side of the border.

## Planned care

The degree to which cross-border healthcare services are utilized varies between the examined areas, especially regarding planned care. As previously mentioned, cross-border commuters have a right to utilize healthcare services within both their country of employment and country of residence. However, there were no official numbers available from any area to determine how common it is for a cross-border commuter to utilize healthcare services in their country of employment.

According to our interviews in the Torne Valley region, it is fairly common to cross the border to access private healthcare services, especially dental care or specialist services, but deciding to utilize public healthcare services across the border for planned care is less common. In terms of planned care, language barriers were seen as one of the key issues in giving and receiving care, as most patients prefer to communicate in their native languages. While the residents of the Nordic countries have the right to receive healthcare in their own language based on the Nordic convention (EU Healthcare 2022), this can cause issues and delays in the cases there is no bilingual staff readily available.

On the other hand, there were examples of successful cross-border collaboration among the examined areas, also in terms of planned care. In the tightly integrated twin cities of Valga and Valka, all healthcare is provided by Estonia and shared between the two countries, granting Latvians living within close proximity of the border full access to them. This arrangement includes a guaranteed amount of bilingual staff to ensure a high quality of care for citizens of both countries.



### Ambulance missions in the Torne Valley area according to our expert interviews:

- From Sweden to Finland: 50-60 per year
- From Finland and Norway to Sweden: 100-150 per year



# **1.2 Areas of close cross-border collaboration**

# Torne Valley (Finland – Sweden)

Torne valley is the area located in the border region between Northern Finland and Northern Sweden, centered around the twin cities of Tornio in Finland and Haparanda in Sweden. Life in the Torne Valley and especially in the twin cities is characterized by the everyday phenomenon of working and purchasing goods and services on both sides of the border.

## Everyday mobility in the area

The exact number of individuals employed across the border in either Finland or Sweden is currently difficult to estimate, since the information is no longer shared between the countries. The last statistics available are from 2015 and thus, any recent trends can only be estimated. However, the Finnish Customs holds monthly records of the number of vehicles crossing the border between Tornio and Haparanda and while it is difficult to differentiate between tourism and everyday life-related crossings in statistics such as these, it provides some indication of the daily cross-border traffic in the area. According to experts in the area, interviewed by the Öresundsinstitutet in 2021, working across the border has always been common and has further increased during the past few decades. The phenomenon of Finnish citizens working in Sweden has been more common than the other way around, but according to estimates, the number of Swedish citizens working in Finland has increased during the 2010s.

In addition to cross-border commuting, purchasing goods and services, owning property and family ties are among the most important reasons for cross-border mobility in the area. The reasons for mobility can vary according to the location also within the area, since further North the distances are longer and there is less infrastructure than around the twin cities of Tornio and Haparanda. Overall, cross-border commuting is more frequent from Finland to Sweden, but this also tends to depend on the location of the infrastructure. For example, in the Muonio area most of the infrastructure has been built on the Finnish side of the border and therefore, in this area it is more common for Swedish citizens to commute to Finland.

## Cross-border use of healthcare services

According to our interviews, in addition to the emergency services, crossing the border to access private healthcare services is fairly common in the area, especially dental care or specialist services. Deciding to utilize public healthcare services across the border for planned care is less common, even though especially cross-border commuters are entitled to healthcare also in their countries of employment. Occupational healthcare systems differ between the countries, however, since in Finland it is further regulated by law. ePrescription is not yet in use between Finland and Sweden and according to our expert interviews, it is only possible to utilize electronic prescription within a country and in a cross-border commuter context only if the commuter has a temporary social security number.



Picture 2. Torne Valley area

### Key numbers

**2 000 – 5 000** individuals are working across the border in the area. On average **210 000** vehicles crossed the border towards Tornio in a month (2019), the numbers showing a slight increase during the summer months.

# Öresund Region (Denmark – Sweden)

Öresund region refers to the areas of eastern Denmark and Skåne in southern Sweden, connected by the Öresund bridge. Working across the border increased quickly during the decade after the bridge was opened in 2000, peaking at around 20 000 individuals and has since plateaued around the year 2012 after declining slightly.

