

Nordic Cross-border Statistics

The results of the Nordic Mobility
project 2016-2020

Contents

Foreword	4
Summary	6
Sammandrag	8
1. Background	10
2. Aim of the project	11
3. Need for cross-border statistics	12
3.1 A non-measured phenomenon	12
3.2 Under-coverage in national statistics	13
4. Preconditions for production of cross-border statistics	14
4.1 Legal preconditions for data exchange	14
4.2 Access to micro level (register) data	15
4.3 Statistical areas and variables	15
4.4 Technical preconditions for data exchange	16
5. Production process	17
5.1 Data exchange	17
5.2 Transfer of data	19
5.3 Combining data to matrices	20
5.4 Storage and/or deletion	20
6. Challenges	21
6.1 Legal challenge	21
6.2 Solution	22
7. Statistical findings	24

7.1 Education: definitions and data sources	24
7.2 Attendance in education	26
7.3 Highest education attained	33
7.4 Commuting	48
7.5 Migration	69
8. Results and achievements of the project	82
8.1 Publishing	82
8.2 Other results and consequences	84
9. Quality impact on national, Nordic and European statistics	85
9.1 Expectations of impact on quality in statistics	85
9.2 Code of Practice	85
9.3 Effects on the quality in national statistics	86
9.4 Effects on the quality in European statistics	89
9.5 Effects on the quality in Nordic cross-border statistics	90
10. Conclusions on the future of Nordic cross-border statistics	91
10.1 Interest on Nordic, national, regional – and European – level	91
10.2 Requirements for future production of Nordic cross-border statistics	91
10.3 Relevant cross-border statistics	92
Links	94
Annexes	96
About this publication	111



Foreword

The Nordic Region aims to be the most sustainable and integrated region in the world by 2030. This is the core of the vision, adopted by the Nordic Council of Ministers and the Nordic prime ministers in 2019.

Promoting freedom of movement and creating a more open Nordic Region, where it is possible and encouraged to relocate, commute, study and run a business across national borders, has always been an essential element of the Nordic cooperation. The new Vision 2030 brings this even more to the forefront of our work.

To be able to identify opportunities for cross-border cooperation and obstacles for cross-border mobility, it is vital to monitor the effects of measures taken at the local, regional, national or international level. This makes valid and high-quality cross-border data indispensable.

Cross-border statistics are however not readily available in the national statistical institutes, as these are not included in the national statistical programs and are quite difficult to produce.

Therefore, the Finnish Presidency of the Nordic Council of Ministers initiated a project in 2016, with the aim of developing cross-border statistics in the Nordic region. Statistics Denmark, Statistics Iceland, Statistics Norway and Statistics Sweden participated in the project, which was led by Statistics Finland.

The project has now succeeded in producing the first ever systematic compilation of Nordic cross-border statistics at a basic level, that include the five Nordic countries. The project was, however, complicated by unexpected legal barriers challenging the exchange of micro data necessary to produce more detailed cross-border statistics. These barriers are not fully overcome yet.

Having more concrete and measurable targets is an important part of achieving Vision 2030. As for integration, this requires updated data on cross-border statistics. It is therefore my sincere wish that the statistical institutes will succeed in finding a way forward and enable a future long-term production of the very much needed cross-border statistics in the Nordic Region.

This report is made by the statistical institutes and presents the results achieved as well as challenges met and methods applied. The data is also published on the Nordic Statistics Database.

Copenhagen, February 2021

Paula Lehtomäki

Secretary general

Nordic Council of Ministers

The Nordic Mobility project is the result of co-operation between five Nordic statistical institutes. More than 30 statisticians and other experts from Statistics Denmark, Statistics Finland, Statistics Iceland, Statistics Norway and Statistics Sweden have participated in the work. The report has been compiled by the project group that included Nicola Brun, Sara Ekmark, Klaus Munch Haagenen, Ómar Harðarson, Anne Marie Rustad Holseter, Helge Nome Næsheim and Kaija Ruotsalainen.



Summary

In this report the prerequisites for production and the production process of cross-border statistics are presented along with the statistical findings, challenges met and suggestions for the future.

The need for cross-border statistics is obvious and cannot be disputed. The present Official Statistics cannot be used to reflect on the movements across borders. Although there have been previous collections of Nordic cross-border statistics, e.g. [Öresundsdatabasen](#) and [Nordisk pendlingskarta](#), there has never been a systematic data collection of cross-border statistics that covered all five Nordic countries.

For the first time, statistics on cross-border statistics for all Nordic countries were produced as a result of the project. The publication of this collection enables the stakeholders to draw conclusions about the mobility across borders in the Nordic countries. These statistics are now available to all interested parts for further examination and interpretation. Matrices on commuting, migration and education attained have been published in the [Nordic Statistics database](#).

The project also generated a general model and a procedure for the exchange of micro data between countries in order to produce cross-border statistics. The project also managed partly to verify that the exchanges led to an increase in the quality of national and European statistics – and to point out the potential of future increase of quality.

Improving the coverage of national education registers as a result of information exchange was the most obvious result. In addition, the quality of statistics that use education registers as a data source also improves. It was evaluated that education information could have been updated for almost 100,000 persons in the Nordic countries as a result of the data exchanges, i.e. for 0.5 per cent of the population aged 15 or over.

Only the data on highest education attained was permanently stored in the databases of the Nordic statistical institutes. The data received in the data exchanges on commuting, migration and studies were only used for production of the matrices published in the Nordic Statistics database and in this report. However, the data exchange enabled the possibility to evaluate e.g. under-coverage of employed persons in the official register-based employment statistics in each country. The underestimation varies from 0.04 per cent in Norway and Finland to 0.86 per cent in Sweden. Naturally the underestimation varies also between the

regions within each country.

At the end of 2015 there were approximately 51,000 persons that held a job in another Nordic country than where they were resident. The data used in this project do not indicate the mode or the frequency of the commuting. Some commuters cross the national border every day, others can be classified as remote workers commuting between home and work, for example, on a weekly basis.

The Nordic Statistics database already includes matrices on students studying abroad. These data are based on other data sources and include students receiving financial support for studies abroad from their home country. In this project the approach was to give a picture of the students commuting from one Nordic country to another at a certain point in time, i.e. of those who are residents in one Nordic country, but students in another. The statistics are based on the data of the national student registers.

Due to different data sources and their content, the data on students produced in the project differ from previously published data. The project found that the already existing statistics in the Nordic Statistics database give quite a good picture of the student mobility in the Nordic countries, even if they lack some groups of students. The work done in this project has given a more comprehensive picture of the student mobility in the Nordic countries and also established some differences in the content of the national student registers. To avoid confusion, new matrices on students will not be published in the database.

The intention was also to collect data on the status of migrants crossing the Nordic borders before and after the migration. However, no sound legal basis was found for the exchange of data between Sweden and Norway and Sweden and Denmark regarding this data. This is unfortunate as Sweden plays a pivotal role in all inter-Nordic migration flows. The matrices on migration are available in the Nordic Statistics database for the other country pairs, as well as the main findings presented in this report.

The Nordic actors on both national and regional level have a big interest in continuous cross-border statistics. With regards to the results of this project the most relevant statistical areas to be produced in the future are highest education attained and commuting. These statistics have been produced partially before and provide information that is of importance for all Nordic countries.

The legal obstacles to exchange data encountered in this project may prevent future full-scale production of Nordic cross-border statistics. In order to produce statistics, the national legislation should be harmonised with the European legislation in all participating countries. In countries where national legislation enables data exchanges, cross-border statistics can be produced bilaterally. Production of statistics that are based on data exchanges is not for the time being possible between Denmark-Sweden and Norway-Sweden.



Sammandrag

I denna rapport presenteras förutsättningarna för produktionen av och produktionsprocessen för gränsöverskridande statistik tillsammans med statistiska resultat, uppkomna utmaningar och förslag för framtiden.

Behovet av gränsöverskridande statistik är uppenbart och kan inte bestridas. Den nuvarande officiella statistiken kan inte användas till att reflektera över rörelse över gränserna. Även om det tidigare samlats in nordisk gränsöverskridande statistik, som t.ex. [Öresundsdatan](#) och [Nordisk pendlingskarta](#), har det aldrig tidigare gjorts en systematisk datainsamling av gränsöverskridande statistik som omfattar alla fem nordiska länder.

Som ett resultat av projektet producerades för första gången gränsöverskridande statistik över alla nordiska länder. Publiceringen av denna statistik gör det möjligt för intressenter att dra slutsatser om mobilitet över gränserna i de nordiska länderna. Denna statistik är nu tillgänglig för alla berörda parter för vidare analys och tolkning. Tabeller över pendling, migration och avslutad utbildning har publicerats i [Nordiska statistiskbanken](#).

Projektet genererade också en allmän modell och en metod för utbyte av mikromaterial länder emellan för produktion av gränsöverskridande statistik. Projektet lyckades också delvis verifiera att utbytet ledde till högre kvalitet i nationell och europeisk statistik – och framhålla potentialen av en framtida ökning av kvaliteten.

Det mest uppenbara resultatet av informationsutbytet var en förbättring av omfattningen av nationella utbildningsregister. Dessutom förbättras kvaliteten på statistik som använder utbildningsregister som datakälla. Information om utbildning för uppskattningsvis nästan 100 000 personer i de nordiska länderna, dvs. för 0,5 procent av den 15 år fyllda befolkningen, hade kunnat uppdateras tack vare informationsutbytet.

Endast uppgifter om den högsta avlagda utbildningen sparades permanent i de nordiska statistiska institutens databaser. Uppgifterna om pendling, migration och studier som erhöles via informationsutbytet användes endast för produktion av tabellerna som publicerats i Nordiska statistiskbanken och i denna rapport. Informationsutbytet gjorde det emellertid möjligt att utvärdera till exempel undertäckningen av sysselsatta personer i den officiella registerbaserade sysselsättningsstatistiken i varje land. Undertäckningen varierar mellan 0,04 procent

i Norge och Finland och 0,86 procent i Sverige. Undertäckningen varierar givetvis också mellan regionerna i varje land.

I slutet av år 2015 arbetade omkring 51 000 personer i ett annat nordiskt land än det de var bosatta i. Uppgifterna som använts i detta projekt anger inte pendlingssättet eller -frekvensen. Vissa pendlare passerar nationsgränsen varje dag, andra kan klassificeras som distansarbetare som pendlar mellan hemmet och arbetet t.ex. varje vecka.

Nordiska statistiskbanken innehåller redan tabeller över studerande som studerar utomlands. Dessa uppgifter grundar sig på andra datakällor och omfattar studerande som får ekonomiskt stöd för studier utomlands från sitt hemland. Utgångspunkten för detta projekt var att skapa en bild av de studerande som pendlar från ett nordiskt land till ett annat vid en särskild tidpunkt, dvs. av dem som är bosatta i ett nordiskt land men studerar i ett annat. Statistiken baserar sig på uppgifter i de nationella studentregistren.

På grund av olika datakällor och innehåll i dem skiljer sig uppgifterna om studerande producerade inom projektet från tidigare publicerade uppgifter. Projektet konstaterade att statistiken som redan finns i Nordiska statistiskbanken ger en ganska bra bild av studerandes rörlighet i de nordiska länderna, även om vissa grupper av studerande saknas. Arbetet inom detta projekt har genererat en mer omfattande bild av studerandes rörlighet i de nordiska länderna och även fastställt några olikheter i de nationella studentregistrens innehåll.

Avsikten var också att samla information om status före och efter migrationen gällande migranter som passerar de nordiska gränserna. Dock saknas en stabil rättslig grund för utbyte av information mellan Sverige och Norge samt Sverige och Danmark i fråga om dessa uppgifter. Detta är beklagligt eftersom Sverige spelar en väsentlig roll i alla internordiska migrationsflöden. Tabellerna över migration för de övriga landkombinationerna är tillgängliga i Nordiska statistiskbanken tillsammans med de viktigaste resultaten presenterade i denna rapport. För att undvika förvirring publiceras inte nya tabeller över studier.

Nordiska aktörer på både nationell och regional nivå har ett stort intresse för fortgående gränsöverskridande statistik. Med avseende på resultaten av detta projekt är högsta avlagda utbildning och pendling de mest relevanta statistiska ämnesområdena att producera i framtiden. Dessa statistikgrenar har producerats till viss del tidigare och de ger information som är viktig för alla nordiska länder.

De lagliga hinder för informationsutbyte som detta projekt stötte på kan förhindra fullskalig produktion av nordisk gränsöverskridande statistik i framtiden. Med tanke på statistikproduktionen borde den nationella lagstiftningen harmoniseras med den europeiska lagstiftningen i alla länder som deltar. I länder där den nationella lagstiftningen möjliggör informationsutbyte kan gränsöverskridande statistik produceras bilateralt. Produktionen av statistik som baserar sig på informationsutbyte är för närvarande inte möjligt mellan Danmark och Sverige samt Norge och Sverige.



1. Background

Nordic cooperation has been conducted on the official level ever since the 1950s. From the start, the objective has been free movement of people and enterprises between the Nordic countries. The aim of the cooperation also today is to make it possible to relocate, commute, study and run a business across national borders.

During this time, the joint labour market has made it possible to even out imbalances between the countries with high unemployment and those with a shortage of labour. The Nordic countries have been able to cope with cyclical fluctuations and have also managed to develop more positively than would otherwise have been the case.

Over the last decade Nordic businesses have also become increasingly integrated and neighbouring countries make up a disproportionately large share of each Nordic country's import and export markets.

All Nordic countries have strong links to the European Union, either as members or because they are part of the EEA. The Nordic Region is therefore part of the EU's inner market in most sectors. Through their links to the EU, the Nordic countries are also obliged to follow the various regulations and directives that are drawn up at European level.

The borders of the Nordic countries are possibly among the most open and well-functioning borders in the world and although there are a lot of Nordic statistics available, there are no exact or comprehensive statistical data on activities across the borders of the countries, such as working and studying.

Although there have been previous collections of Nordic cross-border statistics, e.g. [Öresundsdatabasen](#) and [Nordisk pendlingskarta](#), there has never been a systematic data collection of cross-border statistics that covered all five Nordic countries.



2. Aim of the project

The aim of the project was to produce and publish statistics describing the mobility of people and the social benefits paid across the Nordic borders. Since 2014, the [Freedom of Movement Database](#) has collated information about known barriers to cross-border freedom of movement between the Nordic countries. The goal of this project was to describe the number of people possibly being affected by obstacles to the freedom of movement in the Nordic countries with statistics in specific areas.

Due to the legal challenges the project faced it was extended in 2019. At the same time the project plan was revised to state that the project's work will increase not only the quality of national statistics but also that of European statistics. Cross-border statistics have so far not been included in the official statistics produced by the national statistical institutes or by Eurostat. The outcome of the project should benefit e.g. the statistics produced in the Labour Force Surveys, the EU-SILC and the Population and Housing Censuses. The relevant EU Regulations on European statistics that cover variables to be exchanged according to the agreement for the Nordic Mobility project were [Council Regulation 577/98 \(LFS\)](#), [Council Regulation 1177/2003 \(EU-SILC\)](#), [Council Regulation 763/2008 \(Census\)](#), [Commission Regulation 2017/543 \(Census\)](#) and [Council Regulation 452/2008 \(Statistics on education and lifelong learning\)](#).

The main stakeholders of the project's results were the Nordic governments, the Nordic Council of Ministers, the Freedom of Movement Council, the regional sector, the local governments, other Nordic and European authorities and organisations engaged in or with an interest in freedom of movement and last, but not least, individual citizens of the Nordic countries.



3. Need for cross-border statistics

3.1 A non-measured phenomenon

The need for cross-border statistics is obvious and cannot be disputed. Official Statistics are an unbeatable tool for revealing trends and patterns, but the present Official Statistics cannot be used to reflect on the movements across borders. Approximately 51,000 people are working in another Nordic country. These jobs are missing from the official national statistics (e.g. labour market and education statistics) because of movements across borders. Some estimations of the volume can be made using the data from the [Labour Force Survey](#) (LFS), which is a survey based on an EU regulation and therefore comparable in countries belonging to the ESS. Although the LFS covers the persons, the sample is too small to be used as a source for this kind of statistics, especially on a regional level.

There were high expectations that Nordic cross-border statistics will not only give a picture of the integration between the countries in different regions but also provide a basis for the growth work of the regions, especially the border regions. They could even describe the impact on the labour market if border barriers are changed as well as improve national, Nordic and European statistics.

Also the [European Statistical Programme](#) 2013-2017 (consolidated version 1.1.2018) recognises the need for cross-border statistics:

"(9) In addition, particular attention should be paid in statistical studies to the impact of fiscal consolidation programmes on workers and other citizens. Statistical data should be collected in such a way as to ensure the visibility of developments in individual Member States, such as" ... "labour mobility within the Member States, within the Union and between the Union and third countries, and the related socio-geographical changes in pay structure and training measures."

The report [Boosting growth and cohesion in EU border regions](#) states:

"Statistical and geospatial data describing cross-border flows and phenomena is not always sufficiently available or standardised to allow policy-makers to take informed decisions. Member States, under the coordination of the European Statistical Office should explore innovative data collection methodologies (e.g. geo-referencing or geocoding) ready for cross-border analysis such as grid-based data."

On the European scale it is also clear that cross-border statistics are important to

better understand the European economy. EU internal border regions cover 40 per cent of the EU territory, accounts for 30 per cent of the population (i.e.150 million people) and produce 30 per cent of the EU's GDP.

The need for cross-border statistics became especially apparent during 2020 when the Covid-19 pandemic hit the world and movement across many national borders were restricted. In some of the Nordic countries the borders between the countries were closed and the commuters and students were forced to stay on one side of the border. For most border regions only estimates on the numbers of persons affected by these restrictions could be given. The pandemic also restricted tourism and hindered shopping trips and business travel, which led to a decrease in employment in industries like transport and accommodation, where many of the commuters are working. The 2015 refugee crisis also had an impact on travel between countries. This was particularly evident in commuting between Denmark and Sweden, when passport controls came into force between the two countries.

3.2 Under-coverage in national statistics

In all Nordic countries, statistical production is dependent on the use of administrative resources and registers. Each country has a population register that includes the permanent population in the country and which is used to produce statistics on demography, families and migration. Data on people's activities, employment and studies are also collected from administrative registers. In addition, in each country, the National Statistical Institute maintains a statistical education register, which includes the qualifications of the population.

Generally, the statistics based on the registers are comprehensive and of high quality. However, there are some statistical areas with under-coverage leaving some phenomena not possible to describe with national statistics. For example, in register-based employment statistics most countries lack data on jobs that commuters hold abroad. In statistics on education attained, there is under-coverage in the number of educations completed abroad. This has in several countries been addressed with data collections on the qualifications of migrants. Often the response rates have been quite low, and the data quality not affirmed as it is self-reported data. There are no comprehensive data on the qualifications attained abroad by the national population. There are no separate comprehensive regular statistics on persons working or studying in another Nordic country either.



4. Preconditions for production of cross-border statistics

There are several aspects and issues that need to be taken into consideration before the actual production process can be started. It is imperative that the whole action is carefully planned, and all details investigated in advance.

There are several sources that can be used to produce cross-border statistics (see the report [Border Region Data collection](#)). However, e.g. LFS and mobile phone data are difficult to use while the sample size is too small and/or important variables are not available. The Nordic NSIs rely on their statistical registers based on administrative information as a source for cross-border statistics. Data from the registers were exchanged on micro level (exchange of individual data), the results matched in each country and finally compiled into Nordic cross-border statistics.

4.1 Legal preconditions for data exchange

For two countries to be able to exchange micro data, i.e. individual data, the legislation of both countries must allow for such an exchange. Not only does the legislation need to allow the actual exchange, it also needs to be compatible regarding the storage, possible deletion, further utilisation of data and releasing the data to third parties. If the legislation in the countries involved is not compatible, another option for countries belonging to the [European Statistical System](#) (ESS) is to exchange data under [Regulation \(EC\) No 223/2009](#) of the European Parliament and of the Council. Article 21 of the Regulation states that "1. Transmission of confidential data from an ESS authority, as referred to in Article 4, that collected the data to another ESS authority may take place provided that this transmission is necessary for the efficient development, production and dissemination of European statistics or for increasing the quality of European statistics."

The original intent in this project was to exchange data according to the respective national legislation, as in previous collections of cross-border statistics. This proved not to be possible due to differences regarding provisions of "originator control" between the Nordic countries. The exchanges were therefore done under national legislation between some countries and under Regulation (EC) No 223/2009 between others. This was possible as all national statistical institutes in the Nordic countries are ESS authorities although not all countries are members of the EU. The

territories Greenland and Faroe Islands are not ESS authorities and could therefore not take part in the project. Statistics Finland's data includes the data of Åland.

The discrepancies in national legislation caused a halt in the project lasting almost two years before a solution was found. The problem and its solution are described in more detail in Chapter 6 (Challenges).

In the project all the details were defined in the data exchange agreements the NSIs made. To secure resources and express the mutual will to participate in the project, Statistics Finland firstly made framework agreements with all the participating NSIs. In addition, bilateral agreements were made for the data exchanges in all the statistical areas between all participants. These "Data exchange agreements" covered the following points:

- Background and purpose
- Scope of the agreement
- Confidentiality and integrity
- Secure data transfer
- Storage and deletion
- Ownership
- Publication.

In total, approximately 50 separate agreements were made (see Annex 5).

4.2 Access to micro level (register) data

One condition for producing this type of data is that there are national statistics and data that describe the entire population (as opposed to sample data). In many countries, population-wide statistics are currently produced based on administrative data, and this requires access to individual-level data. The use of register data for statistical purposes is justified by legislation, usually the National Statistics Act. All Nordic countries have a national statistics act that gives the NSI the right to access administrative data on unit level with identification data and to link them with other administrative registers for statistical purposes. Furthermore, the national statistics acts provide detailed definitions of data protection.

4.3 Statistical areas and variables

It should be noted, that although the theoretical definitions of most of the variables in statistics are the same between the countries, the implementations will differ. In addition, there are differences in reference point in time and coverage of persons. It is important to take this into account to be able to define a set of data that is as comparable as possible.

4.4 Technical preconditions for data exchange

Because there is no common personal identity code in the Nordic countries, exchange of data is based on persons' identification by means of name, date of birth and sex. Information needed for identification of persons:

- Date of birth
- Sex
- First names
- Last name (present)
- Last name (former)

The identification of a person is based on the above-mentioned data in two different registers (e.g. country A's register of qualifications and country B's population register) and is carried out on a programmatic basis comparing the sex and name of persons born on the same day. Identified persons receive different status values depending on how complete the identification is. If all data on the person are similar in both registers and only one person is found, the identification is total. In most cases, those who have small deviations in either register regarding first or last names can also be considered as being 100 per cent identified.



5. Production process

5.1 Data exchange

Statistical areas

The project concentrated on the following statistical areas:

- migration between Nordic countries
- employment in and commuting to another Nordic country
- attendance in education in another Nordic country
- highest education attained in another Nordic country

Beforehand there were plans to examine possibilities to also produce statistics on social benefits paid to another Nordic country and on the mobility of businesses. However, during the project it became obvious that it was not possible to focus on the last two topics due to resource and scheduling reasons. It was also discovered that statistics on paid benefits can be found from other sources.

Statistics were produced based on existing register data. The main sources were registers used in the NSIs' national production of statistics, but to some extent auxiliary data was needed in Finland. For example, not all administrative registers in Statistics Finland's possession included the names of the persons. The names were therefore requested from the original data suppliers. Supplementary data on foreign workers was also ordered from the Tax Administration.

The project took into consideration the data content, methods used and experiences gained in the work of [Örestat](#), StatNord and [Nordisk pendlingskarta](#).

Description of the method

In the first phase, all persons with data in the selected statistical area were picked from the respective registers of country A. The identification data of these persons including the formed serial number were sent to country B, where the person's data were compared to the data of the population living in the country.

To identify individuals who exist in administrative registers in both countries, the date of birth (year, month and day), sex and name of these individuals are required.

These data are matched with each country's population register.

The condition that must always be fully met is that the date of birth is the same. In some countries, sex must also be the same in the identification process, while in others, sex is used as background information in the manual review. After that, the name must also be correct. In several cases, the individual's name is exactly the same in both registers which then completes the match. In the matching procedure, letters that look different between countries (å, ä, ö, ø, æ, etc.) are taken into account.

However, there are also cases where a name is spelled differently or where a person's all first names are included. A person can also change their name, both first and last name, which makes the matching complicated. There are also matches that result in several individuals, i.e. the date of birth and name match a few, sometimes several, different individuals in the population register.

Some of these problems can be solved mechanically by accepting a match if the name is "close enough". Some of the problems require a manual review and a decision is made as to whether it should be a match or not. In the manual review, sex is for some countries used as a background information when deciding on a match or not.

Two types of errors can occur, the errors being that people who are in both administrative registers are not identified and people who are not in both administrative registers are identified.

Match	Commuting	Education	Migration	Students	Total
Full match	5,224	39,020	3,805	1,490	49,539
Partial match	633	5,460	331	5,182	11,606
Total	5,857	44,480	4,136	6,672	61,145

Table 1. Example of result of data matches (Finland).

The serial number of an identified person was sent back to country A, where data related to respective statistical area were added for the person. After this, the data were sent back to country B, where the data were processed and analysed (Figure 1).