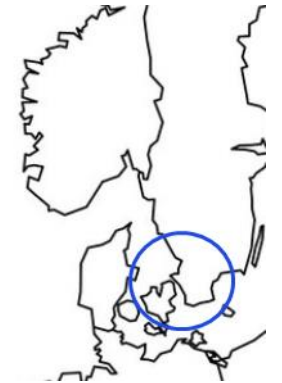
## Everyday mobility in the area

According to a 2022 report by Region Skåne, working across the border is common both in Sweden and in Denmark and the amount of individuals commuting across the border has remained steady for the past years. It is more common for Swedish citizens to commute to Denmark than the other way around. As an area of collaboration, the Öresund Region differs from tightly integrated twin cities, where the everyday life tends to revolve around working, living and consuming services on both sides of the border to a much greater degree.

The Öresund region is quite densely populated on both sides of the border and distances between cities are shorter, at least when compared to the areas examined in the North. Because of this, there has been no need for closer collaboration between the countries to share limited resources. However, the Öresund region is located in the vicinity of Copenhagen, Denmark's capital city, while the southern parts of Sweden are much further away from Sweden's capital Stockholm than they are from Copenhagen. According to our interview participants, this results in many Swedish citizens treating Copenhagen as the "capital city" for the entire area, and crossing the border whenever they need access to services only a larger city can provide, for example culture and a wider selection of goods and services. Many also use the Copenhagen airport as their primary airport. According to our interview participants, the cultural and linguistic similarities, shared history, as well as the geographical closeness brought by the Öresund bridge help tie the region together and make working and consuming goods and services across the borders easy.

## Cross-border use of healthcare services

The fact that there has been little need for collaboration between the countries due to sharing limited resources is also reflected in the use of healthcare services across the borders. According to our interview participants, there is rarely a need to travel across the border for healthcare, since all the necessary services are easily available on both sides of the border. Swedish citizens who work in Denmark are covered by the Danish health insurance system and may utilize Danish healthcare but there were no official statistics available for how many commuters were actually doing this and therefore, how common this is remains unclear.



Picture 3. Öresund Region

## Key numbers

In the year 2020, around **18 200** individuals commuted across the border daily, with **15 300** individuals living in Sweden and working in Denmark and **2 900** individuals living in Denmark and working in Sweden.

# Helsinki and Tallinn (Finland – Estonia)

Helsinki and Tallinn, the capital cities of Finland and Estonia are located on opposing sides of the Gulf of Finland, where the regular ferry traffic and short travel time make traveling between the countries easy.

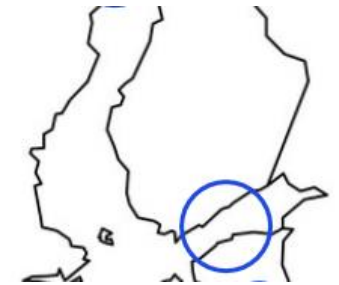
## Everyday mobility in the area

Despite the regular ferry traffic, since Helsinki and Tallinn are separated by the Gulf of Finland, this area differs from the other areas examined. Other than in terms of geographical location, Helsinki and Tallinn are both capital cities of their respective countries, unlike the opposing cities in the other examined areas. This eliminates any need for sharing necessary services or infrastructure between the countries, or even crossing the border from a smaller town to access a neighboring capital city, as is the case for the Öresund Region. However, the extensive amounts of commuting and other travel between Finland and Estonia connect the two cities and have resulted in a great deal of collaboration between the two countries.

According to a 2020 article by Finnish Yle, there are around 10 000 Estonians commuting between Finland and Estonia regularly, and it is estimated that the total number of Estonians working in Finland is almost ten times the amount. Although Finnish citizens travel to Estonia extensively, Finnish travel is mostly based on leisure and tourism and it is much more common for Estonian citizens to work in Finland than the other way around.

## Cross-border use of healthcare services

Because of the extensive commuting and other travel between Finland and Estonia, there is a great deal of collaboration between the two countries. Within the healthcare sector Finland and Estonia are currently the only two Nordic or Baltic countries successfully sharing ePrescription information and thus, the related use cases and end-user benefits have been studied on several occasions in the past few years (e.g. Jogi, 2021 and Kangosjärvi, 2022). Most respondents in these studies had been satisfied with the ePrescription, stating that being able to purchase prescription medicines across the border made long-term travel between the countries easier and more accessible. Many also reported that despite Finnish and Estonian languages not being mutually intelligible, they had received sufficient guidance regarding their medications in a language they could understand.



Picture 4. Helsinki and Tallinn

## Key numbers

There are around **10 000** Estonians commuting between Finland and Estonia regularly. The total number of Estonians working in Finland is estimated to be around **100 000**.

There are around **8 000** Finnish citizens living in Estonia, but since owning a second home in Estonia is common, it is estimated that only a part of these individuals are permanent residents in Estonia.

# Twin cities of Valga and Valka (Estonia – Latvia)

The twin cities of Valga and Valka are located in the border area between southern Estonia and Northern Latvia. Valga and Valka consist of two sides of the same city, having been separated by a border since 1991 after both countries gained independence from the Soviet Union.

## Everyday mobility in the area

According to the city's own website, the two sides of Valga and Valka share a lot of history and cooperate closely in education, culture and health-related questions. Since their unique historical context, they are also working towards developing the twin cities into one for its inhabitants, regardless of nationality. The twin cities of Valga and Valka are much more integrated than in any of the other areas examined in this study and likely due to this, there were no official statistics available for commuting or generally on crossing the border between the countries.

## Cross-border use of healthcare services

In terms of collaboration within the healthcare sector, the hospital catering to the inhabitants of both of the twin cities and residents within a 30 km radius from the twin-cities is entirely owned and operated by Estonia. The healthcare services are provided in both languages and both planned care, as well as emergency medical treatment are offered to residents of both countries. Thus, due to the high degree of integration between Valga and Valka, their collaboration can be taken beyond information sharing and into a more operative level.

According to a 2021 EU commission Border Focal Point Network article, close collaboration has had several positive impacts for the residents of this twin-city and the surrounding area, such as stronger integration between the two twin cities which increases the attractiveness of the area, improved and easier access to healthcare services for Latvians who are no longer forced to travel long distances to get to the hospital, as well as more opportunities available to the hospital because of the ability to accommodate more patients, potentially leading to the enhancement of the services provided.



Picture 5. Valga and Valka area

## Key numbers

No official statistics available for commuting between or generally on crossing the border between the two countries.

# Key Findings

The areas of close collaboration chosen for this study offer a possibility to examine the local practices and needs for sharing healthcare data, in areas where life across country borders is most integrated and cross-border data exchange is most vital. Understanding the current forms of collaboration and future needs in these areas can offer valuable insight for the future development of cross-border data exchange.

## Cross-border data exchange within the healthcare sector is not extensive.

- Finland and Estonia are the only two countries in this study currently exchanging ePrescription information. Other than that, there are no other forms of healthcare-related data shared between any of the countries included in this study and the only way to transfer patient information between countries is to make a formal request for information and have the other country's healthcare center or hospital manually transfer it.
- According to our expert interviews, transferring healthcare information between different information systems even within country borders is currently difficult, which could partially explain the generally slow pace in implementing cross-border solutions.

## There are different forms of collaboration between these areas.

- Even though Estonia and Latvia are currently not exchanging ePrescription information or Patient Summaries, the Valga-Valka area still presents the most advanced example of collaboration in terms of cross-border access to care. In this area citizens from both countries are able to use shared healthcare services in full and in their own native languages.
- In the sparsely populated Torne Valley area, most of the collaboration between Finland and Sweden has focused on sharing limited resources. In terms of healthcare, the emergency services from both countries collaborate closely to ensure patient safety and efficient delivery of the services in the whole area.
- Despite having little healthcare-related collaboration otherwise, Finland and Estonia are currently the only two of the Nordic and Baltic countries that exchange ePrescription information.
- In the Öresund region, there is little healthcare-related collaboration between Sweden and Denmark. Since this area includes several larger cities on both sides of the border, there is generally no need to travel across the border for healthcare. However, according to our interview participants, closer collaboration and sharing services could be beneficial, especially in terms of different specialist services.