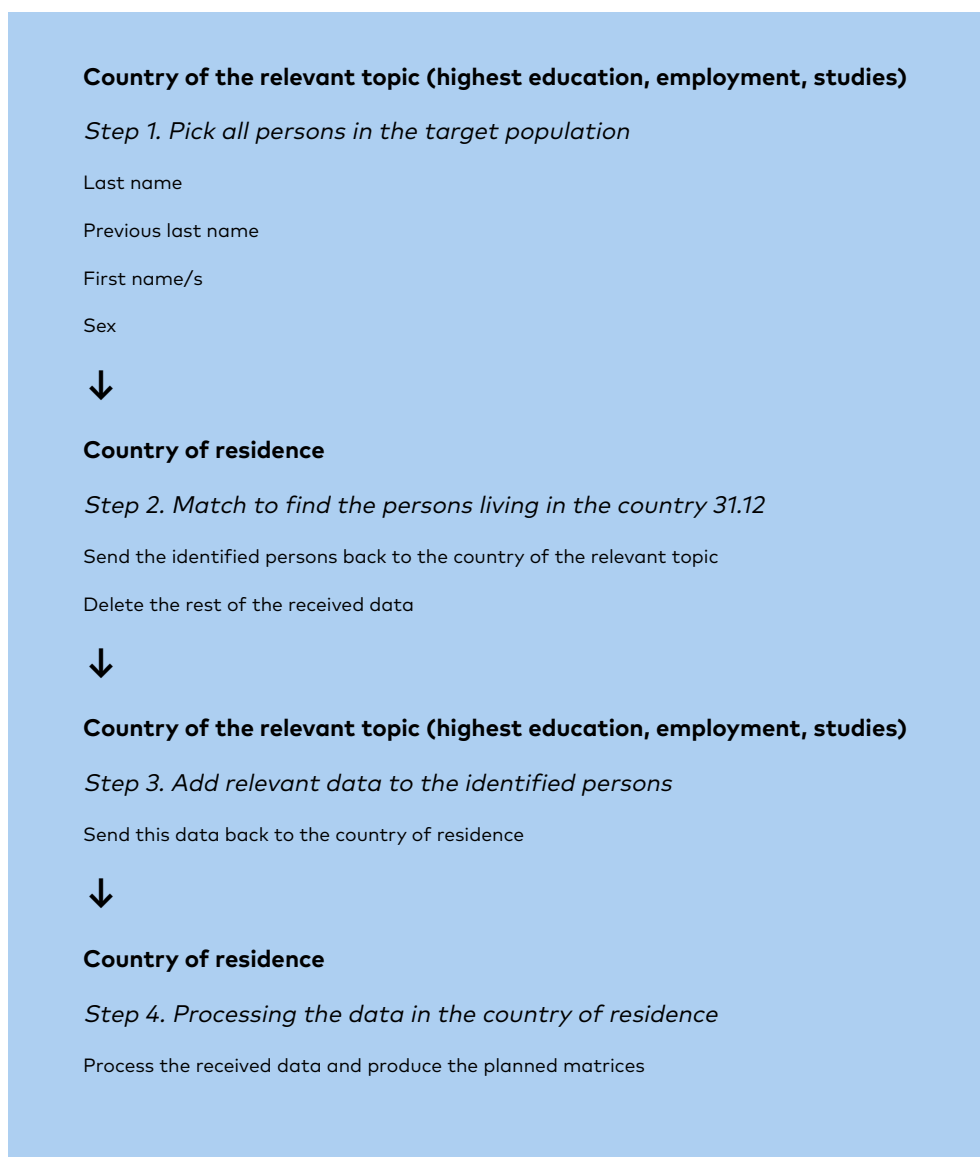


Figure 1. Data exchange process

The original descriptions of the steps in the data exchanges and the variables exchanged for each statistical area are shown in Annexes 1-4.

In total, close to a hundred bilateral data exchanges were made within this project. The separate steps (1-4) in each exchange are not included in this sum, nor the corrective exchanges that were made.

5.2 Transfer of data

Because individual-level data with identifying information were exchanged within this project, data protection had to be ensured in the data transfer. All data were transferred via SFTP, Secure File Transport Protocol. The countries agreed on the

detailed practices for the exchange of data.

5.3 Combining data to matrices

After all data exchanges were done and the national data were ready to use, the statistics for all five countries were combined to px-matrices. The project group designed the matrix content to be produced jointly from each statistical area. Experience with previous projects (Örestat, StatNord etc.) was used as a basis.

Each NSI filled in a template in excel format. The excel files were combined in Statistics Denmark and transformed to px-matrices.

5.4 Storage and/or deletion

The data received in steps 1, 2 and 3 were deleted. Data received in step 4 were incorporated in the receiving institute's register in those cases it had been agreed upon. In all other cases, also data received in step 4 were deleted within the timeframe given in the agreement. See list of agreements in Annex 5.



6. Challenges

At the launch of the project, the risks were assessed. Among others, project coordination and management were on the risk list due to the fact, that the project had participants from several countries and organisations. In addition, different sources of data and different national laws were identified as risks. Of those, differences and interpretations in national legislation turned out to be the biggest challenge.

6.1 Legal challenge

The original intent was to exchange data according to the respective national legislation. This proved not to be possible due to differences regarding provisions of "originator control" between the Nordic countries.

According to Swedish legislation, all data a public authority has in its possession is subject to release provided that there are grounds for the data release. In practice this means that statistical data released to an authority are the responsibility of that authority and can be released further to third parties without permission from the statistical institute. In other Nordic countries the practice is different: the ownership of statistical data remains with the statistical institute and if a third party wants to use the same data, the statistical institute can grant permission to it. This is also in line with the Regulation (EC) No 223/2009, which requires authorisation from the original data owner.

In addition, all data coming to an authority in Sweden are considered equal pursuant to the publicity principle, which means that even if the data are meant to be kept temporarily, they can be subject to a data request by some authority. The authority requesting the release must, however, have the right by law to process personal data in order for Statistics Sweden to consent to the request.

Following the national legislation in Sweden, Statistics Sweden could thus not sign an agreement that would exclude data released by other Nordic statistical institutes from this national practice. As the exclusion of further data release without permission was the requirement of Denmark and Norway, the project came to a halt.

In order to compile statistics on cross-border commuters, Statistics Sweden has exchanged micro data with Statistics Denmark since 1997, and with Statistics

Norway since 2001. The ambiguity has now also stopped this traditional statistics compilation describing cross-border mobility between Sweden, Denmark and Norway and is threatening its continuity.

From the project's viewpoint, Sweden's participation was seen as crucial. Sweden is located in the middle of the area and neighbours three Nordic countries, and naturally has most connections with all countries. Therefore, finding a solution to the problem was extremely important.

6.2 Solution

Joint work between the legal services of the Nordic NSIs was initiated to find a way forward. They concluded that it was possible to exchange data under [Regulation \(EC\) No 223/2009](#). If the transmission is necessary for the efficient development, production and dissemination of European statistics or for increasing the quality of European statistics, according to article 21 in Regulation (EC) No 223/2009 the exchange is justified. However, to ensure that said regulation was applicable, the existing agreements had to be rewritten to make it clear that the project will not only produce and publish statistics describing the mobility of people across the Nordic borders, but that the intent also was to increase the quality of both national and European statistics.

The relevant EU Regulations on European statistics that cover variables to be exchanged in the project were [Council Regulation 577/98](#) (LFS), [Council Regulation 1177/2003](#) (EU-SILC), [Council Regulation 763/2008](#) (Census), [Commission Regulation 2017/543](#) (Census) and [Council Regulation 452/2008](#) (Statistics on education and lifelong learning).

The legal group also established that the solution is not necessarily applicable to other future data exchange projects and that such plans have to be assessed on their own merits.

Data exchange with the support of Regulation (EC) No 223/2009 imposed certain restrictions on how the data exchanged can be used and also on what data can be exchanged (in practice only variables in the above cited regulations). Further use of the data will be restricted to scientific and statistical purposes. Regarding statistical purposes, transmission of confidential data will be possible only to NSIs and other national authorities listed by Eurostat on its website.

A consequence of the solution is that exchanged data has to be stored separately and flagged in a way that will ensure that the "originator control" provision is preserved. In practice, this means that inclusion of exchanged data in any permanent registers can be very costly and complicated to maintain. This is only affecting the exchange between Denmark-Sweden and Norway-Sweden where the reference to Regulation (EC) 223/2009 is explicitly mentioned in the agreements.

For all other exchange of data between the countries, reference is instead made to national legislation and an agreement allowing the receiving country to share the exchanged data with third parties under the condition that the third party sign a provision not to share the data further. With the agreements the requirements according to Regulation (EC) 223/2009 and the "originator control" provision

according to article 21.3 "Any further transmission beyond the first transmission shall require the explicit authorisation of the authority that collected the data" are relaxed.

Based on these changes, Statistics Sweden will, if all conditions are met, disclose data outside the organisation by citing Regulation (EC) 223/2009, which is a precondition set by Denmark and Norway for data exchange.

The solution had limitations and did affect the planned data exchanges, the way they needed to be handled and also the timetable. The standstill in production meant that the project did not have time to exchange all data for more recent years but could mainly finalise the exchanges started before the halt. Only some updates were possible.

In the end the solution resulted in hindering one of the secondary targets the project had, which was to permanently store the exchanged data in the respective national data repositories.



7. Statistical findings

7.1 Education: definitions and data sources

There are different kinds of mobility connected to education. There are those who move from one country to another to study, and there are those who move between countries for other reasons and who bring with them their education. In this report a closer look has been taken at both groups.

Each of the Nordic countries has a student register. All registers cover students in the country. There are, however, some differences according to what is included about those who study abroad. In some of the registers, information about exchange students is reported from the institution in the home country where they study and included in the student register. When it comes to students participating in credit mobility outside an organised program and those who attain a degree abroad, a possible source to detect these students is the national student loan fund in each country. One group of students is particularly difficult to find information about; those who take their whole education abroad with no economic support from the country they travel from.

All the Nordic countries also have registers with information about the educational attainment of the population. The registers are based on the data on educational qualifications and degrees collected in connection with population censuses, from each country's education system and different other sources and are updated annually. However, the registers lack information on education level for many immigrants, and also the education completed abroad by nationals. The free movement of persons between the Nordic countries makes it especially challenging to collect data about immigrants from the other Nordic countries. This relates to education that is completed abroad before immigration.

Standards of classification

Students and completers of education and degrees are classified by level and field of education.

Each country has a national standard of classification, a code system that classifies educational activities by level and field. The level classification is intended to give the best possible notion of the structure of the education system in the country.

As national education systems vary in terms of structure and curricular content, it is

vital to ensure that data are comparable. This can be done by applying the International Standard Classification of Education (ISCED), the standard framework used to categorise and report cross-nationally comparable education statistics ([International Standard Classification of Education 2011](#)).

Therefore, when comparing data about education between the Nordic countries, the International Standard Classification of Education (ISCED) is used. Each education code in the national classifications has a corresponding ISCED code which describes the level and field of the education.

National student registers

There are some differences in what is covered in each of the Nordic country's student register. All registers have information about students from the national education system. In some of the countries' registers (Norway and Sweden), information about exchange students is included, while the Swedish register also includes free movers (students participating in credit mobility outside an organised student mobility programme) with support from Centrala Studiestödsnämnden. In Iceland exchange students are included if they get an Icelandic ID number. Icelandic students abroad are counted if they receive a student loan from the Icelandic Student Loan Fund. Students who come to Denmark to study for e.g. half a year as part of their education abroad, are not included in the student register, while Danish students who take part of their ongoing education in Denmark abroad are included in the student register. The Norwegian register also includes those who are students at a full program abroad with support from Lånekassen. Students at PhD level are included in all the Nordic student registers.

Populations, attendance in education

From each country's student register all those not registered as residents in the country on 31 December for the years 2008 – 2016 were extracted. These data were then matched with registered residents in the other Nordic countries at the same point in time. Identified persons in each country were used as a source for some new tables on student mobility.

Cross-section data, attendance in education

The data reported in this project reflect the number of students enrolled at the education levels upper secondary, post-secondary non-tertiary and tertiary at the beginning of the reference school or academic year (September-October).

Populations Highest education attained

Two different populations in the part about the Highest education attained is described:

1. When describing mobility between the Nordic countries, as has been done in Chapter 7.3, only data about highest education achieved in the reporting Nordic country are included, and only at the education levels upper secondary, post-secondary non-tertiary and tertiary. The population consists of those living in each country on 31 December 2018.
2. In Chapter 7.3.3 the focus is on improvement of the national registers. In this section, in addition to data about highest education attained in another Nordic country, the information exchanged between the NSIs about persons with their highest education achieved from countries outside the Nordic region and at all levels of education is also included. As some countries (Iceland and Norway) updated the education registers retrospectively, comparison can also be made to the population having sometimes lived in the country.

In both populations we take a closer look at persons aged 15 or older.

7.2 Attendance in education

The purpose of exchanging data about attendance in education through this project, was to see if this could improve the description of the student mobility between the countries. Through the exchange of individual data each NSI could also complement and improve its student register/statistics at an individual level, and thereby improve the quality of statistics on attendance at the national level.

7.2.1 Mobility connected to attendance in education

Mobility connected to attendance in education can be described by those who move from one country to another to study. There are two types of student commuters: On one hand, there are those who move to another country for a long period to complete a full education programme, while on the other hand there are exchange students and free movers who move to another country of study for a shorter period to take a few exams as part of the education in their home country.

There are already some existing data on this topic in the [Nordic Statistics database](#). These are based only on registered information about those who receive economic support from their home country to attend education in another country and cover full-time students who are taking all the exams for their study abroad. No information is included about students who for some reason choose to study in another of the Nordic countries without this kind of economic support or about exchange students and free movers.

In the project another approach was employed than using only data from the national loan funds when measuring student mobility. Normally the source for producing statistics about students is the national student register. This is a cross-section of students in the autumn, the timespan varies a little depending on the country.

The project wanted to explore if the exchange of micro data between the Nordic countries' student registers would make it possible to produce more coherent and relevant statistics on student mobility and thereby develop new ways of distributing

statistics about this topic. Thematically this would, however, overlap with the tables in the [Nordic Statistics database](#) under the heading "Studying abroad". But because of different approaches there would be differences in coverage.

The approach was to give a picture of the student commuters from one Nordic country to another at a certain point in time, those who are residents in their home country, but are students in another Nordic country.

The initial population was defined as only those registered in the national student register who do not live (are registered residents) in the country where they study. From each country's student register all those not living in the country on 31 December for the years 2008 – 2016 were extracted. These data were then matched with persons living in the other Nordic countries. Identified persons in each country were used as source for some new tables on student commuters and included PhD students from all countries. This should give a picture of how many students from one Nordic country are commuting to another Nordic country to study at a certain point in time.

7.2.2 Results: Mobility connected to attendance in education

The exchange of student data revealed that the Nordic students to a certain extent can choose whether to register as a resident in the country where they are studying. Because the country of residence was one of the essential variables used for producing the tables in the project, the result was not exactly what was hoped for. Because of that, the exchange of student data between the countries has not resulted in any updating of the national student registers.

The work done in the project has enabled giving a more comprehensive picture of the mobility between the Nordic countries and also establishing some differences in what is included in the registers. In addition to better knowledge about students abroad and where they reside, different reasons have been discovered for why the national student registers lack information about some of those residing in the country and studying abroad. In addition, a surprising finding was that many students were citizens in the country where they study but residents in another Nordic country (this group is more closely examined in the text "Some additional findings" in Chapter 7.2.3 Summary: Mobility connected to attendance in education). Their reason for mobility between the countries is more complicated than just to get education. Altogether this has given better knowledge about who these students are, and also about the number of students not registered in the national student registers.

The project found that the already existing statistics in the Nordic Statistics database give quite a good picture of the student mobility between the Nordic countries for those who are taking all their exams for their study abroad. But since the exchange students, free movers and the PhD students are not included, these tables do not give a full picture of the total student mobility between the countries. To avoid confusion, it was decided that the matrices on student produced by the project should not be published in the database. The results of the data exchanges are only presented in this report.

7.2.3 Summary: Mobility connected to attendance in education

Reporting country	Recipient country	2015/2016	2016/2017
Denmark	Denmark	.	.
	Finland	15	14
	Iceland	68	63
	Norway	298	333
	Sweden	610	699
Finland	Denmark	241	273
	Finland	.	.
	Iceland	10	14
	Norway	117	136
	Sweden	1,842	2,124
Iceland	Denmark	339	296
	Finland	3	4
	Iceland	.	.
	Norway	99	74
	Sweden	154	157
Norway	Denmark	2,898	2,407
	Finland	12	13
	Iceland	36	31
	Norway	.	.
	Sweden	617	559
Sweden	Denmark	1,236	1,140
	Finland	119	127
	Iceland	61	57
	Norway	809	737
	Sweden	.	.

Footnote: Data limited to students registered as receiving financial support for studies abroad. Covers full-time students who are taking all the exams for their study abroad. Students at PhD level are included in the data from Finland.

Table 2. Number of students abroad by reporting country, recipient country and time. Source: Nordic Statistics database

Country of residence	Country of study	2015	2016
Denmark	Denmark	.	.
	Finland	147	130
	Iceland	123	125
	Norway ¹⁾	2,178	2,344
	Sweden	268	306
Finland	Denmark	73	74
	Finland	.	.
	Iceland	10	13
	Norway ¹⁾	54	56
	Sweden	744	773
Iceland	Denmark	138	131
	Finland	13	13
	Iceland	.	.
	Norway ¹⁾	78	64
	Sweden	61	45
Norway	Denmark	582	447
	Finland	113	120
	Iceland	136	120
	Norway	-	-
	Sweden	363	389
Sweden	Denmark	1,035	865
	Finland	600	576
	Iceland	92	77
	Norway ¹⁾	1,073	1,042
	Sweden	.	.

Footnote: Data from the national student registers in the autumn matched with residents in the other Nordic countries 31.12.

1) Students abroad with support from Lånekassen were included in the student data from Norway. This results in too high numbers for residents in the other countries, who are students in Norway, especially for Denmark.

Table 3. Number of students abroad by country of residence, country of study and time. Source: Nordic Mobility project

Table 2 shows results from the Nordic Statistics database while Table 3 shows results based on the data exchange between the Nordic countries. Because of the different conditions for making Tables 2 and 3 the results are not comparable, but they can give a clue according to whether student mobility should be measured by looking at the country of residence and the country of study as described in Table 3.

Table 2 only covers full-time students who are taking all the exams for their study abroad, while Table 3 is based on all registered students in the country's student register who are not residents in the country of study at a certain point in time. One would therefore expect the numbers in Table 3 to be higher than in Table 2 and also to give a better picture of the total number of mobile students between the Nordic countries. However, this is not always the case. For instance, the number of students from all countries reported studying in Denmark and Sweden is higher in the Nordic Statistics database than in Table 3. On the other hand, the numbers of students in Finland and Iceland from the other Nordic countries are, as expected, higher in Table 3 which is a result from the data exchange in the project, while for students in Norway the numbers vary a bit more from country to country. It seems as more students from all countries register as residents in Denmark and Sweden (while studying) than in the other Nordic countries.

It turns out that if a person is going to study in another Nordic country than where the person normally resides for a period (the length of the period varies between the countries), the person is supposed to register at the national registration office in the country of study to receive a national identity number. For most full-time students who are taking all their exams abroad, this implies that while the students are studying, they are also supposed to register as residents of the country where they are students. However, this may be practised differently from country to country. In Denmark, Iceland and Norway, students are requested to register if they are going to study for a period of more than six months. In Denmark they can also, but it is not mandatory, register if they reside for more than three months. To be registered in Sweden as a student, students need to show that they will study for at least 12 months. If students' residence in Finland lasts for more than three months, they must apply for registration of an EU citizen's right of residence. If a person moves to live permanently in Finland for at least a year, he or she has to register as a resident at a service location of the Digital and Population Data Services as well.

The data exchange implies that the students to a certain extent can choose whether to register as a resident in the country where they are studying. This makes it difficult to measure student mobility by movement from the country of residence to the country of study. Residence proves not to be a determining criterion to define mobility.

Some additional findings...

Even so, some students are still registered as residents in another Nordic country than where they are studying, but they cannot be found registered as students abroad in the residence country's education register or in the data from the national student loan funds. Since they are not reported by the national student loan fund they are therefore not included in the source for the existing tables in the Nordic Statistics database. The data exchange gives us the opportunity to take a closer look at these students. Who are they? How many are they? Why are they not registered as students abroad, and will it be possible to include them in the student register and in the mobility statistics in the future? The following paragraphs only describe the Norwegian setting but reflects the situation in the other Nordic countries as well.

In the data exchange all persons attending education in the autumn but not registered as residents in the country of study were matched with residents in the other Nordic countries on 31 December in the respective year (2008-2016). From the matched data those already registered as students abroad in the Norwegian student register were excluded; those who receive economic support from the country of residence for studies abroad, and exchange students. After that it was possible to focus on persons registered as residents in the country and who were registered as students in another Nordic country, but not registered as students abroad in the national student register.

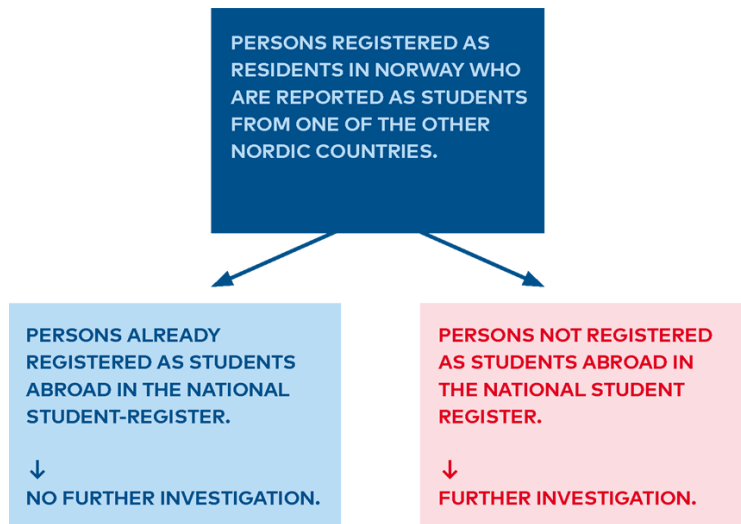


Figure 2. Division of students according to registration/non-registration

This proved to be quite a few students, and when looking closer at them, several possible reasons were revealed as to why they are not registered as students abroad in the national registers. The most obvious reason is that the students take complete education in another Nordic country without receiving financial support from the country of residence, and because of that, they will not be registered as a student abroad anywhere in their home country. Maybe because they do not need, do not want to or are not entitled to receive this kind of support. This is a group of students that is not normally captured through register-based information.

1. Delays or missing observations reported from the student loan fund may occur, and the information about some of the students abroad is registered at another point in time or not registered at all in the national student register. When combining data from 2016 of the 246 students in the Nordic countries who are Norwegian citizens, thereby entitled to economic support from Norway and who also are residents in Norway without being registered as students abroad in autumn 2016, with data from the Norwegian student register from 2015 and 2017, it is found that 83 of these persons are reported as students in another Nordic country in 2015, while the corresponding number for 2017 is 25 students. Eighteen of these were reported as students in another Nordic country in both years. The source for this information is the Norwegian student loan fund (Lånekassen). This implies that there may be a mismatch in time

when combining these data sources.

2. Table 4 shows that some (in some cases quite many) of the students have citizenship in the country where they are registered students, not in the country where they reside. They will therefore not be reported from the student loan fund in the residing country. This is the case for 293 of the 608 students in this group in Norway in 2016 and reverses the most obvious interpretation of the student exchange between countries.

2016		Citizenship					
Country of study	Total	Denmark	Finland	Iceland	Norway	Sweden	Other
Denmark	260	101			129		30
Finland	100		67		22		11
Iceland	100			90	2		8
Sweden	148				93	35	20

Table 4. Norwegian residents studying in another Nordic country, not registered as students abroad, by citizenship. 2016. Source: Nordic Mobility project

In all, 181 of these 293 students are still living in Norway on 31 December 2019, while 112 have moved out of the country. There may be various reasons for why they are residents in Norway while studying in their home country. A closer look at their age when moving to the country in Table 5 might give a clue.

Age when moving to Norway	Number of students
15-20 years	47
21-40 years	223
41-59 years	22
60 + years	1

Table 5. Age when moving to Norway. Source: Nordic Mobility project

Those who were quite young when coming to the country probably moved there with their parents. Some have immigrated because of marriage or finding a Norwegian partner. But there may also be other various reasons for coming that cannot be established.

Since the country of residence is not taken into consideration in the usual student statistics, the fact that some students are registered as residents in another country while studying in the country where they are citizens is normally not detected.

3. The student registers are cross-sections of the situation at the same point of time

each year. When combining the student data at one point in time with residence registration from another point in time, this may also cause deviations.

7.3 Highest education attained

This chapter presents the results of the exchange of data on highest education attained by people who have migrated between the Nordic countries.

Qualifications attained in another Nordic country can be seen as a sign of the movement of the population from one country to another. This means that the person has had a relatively long relationship with the country in question: he or she has lived there to study or lived there permanently and moved to another country after becoming an adult.

There are two principal aims of the data exchange of the highest education attained:

1. To describe this kind of mobility between the Nordic countries
2. To improve the coverage of the national registers on the highest education completed.

In the data exchange all persons¹, for whom there were at some point registered information about the highest level of education attained, were selected from each country's register of educational attainment of the population. The date of birth, sex and name of these persons were sent to the other NSIs for identification. Identification was done by comparing the received identification data to the population database of the NSI of each country, both with the population in each country on 31 December 2018 and also with all those who had ever lived in the country.