## **2. Comparing the Costs and Benefits**



# Identifying the Key Costs and Benefits

In this section, the key benefits of developing cross-border exchange of healthcare data are presented, based on our study of the areas of close cross-border collaboration. Additionally, the key barriers slowing down, limiting or preventing cross-border data exchange are presented, based on our analysis of existing studies and official public sources. Through analyzing the current state of data exchange in each country and the identified barriers to further development, the barriers and requirements are then evaluated as costs against the identified benefits.



- Firstly, the current state of cross-border data exchange in each country will be explored, including an overview of the EU-level initiative eHDSI (Health Digital Service Infrastructure), which is closely linked to the current state and future development of cross-border data exchange in the Nordic and Baltic countries.
- Secondly, the key barriers limiting or preventing cross-border data exchange are explored, followed by the key benefits identified in our study of the areas of close cross-border collaboration.
- Lastly, the costs and benefits are compared.

# Current State of Healthcare Data Exchange 1/2

**The Health Digital Service Infrastructure (eHDSI)** is a central initiative for developing service infrastructure for cross-border health data exchange between the EU countries. The service infrastructure enables the exchange of ePrescriptions and Patient Summaries electronically between the EU countries, through National Contact Points. Since there is no common European framework and the maturity of national solutions is still low across the EU, the focus of the eHDSI has been on including only strictly necessary requirements. Additional desirable features that could improve the service have been identified, but since it might be difficult to implement them in all countries, the main goal has been to achieve a minimum level of service while still maintaining security and safety.

According to the KPMG baseline study (2021), many countries have identified the readiness and synchronization across the different countries as a challenge for the development of cross-border exchange of Patient Summaries and ePrescriptions. The Health Digital Service Infrastructure (eHDSI) initiative is also based on voluntary action, meaning that any EU country can choose whether or not to develop their service infrastructure accordingly. Considering the numerous barriers slowing down the development in different countries, the voluntary nature of the initiative could be a potential contributing factor to the slow deployment in different countries.

**The European Health Data Space ('EHDS')**, however, is a new (May 2022) proposal for a Regulation which would better address specific challenges to electronic health data access and sharing. The general objective of the EHDS is to ensure that natural persons in the EU have an increased control over their electronic health data. The EHDS would also promote better exchange and access to different types of electronic health data, including electronic health records, genomics data, patient registries etc. Additionally, it would support not only healthcare delivery, that is, services and personnel involved in providing health care (primary use of electronic health data), but also health research, innovation, policy-making, regulatory purposes and personalized medicine purposes (secondary use of electronic health data).

# Current State of Healthcare Data Exchange 2/2

As previously mentioned, the eHDSI service infrastructure has been set up and deployed in different countries to a varying degree and as of December 2022, all Nordic and Baltic countries have committed to both setting up a national contact point and implementing either ePrescription or Patient Summary services or both. However, according to the baseline study, in addition to differing levels of technical capability of national systems, many of the countries involved lack national or supplementary legislation that would support cross-border health data exchange.

The service infrastructure has been set up and deployed in countries to a varying degree and while patient information is not currently exchanged between any Nordic and Baltic countries, ePrescriptions are to some degree. Below, we have summarized **the current state of each country, the countries in scope for this analysis listed in blue and the rest of the countries in gray**, as of December, 2022.

## Nordic Countries

**Finland** has established a national contact point and is currently exchanging ePrescription data with other EU countries. Finland has decided to implement the Patient Summary service but it has not yet been deployed.

**Sweden** has committed to set up a national contact point and has the technical capability for exchanging ePrescription data but the service has not been deployed. Sweden is currently considering implementing the Patient Summary service but has not yet decided on it.

**Denmark** has committed to set up a national contact point and to implement both ePrescription and Patient Summary services. Neither of the services have yet been deployed.

**Norway** has committed to set up a national contact point and to implement both ePrescription and Patient Summary services. Neither of the services have yet been deployed.

**Iceland** has committed to set up a national contact point and to implement Patient Summary services but they have not yet been deployed. They are looking into the ePrescription service. Neither of the services have yet been deployed.

## Baltic Countries

**Estonia** has established a national contact point and is currently exchanging both ePrescription data and Patient Summaries with other EU countries.

**Latvia** has committed to set up a national contact point and to implementing both ePrescription and Patient Summary services. Neither of the services have yet been deployed.

**Lithuania** has committed to set up a national contact point and to implement both ePrescription and Patient Summary services. Neither of the services have yet been deployed.

# Identifying the Key Barriers

In the 2021 KPMG baseline study, a number of factors preventing, slowing down or constraining cross-border data exchange were identified, utilizing the European Interoperability Framework that divides interoperability requirements into legal, organizational, semantic and technical layers. As previously mentioned, as of December 2022, the eHDSI service infrastructure has been set up and deployed in different countries to a varying degree and many of the countries involved lack national or supplementary legislation that would support cross-border health data exchange. Thus, the key remaining barriers identified in this study were linked to technical and legal interoperability issues.

## Legal interoperability

The first of the identified key barriers preventing cross-border data exchange between the Nordic and Baltic countries is legislation. In the European Interoperability Framework (EIF), **legal interoperability** refers to ensuring organizations are able to work together although they are operating under different legal frameworks, policies and strategies but as previously mentioned, many of the countries involved lack national or supplementary legislation that would support cross-border health data exchange. However, European Commission's proposals for Regulations are emerging to further promote interoperability (Interoperability Europe Act) and cross-border health data exchange (The European Health Data Space) on both national, as well as EU-level.

## Technical interoperability

The second of the identified key barriers is related to **technological challenges**. According to the EIF framework, technical interoperability covers the applications and infrastructures linking systems and services. Aspects of technical interoperability include interface specifications, interconnection services, data integration services, data presentation and exchange, and secure communication protocols. According to the baseline study, the levels of technical readiness required of different national and local systems to produce and use internationally interoperable data remain unclear, especially when a country has multiple systems in use. It is generally agreed upon that common standards are a key to successful data exchange.

# Identifying the Key Benefits

The benefits of cross-border exchange of healthcare data have been studied on several occasions over the recent years from different perspectives (e.g. Jogi 2021, KPMG 2021, Kangosjärvi 2022). These studies provided a comprehensive overview of the experienced benefits from both professional and individual citizen's perspective, especially regarding the use of ePrescriptions. As the ePrescriptions are currently the only form of healthcare-related information shared between any Nordic and Baltic countries, there were no studies addressing the experienced benefits of sharing patient summaries. Instead, the expected benefits to be gained from cross-border exchange of patient summaries were explored in detail in the 2021 KPMG baseline study. In this study, we set out to explore the needs and expected benefits for both healthcare professionals as well as citizens, focusing our study to the specific areas of close cross-border collaboration to gain further insight on the needs and existing practices in these areas of high and frequent mobility. Based on both the existing research and our expert interviews, the following key benefits of improving cross-border healthcare data exchange were identified.

## **Patient safety and overall improved accessibility of cross-border mobility**

According to both previous studies and our interviews, patient safety would be improved if the patient's medical history, such as previous medical procedures, diagnoses and allergies were available to the care provider across country borders. This is especially true in terms of unplanned, urgent care. Having adequate information on the patient's medical history would also make it easier to provide quality care, which would help increase trust and result in better service. Especially in the Northern areas of close cross-border collaboration where distances are long and especially emergency services need to collaborate closely, the ability to share information between the different countries responding units and hospitals would be crucial for improving patient safety in the field. Access to ePrescriptions, on the other hand, help reduce the amount of errors concerning medication purchased abroad and offer overall better medication safety and improved accessibility of healthcare, as well as better commitment to medical treatment when staying abroad. Developing cross-border healthcare data exchange would also improve the overall accessibility of cross-border mobility for all groups, also for those with disabilities or chronic conditions that require regular monitoring or medication, for example in terms of being able to work or study across borders.