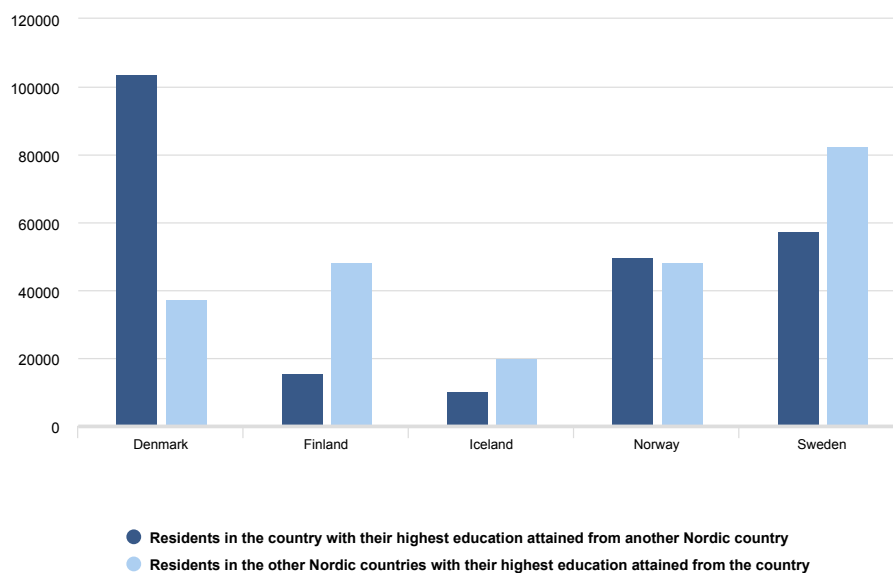
For the identified persons, i.e. those who at some point had lived in the country receiving data through the micro data exchange, the information about highest completed qualification attained could be updated. This would be the case if the level of education in the information received was higher than the existing information or information about education was missing for the person in the national register.

7.3.1 Results: Mobility connected to highest education attained

This part presents some results about mobility connected to the micro data exchange of completed education for each of the Nordic countries. The data described concern those who have completed education in another Nordic country than where they are now residents and where this education is also the person's highest education attained in the reporting country. Included in these data are people at the age of 15 or older, and who have completed at least upper secondary education. The basic population is the population with a permanent place of residence in the country on 31 December 2018. Only education received through the data exchange, and where the country of education is the same as the country of data release is included in the figures and tables. The results in the figures and tables

1. The microdata exchange between Sweden and Norway included residents on 31 December 2018.

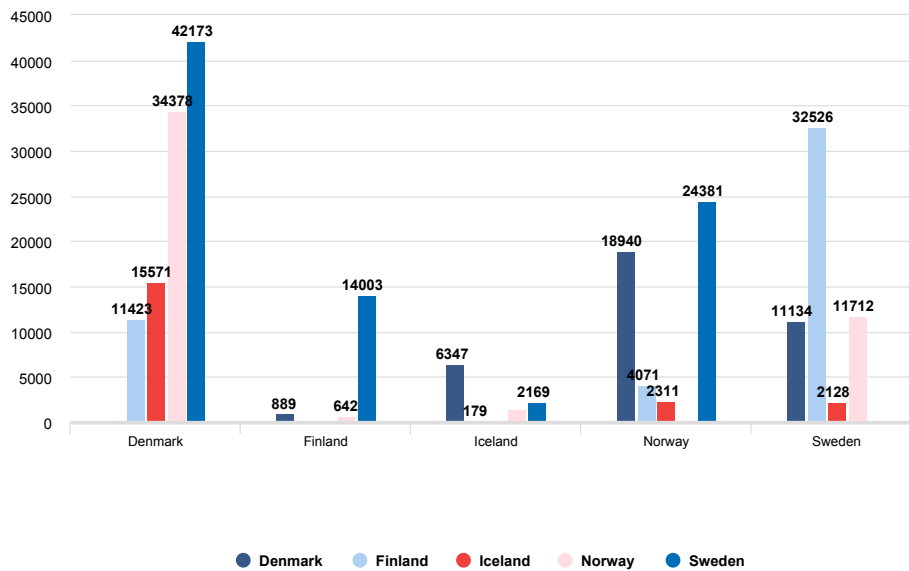
in this part of the education chapter can also be found in the new px-matrices in the [Nordic Statistics database](#).



Graph 1. Number of residents with their highest education attained in another Nordic country, and number of residents in the other Nordic countries with an education from the country. 31st December 2018. Source: [Nordic Statistics Database](#)

Graph 1 shows the number of persons for whom micro data about education has been exchanged for residents in each of the countries at the end of 2018. More than 103,000 of the residents in Denmark have completed education in another Nordic country, while a little fewer than 40,000 residents in the other countries have completed education from Denmark. In the chapter about attendance in education, it was found that there are many students, especially in Denmark, who also register as residents while studying, which especially contributes to the high number of received information for this country at upper secondary level. In Finland, Iceland and Sweden on the other hand, the number of residents who have completed education in the other Nordic countries is smaller than the amount of information given to the other countries while for Norway there is no big difference between the numbers of given and received information.

In total, more than 236,000 persons were reported through the data exchange to have attained a qualification in another Nordic country. If the same person was reported with education from more than one country, the highest educational qualification attained was included in the figures.



Graph 2. Number of residents in each country with education attained reported from another of the Nordic countries. Source: [Nordic Statistics Database](#)

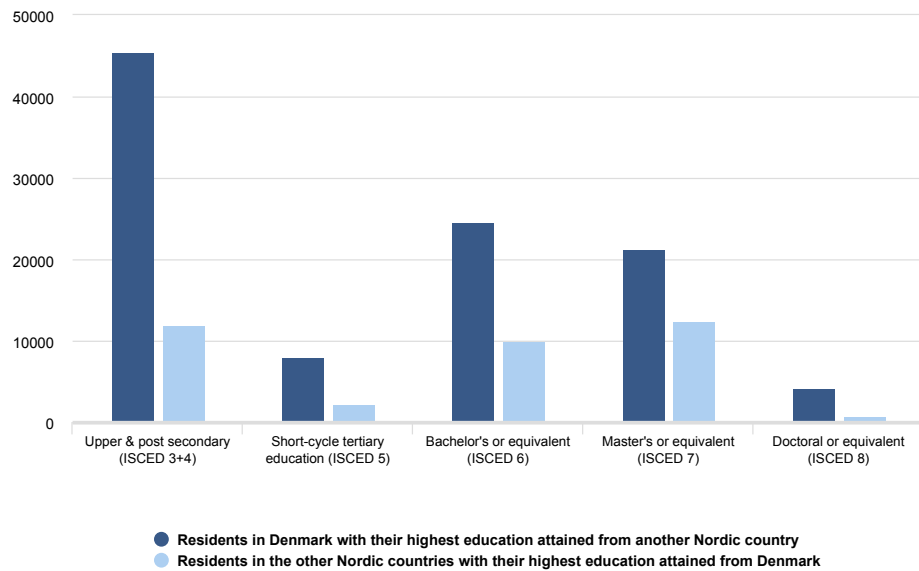
As Graph 2 shows, Denmark received most information about education completed in other countries from Sweden and Norway, while Finland got almost all information from Sweden. Iceland received a majority from Denmark, while Norway received the most from Sweden and Denmark. Among residents in Sweden most have completed education in Finland, but also more than 10,000 persons have completed education in Denmark and Norway. The figure implies that similarity in languages may in several cases be an essential factor when choosing to move to another Nordic country to study.

7.3.2 Summary: Mobility connected to highest education attained

This chapter presents some key results concerning the data exchange for each of the Nordic countries.

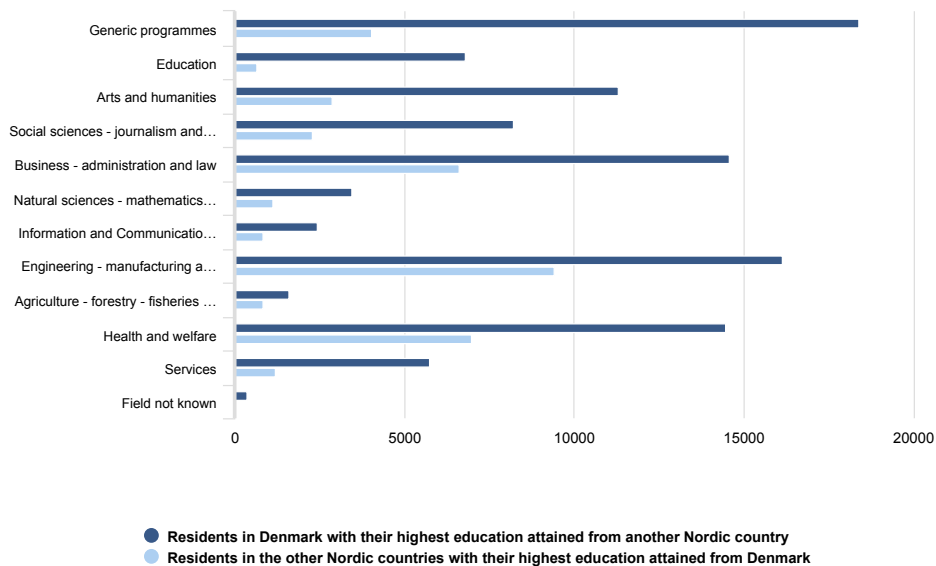
Denmark

As shown earlier, Denmark is a bit different from the other countries due to all the students from the other Nordic countries who are residents in Denmark while studying.



Graph 3. Inflow and outflow of number of people with their highest education attained reported from another of the Nordic countries than where they are residents, by level of education. 31 December 2018. Denmark. Source: [Nordic Statistics Database](#)

Especially included in the large amount of received information at upper secondary level are several students from the other countries registered as residents in Denmark while studying in tertiary education. But still, at all levels of education Denmark receives a much greater inflow of education from the other Nordic countries than outflow.

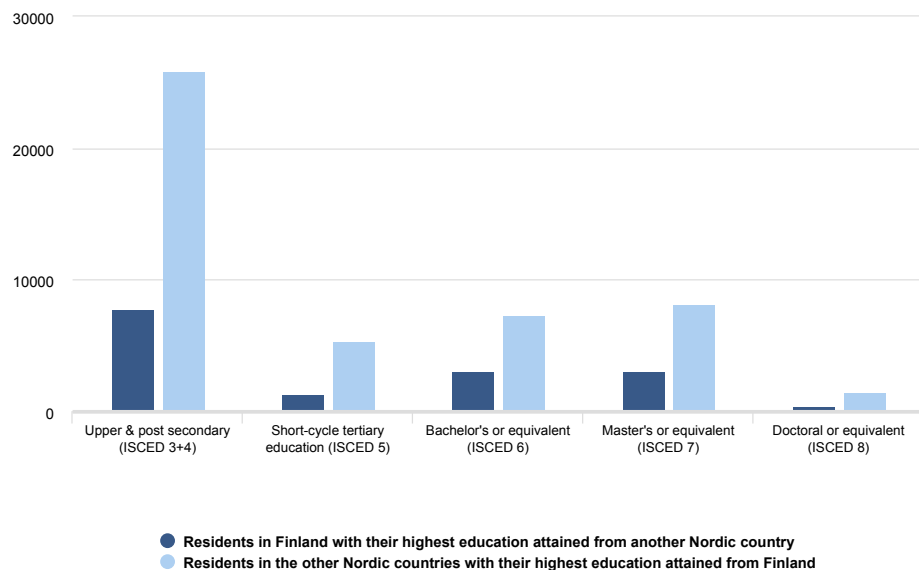


Graph 4. Inflow and outflow of number of people with their highest education attained reported from another of the Nordic countries than where they are residents, by field of education. 31 December 2018. Denmark. Source: [Nordic Statistics Database](#)

Most of the education of those residing in Denmark with an education from another Nordic country are within Generic programmes and Engineering, manufacturing and construction. More than 14,000 of the educations are within Health and welfare and Business, administration and law while a bit more than 11,000 have attained education in Arts and humanities. The large number of people with education in Generic programmes include students from other countries with the highest education attained at upper secondary level.

Engineering, manufacturing and construction, Health and welfare as well as Business, administration and law are the fields of education where most of those from the other Nordic countries who completed education in Denmark have their education.

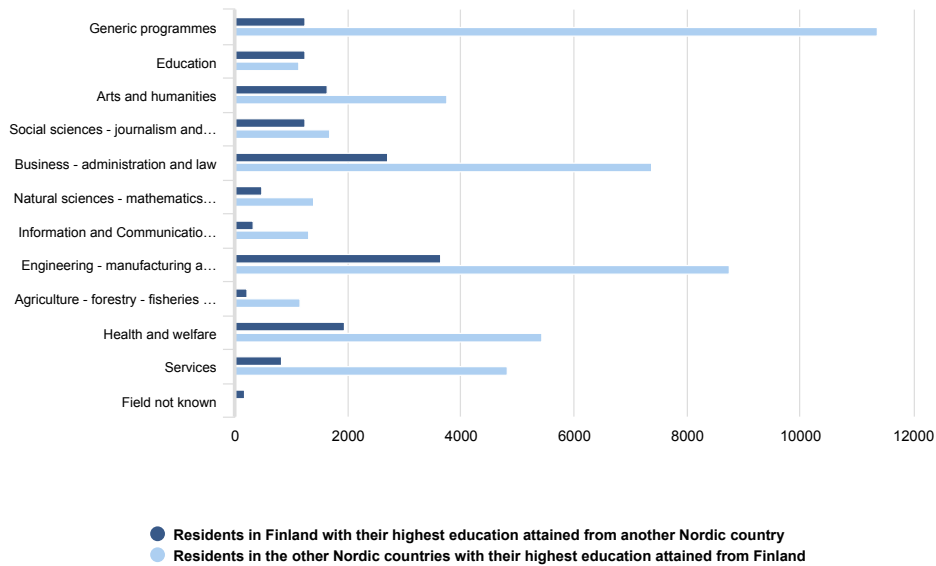
Finland



Graph 5. Inflow and outflow of number of people with their highest education attained reported from another of the Nordic countries than where they are residents, by level of education. 31 December 2018. Finland. Source: [Nordic Statistics Database](#)

As Graph 5 shows, there is a great difference between the number of people living in Finland who have education from another Nordic country and people with education from Finland who now live in another of the Nordic countries. The most important explanatory factor is the earlier high migration rate from Finland to Sweden, and as the result of the data exchange, the coverage of education data of those who have moved to Sweden as adults and completed their education in Finland has improved. The outflow of education is much bigger at all levels of education than the inflow. The high number of outflow of people with upper or post-secondary education includes students who are temporary registered as residents in another Nordic country before returning to Finland. At all levels 80 per cent or more of the

information received comes from Sweden, while at the lowest levels (ISCED 3-5) more than 70 per cent is given to Sweden.

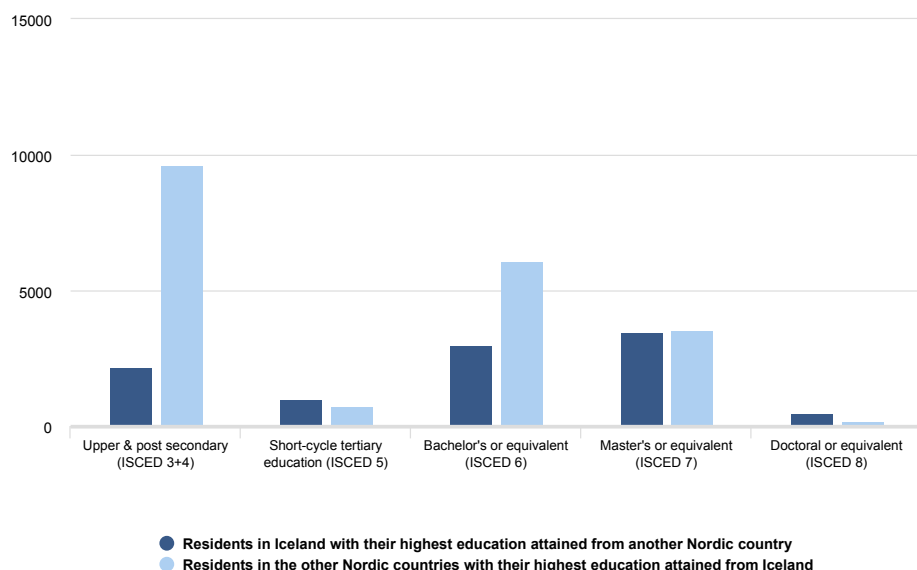


Graph 6. Inflow and outflow of number of people with their highest education attained reported from another of the Nordic countries than where they are residents, by field of education. 31 December 2018. Finland. Source: [Nordic Statistics Database](#)

Engineering, manufacturing and construction and Business, administration and law are the fields of education where most of those who have education from another Nordic country have attained education. Apart from Generic programmes this is also the case for residents in the other Nordic countries with education from Finland. The high figure for education within Generic programmes includes many students from Finland registered as residents in other Nordic countries.

Iceland

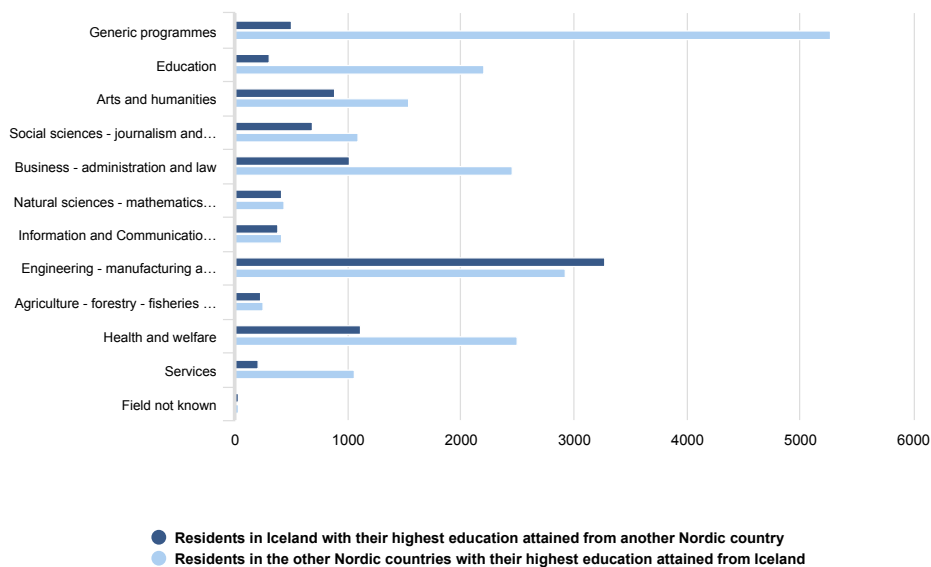
At first a look at the information about the level of education exchanged between Iceland and the other Nordic countries.



Graph 7. Inflow and outflow of number of people with their highest education attained reported from another of the Nordic countries than where they are residents by level of education. 31 December 2018. Iceland. Source: [Nordic Statistics Database](#)

Of those living in Iceland at the end of 2018 who had completed education in another Nordic country, most had a tertiary education. Around 3,000 had a bachelor's degree from one of the other countries, while almost 3,500 had a master's degree. At bachelor's and master's level more than 70 per cent of the received information came from Denmark, while the same applied to given information to Denmark at all levels. For those who have moved from Iceland to another Nordic country with education from Iceland, the majority had achieved education at upper secondary or post-secondary non-tertiary level, as many as 9,600. At bachelor's level there is a big difference between the inflow and outflow, twice as many bachelor's degrees are sent out of the country as received.

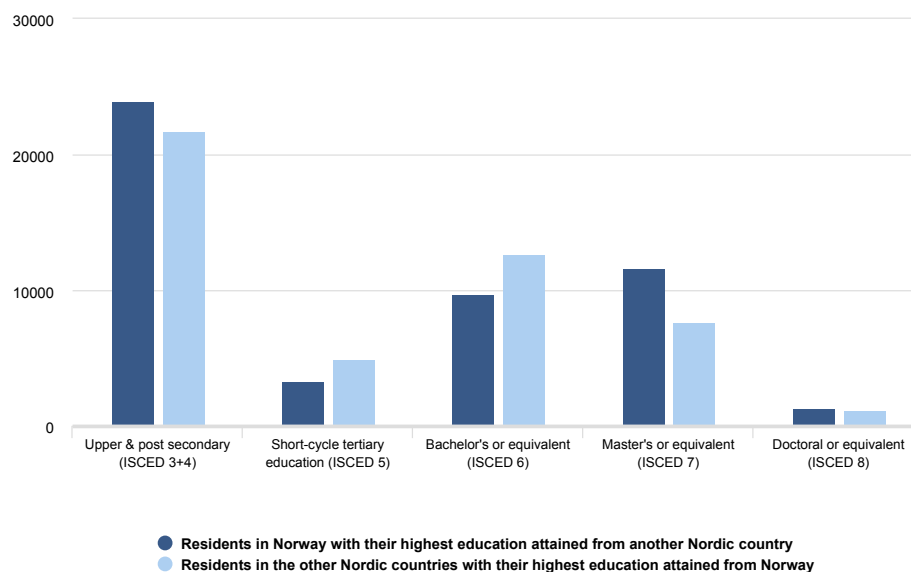
The high number of outflow of people with upper or post-secondary education includes students who are temporarily registered as residents in another Nordic country before returning to Iceland.



Graph 8. Inflow and outflow of number of people with their highest education attained reported from another of the Nordic countries than where they are residents, by field of education. 31 December 2018. Iceland. Source: [Nordic Statistics Database](#)

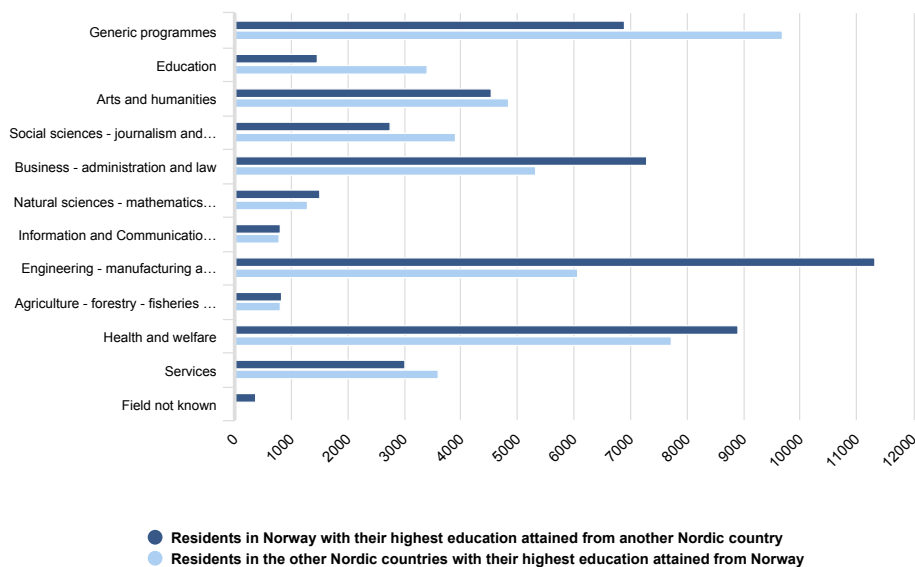
Graph 8 shows that Engineering, manufacturing and construction is the field of education where most of those who have studied in another Nordic country have their education while Health and welfare is the second largest. Except from Generic programmes this is also the case for those who have education from Iceland and reside in another of the countries. In addition, the figure for education within the field Business, administration and law is almost of the same size as for Health and welfare. Included in the high figure for education within Generic programmes are several students from Iceland registered as residents in other Nordic countries.

Norway



Graph 9. Inflow and outflow of number of people with their highest education attained reported from another of the Nordic countries than where they are residents by level of education. 31 December 2018. Norway. Source: [Nordic Statistics Database](#)

For Norway there is very little difference between received information about education attained in another Nordic country and information about education attained in Norway by people who are now living in another Nordic country. Almost 4,000 more people with a master's degree from the other countries have moved to Norway than the other way around, while almost 3,000 more with a bachelor's degree have moved out. More than 60 per cent of the inflow of people with upper or post-secondary education come from Sweden, while the same applies to more than 50 per cent with education at bachelor's level. There are many Norwegian students abroad, especially in Denmark, whose highest level of education is at upper secondary level, but since they also are temporarily registered residents in Denmark while studying, they are not included in Graph 9 but in Graph 3.