## **Lower costs**

In addition to improving access to safe healthcare, cross-border exchange of healthcare data could help reduce costs by limiting unnecessary double tests and scans. On the other hand, as some of our interviewees pointed out, the patient summary includes only a limited overview of the patient's records and thus, especially in urgent care cases, it is likely all tests would be done just in case to follow set procedures. Even if more of the patient's information were available, medical professionals were concerned that language barriers would limit the usage of it. Generally, in the event of another country's citizen needing care, whether urgent or non-urgent, the care provider will send out a request for information to the patient's provider in their country of origin. In the areas examined in this study, there are well-established, although manual processes for treating patients from both sides of the border, including receiving the necessary information from their country of origin. Direct access to some information could, thus, be a general improvement to the process and a potential way to reduce the amount of administrative work needed and therefore also costs. The EHDS proposal, for instance, includes improvements such as access to and transmission of personal electronic health data for primary use, with a list of priority categories of personal electronic health data for primary use.

# Comparing the Costs and Benefits

In this section, we have presented the current state of cross-border data exchange in each Nordic and Baltic country in scope for this study and the related EU-level initiatives, as well as the identified barriers and benefits. In this analysis, the barriers to further development are evaluated as costs against the identified benefits.

Below, we have summarized the key costs and benefits and in the following section, the conclusions of our analysis are presented.

## Costs: Barriers currently preventing cross-border data exchange

- Lack of standardization and synchronization of patient record systems across countries
- The amount of resources required to develop national information systems towards common standards, as well as to develop and maintain national contact points
- Lack national legislation that would support cross-border health data exchange
- Lack of stronger EU-level guidance to support and guide countries to directing resources into the development of cross-border data exchange

## Benefits from improved cross-border data exchange

- Increased patient safety, especially in terms of unplanned urgent care if the patient's medical history, such as previous medical procedures, diagnoses and allergies were available to the care provider across country borders. Having adequate information on the patient's medical history would also make it easier to provide quality care, which would help increase trust and result in better service
- Reduced costs by limiting unnecessary double tests and scans, as well as manual administrative work
- Less errors concerning medication purchased abroad and better medication safety
- Improved overall accessibility of cross-border mobility through improved access to healthcare across borders

# 3. Conclusions



# Conclusions 1/2

In this section, the key conclusions of our cost-benefit analysis are presented.



## **There is an increased need for cross-border exchange of healthcare data in the areas of close cross-border collaboration**

The areas of close cross-border collaboration share many characteristics but as we identified in our analysis, there are a number of factors that affect the amount and nature of cross-border mobility, as well as collaboration between the countries. In the areas where distances are long and population density is low, countries need to collaborate more closely and share resources to provide all necessary services, also in terms of healthcare. The extensive collaboration between the ambulance services of Finland, Sweden and Norway in the Torne Valley and the collaboration between Estonia and Latvia around the Valka-Valga region are great example of such collaboration. In the more urban areas of close cross-border collaboration, such as The Öresund region or Helsinki and Tallinn, there are no such needs for sharing resources and collaboration on that front. However, since there is a significant amount of cross-border commuting also in these areas and since the commuters are often entitled to utilize the healthcare system of their country of employment, it can be concluded that cross-border exchange of healthcare information would provide significant improvements to the citizens of these areas as well.

Therefore, despite regional differences, we found that there is an increased need for cross-border exchange of healthcare data and overall access to healthcare services across borders in most of the examined areas of close cross-border collaboration. Similar areas for close cross-border collaboration have been identified between many other European countries, which implies that there may be a more substantial need for cross-border exchange of healthcare data across the EU than expected. This is especially likely if previous estimations of needs have been based on use cases related to tourism.