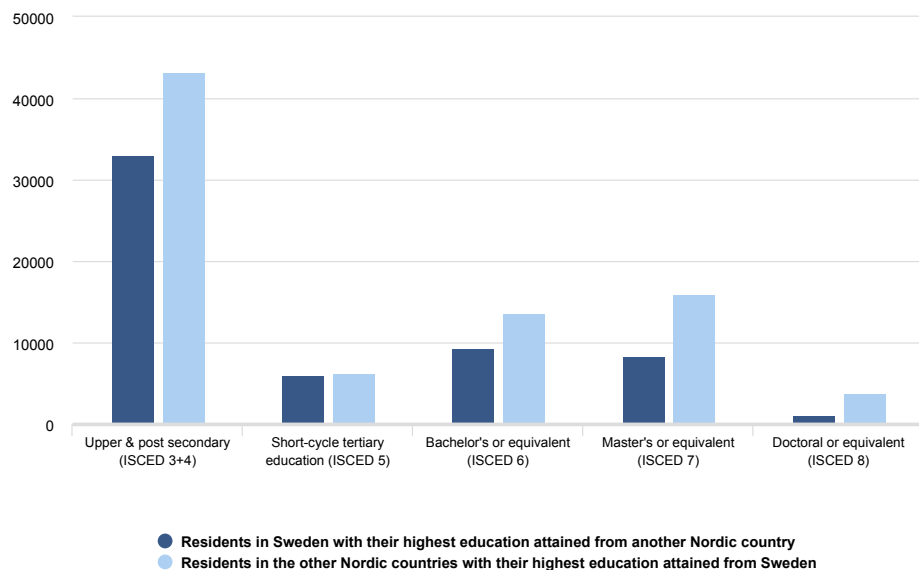


Graph 10. Inflow and outflow of number of people with their highest education attained reported from another of the Nordic countries than where they are residents, by field of education. 31 December 2018. Norway. Source: [Nordic Statistics Database](#)

Most of the education attained in another Nordic country by residents in Norway is within Engineering, manufacturing and construction, while Health and welfare and Business, administration and law are the second and third largest fields of education.

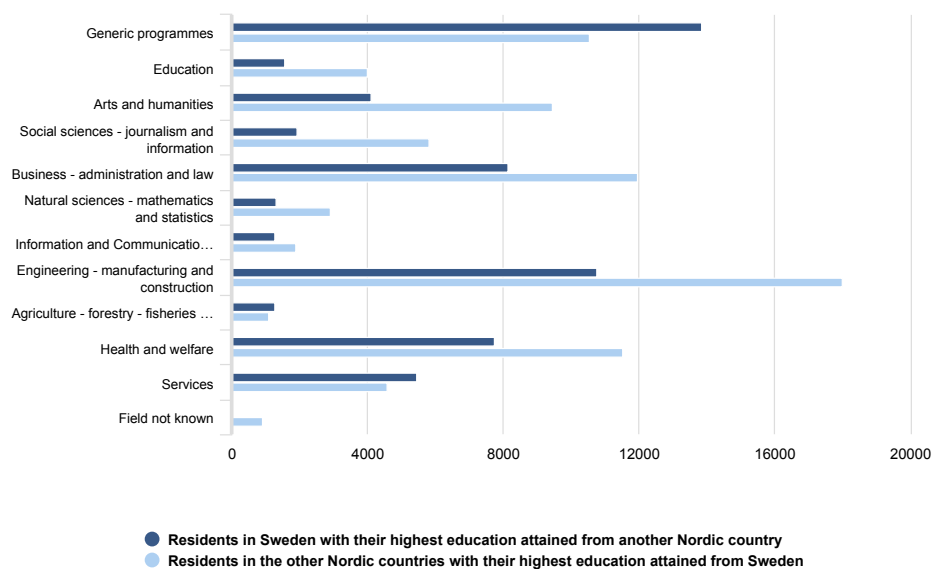
Many of the residents in other Nordic countries with attained education from Norway have attained education within the field Health and welfare, Engineering, manufacturing and construction, Business administration and law or Arts and humanities. The large number of residents in other Nordic countries who have attained education within Generic programmes, includes students from Norway who are temporarily registered as residents in the country of study.

Sweden



Graph 11. Inflow and outflow of number of people with their highest education attained reported from another of the Nordic countries than where they are residents by level of education. 31 December 2018. Sweden. Source: [Nordic Statistics Database](#)

Graph 11 shows that for Sweden the outflow of attained education is larger at all levels of education than the inflow. When looking at information received about attained education from another Nordic country, more than 60 per cent at the lowest levels (ISCED 3-5) comes from Finland. The same applies to more than 40 per cent at all other levels. Most of the given information goes to Denmark, more than 50 per cent at all tertiary levels and as much as 63 per cent at doctoral or equivalent's level.



Graph 12. Inflow and outflow of number of people with their highest education attained reported from another of the Nordic countries than where they are residents, by field of education. 31 December 2018. Sweden. Source: [Nordic Statistics Database](#)

As Graph 12 shows, most of the residents in Sweden with education from another Nordic country have attained their education within the field Generic programmes. Many of these are probably students from the other Nordic countries who are only temporary residents in Sweden. The second largest field of education is Engineering, manufacturing and construction, while Business, administration and law and Health and welfare comes third and fourth.

Of those in the other Nordic countries who have attained education in Sweden most hold education within Engineering, manufacturing and construction, Business, administration and law and Health and welfare.

7.3.3 Improving education registers and statistics

National registers on the highest education attained include residents in the country from the age of 15 and older. The data on highest education attained are mainly based on reports on education achieved from the school system in each country. The quality of the statistics based on the registers is generally high.

There is, however, under-coverage in the qualifications and degrees taken abroad, especially among persons born in another country. The NSIs do not receive enough information about education attained in other countries for many immigrants, nor for many of the qualifications attained abroad by the national population.

With expanding immigration in recent years, and probably also in the future, the gap is increasing. To update the registers on missing information about immigrants' education attained abroad before immigrating to the country, surveys may be conducted in each of the Nordic countries. But these surveys are expensive, and with

rising non-response in surveys, the problem is unlikely to disappear.

The free movement of persons between the Nordic countries makes it especially difficult to reach this group of immigrants, but the exchange of micro data has made it possible to receive and store more and better data on immigrants from other Nordic countries connected to their situation before the migration.

Immigrants can be split into different groups concerning mobility and the highest education attained. For those who immigrated as children, the mobility is not connected to education at all. Both for this group as well as for persons that immigrated due to studying, the NSIs receive information about education from the national educational institutions. The groups that the project would like to reach are adults who immigrated to take up a job or because of family reasons, but also those in the original population who have attained their highest education in one of the other Nordic countries and where this information is not registered in the national education register.

The data exchange provided data on qualifications both attained in the reporting country and in other countries from each country's register on educational attainment of the population. In addition, Denmark, Finland, Iceland and Norway also combined data for other populations than that of 2018. Iceland and Norway have updated their education registers retrospectively with this information.

So, for whom was the project trying to find a qualification? The target group consisted of the population having sometimes lived in the country, with an upper secondary qualification or higher as their highest education (ISCED levels 3-8), but there has also been exchange of data on lower ISCED levels between some of the countries.

7.3.4 Results and benefits for the future: Improving registers and statistics

In this chapter some results are presented to illustrate the possible improvement in national registers on the highest education attained due to the data exchange done in this project.

All persons, for whom there were registered education data, were selected from each country's register of educational attainment of the population. The date of birth, sex and name of these persons were sent to the other statistical institutes for identification. Identification was done by comparing the received identification data to the population database of the statistical institute of each country.

For the identified persons, i.e. those who at some point had lived in the country, the highest attained qualification in another country's register of qualification was received, as well as other data connected to it, such as the level and field of the education and the time and place of attaining the qualification.

Total number of qualifications exchanged	Country receiving information, all persons having ever lived in the country				
	Denmark	Finland	Iceland	Norway	Sweden 1)
841,654	232,738	199,532	53,462	261,270	94,652

1) "Total number of people that has been reported" refers to registered in Sweden on 31 December 2018.

Table 6. Number of qualifications at upper secondary or higher level of education (ISCED 3-8) received through data exchange from other Nordic statistical institutes. Source: Nordic Mobility project

Table 6 shows that information about the education of 841,654 people were exchanged in the project. All data received in the data exchange will not, however, end up in the national register of qualifications. A person can already have a higher or equal qualification in the national register in which case the data received through the data exchange will not replace the existing data.

Not all countries have so far been able to store all information exchanged in their registers due to different legal circumstances. More information about this topic and also about what has so far been stored can be found in Chapters 6.1 (Legal challenge), 9.3 (Effects on the quality in national statistics) and 9.3.1 (Update of the national registers). However, the project would like to show the possibilities an exchange of this kind of micro data gives if it were possible to store all the new information exchanged in each country's register of educational attainment of the population. Tables 7 and 8 therefore show the possible results on the statistics about Educational attainment of the population for 2018 if all countries were able to store all the new information received and use it in national and international statistics.

Country	Population with a citizenship from another Nordic country	Number of persons with a citizenship from another Nordic country for whom highest education could be updated	Per cent possible updates for the Nordic population
Denmark	40,600	15,719	38.7
Finland ¹⁾	9,084	2,066	22.7
Iceland	1,658	522	31.5
Norway ²⁾	72,469	16,488	22.8
Sweden	108,756	19,666	18.1

¹⁾ The Finnish figures are from 2019 and are real updates to the education register

²⁾ Population aged 16 or higher at the end of 2018

Table 7. Share of possible updates for the Nordic population in each country aged 15 or older, 2018. ISCED 3-8 upper secondary level or higher. Source: Nordic Mobility project

As Table 7 shows, the data exchange greatly improves the knowledge about the education that the population from the other Nordic countries has brought with

them to one of the other countries. As mentioned earlier, it is difficult to get this knowledge from other register sources because of free movement between the Nordic countries. Iceland had the largest share of updates, as much as 31.5 per cent for the Nordic population. In Finland and Norway, the information could be updated for as much as almost 23 per cent while the respective share is 18 per cent for Sweden. This shows that the effect of a regular micro data exchange will secure a much better register material than is the case today.

Country	Population in the country	Number of people with a higher degree than registered in the country	Number of people where we had no information at all about their education	Total number of persons for whom highest education could be updated	Per cent possible updates for the population
Denmark	4,848,611	16,026	11,021	27,047	0.6
Finland ¹⁾	4,654,256	7,381	6,709	14,090	0.3
Iceland	289,174	2,810	816	3,626	1.3
Norway ²⁾	4,339,490	10,548	16,332	26,880	0.6
Sweden	8,410,456	20,550	11,666	32,216	0.4

¹⁾ The Finnish figures are from 2019 and are real updates to the education register.

²⁾ Population aged 16 or higher at the end of 2018.

Table 8. Possible updates for the population aged 15 or over 31 December 2018, ISCED 3 - 8 upper secondary level or higher, numbers and share of population. Source: Nordic Mobility project

For residents in the Nordic countries on 31 December 2018, data on the highest qualification attained could have been updated in the national registers of qualifications for nearly 104,000 persons. Around 47,000 persons had no previous qualification data while more than 57,000 would receive a higher qualification than registered. Table 8 shows that both in Denmark and Norway the information about highest education attained could have been updated for around 27,000 persons, while the respective numbers for Iceland, Finland and Sweden are around 3,600, 14,000 and 32,200.

The data exchange had the biggest effect on the quality of the register of qualifications for Iceland. There, 1.3 per cent of the population aged 15 or over received new data on the highest qualification attained, while the share in the other countries was from 0.3 to 0.6 per cent.

The effect on international statistics where information about the highest education attained for the populations in the Nordic countries is included will of course be much smaller than when looking only at the Nordic populations as done in Table 7. However, the effect may vary according to how the information is used. For instance, whether the highest level of educational attainment of parents is used as a proxy for socio-economic status and whether it is often combined with data from other areas than education and when measuring equity in education. Large shares of unknown information from the Nordic countries is unfortunate and may not in some coherences give us the right picture.

As mentioned earlier, different legal circumstances have limited the ability to use data from all countries to update the information about the highest education achieved in the countries' registers. So far, Iceland and Finland have updated their registers with data from all the other countries while Sweden has stored data from Finland and Iceland. Norway has stored, and Denmark is planning to store data from all countries except from Sweden. With that, the result of the data exchange will influence future statistics where the level and field of education are used as variables.

The problem concerning missing data about Nordic immigrants' education in the future can be solved by regular data exchange between the countries. The ability to exchange and store data on the highest education attained between the Nordic countries makes it possible to improve the information about the highest attained education for this group in the national registers. A regular data exchange between the countries can reduce the size of expensive surveys. At the same time information from each country's education system can improve the quality of data about the highest education attained compared to self-reported information from surveys (see Chapter 9.4 Effects on the quality in European statistics).

7.4 Commuting

There are two kinds of mobility connected to employment. First, there are those that immigrate from one country to another and take up work in their new country of residence. The second group are persons that commute to work by crossing national borders. In this report we only use the phrase commuters for the second group. For most of the commuters this will imply that they physically cross the national borders. But for some persons it can also be that they are only or to some degree digital commuters.

In principle the national [Labour Force Surveys](#) (LFS) cover commuters. But since the LFS' are sample surveys, they would not be able to give reliable data compared to information that is requested by the users. This is due to a small number of commuters and that regional breakdowns are the most requested dimension. Therefore, one makes use of register data instead.

Before presenting the figures for commuters between the Nordic countries in 7.4.2, the definitions and data sources are described in 7.4.1.

7.4.1 Definitions and data sources

First the definition and measurement of jobs as commuters is described. This is done in a context of describing possible kinds of commuter jobs. Then other variables used in the report are looked at.

Paid commuter jobs

All countries try to use the international recommended definition of employment as an employee. This says that a person should be defined as an employee if the person

has a paid job of at least one hour in a reference week or if he or she is temporarily absent from such a job. Paid job means that a person is a wage earner and not self-employed. Due to the available registers on employees in the different countries and other supporting data sources, there will be some variation to what degree data are produced in line with the theoretical definition. Self-employed jobs are not included since the register information on these kinds of jobs is less precise concerning the period the self-employed are employed during a year. There are probably relatively few self-employed that have their economic activity based in a neighbour country.

In Denmark, Iceland, Norway and Sweden register data on employees are mainly based on reports from the employers covering each employee. The reports update an administrative register run by the tax authorities. The registers include all employees that the employers by law have to report. This will then also include some employees that are not resident in the country. On the other hand, jobs held by resident persons working as employees for an employer in another country are not included in the national register for their resident country.

Finland does not have a register on employees that cover the whole group and has to collect data from several registers to cover all employees. Until 2019, the most important information were data on work pension insurance (*pensionsförsäkring för arbetare*) at the end of year (last week in December). This register does not cover jobs people resident in Finland have in other countries. If a person does not have a valid work pension insurance (employment) at the end of the year and s/he neither is self-employed, unemployed, a pensioner, student or conscript and has enough earned income according to the personal income taxation, s/he will be defined as an employee. Since a person resident in Finland has to declare income from jobs abroad, some commuter jobs will be included. They do however not have information on which country they have worked in or what kind of job they have had.

Concerning the definition of employment, the most difficult part is that it should refer to a specific week. The registers in Denmark and Norway are based on monthly reports from the employers and in Norway the employer should state the dates the job is active as well. Denmark defines the last week in November as their reference week while Norway uses the middle week in November. In Sweden the register is based on annual reports, but the employers should mark those that were employed in the period October to November. Using LFS data and some other sources they have a model that decides which jobs were estimated to be active in the synthetic reference week in November. Finland tries to estimate which jobs were active at the end of the year.

All the Nordic countries use the national population register to identify the resident persons having an employee job. Norway uses the resident population in the reference week for employment in November while the others use the resident population at the end of the year.

The implication of these differences in reference periods and quality problems to measure this precisely is that some jobs may not have been active in the reference week. This would then also apply to commuter jobs. This is probably one reason for the fact that some commuter jobs are held by persons that also hold a job in the resident country. On the other hand, it is not impossible to hold two such jobs at the same time.

Persons resident in border municipalities could commute on a daily basis to a part-

time job in a border municipality in another country. This makes it possible to have a part-time job in both country on a regular basis. But even persons that are long distance commuters could have two paid jobs in the reference week. The definition of having a paid job refers to an agreement of having a job in a reference week. Some persons have a working time schedule that means that they are not present on the job every week. This can make it possible to hold another job permanently or for a period of time. As an example, persons working on an oil field in the North Sea might have a working time schedule with two weeks on and four weeks off. There are also examples of doctors and nurses with working time schedules that make it possible to take up a job for a few days in another country. Another example is university teachers that can hold a second part time job at a university in another country. Meaning that they give a few lectures during a year and may also take part in research projects that are paid by the university in the neighbour country. Giving lectures normally means that you physically cross the border, while you can perform work on a project in another country as a digital commuter. There are also some atypical jobs that last for a short period of time like a paid speaker at a conference. Such short-time jobs can be combined with holding your main job in your country of residence.

In 2015, altogether 35 per cent of the commuters from Norway were at the same time registered with a job in Norway. For commuters from Denmark, Iceland and Sweden the percentage was 22, 24 and 12 per cent. One important reason for the low figures for Sweden was that among the high number of commuters from Sweden to Denmark only three per cent hold a job in Sweden at the same time. Since the distance between Skåne and Copenhagen is short, many of the commuters can hold a full-time job and commute on a daily basis. Their job situation is then more like what we find for non-commuter jobs.

Region

Data on the commuters are exchanged containing information on their resident and working place municipality. In the analyses this is aggregated to [NUTS 2](#) regions. For NUTS 2 regions having municipalities with a border to a neighbour country the NUTS 2 regions are split into two groups; border municipalities and non-border municipalities. For municipalities in Finland, Norway and Sweden this will be municipalities having common geographical borders. Between Denmark and Sweden municipalities in the Capital region in Denmark and the whole county of Skåne are defined as border municipalities. In addition, the municipalities of Northern Jutland are defined as the border region to Norway. Iceland is defined as having no common border with other Nordic countries.

Using this definition of border municipalities, all commuters that are residents in these municipalities will be defined as commuting from a border municipality irrespective of to which municipality they commute to work. Many of the commuters in border municipalities will in fact commute to a municipality that is not the municipality with which they have a border but another municipality in the border country or a country to which they have no border. Border municipalities are listed in annex 6.

In each of the Nordic countries most of the municipalities have a small number of

commuters. For many of them the number of commuters by age, sex and industry is too small to publish on the municipality level. This is partly due to data protection of individuals but also to have reliable figures. For numbers of five or under the relative error could be very high. The main purpose of this project is to describe the level of mobility between the Nordic countries. The data on commuters are also of interest for studies looking at specific regions where one knows that the number of commuters is of importance related to the total number of employees. Then the use of municipality information on a much more detailed level would be of interest. This could be done taking into account the number of commuters in the different municipalities of that region. Many studies of this kind have been done, such as [Nordisk pendlingskarta](#).

Industry

Persons are distributed by the industry of the workplace to which they commute. The industry is according to the [NACE](#) classification

7.4.2 Results

Below is given a summary of the results and the size and the structure of commuters for each of the Nordic country is described.

All the figures are based on tables on commuters in the [Nordic Statistics database](#).

For obvious reasons there are large variations between municipalities concerning the size of the outflow and inflow of commuters to and from other Nordic countries. Therefore, some figures splitting the countries in NUTS 2 regions have been produced. In addition, for those regions having a border to another country, the regions in border municipalities and non-border municipalities have been split.

Studies on commuting are very often done for smaller regions on each side of the border between two countries like the [Øresund](#) projects. Then most of the zero figures you have on the Nordic level are omitted. By exchanging data on the municipality level, as done in this project, one can choose the regional level to analyse depending on the purpose of the studies.

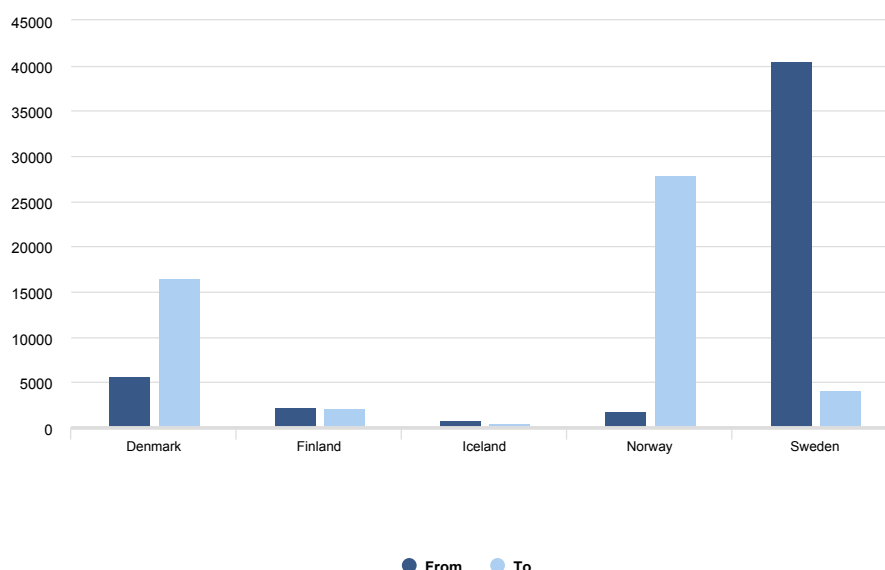
Summary

At the end of 2015 there were 51,234 persons in the Nordic countries that had a job in a country different from their country of residence. This commuting from home to work means for some persons that they cross the national border each day. But there is a large variation in how this commuting takes place. The data used in this project do not give information on how, or how frequently the commuting takes place. But indirectly and from data on commuters within countries it is known that commuting can take many forms. Some working time arrangement gives long periods of time off which makes it possible to be a long-distance commuter. In some jobs the commuting could to some extent be done as digital commuting. It means that some of the work can be done from home. Some students are registered as

resident in their home country while studying in another country. If they then take up a part-time job in that country, they will be counted as commuters.

Most commuters from Sweden

Commuting on the Nordic level is dominated by the flow of commuters from Sweden to Norway and Denmark. This commuting counts for 75 per cent of all the commuting in the Nordic area. Both in Denmark and Norway you find large labour markets a short distance from the Swedish border. And the border area in Sweden to Denmark has a large population. Altogether 89 per cent of the commuters to Denmark come from the Skåne county in Southern Sweden. Opposite to this, the large inflow of commuters to Norway is spread out on many regions in Sweden. One reason for this is Norway and Sweden having a long common border. But Norway is also a net receiver of commuters from Sweden because unemployment was much lower in Norway in 2015 and for some occupations the wages were higher.



Graph 13. Inflow and outflow of commuters by country. 2015. Source: [Nordic Statistics Database](#)

Commuters important in some regions

The absolute number of commuters was small compared to the total number of employees in each country. The number of resident commuters as per cent of the total resident employees in a country vary from 0.95 per cent in Sweden to 0.07 per cent in Norway. For Denmark and Finland, the numbers are 0.23 per cent and 0.11 per cent respectively. But for some regional labour markets the numbers are much more significant. In Table 9 the resident commuters account for more than one per cent of the resident employees in the region. The regions are split between border municipalities and non-border municipalities (for definition of regions and border municipalities, see 7.4.1).

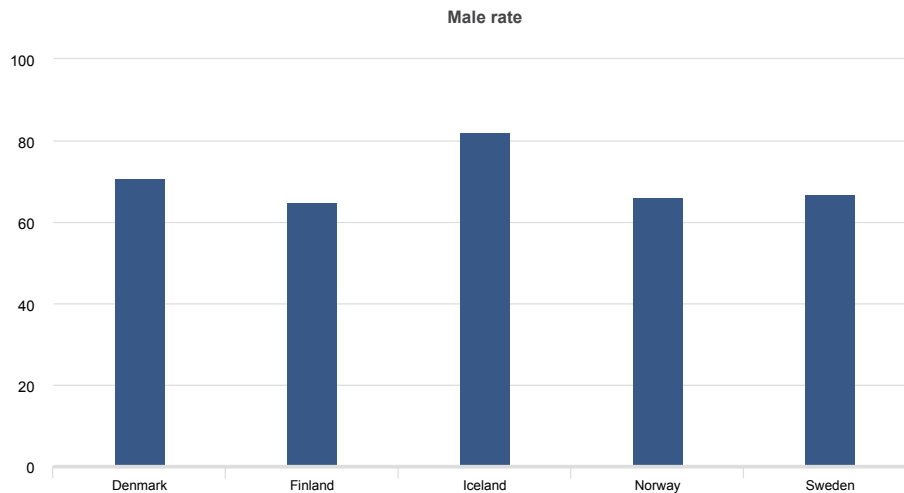
Region	Per cent commuters	Commuters
Border municipalities		
West Sweden	13.2	1,519
North Middle Sweden	10.7	2,997
South Sweden	3.1	16,235
Northern and Eastern Finland	3.1	462
Middle Norrland Sweden	2.5	550
Upper Norrland Sweden	2	750
Sør-Østlandet Norway	1.4	253
Non-border municipalities		
Åland, Finland	2.7	343
North Middle Sweden	1.2	3,893

Table 9. Commuters from regions counting for more than one per cent of resident employees in the region. Source: [Nordic Statistics Database](#)

From the absolute figures we see that many of the municipalities with a high share of commuters are found in rural areas. The exception is South Sweden.

Most of the commuters are men

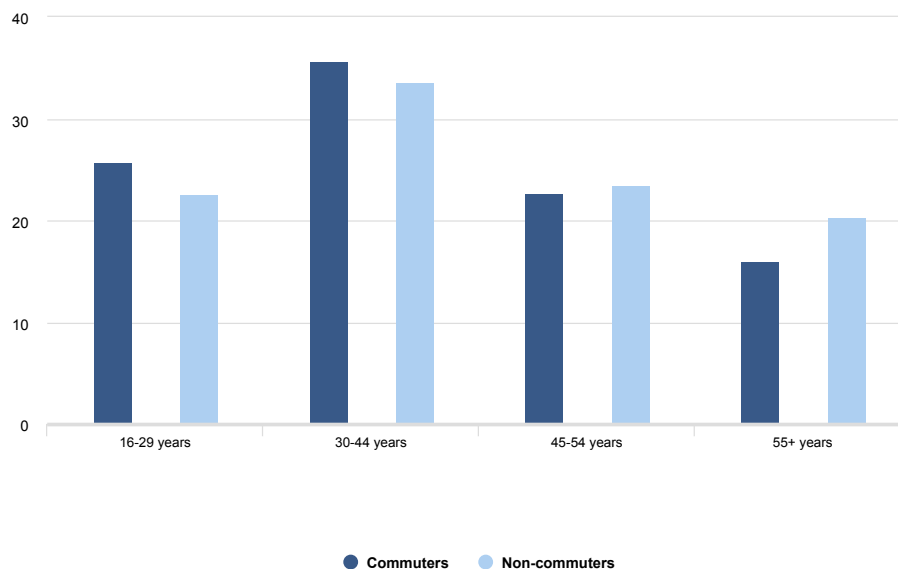
The male rate among all the 51,234 commuters were 67 per cent. This is much higher than the male rate for all resident employees which vary from 48 per cent in Finland to 53 per cent in Norway. There are some clear patterns on male rates depending on the country to which the commuters go to work. For all the countries the male rates are highest for those commuting to Norway and lowest for those commuting to Iceland or Finland.



Graph 14. Male rates among commuters from Nordic countries. 2015. Source: [Nordic Statistics Database](#)

Commuters in all age groups

Even among those aged 55 and older there were many commuters although it is most common among young persons. The highest percentages among those aged 16-29 are commuters from Norway (30%). Finland had the lowest figure on young commuters to other countries (13%). In the oldest age group, we find 24 per cent among the commuters from Finland.



Graph 15. Commuters and non-commuters by age group. Per centages. 2015 Source: [Nordic Statistics Database](#)

Looking at the age distribution among the commuters to the countries of work, commuters coming to Finland are younger than commuters to other countries. The male rate is also lower for those commuting to Finland.

One of four commuters work in Trade and transport

When comparing the distribution by industry for the commuters and the resident population in the country of work, it can be seen that commuters have a much higher share of jobs than non-commuter employees in three of the industry groups. The group Other business services cover among others temporary employment agencies. It can be convenient to use this as a gate to jobs in a foreign country.

Industry	Commuters	Non-commuters
Trade and transport	25	18
Other business services	16	11
Construction	13	6
Human health and social work	13	19
Manufacturing, mining and quarrying and utility services	11	13
Accommodation and food service activities	6	4
Education	4	10
Information and communication	4	4
Other activities	3	4
Financial and insurance activities, real estate	2	4
Public administration, defence	2	6
Agriculture, forestry and fishery	1	1

Table 10. Commuters and non-commuters by industry in the country of work. Per cent.

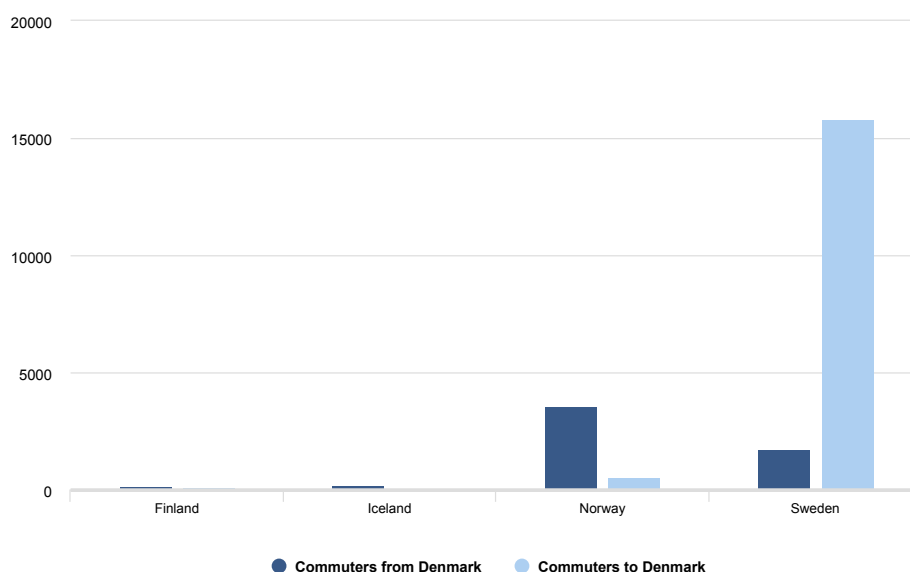
2015. Source: [Nordic Statistics Database](#)

For the commuters to Denmark and Sweden more than 30 per cent worked in trade and transport. For commuters to the other countries Trade and transport had a high share of jobs as well, but not as dominating as for Denmark and Sweden.

Denmark

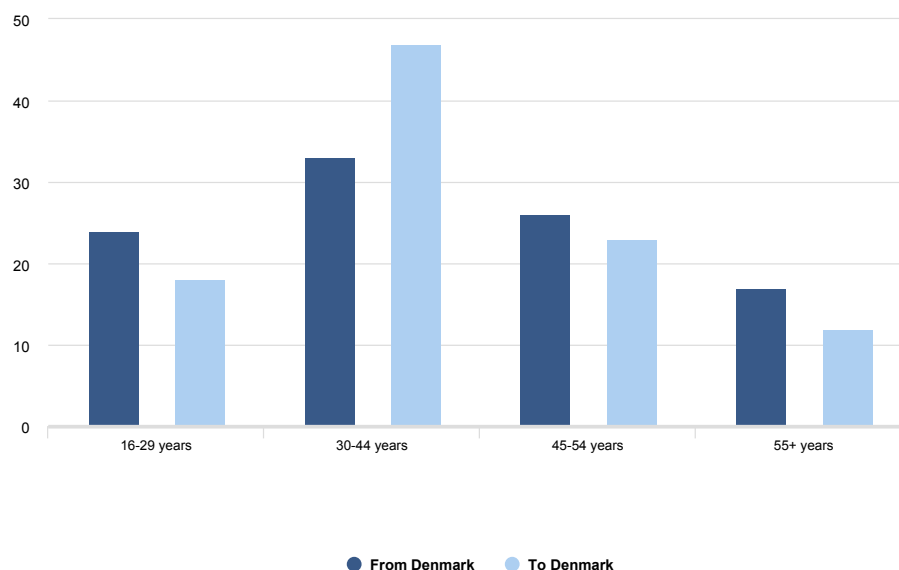
Altogether 5,720 people that were resident in Denmark in 2015 commuted to another Nordic country, while 16,455 people resident in another Nordic country in 2015 commuted to work in Denmark. As Graph 16 clearly shows the commuters to Denmark from Sweden count for the largest numbers while Norway is the country

receiving most commuters from Denmark. The male rate of commuters from Denmark was 71 per cent. Those working in Norway and Sweden had male rates of 76 and 66 per cent, while it was much lower for those working in Finland and Iceland (51% and 52%). For commuters coming to Denmark from Sweden, the male rate was 62 per cent. For those coming from the other countries the male rates were higher. About 70 per cent for those from Finland and Iceland and 78 per cent for commuters from Norway.



Graph 16. Commuters between Denmark and other Nordic countries. 2015. Source: [Nordic Statistics Database](#)

Persons aged 30-44 were the largest age group of commuters between Denmark and the other countries. Commuters coming to work in Denmark had a higher proportion in this age group than commuters leaving Denmark for work. For the other age groups the situation was the opposite. This number for the commuters coming to Denmark was of course dominated by the large number of commuters from Sweden. But almost the same pattern can be found among commuters from the other countries as well. The commuters leaving Denmark for work had almost the same age distribution as the resident employees working in Denmark. Only in the oldest age group the commuters had a somewhat lower proportion, 17 versus 20 per cent. But there were large differences in the age distribution among the commuters from Denmark depending on the country they work in. For those working in Sweden the rate for those aged 16-29 was only 15 per cent compared to 24 per cent for the average of the commuters from Denmark. On the other hand, the commuters from Denmark to Iceland and Finland had a very low proportion among those over 45 years of age.



Graph 17. Commuters between Denmark and other Nordic countries by age. Per cent.
2015. Source: [Nordic Statistics Database](#)

Industry	From Denmark	To Denmark	From Denmark	To Denmark
All industries	100	100	5,720	16,455
Agriculture, forestry and fishery	1	0	49	19
Manufacturing, mining and quarrying and utility services	17	9	979	1,435
Construction	12	3	680	445
Trade and transport	16	34	891	5,672
Accommodation and food service activities	4	6	208	1,001
Information and communication	4	7	206	1,088
Financial and insurance activities, real estate	2	5	115	884
Other business services	21	16	1,214	2,608
Public administration, defence	2	3	112	431
Education	7	4	396	703

Human health and social work	11	10	642	1,662
Other activities	4	3	212	504

Table 11. Commuters between Denmark and other Nordic countries by industry.

2015. Source: [Nordic Statistics Database](#)

More than 30 per cent of the commuters from other Nordic countries were working in Trade and Transport. This pattern is found for commuters from all countries except for Iceland, having 14 per cent working in these industries. For Denmark, as for other Nordic countries, other business services had a high rate among commuters. For these two industries the commuters in Denmark had a higher rate of employees than we find for the resident employees in Denmark. The commuters did also have a somewhat higher rate in Accommodation, etc. and Information and communication.

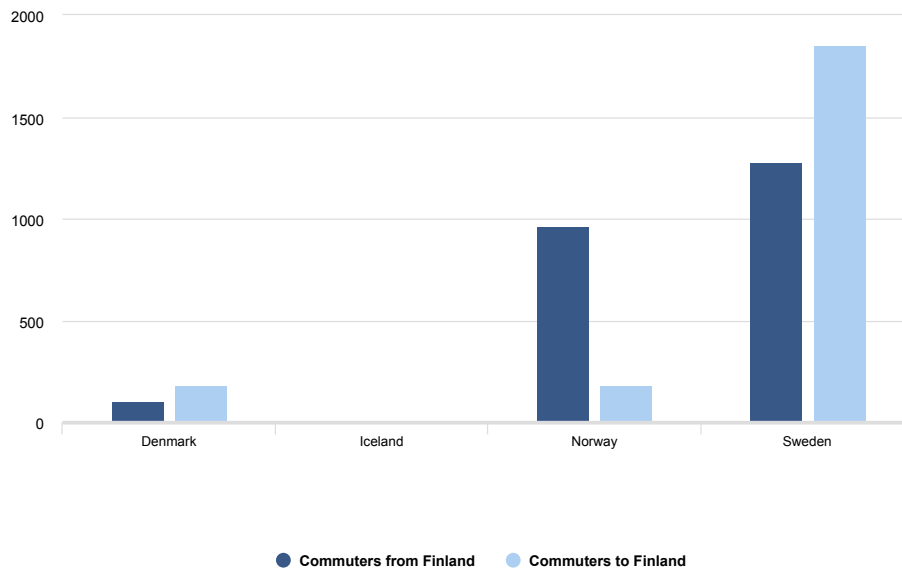
Commuters from Denmark were more evenly spread out on industries than commuters coming to Denmark. The relative high number in Manufacturing, etc. was commuters working in the Oil and Gas industry in Norway. The number of Danish commuters working in Construction are also much higher in Norway compared to what was found in other countries. More than 20 per cent of the commuters to Finland and Sweden worked in Trade and Transport. A relatively high share of commuters from Denmark to Sweden also had a job in Education and Human health etc. In Human health etc., we also find a high rate of commuters to Iceland. But for Iceland it was even higher in the Accommodation and food service industry.

Most of the commuters from Sweden to Denmark, 89 per cent, come from South Sweden. In Finland and Norway, the largest number of commuters came from Helsinki (61 persons) and Oslo/Akershus (189 persons). In Sweden, West Sweden and Stockholm also had a higher number of commuters to Denmark compared to the region Oslo/Akershus.

Most of the persons in Denmark commuting to Norway lived in the region of Northern Jutland and the Capital Region. In all 54 per cent came from these two regions. Altogether 87 per cent of those commuting to Sweden lived in the Capital Region.

Finland

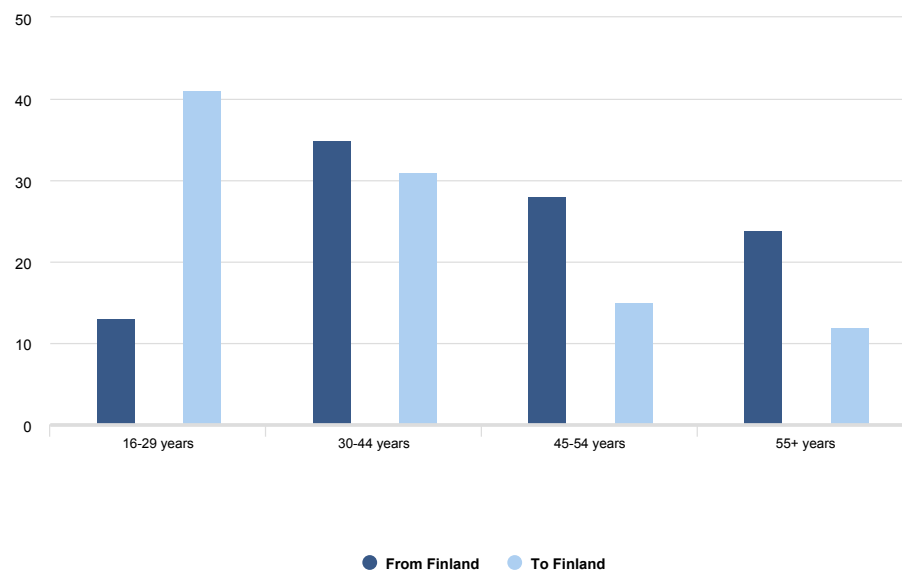
In 2015 there were 2,356 resident persons in Finland that had a job in another Nordic country. At the same time 2,229 resident persons in another Nordic country commuted to a job in Finland. Most of the commuters from Finland (54%) commuted to a job in Sweden. But as many as 41 per cent commuted to a job in Norway. When we then look at people commuting to Finland 83 per cent were resident in Sweden. There were approximately the same number of persons that commuted from Denmark and Norway to Finland.



Graph 18. Commuters between Finland and other Nordic countries. 2015. Source: [Nordic Statistics Database](#)

The male rate of commuters from Finland to other countries was 65 per cent compared to a male rate of 48 per cent for all resident employees in Finland. The male rate of commuters to Finland from all the other Nordic countries was between 50 and 65 per cent.

Finland was the only country having the age group 16-29 as the largest age group of commuters coming to the country for work. As for most of the other countries the age group 30-44 was the largest group among the commuters that left Finland for work.



Graph 19. Commuters between Finland and other Nordic countries by age. Per cent.

When comparing commuters from Finland and resident employees in Finland, it can be seen that the commuters had a lower share of persons aged 16-29 and a higher share of those aged 55 and older. The commuters from Finland to Sweden make up the high rate in the oldest age group.

Commuters leaving Finland for work had a higher share in Trade and transport and Construction than commuters coming to Finland from other countries. The rate for Trade and transport was especially high for commuters from Finland to Denmark and Sweden. For those commuting to Norway it was more common to have a job in Construction. The same pattern is found when looking at the commuters coming to Finland for work. Compared to other countries, Finland has a relatively high share of commuters working in Public administration. This is mainly commuters coming from Sweden.

Industry	From Finland	To Finland	From Finland	To Finland
All industries	100	100	2,356	2,229
Agriculture, forestry and fishery	1	1	15	16
Manufacturing, mining and quarrying and utility services	10	13	229	287
Construction	12	7	283	161
Trade and transport	32	17	755	373
Accommodation and food service activities	3	4	79	87
Information and communication	2	4	36	99
Financial and insurance activities, real estate	1	3	29	67
Other business services	12	12	292	278
Public administration, defence	3	13	59	292
Education	7	7	170	152
Human health and social work	13	10	316	214
Other activities	4	8	91	185

Table 12. Commuters between Finland and other Nordic countries by industry. Per cent.
2015. Source: [Nordic Statistics Database](#)

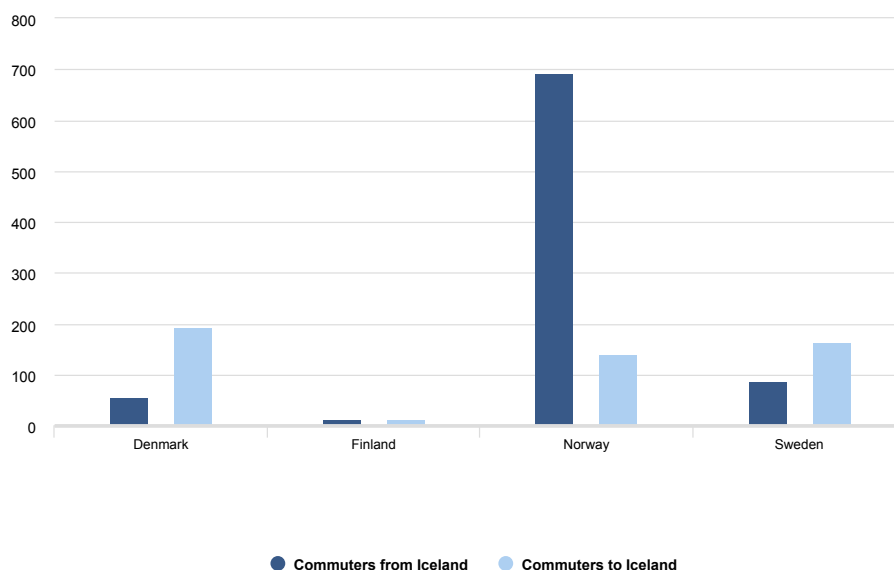
Looking at the employees by industry for all persons that were residents of Finland, the commuters coming to Finland had a lower rate in Health and social work (17% versus 10%). But the rate in Public administration and Other activities was somewhat higher among the commuters.

Most persons commuting from Finland in 2015 went to Sweden and Norway, and especially from the border region of Northern Finland. There were also relatively many commuting from Åland to the Swedish side. The most common industry was Trade and transport, but from the border municipalities of Northern Finland also the role of Human health and social work care was high. From Åland, commuters were mainly in Trade and transport.

As for the other Nordic countries most of the commuters in Finland are resident in the capital region. The border regions to Norway and Sweden have few commuters in numbers, but since these are regions with relatively few residents, they are the regions with the highest share of commuters.

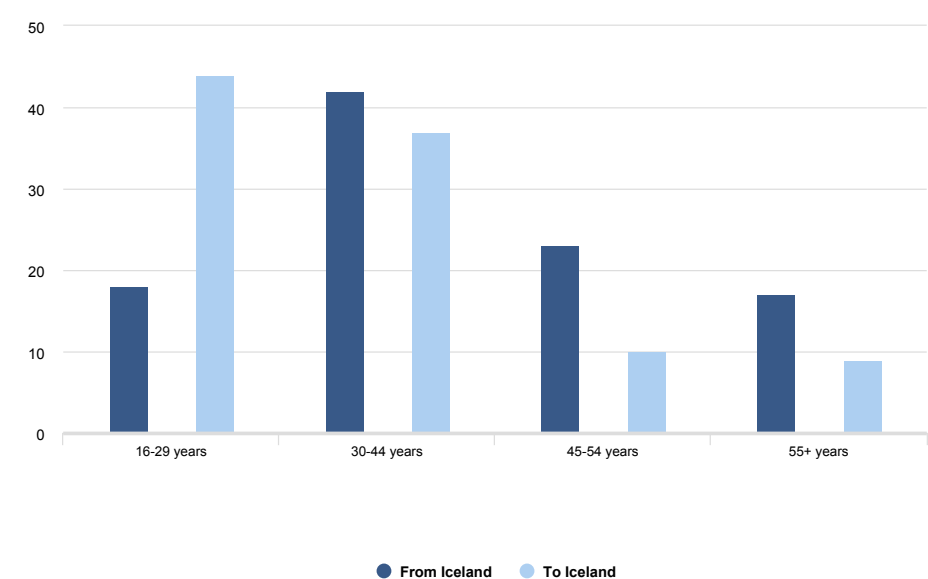
Iceland

In 2015 there were 850 resident persons in Iceland that had a job in another Nordic country. At the same time 513 resident persons in another Nordic country commuted to a job in Iceland. While Iceland was a net receiver of commuters from Denmark and Sweden, it is the opposite between Iceland and Norway. Between Finland and Iceland there were very few commuters.



Graph 20. Commuters between Iceland and other Nordic countries. 2015. Source: [Nordic Statistics Database](#)

The male rate for commuters from Iceland to other countries was 82 per cent. The commuters coming to Iceland for work was 52 per cent. Commuters from Finland and Sweden had male rate of 62 and 55 per cent respectively. The male rate was above 50 per cent for Denmark and Norway as well.



Graph 21. Commuters between Iceland and other Nordic countries by age. Per cent.
2015. Source: [Nordic Statistics Database](#)

In all, 50 per cent of the commuters from Iceland to Norway worked in the Construction industry. About 20 per cent of the commuters from Iceland worked in Business services in all the other Nordic countries. Health and social service was the largest industry group (38%) for those commuting to Sweden.

When looking at persons commuting to Iceland, Health and social work had the highest share among the commuters (17%). For those coming from Sweden 22 per cent had a job in that industry. Commuters from Denmark had their highest share in Accommodation.

More than 40 per cent of the commuters from Iceland work in the Construction industry. This is because 82 per cent of the commuters went to Norway and 50 per cent of those had a job in Construction.

Industry	From Iceland	To Iceland	From Iceland	To Iceland
All industries	100	100	850	513
Agriculture, forestry and fishery	2	2	14	12
Manufacturing, mining and quarrying and utility services	3	10	25	49
Construction	42	4	360	22
Trade and transport	8	13	66	67
Accommodation and food service activities	4	14	30	71
Information and communication	2	6	14	29
Financial and insurance activities, real estate	1	3	6	16
Other business services	22	11	185	55
Public administration, defence	2	5	14	27
Education	4	11	36	55
Human health and social work	10	17	81	88
Other activities	2	4	19	18

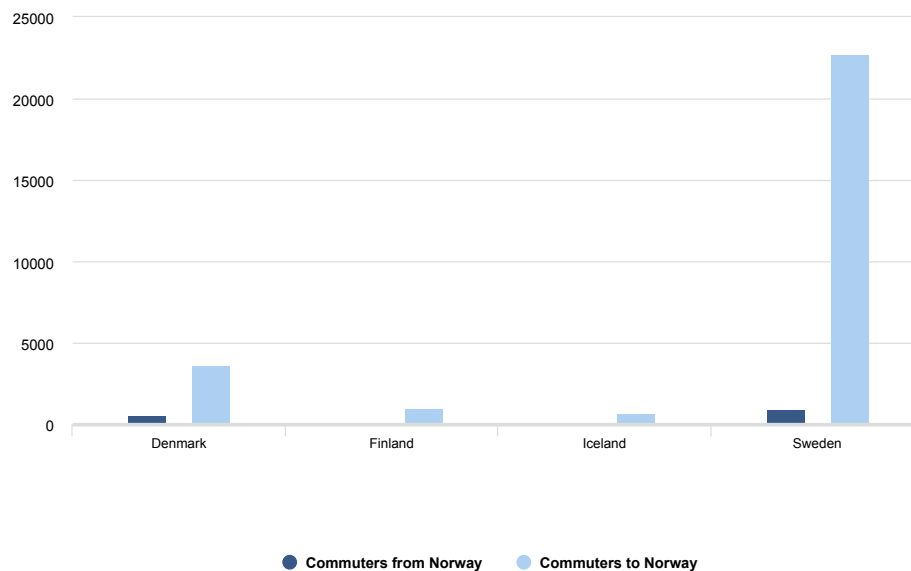
Table 13. Commuters between Iceland and other Nordic countries by industry. Per cent.

2015. Source: [Nordic Statistics Database](#)

For commuters to Sweden almost 40 per cent worked in Human health and social work. The commuters to Denmark had a more even distribution in different industries.

Norway

In November 2015 the number of commuters from Norway to another Nordic country was 1,752 persons. The number of commuters from another Nordic country was as high as 27,998. Norway is a net receiver of commuters from all the other Nordic countries. More than 80 per cent of the commuters to Norway came from Sweden. Lower unemployment rate, higher wage rates for some occupations in Norway and many available jobs close to the Swedish border can explain this.

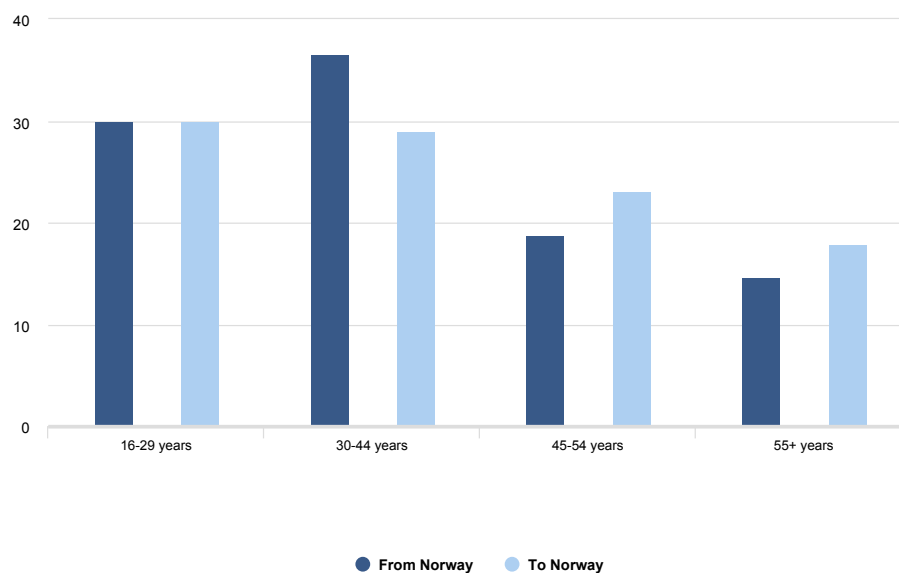


Graph 22. Commuters between Norway and other Nordic countries. 2015. Source: [Nordic Statistics Database](#)

In all, 66 per cent of the commuters from Norway to the other countries were men. The highest figure was those commuting to Denmark, 78 per cent, while the number of commuters to Iceland was about the same for men and women. For those persons commuting to Norway from other Nordic countries the average rate for men was 72 per cent. The male rate for resident persons working as employees in Norway was 53 per cent in 2015.