## **The benefits to be gained from cross-border exchange of healthcare data are clear and supported by previous research**

The benefits to be gained from cross-border exchange of healthcare-related information have been studied on several occasions over the years and, in accordance with the results of this study, it has been clear for some time that there is a strong need for exchanging healthcare information between the Nordic and Baltic countries. Most cited benefits include improved patient safety and quality of care, as well as patient access to care, especially in terms of unplanned urgent care. Additionally, improved cross-border exchange of healthcare data could result in cost savings due to a decrease in manual request for information processes, as well as in the form of not needing to perform unnecessary double tests and scans.

# Conclusions 2/2

In this section, the key conclusions of our cost-benefit analysis are presented.



## **Current state of cross-border data exchange still varies by country, especially due to legal and technological barriers**

In terms of the current state of cross-border exchange of healthcare data in the Nordic and Baltic countries, the eHDSI service infrastructure has been set up and deployed to varying degrees in the different countries. Finland and Estonia are currently the only countries sharing ePrescription information, but Patient Summaries are not exchanged between any Nordic or Baltic countries. According to our review of the existing materials and official documentation, the key remaining barriers are related to legal and technological interoperability. Many of the countries still lack national or supplementary legislation required to support cross-border data exchange and the technical readiness of the national information systems required to produce and use internationally interoperable data.

## **Continued strong Nordic and Baltic collaboration could help address some of the barriers preventing cross-border data exchange**

When it comes to comparing the identified costs and benefits, many of the barriers identified in earlier studies that are currently preventing cross-border data exchange could be better addressed if there was a stronger mandate for the countries to direct resources into the development. Depending on the level of maturity of national information systems, the development required of each country to reach the common standards and compatibility may demand much stronger prioritization in terms of resource allocation than what has been done so far.

Implementing the eHDSI service infrastructure has thus far been based on voluntary action, which may explain its slow adoption across countries, even if the benefits of cross-border data exchange may have been clear. This could imply that if the Regulation for the EHDS (European Health Data Space) goes into effect, some of the identified barriers currently preventing cross-border data exchange could be significantly reduced in all the EU countries. This further underlines the need for strong Nordic and Baltic collaboration and coordination related to cross-border exchange of healthcare data, such as the coordination work done by the Nordic eHealth Network. This sort of collaboration is essential for not only making cross-border mobility and daily life easier for citizens, but also for finding a common voice among the Nordic and Baltic countries to share knowledge and contribute to EU-level discussions as an integrated region.

# Appendices

# Appendix 1: Interview Guide

# Interviewees

Below, we have gathered a list of the interviewees, their roles and their respective organizations. The interviewees were all from Finland or Sweden, either from the Torne Valley or Skåne area in the Öresund region, with backgrounds ranging from healthcare professionals to administrative staff.

Organization	Role
Tornio City	Cross-border Development Specialist
The Wellbeing Services County of Lapland	Senior Physician
Tornedalsrådet	Executive Director
Lund University	Physician, Head of Research
Region Norrbotten	Manager of Ambulance Service

# Interview questions

## 1. The phenomenon of everyday cross-border mobility in the area

- Could you describe the phenomenon of cross-border mobility in your area? For example, how common is it for people to cross the border on everyday errands such as work, school, hobbies or for consuming goods or services? What would you say are the most important reasons? These could be for example better price or availability of goods or services across the border, better employment or education possibilities etc.
- How common would you say working across the border in the neighboring country is?

## 2. Utilizing healthcare services across country borders

- How common would you say it is for people to utilize healthcare services across the border?
- In what situations do people utilize healthcare services across the border? Can people choose to utilize public sector healthcare in the neighboring country and if so, on what grounds? (for example based on employment or in emergencies only)
- Would you say it is easy for the citizens of both countries in the area to utilize healthcare services on both sides of the border? Or would it be easier for people to for example drive longer distances within their own countries to access healthcare instead of crossing the border? What would you say are the key challenges in receiving care on the other side of the border? For example language barriers or challenges in information transfer?
- Is there any collaboration between healthcare organizations of the different countries in your area? For example between different specialist groups, hospitals or healthcare centers and if so, how regular is it?