Looking at the age distribution, commuters from Norway were in general younger than those commuting to Norway from the other Nordic countries. Commuters from Norway to Denmark had a lower rate in the youngest age group (19%) than commuters to the other countries (about 30%). Commuters to Sweden had a high rate in the oldest age group compared to other countries. Commuters from Norway had a higher share of persons in the two lower age groups than the resident population working as employees in Norway.

Looking at commuters to Norway from the other countries, commuters from Sweden had the highest share in the age group 16-29. In fact, the share was the same (about 30 %) as those commuting the other way. Commuters from Finland and Iceland had a much lower share than Denmark and Sweden in the youngest age group, but then instead a higher share among those aged 30-44.



Graph 23. Commuters between Norway and other Nordic countries by age. Per cent.
2015. Source: Nordic Statistics Database

Commuters coming to Norway had a much higher rate in Construction and in Manufacturing etc. than commuters leaving Norway for work, 21 vs 7 per cent and 13 vs 7 per cent.

Industry	From Norway	To Norway	From Norway	To Norway
All industries	100	100	1,752	27,998
Agriculture, forestry and fishery	1	1	22	205
Manufacturing, mining and quarrying and utility services	7	13	114	3,624
Construction	7	21	123	5,898
Trade and transport	32	19	556	5,187
Accommodation and food service activities	5	7	89	2,057
Information and communication	3	2	60	453
Financial and insurance activities, real estate	4	1	65	163
Other business	14	17	248	4,887

services				
Public administration, defence	4	1	62	250
Education	9	3	153	718
Human health and social work	10	14	170	3,950
Other activities	5	2	85	582

Table 14. Commuters between Norway and other Nordic countries by industry. Per cent.

2015. Source: [Nordic Statistics Database](#)

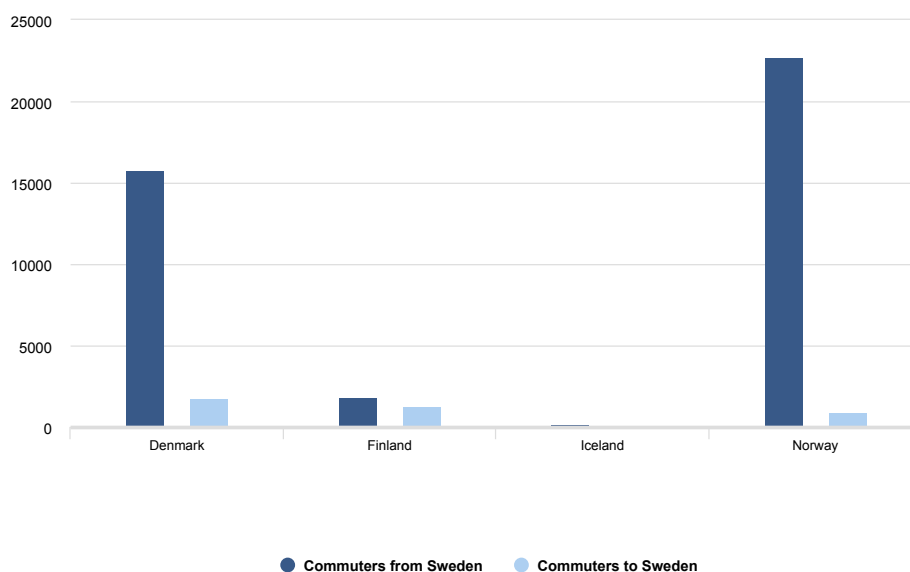
Trade and transport had the highest share of persons for those commuting from Norway to Denmark and Sweden. For Iceland most commuters from Norway work in Health and social services, while in Finland they can be found in Construction.

For every industry the absolute number of commuters coming to Norway was higher than among commuters travelling from Norway. This holds even for Trade and transport where the rate for commuters from Norway is much higher than for commuters to Norway. The figures of commuters to Norway by industry are dominated by the large group coming from Sweden. Their distribution by industry is therefore close to the total. Commuters from Denmark had a higher rate on Manufacturing etc. which in this case is mainly connected to Oil and gas extraction. The working time schedule in many of these jobs – two weeks on and four weeks off – is well suited for long-distance commuting. For commuters from Finland and Iceland to Norway, Construction was the most common industry.

Most of the commuters from Norway are resident in non-border municipalities. This is because the border municipalities in Norway have a small number of inhabitants, while there are large municipalities like Oslo that is not far away from the Swedish border. But the relative number of commuters in relation to total employment is five times higher in border municipalities compared to that of non-border municipalities.

Sweden

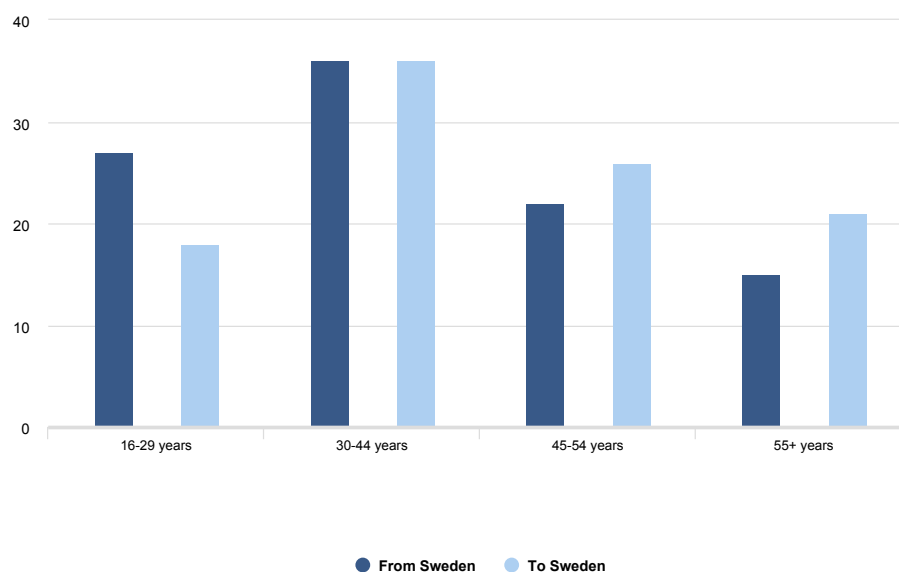
In November 2015 the number of commuters from Sweden to another Nordic country was 40,556 persons. The number of commuters to Sweden from another Nordic country was 4,039 persons. All the other Nordic countries were net receivers of commuters from Sweden. The large inflow of commuters to Denmark and Norway can partly be explained by the capitals in the two countries being close to the Swedish border. In addition, the border area in Sweden to Denmark, Skåne, has a large population. The inflow of commuters to Norway is caused more by Norway in 2015 having a lower unemployment rate and higher wage rates for some occupations.



Graph 24. Commuters between Sweden and other Nordic countries. 2015. Source: [Nordic Statistics Database](#)

As for the other countries most of the commuters were men. The male rate was higher (67%) for the commuters leaving Sweden compared to the commuters coming to Sweden for work (63%). For resident employees working in Sweden the male rate was 50 per cent.

The commuters from Sweden to Finland and Iceland had a very high share (40%) in the age group 16-29. This age group was also the largest group going for work in Norway. Those commuting to Denmark was dominated by the age group 30-44 (48%). When comparing age distribution for resident persons working in Sweden, the commuters have a somewhat higher share in the youngest age group and a lower share among those aged 55 and older.



Graph 25. Commuters between Sweden and other Nordic countries by age. Per cent.
2015. Source: [Nordic Statistics Database](#)

The commuters coming to work in Sweden are older than those leaving Sweden for work. The commuters to Finland have a higher rate among the older age groups than the other countries while commuters to Norway have the highest rate in the youngest age group.

For the commuters from Sweden working in another Nordic country, Trade and transport was the most common industry. For those working in Denmark 35 per cent had a job in this industry. Commuters to Finland from Sweden had a relatively high percentage working in Public administration and Manufacturing compared to commuters to other Nordic countries. Those commuting to Iceland had a large share working in Health and social work. The large number of commuters from Sweden to Norway was more evenly spread out on industries.

Industry	From Sweden	To Sweden	From Sweden	To Sweden
All industries	100	100	40,556	4,039
Agriculture, forestry and fishery	0	1	178	26
Manufacturing, mining and quarrying and utility services	11	8	4,365	317
Construction	13	4	5,234	154
Trade and transport	25	32	10,315	1,284
Accommodation	7	3	2,913	103

and food service activities				
Information and communication	4	4	1,523	170
Financial and insurance activities, real estate	3	4	1,057	142
Other business services	16	14	6,455	566
Public administration, defence	2	4	895	142
Education	3	10	1,285	412
Human health and social work	13	13	5,225	520
Other activities	3	5	1,081	198

Table 15. Commuters between Sweden and other Nordic countries by industry. Per cent.

2015. Source: [Nordic Statistics Database](#)

Trade and transport had the highest rate among commuters coming to work in Sweden. Especially those coming from Finland and Norway had a high rate working in these industries (44% and 38%). Commuters from Iceland had a high rate working in Human health and social work (38%). The largest group of commuters to Sweden, Danes, was more evenly spread out on industries.

Compared to resident employees working in Sweden, the commuters to Sweden had a much higher share in Trade and transport. On the other hand, they had a lower share in Manufacturing etc and Health and social work.

Nearly 90 per cent of the commuters to Denmark lived in South Sweden. For those commuting to Norway 60 per cent lived in the border regions, 31 per cent lived in West Sweden and 30 per cent in North Middle Sweden. In all, 30 per cent of the commuters to Finland lived in Upper Norrland and 33 per cent in Stockholm.

7.5 Migration

By external migration it is referred to the event when a person, or a group of persons, leaves his/her/their place of usual residence in order to take up usual residence in another country.

Migrant data are usually only partial when looking from the perspective of either the country of departure or the country of destination. The country of departure typically has data on many characteristics of the emigrant, such as the region of residence, education, family status, income, employment until the migration and even more data. The destination country typically only collects immigration data on the age, sex, citizenship and country of birth, and sometimes marital status.

The country of departure might, however, be interested in what pulls people to

emigrate, and the country of destination might be keenly interested in the background of the new immigrants. Yet neither has such information unless data are exchanged, unless a special survey is carried out or questions are added to existing surveys.

Migration across the Nordic borders is common, but these events account only for the minority of international migration flows in the region. Most immigrants to the Nordic countries come from other countries, in particular from the EU countries.

In the Nordic Mobility project, the intention was to collect data on migrants crossing the Nordic borders before and after the migration. However, no sound legal basis was found for the exchange of data between Sweden and Norway and Sweden and Denmark. This is unfortunate, as Sweden plays a pivotal role in all inter-Nordic migration flows. It is thus impossible to summarise the findings, or generalise over the Nordic region, except with regard to already published figures on these two migration exchanges by country of departure, nationality and sex.

7.5.1 Definitions and data sources

The population of interest

The population that was examined in the project is any person that was registered as having his or her residence in one Nordic country by the end of the reference year, while having been registered as residing in another Nordic country at the end of the year before.

This is not exactly the definition of the migrant population, but a close enough proxy which has the advantage of providing a standard approach for the analysis of status before and after migration. Overall, the total number of persons analysed in the project amounts to 83.8 per cent of the immigrant population from the other Nordic countries as counted in the official migrant statistics. This ranges from 78.7 per cent in Sweden to 90.2 per cent in Finland (project data compared to the migration data as published in the [Nordic Statistics](#) database).

With this caveat the population of interest will be referred to as immigrants or migrants whenever the project data are analysed.

Regions

Regions are classified according to NUTS, ([Nomenclature of Territorial Units for Statistics](#)), level 2, version 2013. For Iceland and Norway, the comparable classification was implemented.

Family status

The family status is derived from the definition of the family nucleus, which consists of couples living in marriage or consensual unions with or without children under the

age of 18, or single parents living with children under the age of 18. From these five categories are derived: couples without children, couples with children, single parents, children, persons not in families, living alone. A child who is 18 years or older, but still living with the parents, can be classified as "Other" in the following analysis, as well as institutionalised persons and unclassified.

Activity status

Children younger than 15 years at the reference time, cannot be classified as employed. When collecting data on the activity status the countries applied a hierarchical approach, as a person can be both a student and employed as well as receiving pensions or unemployment benefits at the reference time. First it is checked if the person is employed, then unemployed, then attending school, then receiving pension (old age pension, early retirement pension or disability pension) and finally, if none of the above, the person's activity status is classified as "Other".

Occupation

The occupation of employed persons is classified in accordance with the [International Standard Classification of Occupations](#) 2008 (ISCO-08).

Industry

The economic activity of the entity where an employed person is working is classified according to the [Statistical Classification of Economic Activities in the European Community](#), rev. 2 (NACE, rev. 2, 2008).

Data sources

The data on migration and family status are taken from the population registers in each country. The data on employment are taken from the employment and income registers, as well as student registers of the countries for those attending school.

7.5.2 Results

Overview

During 2015, official statistics² show that 38,255 persons immigrated to a Nordic country from one of the other four (not including Greenland and the Faroe Islands). This was 11.5 per cent of the total immigration to the Nordic countries. For Denmark,

2. All the data in this section are to be found in the Nordic Statistics Database. Percentages and ratios are own calculation.

Finland and Sweden this figure is 10.2, 12, and 9.8 per cent, respectively. The figures for Norway were 14.7 per cent, while immigration to Iceland from the other Nordic countries was as high as 28 per cent.

There is a gender difference to be noted, relatively fewer men than women are immigrating from another Nordic country, or 965 for every 1,000 women. This is in contrast with immigration from other countries, where the number of males exceeds that of women by 1,205 males for every 1,000 women.

The figures below indicate that the people of Iceland are more prone to migrate than people of the other countries, with Norway coming a distant second. This is borne out when correlating the country of departure figures with the population on 1 January 2014. It then turns out that in 2015 approximately one out of every 1,000 persons in Denmark, Sweden and Finland migrated to another Nordic country, with twice that many migrating from Norway and almost 10 out of 1,000 inhabitants of Iceland (Table 16). These figures also show that only in Sweden women were less likely than men to emigrate to another Nordic country in 2015.

Country	Total	Men	Women
Denmark	1.36	1.28	1.44
Finland	0.84	0.75	0.92
Iceland	9.42	9.37	9.47
Norway	2.08	2.06	2.11
Sweden	1.27	1.32	1.23

Table 16. Emigrants to another Nordic country 2015 per 1,000 population 1 January 2015. Source: [Nordic Statistics database](#)

Net migration

The net migration in 2015 between the Nordic countries showed Denmark and Sweden in the positive, while Finland, Iceland and Norway were in the negative. This pattern holds, even if the migration flows between Denmark and Sweden, and Norway and Sweden are ignored.

Nordic migration by nationality

Immigrants to Finland and Iceland from the other Nordic countries are mostly nationals returning to the home country.

Nationality / country of departure	Country of destination				
	Denmark	Finland	Iceland	Norway	Sweden
Total immigration	9,723	3,439	2,076	9,896	13,121
Total nationals	3,611	2,589	1,776	2,746	5,202
From Denmark	.	371	681	1,189	1,044
From Finland	47	.	17	55	528
From Iceland	126	25	.	40	67
From Norway	1,340	357	633	.	3,563
From Sweden	2,098	1,836	445	1,462	.
Nationals, % of total immigration	0.37	0.75	0.86	0.28	0.4

Table 17. Immigration from other Nordic countries 2015 by nationality. Source: [Nordic Statistics database](#)

For Denmark, Norway and Sweden most of the Nordic migrants are not nationals but citizens of another Nordic country, in particular the country of departure (Table 18). Most Finns migrate to Sweden if moving to another Nordic country, and Icelanders to Denmark, Norway and Sweden fairly equally. Otherwise, Danes have a slight preference for Sweden over Norway, with Norwegians emigrating in equal measure to Sweden and Denmark, but Swedes mostly migrating to Norway when migrating to another Nordic country.

Nationality	Total	Country of destination				
		Denmark	Finland	Iceland	Norway	Sweden
Total nationals emigrating	19,943	5,181	958	364	6,202	7,238
Danes from Denmark	3,376	.	70	122	1,357	1,827
Finns from Finland	3,692	556	.	32	441	2,663
Icelanders from Iceland	2,746	1,030	17	.	937	762
Norwegians from Norway	4,134	2,019	86	43	.	1,986
Swedes from	5,995	1,576	785	167	3,467	.

Table 18. Emigration to another Nordic countries 2015 by nationality. Source: [Nordic Statistics database](#)

Age

The majority of migrants is in the age group 20-29 for all of the migration flows, except for the migration between Sweden and Finland where the migrants are generally older, as well as the immigrants to Iceland. The migrants to Finland from Sweden in the age group 65 and older are also exceptionally many relatively (11.1%).

Migrants from Iceland are more likely to be in the age group 0-19. From Iceland this age group was 30 per cent compared to 13.2 to 18.6 per cent emigrating from the other Nordic countries to another.

These patterns also apply to the immigration flows.

Sex

More women than men are overall involved in migration flows between the Nordic countries. Immigrants to Iceland from the other Nordic countries are, however, markedly more male than female in character. So is the migration between Norway and Finland.

Current year	Residence one year before					
	Total	Denmark	Finland	Iceland	Norway	Sweden
Total	910.8	787.2	808.1	1,014.3	979.0	1,079.0
Denmark	913.6	.	881.5	1,070.2	873.7	..
Finland	1,076.8	884.0	.	933.3	1,329.6	1,068.2
Iceland	1,290.0	1,187.5	1,000.0	.	1,592.6	1,139.4
Norway	819.5	708.5	1,105.0	1,053.1	.	..
Sweden	780.0	..	749.8	905.9	..	.

Table 19. Men per 1,000 women in inter-Nordic migration in 2015. Source: [Nordic Statistics database](#)

Family status

Only half of inter-Nordic migrants retain their family status in the migration year. Some by definition, such as when children become 18 years old and stop being a child in the family. Some other changes might be because of registration issues such as marriages might not be recognised without further documentations. Those, however, do not explain but a fraction of the changes.

The majority of emigrant partners without children show up in the other Nordic country without a family to register (1,021 out of 2,057), whereas if children are

involved the family status is retained or the once partner becomes a single parent. A significant number of persons not in a family nucleus emigrate to become a member of a family unit, or 2,777 out of 9,296. These patterns apply to all of the migration flows studied in the project.

Current year	Total	Previous year				
		Partner, no children	Partner with children	Single parent	Child	Other
Total	16,490	2,057	2,009	436	2,692	9,296
Partner, no children	2,807	843	63	24	45	1,832
Partner with children	2,287	119	1,491	175	15	487
Single parent	338	13	107	172	0	46
Child	2,931	57	16	2	2,444	412
Other	8,127	1,025	332	63	188	6,519

Table 20. Family status before and after inter-Nordic migration in 2015. Source: [Nordic Statistics database](#)

Activity status

When looking at the differences in activity status before and after migration across the Nordic borders in 2015 the migrants aged 20–64 had a higher labour force participation rate in the previous year than in the current year. With migration the number of students would be reduced by about 2/5. This indicates migration somewhat driven by returning students³. In general, however, we may note that the labour force participation rate in the year previous to the migration was only 61 per cent, which is significantly lower than this rate for the age group 20–64 in any of the Nordic countries (Table 21). These observations do have the caveat that migration flows between Sweden and Denmark/Norway are missing from the data.

Current year	Total	Previous year				
		Employed	Un-employed	Student	Pensioner	Other or not known
Total	12,954	7,274	647	2,170	204	2,659
Employed	6,133	3,581	276	930	22	1,324
Unemployed	1,652	896	137	199	19	401
Student	1,288	611	64	364	8	241

3. Apparently, the data show a significant move into pension, but this is almost entirely due to the Danish data which show 30 persons previously in pension in another Nordic country multiplying into 1,175 pensioners in the current year in Denmark. Without further inspection of the data, we will have to ignore this as an artefact of the data.

Pensioner	1,312	737	23	330	49	173
Other or not known	2,569	1,449	147	347	106	520

Table 21. Activity status before and after inter-Nordic migration in 2015. Age groups 20–64 (current year). Source: [Nordic Statistics database](#)

The observations above apply in general to all the Nordic countries, with the exception that more students come into Sweden than leave in the age group 20–64. That, however, could be a consequence of Sweden missing data on two of the most important migration flows.

Occupation

Only the minority of migrants in the age group 20–64 in 2015 were employed both in the previous year/country and in the current year, or 3,581 out of 12,954. The main difference is that the migrants are more likely to be in managerial and professional occupations after migration than in the previous year, and less likely to be in elementary occupations (Table 22).

Current year	Total	Previous year					
		Managers and Professionals	Technicians and Associate Professionals	Skilled workers	Elementary occupations	Armed forces and unknown	Not employed
Total	10,083	1,504	807	2,006	641	599	4,526
Managers and Professionals	1,625	597	199	132	13	75	609
Technicians and Associate Professionals	548	100	100	85	6	40	217
Skilled workers	1,364	68	63	374	101	111	647
Elementary occupations	311	7	8	60	36	7	193
Armed forces and unknown	677	128	60	109	19	78	283
Not employed	5,558	604	377	1,246	466	288	2,577

Table 22. Occupation before and after inter-Nordic migration in 2015. Age group 20–64. Icelandic migration not included due to lack of occupation data. Source: [Nordic Statistics database](#)

Economic activity

After migration, the economic activity of the employed persons, aged 20–64, is

surprisingly similar when comparing the countries. Norway is, however, somewhat different from the other countries with a much higher percentage of workers in Human health and social work than the rest of the countries, with correspondingly fewer in Manufacturing, mining and quarrying. Iceland and Norway also have relatively many in Accommodation and food service activities, with Denmark having Other activities relatively higher than the rest of the countries (Table 23).

Current activity	Current residence					
	Total	Denmark	Finland	Iceland	Norway	Sweden
Employed, total	100	100	100	100	100	100
Agriculture, forestry and fishery	2	1	2	2	2	1
Manufacturing, mining and quarrying and public utilities	8	8	10	9	5	9
Construction	5	5	5	7	7	6
Trade and transport	14	16	14	16	11	13
Accommodation and food service activities	8	9	4	13	9	4
Information and communication	6	5	7	6	4	6
Financial and insurance activities, real estate	4	3	4	3	2	6
Other business services	15	16	17	11	17	18
Public administration, defence	2	2	2	3	1	2
Education	9	8	9	9	6	13
Human health and social work	15	12	12	13	24	15
Other activities	10	16	7	4	9	7
Unknown	2	0	6	4	3	1

Table 23. Current economic activity of inter-Nordic migrants. Per cent. 2015. Source: [Nordic Statistics database](#)

Regional migration

The Nordic Mobility project collected data on the regional aspect of the migration. In particular, the regional origin of those who move to another Nordic country has been looked at. The majority of the inter-Nordic migrants originate from the NUTS 2 regions containing the capital city (51 %) (Table 24). These regions, however, only represent about 27 per cent of the population in the Nordic countries (Eurostat population statistics).

Region of previous residence	Total	Country of residence				
		Denmark	Finland	Iceland	Norway	Sweden
Denmark	3,503	.	341	560	2,602	..
Northern Jutland	732	.	32	288	412	..
Middle Jutland	183	.	22	23	138	..
South Denmark	346	.	18	89	239	..
Capital area	1,638	.	212	117	1,309	..
Zealand	604	.	57	43	504	..
Finland	3,958	540	.	42	501	2,875
Western Finland	742	82	.	10	94	556
Helsinki-Uusimaa	1,789	322	.	25	216	1,226
Southern Finland	541	74	.	4	94	369
Northern and Eastern Finland	551	56	.	3	88	404
Åland	335	6	.	0	9	320
Iceland	2,669	1,002	29	.	889	749
Norway	4,036	3,129	417	490	.	..
Oslo and Akershus	1,443	1,178	139	126	.	..
Hedmark and Oppland	202	166	8	28	.	..
Sør-Østlandet	412	296	38	78	.	..
Agder and Rogaland	718	572	47	99	.	..

Vestlandet	515	385	45	85	.	..
Trøndelag	271	200	36	35	.	..
Nord-Norge	290	147	104	39	.	..
Sweden	2,324	..	1,971	353	..	.
Stockholm	904	..	808	96	..	.
East Middle Sweden	364	..	332	32	..	.
Småland and the islands	89	..	81	8	..	.
South Sweden	241	..	125	116	..	.
West Sweden	305	..	226	79	..	.
North Middle Sweden	121	..	110	11	..	.
Middle Norrland	34	..	29	5	..	.
Upper Norrland	266	..	260	6	..	.

Table 24. Country of residence 2015 by region of residence one year before. Source: [Nordic Statistics database](#)

Denmark

The population to be analysed refers to resident persons at the end of the year who were residents of Finland, Norway or Iceland. By the end of 2015, 4,671 persons were registered in Denmark, of which 3,129 came from Norway, 1,002 from Iceland and 540 from Finland.

In the reverse, the migrants with Danish origin in these countries was 3,503, of which the bulk, 2,602 persons, were registered in Norway, 560 in Iceland and 341 in Finland by the end of 2015.

In 2015, Denmark received more people from the other Nordic countries than were sent from Denmark. This is also true when looking at the official statistics on the migration flows.

Most Danes who move to another Nordic country originate from the Capital region, with Northern Jutland coming second. Most of the Danish immigration to Iceland originates in the Northern Jutland region.

Finland

The Finnish data cover persons arriving from all the other Nordic countries, or 2,758 in total. The bulk of the migrants originated from Sweden (1,971), with persons from Norway and Denmark numbering 417 and 341, respectively. Only 29 were registered in Iceland in the year before.

The number of persons moving from Finland to the other Nordic countries was 3,958. Mostly they went to Sweden, or 2,875, while 540 and 501 went to Denmark and Norway, respectively. The number of persons originating from Finland but registered in Iceland by the end of 2015 was 42.

Finland was in 2015 a country that sent more people to the other Nordic countries than received from them.

Most emigrants from Finland to any of the other Nordic country originate from the Helsinki-Uusimaa region. Persons originating from Åland are almost entirely emigrating to Sweden, or 320 out of 335.

Iceland

In Iceland 1,445 persons were registered on 31 December 2015 that were registered in another Nordic country one year before. Most had an origin in Denmark (560), but otherwise the migrants to Iceland were relatively evenly spread.

In contrast, 2,669 persons were registered in the other Nordic countries by the end of 2015 who were registered in Iceland one year before. Very few of them were registered in Finland (29) with the rest evenly split between the other three Nordic countries, 1,002, 889 and 749 in Denmark, Norway and Sweden, respectively.

Iceland is a single NUTS 2 regional unit, so there is no analysis of regional differences within Iceland with regard to external migration to and from the Nordic countries.

Norway

The immigrant population from the Nordic countries other than Sweden amounted to 3,992 persons by the end of 2015, mostly coming from Denmark (2,602).

The number of persons moving from Norway to the other countries other than Sweden was 4,036. Mostly they went to Denmark, or 3,129, while 417 emigrated to Finland and 490 to Iceland.

Most of the Norwegian emigrates originated from the Oslo and Akershus region. This is true for all of the receiving Nordic countries. The regional preferences appear when considering the second place, where Vestlandet came second for emigration to Denmark, Nord-Norge for emigration to Finland and Agder and Rogaland for emigration to Iceland.

Sweden

The population of Sweden by the end of 2015 that were registered in Iceland or Finland one year before was 3,624, with the bulk coming from Finland (2,875). In turn, 2,324 persons emigrated from Sweden to those two countries, 1,974 to Finland and 353 to Iceland.

Most of the emigrants to Finland came from the Stockholm region (808), with Upper-Norrland region and West Sweden coming distant second, 260 and 226, respectively.

Most of the emigrants to Iceland came from the South Sweden region (116) with the Stockholm region coming second (96).



8. Results and achievements of the project

The project succeeded to fulfil its primary aim, which was to produce the first ever systematic collection of Nordic statistics on mobility that includes all five Nordic countries. The publication of this collection enables the stakeholders to draw conclusions about the mobility across borders in the Nordic countries. These interesting statistics are now available for further examination and interpretation for all interested parts.

The project also generated a general model and a procedure for the exchange of micro data between countries in order to produce cross-border statistics. The project also managed partly to verify that the exchanges led to an increase in the quality of national and European statistics – and to point out the potential of future increase of quality. When possible, the results of the data exchanges were used to fill in the gaps in the national databases, hence improving the coverage.

8.1 Publishing

Matrices

Matrices on the selected statistical areas have been published in the [Nordic Statistics database](#):

- COMM10. Cross-border commuters by type of municipality, region of residence, sex, age, time and country of work
- COMM11. Cross-border commuters by type of municipality, region of residence, industry, time and country of work
- COMM12. Cross-border commuters by region of residence, sex, level of education, time, country of work and industry
- COMM13. Cross-border commuters by status of employees, region of residence, sex, age, time and country of work
- EDUC41. Educational attainment achieved in another Nordic country, per 1 January by country of residence, level, sex, age, time, time of education and country of education
- EDUC42. Educational attainment achieved in another Nordic country by country

- of residence, field, sex, age, time and country of education
- EDUC43. Educational attainment achieved in another Nordic country, per 31 December by country of residence, sex, time and region of education
- MIGR41. Migrated people from one Nordic country to another by country of residence (current year t), sex (current year t), age (current year t), activity status (current year t), time, region of residence previous year (year t-1) and activity status previous year (year t-1)
- MIGR42. Migrated people from one Nordic country to another by country of residence (current year t), sex (current year t), age (current year t), family status (current year t), time, region of residence previous year (year t-1) and family status previous year (year t-1)
- MIGR43. Migrated people from one Nordic country to another by country of residence (current year t), sex (current year t), age (current year t), occupation (current year t), time, country of residence previous year (year t-1) and occupation previous year (year t-1)
- MIGR44. Migrated people from one Nordic country to another by country of residence (current year t), sex (current year t), age (current year t), industry (current year t), time, country of residence previous year (year t-1) and industry previous year (year t-1).

Articles and reports

- Data exchange between the Nordic countries improves the image of Finland's level of education, Kaija Ruotsalainen 15.11.2018: http://tilastokeskus.fi/org/tilastokeskus/nordic-project-on-cross-border-mobility-and-benefits_en/data-exchange-between-the-nordic-countries-improves-the-image-of-finlands-level-of-education.html
- Yli 50 000 pohjoismaalaista työskentelee toisessa Pohjoismaassa – suomalaisista pendelöijistä viidennes rajakuntien asukkaita ('More than 50,000 Nordics work in another Nordic country - one-fifth of Finnish commuters are border residents'), Kaija Ruotsalainen 23.6.2020: <http://www.stat.fi/tietotrendit/blogit/2020/yli-50-000-pohjoismaalaista-tyoskentelee-toisessa-pohjoismaassa-suomalaisista-pendeloiijista-viidennes-rajakuntien-asukkaita/>

Presentations, panel discussions

- Nordic Statistical Meeting 2019, Kaija Ruotsalainen & Ulla Agerskov: <https://nsm2019.fi/papers-and-presentations.html>
- Nordic Forum for geography and statistics 2019, Nicola Brun
- European conference on quality in official statistics 2018, Kaija Ruotsalainen: <https://www.q2018.pl/>
- Nordic Forum for geography and statistics 2017, Nicola Brun
- Almedalen week 2017, Therese Hedlund: <https://program.almedalsveckan.info/event/user-view/47683?redir=>
- Several presentations to stakeholders such as the Freedom of Movement Council, the Nordic Institutes and Nordregio

Related news

First ever systematic production of Nordic statistics on mobility (Norden 10.2.2017): <https://www.norden.org/fi/node/4426>

Statistik över gränspendlare i fara – Norge och Danmark kan sluta utbyta data med Sverige (News Øresund, 9.5.2018): <https://www.newsøresund.se/statistik-over-granspendlare-i-fara-norge-och-danmark-kan-sluta-utbyta-data-med-sverige/>

8.2 Other results and consequences

Following the positive results on the coverage in the national education registers, Finland and Sweden have made an agreement to annually exchange data on the subject. The other countries are considering a regular data exchange every three or five years, but no decisions have been made yet.

Inspired by the project, Statistics Estonia is also negotiating with Statistics Finland concerning the exchange of education data.

The discrepancies discovered in national legislation during the project unfortunately stopped the ongoing production of cross-border statistics in [Öresundsdatenbanken](#), and also restricted the availability of data for researchers.

The findings also led to the registration of a new cross-border [obstacle](#) in the Freedom of Movement Database. The database collates information about known barriers to cross-border freedom of movement between the Nordic countries. "Cross-border statistics" has been added to the list due to the findings of this project.



9. Quality impact on national, Nordic and European statistics

9.1 Expectations of impact on quality in statistics

The aim of the project was to produce cross-border statistics by exchanging data bilaterally between all Nordic countries. An additional aim within the project was to store the results of the exchanges, i.e. the micro level data received from another country, in the national databases and/or registers. These data could have been used not only for updating and improving the coverage and increasing quality of the national data (and hence also the European data which are derived from the national data), but also for other purposes such as research and production of ad-hoc statistics on the mobility in the Nordic countries. Since this was not possible due to the differences in legislation, the NSIs had to settle for the original main aim to compile a set of Nordic cross-border statistics and – with a few exceptions concerning the data on education – deleting received data. The impact is therefore less than what the project and the NSIs would have wished for.

9.2 Code of Practice

The European Statistics [Code of Practice](#) is the cornerstone of the quality framework and sets the standards for developing, producing and disseminating European statistics. The Code of Practice (CoP) concerns the independence and accountability of statistical authorities and the quality of processes and data to be published. The principles are in line with the Fundamental Principles of Official Statistics approved by the United Nations Statistics Division and are supplementary to them. The principles are also compatible with those of the European Foundation for Quality Management (EFQM).

Especially the following CoP principles have been regarded in this project:

- Relevance: European Statistics meet the needs of users. (Principle 11)
- Accuracy and reliability: European Statistics accurately and reliably portray reality. (Principle 12)
- Coherence and comparability: European Statistics are consistent internally, over time and comparable between regions and countries; it is possible to combine and make joint use of related data from different sources. (Principle 14)

9.3 Effects on the quality in national statistics

9.3.1 Update of the national education registers

Data from the national education registers are used as source for education data not only in register-based statistics but also in surveys like [LFS](#) and [SILC](#). Improvements in the education registers will then lead to improvements in the statistics as well. It was assumed that one advantage of the project was the possibility to improve the coverage of the registers of **education** by exchanging unit-level data on education completed by persons. It is known that most of the education completed in another country are missing from the national educational statistics.

The preliminary conclusion is that all Nordic NSIs were able to include at least part of the data exchanged on highest education attained in their national registers, which improved the coverage of the national data/statistics on educational structure of the population.

Country-specific findings of the update of the national education registers

As an outcome of this project, Statistics **Denmark** got new or additional information about 27,047 citizens who took their qualifications in another Nordic country. These qualifications were at a higher level than what was registered in the national register as their highest education attained. This information could be added to and, would thus improve the national register. The largest part of citizens took their qualifications in Sweden. To be more exact 17,287 citizens in total took a qualification in Sweden with a higher degree than was registered in the Danish national education register. These data will however be deleted in accordance with the agreement between Sweden and Denmark and can therefore not be stored. But as a result of this project the potential improvement a similar micro data exchange could have is now known.

The second largest proportion of citizens with a higher degree from another Nordic country stems from Norway. 5,775 citizens took a higher qualification in Norway than registered in the Danish national register.

In **Finland** the results are visible especially on Åland where many of the population have completed their qualifications in Sweden, which means that data on completed qualifications and degrees have not been included in Statistics Finland's education register.

Around 14,100 of the qualifications obtained from the other Nordic countries' registers of qualifications were accepted as the person's highest completed qualification in 2019. Around one-half of them already had some lower level degree in Statistics Finland's Register of Completed Education and Degrees received from other data sources. Thus, for around 6,700 persons, who did not have an entry in the

register of qualifications, data on education attained were received. This raised the share of those with at least upper secondary qualifications by 0.1 percentage points. As assumed, the biggest change in the share of people with qualifications was on Åland, 4.3 percentage points.

The Education Register in **Iceland** received highest educational attainment for 9,331 persons for which no data were in the register. Another 5,551 persons were updated with higher educational attainment than otherwise recorded. In addition, data for 1,030 were considered of higher quality even if the education level was the same.

Data about educational attainment of the population in **Norway** is stored in the National Educational Database (NUDB). The exchange of micro data with Denmark, Finland and Iceland led to the update of education information for 14,029 people in the database. These qualifications were at a higher level of education than what was registered in NUDB before the data exchange. In addition, Norway received information about the education of 36,091 people who were registered with unknown education before the data exchange. In total, information about highest education attained was updated for more than 50,000 people in the Norwegian database. The largest impact was found in the exchange with Denmark, with new information about 39,808 people.

Norway also received information about highest education attained from Sweden for the year 2018, which will be deleted.

For the Education Register 2017 in **Sweden**, just over 700 people received a higher level of education with information from Statistics Island, 200 people who did not have an education level received an education level. With the data from Iceland, we see that for the group born in Iceland in the age group 25 to 64 years, the proportion who do not have an education level decreases by half.

For the Education Register 2017, 18,800 people received a new education level from Statistics Finland, where 2,200 lacked an education level previously.

For the Education Register 2020, which is still in production, we see that close to 1,000 people, who previously had no information, now receive a level of education with the information from Statistics Finland. For 300 persons it was possible to get better information upgrading the quality of the source. The data from Statistics Finland primarily contribute to better precision in level and field at upper secondary and post-secondary level. Compared with previous information, we also get a better specification of other doctoral degrees that can now be specified as licentiate or doctoral degrees.

Tables with results of the update of national registers are presented in Chapter 7.3.4 (Results and benefits for the future: Improving registers and statistics).

9.3.2 Measuring the under-coverage in employment statistics

Due to the findings of this project, the Nordic NSIs are now also aware of the underestimation of employed persons in the official register-based employment statistics in each country. Although micro data cannot be included in the national registers, they give figures on the size of the under-coverage on jobs and employees among the resident population. These are broken down by age, industry and region. Due to the timeliness of the exchanged data on commuters compared to the

production of employment statistics, these will not be available when the latest employment data are published. But they can be used for previously published data. If the exchange of data on employment was done as a regular routine, the timeliness could be improved compared to what was done in this project.

Country	Resident population	
	Employee jobs not included	Employees not included
Denmark	5,74	1,263
Finland	2,356	725
Iceland	850	199
Norway	1,753	386
Sweden	40,556	8,922
Total	51,255	11,495

Table 25. Cross-border employee jobs and employees 2015 not included in the official statistics.

Source: Nordic Mobility project.

The underestimation for **Denmark** in 2015 is 0,11 per cent. The highest underestimation is found in the two border regional areas i.e. the capital area where it lies around 0,16 per cent and Northern Jutland with around 0,14. Some island municipalities also have quite a high underestimation (0,3-0,6%), but the number of people is quite low, so they are disregarded in this context.

In **Finland**, cross-border employment is, naturally, most important in the border regions of Lapland and Åland in proportion to the number of people employed in the regions. It can be estimated that in these areas about 2.5 per cent of the employed have a job in another Nordic country. Elsewhere in Finland, the importance of employment in the other Nordic countries is marginal.

In Finland the number of employed persons was underestimated by 0.03 per cent in the national employment statistics. At the national level, the underestimation has little effect on the employment rate. In Åland, the employment rate would increase by 0.4 percentage points and in Lapland and Ostrobothnia by 0.1 percentage points. In the border regions of Lapland, the effect on the employment rate would be on average 0.3 percentage points.

The number of employed persons in **Iceland** in 2015 was underestimated by 0.46 per cent, due to commuters to other Nordic countries that were not accounted for.

The number of employed persons in **Norway** in 2015 was underestimated by 0.04 per cent since commuter jobs are not included in the register-based employment statistics. For some regions the impact is much higher. For Halden municipality, close to the Swedish border, the number of resident employed persons is underestimated by 1,5 per cent. This then causes the employment rate to be underestimated by 0,9 per cent. For some other municipalities in the same area the underestimation in the number of employed persons varies from 0,5-0,7 per cent.

The number of employed persons in **Sweden** in 2015 was underestimated by 0.86 per cent, due to commuters to other Nordic countries that were not accounted for. If it were possible to capture people, cross-border commuters, who live in Sweden and work in another country in the register-based labour market statistics in Sweden, it would have an impact on employment in several Swedish municipalities and regions.

In 2015, the municipalities where the employment rate is most affected are Strömstad, Eda and Årjäng, where the number of employed increases by 16-19 per cent. In Årjäng, the employment rate increases from 68 to 81 per cent. All three are border municipalities to Norway. The municipalities of Dals-Ed and Torsby also have a low employment rate in the official statistics, if you include border commuters, the number of employed increases by seven per cent in both municipalities.

At the border between Sweden and Finland, it is Haparanda that is most affected in Sweden, here the employment rate increases from 66.8 to 73.4 per cent if you include those who live in Haparanda and are cross-border commuters.

The Swedish municipality in the Öresund area where most people live who work in Denmark is Malmö, where the number of employed increases by over 8,000 people or 6.2 per cent. If you include cross-border commuters, the employment rate in Malmö increases from 65.9 to 70.0 per cent.

Although the numbers of commuters are small compared to the total employment in each country, they are important for many border regions. In West Sweden and North Middle Sweden, the commuters account for more than 10 per cent of the resident employees. Even in a large region like South Sweden they count for more than 3 per cent of the employees. Looking at some border municipalities, the impact of commuters is even higher. Another dimension of the importance of commuters is that they reduce the lack of certain professionals in some countries, like nurses and doctors in Norway.

9.4 Effects on the quality in European statistics

Data in national statistics are used to report data to Eurostat and other international organisations. Improvements in national statistics will therefore also increase the quality of data in international statistics.

The use of administrative registers for producing statistics on the population is not a new phenomenon nor is it a Nordic invention. The Nordic countries, however, have been in the forefront of using administrative data to describe the population. All of the NSIs have abandoned the traditional Census of the population and housing in favour of producing the data entirely by combining the various registers.

The development of complete statistical registers of high quality has also enabled the countries to replace certain characteristics of sample surveys by data directly plucked from the registers. The European statisticians have embraced this approach, the current regulations on the [LFS](#) and [SILC](#) explicitly allow for this. The new household sample framework [regulation of the Council and the European Parliament no. 2019/1700](#) to be enacted from 1 January 2021 adopts this approach with no other restriction than that the register data are "comparable and compliant" with the regulatory requirements.

Some of the Nordic NSIs have already fully or partially made use of the national Education Registers for completing the characteristics on educational attainment in the LFS and the SILC. Once the new framework for conducting household sample surveys is enacted, this will only increase, and will apply to statistical domains like education, health, time use, consumption and ICT, as well as the labour force and income and living conditions.

There are obvious advantages. The direct advantages are that the accuracy and reliability of the information is improved compared to self-declarations, and the coherence and comparability of the statistics will be improved. There is also an improved cost-effectiveness involved. All of these comply with principles 12, 14 and 10, respectively, of the [European Code of Practice](#). The indirect advantage is that by reducing the effort in collecting data from the sample on characteristics that are available from registers, more effort can be made to collect data on other issues that can only be discovered by asking the persons directly.

Administrative sources are not perfect. Statistical registers relying on administrative sources are, in particular, vulnerable to information that originates from outside the boundaries of the country. This applies to information on the employment of persons commuting across the borders, of students commuting across borders to attend school, educational levels attained abroad, and the prior situation of persons immigrating to the country, businesses that operate across borders and social benefits that are received from a previous country of residence. As stated earlier, it can be costly and often not particularly effective to collect data on, e.g., immigrants' educational level. Exchange of data between NSIs for these groups of people is the most cost-effective way of filling in the gaps.

Due to the extensive and expanding use of statistical registers to complement survey data and basing the Census of the Population and Housing on such registers, any improvement in the registers, particularly those that target known weaknesses, will not only improve the national statistics, they will inevitably mean better European statistics. At the moment the Census is executed every 10 years, but there are plans to implement it annually in the future.

9.5 Effects on the quality in Nordic cross-border statistics

CoP Principle 11: Relevance. "European Statistics meet the needs of users."

Despite the fact that the free movement in the Nordic countries has a long history, there are – with the exception of a few bilateral or trilateral efforts – no comprehensive statistics to show to what extent the Nordic citizens utilise the opportunities this possibility offers. It is therefore clear that from both a national and Nordic point of view cross-border statistics are valuable and very much in demand by all stakeholders in the Nordic cooperation.

For the first time cross-border statistics are now available in the [Nordic Statistics Database](#) for all five countries. It is obvious that for some country pairs the numbers are so small that the impact is modest and future exchange of data is not necessarily needed, at least not annually. For other country pairs and especially in certain regions, the impact is vast and has a great sociological relevance to all stakeholders.



10. Conclusions on the future of Nordic cross-border statistics

10.1 Interest on Nordic, national, regional – and European – level

It seems evident that not only the Nordic actors on both national and regional level, but also the EC are interested in cross-border statistics. DG Regio of the EC launched a pilot project in 2018 to gather more information on how data collection for cross-border cooperation areas can be improved ([Border Region Data collection](#)). The project investigated the utilisation of the Labour Force Survey (LFS), administrative data and mobile data in the production of labour market statistics in border regions. The investigation gave promising results from all these methods, but at the same time emphasised that further research was needed to ensure their usefulness and usability. This pilot project has resulted in the creation of the [European Cross-Border Monitoring Network](#), which has members all over Europe.

10.2 Requirements for future production of Nordic cross-border statistics

During the Nordic Mobility project, it has been discovered that the future production of cross-border statistics **in the scope of this project and covering all Nordic countries** does not seem likely as long as

- the practice of handling the received micro data differs in the Nordic countries,
- 'European statistics' are defined only as statistics included in the ESS and
- Regulation (EC) 223/2009 can only be used as the legal frame if it can be verified that the data exchanges increase the quality of the European statistics in the regulations earlier specified.

A future **full-scale production** of Nordic cross-border statistics would require

- national legislation that is aligned with the European legislation in all participating countries,
- a Nordic agreement on statistical production of cross-border statistics,
- political will and

- funding.

In countries where national legislation enables data exchanges, **cross-border statistics can still be produced bilaterally** if the other requirements are met. Production of statistics that are based on data exchanges is not for the time being possible between Denmark-Sweden and Norway-Sweden.

Other issues

It should be noted that Regulation (EC) No 223/2009 cannot force a member of the ESS to exchange data with another member – it only allows it.

Incorporating the exchanged data into national official statistics is a challenge in terms of timing – with the exception of the highest education completed. The production and publication schedules of statistics in different countries differ, and the NSIs cannot await the results of several exchanges of information when producing official statistics.

Future funding

Future provision of cross-border statistics cannot be done within the budgets of the NSIs and has to be funded by external sources. The result of possible bilateral data exchanges can be used in future production of cross-border statistics, hence reducing the total production costs slightly. So far only Finland and Sweden have agreed to exchange data on education attained on an annual basis.

10.3 Relevant cross-border statistics

With regard to the results of this project the most relevant statistical areas to be produced in the future are **highest education attained** and **commuting**. These statistics have been produced partially before and provide information that is of importance for all Nordic countries.

Some statistics on students studying in another Nordic country that are based on data on financial support for studying abroad are already published in the [Nordic Statistics Database](#). These have been produced without the exchange of micro data and present the statistics from national sources. The comparison of the existing statistics and the statistics compiled on **attendance in education** in the project raised some interesting questions, which would benefit from further investigation.

Migration statistics can also be compiled without data exchange, although the quality and content of the data can be improved through data exchange. In addition, statistics on the pre-migration and current labour market and family status of migrants make it possible to study the causes of the migration flows in a new way.

An annual exchange of data between all five Nordic countries is not necessary, given the low number (of commuters or students) in some countries. For these country pairs, the data exchange can take place every five years or in the context of

censuses.