# Interview questions

## 3. The availability of healthcare data across country borders

- How well-established would you say the processes for treating people from the neighboring countries are in the area? Have any local practices formed for making it easier or is it still challenging due to a lack of automatic transfer of information between the countries?
- How is the transfer of patient information for across the border currently done? Is the information available only through an official request for information to the hospital or healthcare center in the patient's country of origin? Is it possible to deliver any patient information electronically or is all cross-border information transfer done through paper mail?

## 4. The need for cross-border access to healthcare data in patient work

- How much easier would it make treating international patients if the relevant information was transferred automatically and electronically? What information would be especially critical to have access to or what is needed most often?
- Have you encountered situations during your career where the unavailability or slow transfer of information from another country would have endangered a patient?

## 5. Developing cross-border data exchange or international collaboration: ongoing initiatives in the area

- Are you aware of any initiatives in your area that would be focused on improving cross-border collaboration or cross-border exchange of data? Or have any local best practices for exchanging information across borders formed in the area due to a lack of international guidelines or development?
- Have you been able to identify any tangible results from these initiatives? What kind of goals does your area have for improving cross-border collaboration?

# Appendix 2: Reviewed Materials



# List of reviewed materials

- Dagens Medicin. (2018). Jämtland Härjedalen skickar patienter över gränsen. [Jämtland Härjedalen skickar patienter över gränsen - Dagens Medicin](#)
- European Commission. (2017). New European Interoperability Framework
- European Commission Border Focal Point Network. (2021). Cross-border healthcare in the twin cities of Valga and Valka. Available: [Cross-border healthcare in the twin cities of Valga and Valka | Futurium \(europa.eu\)](#)
- European Commission. Cross-border healthcare related memos. Available: [Events \(europa.eu\)](#)
- European Commission. Electronic cross-border health services. Available: [Electronic cross-border health services \(europa.eu\)](#)
- EU Healthcare. (2022). Language Rights. Available: [Language rights - EU-healthcare.fi](#)
- Jögi, R. (2021). Cross-Border e-Prescriptions – the First Experience of the Pharmacists in Estonia and Finland
- Kela. (2023). Social Security Coverage in Certain Special Circumstances. Available: [Social security coverage in certain situations abroad | Our Services | Kela](#)
- Kangosjärvi, M. (2022). Pharmacy Customers' Experiences with Cross-Border Electronic
- Läkartidningen. (2020). Smidigare vård när Härjedalen skickar patienter till Norge. Available: [Smidigare vård när Härjedalen skickar patienter till Norge \(lakartidningen.se\)](#)
- Ministere des Solidarites et de la Sante. (2022). Study on Digital Health Implementation in the EU
- Nordic Council of Ministers. (2020). Nordic eHealth Benchmarking – Towards Evidence Informed Policies
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- Region Skåne. (2022). Pendlarstatistik i Öresundsregionen. Available: [Pendlarstatistik i Öresundsregionen - Utveckling Skåne \(skane.se\)](#)
- THL. (2019). Miten tietojärjestelmät palvelevat terveydenhuollon ammattilasten työtä? Vaikutukset työhön ja hyvinvointiin
- Tornionjokilaakson neuvosto. (2023). Pilottialue Tornionlaakso. Available: [Pilottialue Tornionlaakso – Tornionlaakson neuvosto \(tornedalen.org\)](#)
- Yle. (2020) Suomen päätös sallia työmatkaliikenne on Virolle valtava helpotus Available: <https://yle.fi/a/3-11335815>
- Your Europe. (2022)a. Your Health Insurance Cover. Available: [Health insurance cover in your host country - Your Europe \(europa.eu\)](#)
- Your Europe. (2022)b. Cross-border Commuter. Available: [Cross-border commuters - Your Europe \(europa.eu\)](#)
- Öresundsinstitutet. (2021). Mentaaliset rajaesteet – Kokemuksia Suomen ja Ruotsin välisen rajatyöskentelyn esteistä ja mahdollisuuksista



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