Links

- Boosting growth and cohesion in EU border regions: https://ec.europa.eu/regional_policy/sources/docoffic/2014/boosting_growth/com_boosting_borders.pdf
- Border Region Data collection: https://ec.europa.eu/regional_policy/sources/docgener/studies/pdf/border_data_collect_en.pdf
- Commission Implementing Regulation (EU) 2017/543 of 22 March 2017 laying down rules for the application of Regulation (EC) No 763/2008 of the European Parliament and of the Council on population and housing censuses as regards the technical specifications of the topics and of their breakdowns: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32017R0543>
- Council Regulation (EC) No 577/98 of 9 March 1998 on the organisation of a labour force sample survey in the Community. OJ L77, 17.3.1998: <https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX%3A31998R0577>
- European Code of Practice: <https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&cad=rja&uact=8&ved=2ahUKEwiQlajRI6fsAhXDtYsKHTBuDUUQFjAAeqQIARAC&url=https%3A%2F%2Fec.europa.eu%2Feurostat%2Fweb%2Fquality%2FEuropean-statistics-code-of-practice&usq=AOvVaw3GBxUdTyV70u-OstdSkDTI>
- European Cross-Border Monitoring Network: www.network-crossborderdata.eu
- European Statistical System: <https://ec.europa.eu/eurostat/web/european-statistical-system>
- European Union Labour Force Survey: <https://ec.europa.eu/eurostat/web/microdata/european-union-labour-force-survey>
- EU statistics on income and living conditions (EU-SILC) methodology: [https://ec.europa.eu/eurostat/statistics-explained/index.php/EU_statistics_on_income_and_living_conditions_\(EU-SILC\)_methodology](https://ec.europa.eu/eurostat/statistics-explained/index.php/EU_statistics_on_income_and_living_conditions_(EU-SILC)_methodology)
- Freedom of Movement Database: <https://www.norden.org/en/border-database>
- International Standard Classification of Education 2011: [https://ec.europa.eu/eurostat/statistics-explained/index.php/International_Standard_Classification_of_Education_\(ISCED\)](https://ec.europa.eu/eurostat/statistics-explained/index.php/International_Standard_Classification_of_Education_(ISCED))
- International Standard Classification of Occupations (ISCO): <https://www.ilo.org/public/english/bureau/stat/isco/>
- Nomenclature of territorial units for statistics (NUTS): <https://ec.europa.eu/eurostat/web/nuts/background>
- Nordic Statistics Database: <https://www.nordicstatistics.org/>

- Nordisk pendlingskarta: https://granstjanst.se/wp-content/uploads/sites/2/2018/09/Nordisk_pendlingskarta_2012.pdf
- Regulation (EC) No 1177/2003 of the European Parliament and of the Council of 16 June 2003 concerning Community statistics on income and living conditions (EU-SILC). OJ L165, 3.7.2003: <https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX%3A32003R1177>
- Regulation (EC) No 223/2009 of the European Parliament and of the Council of 11 March 2009: <https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX%3A32009R0223>
- Regulation (EC) No 452/2008 of the European Parliament and of the Council of 23 April 2008 concerning the production and development of statistics on education and lifelong learning: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32008R0452>
- Regulation (EC) No 763/2008 of the European Parliament and of the Council of 9 July 2008 on population and housing censuses: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex:32008R0763>
- Regulation (EU) No 99/2013 of the European Parliament and of the Council of 15 January 2013 on the European statistical programme 2013-17: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32013R0099>
Current consolidated version: 01/01/2018.
- Regulation (EU) 2019/1700 of the European Parliament and of the Council of 10 October 2019 establishing a common framework for European statistics relating to persons and households, based on data at individual level collected from samples, amending Regulations (EC) No 808/2004, (EC) No 452/2008 and (EC) No 1338/2008 of the European Parliament and of the Council, and repealing Regulation (EC) No 1177/2003 of the European Parliament and of the Council and Council Regulation (EC) No 577/98 (Text with EEA relevance): <https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1603113876487&uri=CELEX:32019R1700>
- Statistical classification of economic activities in the European Community (NACE): https://ec.europa.eu/eurostat/statistics-explained/index.php/Glossary:Statistical_classification_of_economic_activities_in_the_European_Community_%28NACE%29
- Öresundsdatenbanken: <http://www.orestat.se/sv/oresundsdatenbanken>



Annexes

1. Steps and variables in the data exchange for the statistical area Highest education attained

Country of Education attained

Step 1. Persons who ever have completed their education in the national education system (ever have been registered)

Variables for identification sent to another Nordic country:

Serial number

Date of birth (yyyymmdd)

Sex

First name/s

Last name

Maiden name



Country of Residence

Step 2. Match the population against the population register to identify persons in the population register (ever lived in the country or the latest available year). Send the identified persons back to the country of education. Delete the rest of the received data.

Serial number



Country of Education

Step 3. Add education data to the identified persons and end this data back to the county of residence

Variables:

Serial number

Highest education in the country person is non-resident, ISCED 2011 (field)

Highest education in the country person is non-resident, ISCED 2011 (level)

Highest education in the country person is non-resident, national code

Date when the ISCED level was achieved

Country where the ISCED level was achieved

Municipality where the ISCED level was achieved

Source of the highest education in the country where person is non-resident

**Country of Residence**

Step 4. Process the received data and store it in the database.

Figure 3. Steps in the data exchange for the statistical area Highest education attained

From country of education:			
Label	Title	Type	Codes
snum	Serial number	numeric/int	Countrycode+serial number
birth_date	Date of birth	int	yyyymmdd
first_name	First name	varchar(xx)	
second_name	Second name/s	varchar(xx)	
last_name	Last name	varchar(xx)	
maiden_name	Maiden name	varchar(xx)	
sex	Sex	Varchar(1)	1 = male, 2 = female
iscfi_other_country	Highest education in the country person is non-resident, ISCED 2011 (field)	char(4)	ISCED2011 code, 4-digit
isccat_other_country	Highest education in the country person is non-resident, ISCED 2011 (level)	char(2)	ISCED2011 code, 2-digit
educ_other_country	Highest education in the country person is non-resident, national code	char(x)	National educational code

date_other_educ	Date when the ISCED level was achieved	int	yyyymm
country_other_educ	Country where the ISCED level was achieved	char(1)	International alphabetic code (ISO 3166-1)
mun_other_educ	Municipality where the ISCED level was achieved	char(x)	x-digit code depending on the country
source_other_educ	Source of the highest education in the country where person is non-resident	char(3)	x-digit code depending on the country

From country of residence:

Label	Title	Type	Codes
snum	Serial number	numeric/int	Countrycode+serial number
birth_date	Date of birth	int	yyyymmdd
first_name	First name	varchar(xx)	
second_name	Second name/s	varchar(xx)	
last_name	Last name	varchar(xx)	
maiden_name	Maiden name	varchar(xx)	
sex	Sex	Varchar(1)	1 = male, 2 = female

Table 26. Variables included in the data exchange for the statistical area Highest education attained

2. Steps and variables in the data exchange for the statistical area Attendance in education

Country of Education Attendance

Step 1. Pick all persons attending the education and delete those who lives in the country 31.12.

Variables for identification sent to another Nordic country:

Serial number

Year

Date of birth (yyyymmdd)

Sex

First name/s

Middle name/s

Last name

Maiden name



Country of Residence

Step 2. Match to find the persons living in the country 31.12. Send the identified persons back to the country of education attendance. Delete the rest of the received data

Variables back to the country of education attendance:

Serial number

Year



Country of Education Attendance

Step 3. Add education attendance data to the identified persons and send this data back to the country of residence

Variables sent to the country of residence:

Serial number

Year

The education the person is attending to in the country where the person is non-resident, ISCED 2011 (field)

The education the person is attending to in the country where the person is non-resident, ISCED 2011 (level)

Date when the education started

Municipality of the educational attendance (=where the school is located)

Type of school



Country of Residence

Step 4. Process the received data and store it in the database

Figure 4. Steps in the data exchange for the statistical area Attendance in education

From both countries for the data matching and identification of the persons			
Label	Title	Type	Codes

snum	Serial number	numeric	Countrycode+serial number
birth_date	Date of birth	char(8)	yyyymmdd
first_name	First name/s	varchar(xx)	
last_name	Last name	varchar(xx)	
middle_name	Second name/s	varchar(xx)	
maiden_name	Maiden name or previous name/s	varchar(xx)	
sex	Sex	char(1)	1 = male, 2 = female
year	Year	char(4)	2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016
From country of school attendance			
year	Year	char(4)	
iscfi	The education the person is attending in the country where the person is non-resident, ISCED 2011 (field)	char(4)	ISCED2011 code, 4-digit
isccat	The education the person is attending in the country where the person is non-resident, ISCED 2011, sub-category	char(3)	ISCED2011 code, 3-digit
start_date	Date when education started	char(6)	yyyymm
mun_educ	Municipality of the educational attendance (=where the school is located)	char(x)	x-digit code depending on the country
school_type	Type of educational institution	char(x)	

Table 27. Variables included in the data exchange for the statistical area Attendance in education

3. Steps and variables in the data exchange for the statistical area Commuting

Country of Work

Step 1. All persons who have worked in the country during the year but who are not resident in the country 31/12

Variables for identification sent to another Nordic country:

Serial number

Country code

Year

Date of birth (yyyymmdd)

Sex

First name/s

Last name

Maiden name/Previous last name



Country of Residence

Step 2. Match the population against the population register to identify persons in the population register. Send the identified persons back to the country of work. Delete the rest of the received data.

Variables back to the country of work:

Serial number

Country code

Year



Country of Work

Step 3. Add data relating to the work to the identified persons and send this data back to the county of residence

Variables:

Serial number

Country code

Year

Indicating whether the person is a cross border commuter

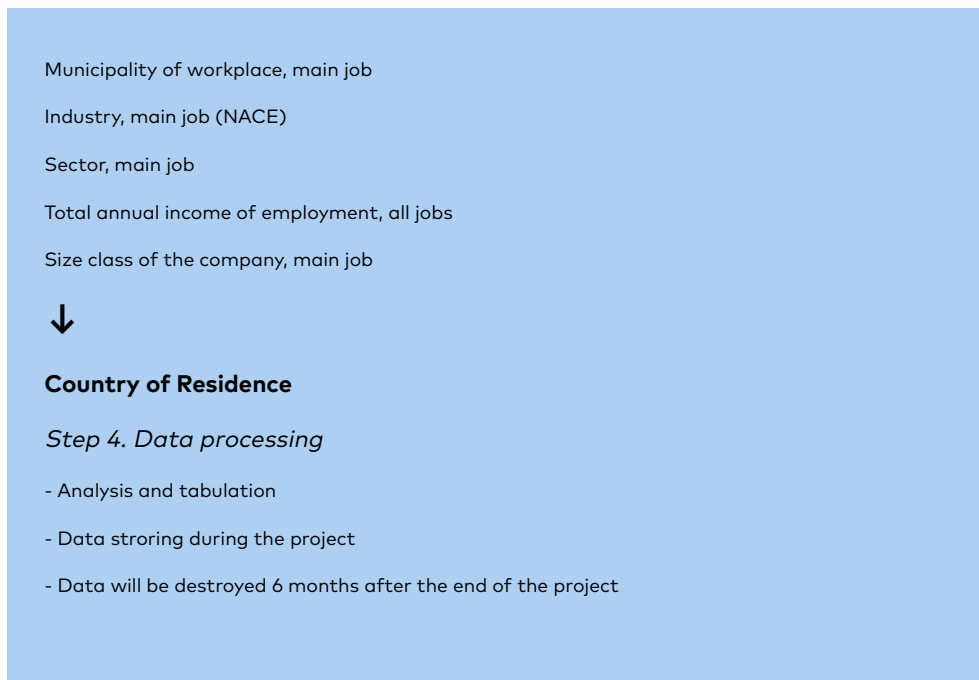


Figure 5. Steps in the data exchange for the statistical area Commuting

From both countries for the data matching and identification of the persons:			
Label	Title	Type	Codes
snum	Serial number	numeric/int	serial number
country_code	Country code	char(2)	DK= Denmark FI = Finland IS = Iceland NO = Norway SE = Sweden
birth_date	Date of birth	char(8)	yyyymmdd
first_name	First name/s	varchar(xx)	
last_name	Last name	varchar(xx)	
maiden_name	Maiden name or previous name/s	varchar(xx)	
sex	Sex	char(1)	1 = male, 2 = female
year	Year	char(4)	
From country of employment:			
Label	Title	Type	Codes
snum	Serial number	numeric/int	serial number
country_code	Country code	char(2)	DK= Denmark FI = Finland IS = Iceland NO = Norway

SE = Sweden			
Commuter	Indicating whether the person is a cross-border commuter	char(1)	1 = cross-border commuter
Work_mun	Municipality of workplace, main job	char(x)	
NACE	Industry, main job 4-digit NACE rev. 2	char(4)	
Q_workplace	Quality indicator which indicates whether the workplace and industry is related to the headquarter or the establishment (NB! Additional information, used for Finnish data)	char(1)	1 = main office
Sector	Sector, main job	char(1)	1 = Public sector (excl. publicly owned enterprises) 2 = Publicly owned enterprises 3 = Private sector
Income	Total annual income of employment, all jobs	int	in the currency of respective country
Size_class	Size class of the company, main job	(char(1)	1 = ≤ 4 employees 2 = 5 - 19 employees 3 = 20-49 employees 4 = 50-99 employees 5 = 100-199 employees 6 = 200 - 499 employees 7 = ≥ 500 employees

Table 28. Variables included in the data exchange for the statistical area Commuting

4. Steps and variables in the data exchange for the statistical area Migration

Country of residence, year t

Step 1. Pick the target population (All persons living in the country 31.12.2015, but not 31.12.2014, excl. those who are born during the year 2015)

Variables for identification sent to the other Nordic countries:

Serial number

Date of birth (yyyymmdd)

First name/s

Last name

Maiden/previous name name



Country of residence, year t-1

Step 2. Match to find the population lived in the country previous year

Add variables from population data:

Serial number

Date of birth (yyyymmdd)

First name/s

Last name

Maiden name

Year

Municipality of residence

Highest education (ISCED2011)

Activity status

School attendance in autumn term

Occupation (ISCO08)

Industry (NACE)

Family status



Country of residence, year t

Step 3. Add variables from country of residence/ immigration

Serial number

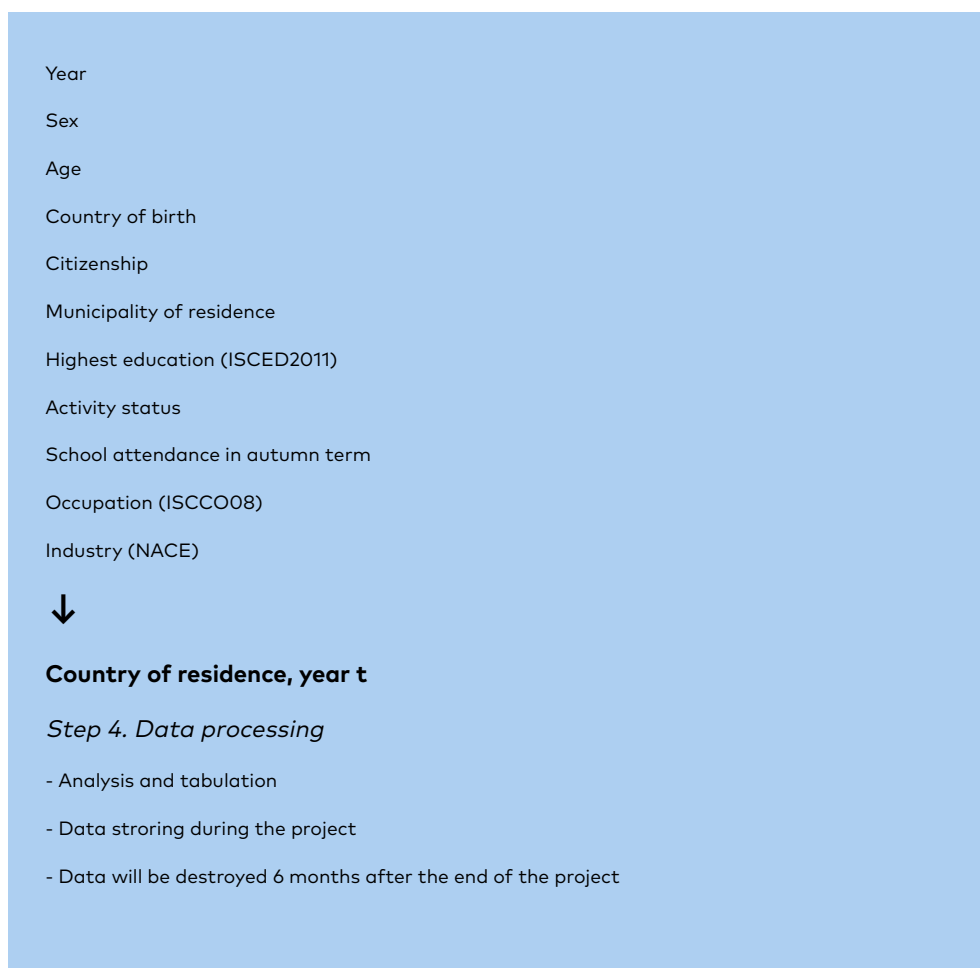


Figure 6. Steps in the data exchange for the statistical area Migration

Variables from both countries for data matching:			
Label	Title	Type	Codes
year	Year	char(4)	yyyy
birth_date	Date of birth	char(8)	yyyymmdd
first_name	First name	varchar(xx)	
last_name	Last name	varchar(xx)	
maiden_name	Maiden name or previous last name/s	varchar(xx)	
sex	Sex	char(1)	1 = male, 2 female
From country of emigration (year t-1):			
year	Year	smallint	yyyy
mun_emigration	Municipality of emigration	char(x)	x-digit code depending on the country
educ_em_country	Highest education (ISCED2011) in the	char(4)	ISCED2011 code, 4-digit

emigration country			
Activity_em_country	Activity status	char(1)	0 = Children 1 = Employed 2 = Unemployed 3 = Students 4 = Pensioners 5 = Others
school_attn_em	School attendance in autumn term	char(1)	1 = yes 0 = no
Occupation_em_country	Occupation (ISCO-08)	char(4)	ISCO-08 code, 4-digit
Industry_em_country	Industry (NACE rev 2, 2008)	char(4)	NACE rev 2, 2008, 4-digit
Family_em_country	Family status before	char(1)	1 = Spouse, no children 2 = Spouse with children 3 = Cohabiting partner, no children 4 = Cohabiting partner with children 5 = Mother or father, no spouse 6 = Child 7 = Not belonging to families, lives alone 8 = Not belonging to families, does not live alone 9 = Institutionalised population and unclassified
From country of immigration (year t):			
year	Year	char(4)	yyyy
sex	Sex	char(1)	1 = male, 2 female
age	Age	numeric	Age in total years
birth_country	Country of birth	char(3)	ISO 3166, 3-digit code
citizenship	Citizenship	char(3)	ISO 3166, 3-digit code
mun_immigration	Municipality of immigration	char(x)	x-digit code depending the country
educ_imm_country	Highest education (ISCED2011)	char(4)	ISCED2011 code, 4-digit
Activity_imm_country	Activity status	char(1)	0 = Children 1 = Employed

			2 = Unemployed
			3 = Students
			4 = Pensioners
			5 = Others
school_attn_imm_country	School attendance in autumn term	char(1)	1 = yes
			0 = no
Occupation_imm_country	Occupation (ISCO-08)	char(4)	ISCO-08 code, 4-digit
Industry_imm_country	Industry (NACE rev 2, 2008)	char(4)	NACE rev 2, 2008, 4-digit
Family_imm_country	Family status		1 = Spouse, no children
			2 = Spouse with children
			3 = Cohabiting partner, no children
			4 = Cohabiting partner with children
			5 = Mother or father, no spouse
			6 = Child
			7 = Not belonging to families, lives alone
			8 = Not belonging to families, does not live alone
			9 = Institutionalised population and unclassified

Table 29. Variables included in the data exchange for the statistical area Migration

5. Data exchange agreements

In the table below all the bilateral agreements on data exchange are listed describing the framework for the exchange of data in each agreement and the possibility to store the data exchanged in the agreement.

In addition to these bilateral data exchange agreements, framework agreements and prolongations of the framework agreements were made between Statistics Finland and the other NSIs.

Country pair	Statistical area	Framework for exchange	Storage of data in step 4
Finland - Sweden	Highest education	National	Can be stored
Finland - Sweden	One agreement for Attendance in	National	Shall be deleted

	education, Commuting and Migration		
Finland - Denmark	Highest education	National	Can be stored
Finland - Denmark	Attendance in education	National	Can be stored
Finland - Denmark	Commuting	National	Shall be deleted
Finland - Denmark	Migration	National	Shall be deleted
Finland - Norway	Highest education	National	Can be stored
Finland - Norway	Attendance in education	National	Can be stored
Finland - Norway	Commuting	National	Shall be deleted
Finland - Norway	Migration	National	Shall be deleted
Finland - Iceland	Highest education	National/EEA (223/ 2009)	Can be stored
Finland - Iceland	Attendance in education	National/EEA (223/ 2009)	Can be stored
Finland - Iceland	Commuting	National/EEA (223/ 2009)	Shall be deleted
Finland - Iceland	Migration	National/EEA (223/ 2009)	Shall be deleted
Denmark - Norway	Highest education	National	Can be stored
Denmark - Norway	Attendance in education	National	Can be stored
Denmark - Norway	Commuting	National	Can be stored
Denmark - Norway	Migration	National	Can be stored
Denmark - Sweden	One agreement for all areas	223/2009	Shall be deleted
Denmark - Iceland	Highest education	National/EEA (223/ 2009)	Can be stored
Denmark - Iceland	Attendance in education	National/EEA (223/ 2009)	Can be stored
Denmark - Iceland	Commuting	National/EEA (223/ 2009)	Shall be deleted
Denmark - Iceland	Migration	National/EEA (223/ 2009)	Shall be deleted
Norway - Sweden	One agreement for all areas	223/2009	Shall be deleted
Norway - Iceland	Highest education, extension	National/EEA (223/ 2009)	Shall be deleted
Sweden - Iceland	Migration	National	Shall be deleted
Sweden - Iceland	Commuting	National	Can be stored
Sweden - Iceland	Highest education	National	Can be stored
Sweden - Iceland	Attendance in	National	Can be stored

education			
Norway - Iceland	Highest education	National/EEA (223/2009)	Can be stored
Norway - Iceland	Attendance in education	National/EEA (223/2009)	Can be stored
Norway - Iceland	Commuting	National/EEA (223/2009)	Shall be deleted
Norway - Iceland	Migration	National/EEA (223/2009)	Shall be deleted

Table 30. Bilateral data exchange agreements made in the Nordic Mobility project

6. Border municipalities

Data on the commuters are exchanged containing information on their resident and working place municipality. In the analyses this is aggregated to NUTS 2 regions. For NUTS 2 regions having municipalities with a border to a neighbour country the NUTS2 regions are split into two groups; border municipalities and non-border municipalities. For municipalities in Finland, Norway and Sweden this will be municipalities having common geographical borders. Between Denmark and Sweden municipalities in the Capital region in Denmark and the whole county of Skåne are defined as border municipalities. In addition, the municipalities of Northern Jutland are defined as the border region to Norway. Iceland is defined as having no common border with other Nordic countries.

The following municipalities are defined as border municipalities in each country by NUTS2 regions.

Denmark

Region Capital Area: Copenhagen, Frederiksberg, Dragør, Tårnby, Albertslund, Ballerup, Brøndby, Gentofte, Gladsaxe, Glostrup, Herlev, Hvidovre, Høje-Taastrup, Ishøj, Lyngby-Taarbæk, Rødovre, Vallensbæk, Allerød, Egedal, Fredensborg, Frederikssund, Furesø, Gribskov, Halsnæs, Helsingør, Hillerød, Hørsholm, Rudersdal, Bornholm.

Region Northern Jutland: Brønderslev, Frederikshavn, Hjørring, Jammerbugt, Læsø, Mariagerfjord, Morsø, Rebild, Thisted, Vesthimmerland

Finland

Region Northern and Eastern Finland: Enontekiö, Inari, Kolari, Muonio, Pello, Tornio, Utsjoki and Ylitornio.

Norway

Sør-Østlandet: Halden, Hvaler, Aremark, Marker, Rømskog

Hedmark og Oppland: Eidskog, Kongsvinger, Grue, Åsnes, Våler, Trysil, Engerdal

Trøndelag: Røros, Tydal, Meråker, Verdal, Snåsa, Lierne, Røyrvik

Nord-Norge: Hattfjelldal, Hemnes, Rana, Saltdal, Fauske, Sørfold, Hamarøy, Narvik, Tysfjord, Ballangen, Bardu, Målselv, Storfjord, Kåfjord, Nordreisa, Kautokeino,

Karasjok, Tana, Sør-Varanger, Nesseby

Sweden

Region South Sweden: Svalöv, Staffanstorp, Burlöv, Vellinge, Östra Göinge, Örkellunga, Bjuv, Kävlinge, Lomma, Svedala, Skurup, Sjöbo, Hörby, Höör, Tomelilla, Bromölla, Osby, Perstorp, Klippan, Åstorp, Båstad, Malmö, Lund, Landskrona, Helsingborg, Höganäs, Eslöv, Ystad, Trelleborg, Kristianstad, Simrishamn, Ängelholm, Hässleholm

Region West Sweden: Dals-Ed, Tanum, Strömstad

Region North Middle Sweden: Älvdalen, Malung-Sälen, Torsby, Arvika, Eda, Årjäng

Region Middle Norrland Sweden: Åre, Strömsund, Krokom, Härjedalen, Berg

Region Upper Norrland Sweden: Haparanda, Övertorneå, Pajala, Kiruna, Gällivare, Jokkmokk, Arjeplog, Sorsele, Storuman, Vilhelmina

About this publication

Nordic Cross-border Statistics: The results of the Nordic Mobility project 2016-2020

Nicola Brun, Sara Ekmark, Klaus Munch Haagensen, Ómar Harðarson, Anne Marie Rustad Holseter, Helge Nome Næsheim, Kaija Ruotsalainen

Nord 2021:006

ISBN 978-92-893-6903-9 (PDF)

ISBN 978-92-893-6904-6 (ONLINE)

<http://dx.doi.org/10.6027/nord2021-006>

© Nordic Council of Ministers 2020

Layout: Louise Jeppesen

Photos: Front page: johner.dk Foreword: unsplash.com - johner.dk - unsplash.com

Summary: unsplash.com - johner.dk - johner.dk Chapter 1: unsplash.com Chapter 2:

unsplash.com Chapter 3: unsplash.com Chapter 4: unsplash.com Chapter 5:

unsplash.com Chapter 6: unsplash.com Chapter 7: johner.dk - unsplash.com -

unsplash.com Chapter 8: johner.dk - unsplash.com - unsplash.com Chapter 9:

johner.dk - unsplash.com - unsplash.com Chapter 10: unsplash.com Links:

unsplash.com Annexes: unsplash.com

Nordic co-operation

Nordic co-operation is one of the world's most extensive forms of regional collaboration, involving Denmark, Finland, Iceland, Norway, Sweden, and the Faroe Islands, Greenland and Åland.

Nordic co-operation has firm traditions in politics, economics and culture and plays an important role in European and international forums. The Nordic community strives for a strong Nordic Region in a strong Europe.

Nordic co-operation promotes regional interests and values in a global world. The values shared by the Nordic countries help make the region one of the most innovative and competitive in the world.

The Nordic Council of Ministers

Nordens Hus

Ved Stranden 18

DK-1061 Copenhagen

www.norden.org

Read more Nordic publications on www.norden.org/publications