

# Migration Statistics based on Admin Data. Opportunities and Challenges.

## The Danish Case

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### 1. Introduction

The use of admin data for the production of official statistics is part of the strategic developments in many NSI's. For some it is a new thing while others have been using admin data sources for decades. It is quite natural to be sceptical in relation to the use of a new data source and therefore there is some focus on the gaps in relation to the use of admin data for statistics. This said, the experience for those countries like Denmark that have used admin sources as the main input for population as well as most other statistics on persons (social statistics in a broad sense) is that not only are statistics based on admin sources a cost effective way of producing statistics – it also gives you statistics of good quality.

This paper deals with the production of population and migration statistics based on admin sources in Statistics Denmark. It explains the statistical production system in general including quality checks and quality assurance and it deals more specifically with two challenging cases; the registration of asylum seekers in population statistics and the issue of deregistration of emigrants.

### 2. The Civil Registration System and the use of register-based census in Denmark

Population and housing censuses has for decades been the back bone in the social statistics in most countries including Denmark. However, a traditional census is an extremely costly operation and a long lasting process. This is one of the reasons why the direct use of administrative registers in statistics was introduced in Denmark in the 1970's which led the way to the world's first totally register-based population and housing census in 1981. The introduction of a register based population and housing census was made possible by the establishment of the Civil Registration System that was implemented in 1968.

#### 2.1 The Civil Registration System

The Civil Registration System is a nationwide civil register that was implemented in 1968 as a part of a reform of the local population register-system. An essential part of the reform was the introduction of a unique identification number for each individual person, the personal identification number (PIN-number). The PIN-number was considered a practical necessity for the operation of Civil Registration System and was introduced into all sectors of public administration. The PIN-number replaced many different numbering systems which had previously been employed by the various branches of the public administration.

### 2.1.1. General application of the PIN-number

The Civil Registration System contains basic personal data of individuals. Generally, the PIN-number is used in the public administration as a kind of file number, which at the same time serves as an accurate identification of individual persons. Public authorities have access to the information in the Civil Registration System which it needs to carry out its tasks. The PIN-number serves as a key for identifying individuals and for the exchange of data between registers.

The PIN-number is used in virtually all public administrative registers in Denmark that contain information on individuals. A PIN-number must be stated, in practically all matters, when a person is in contact with the public authorities. This involves tax cases, payment of social benefits, hospitalization, visits to the doctors, admission to schools or institutions and military service, use of public libraries etc. Many private finance companies also have access to the Civil Registration System and use it in their contact with the public. As an example the Civil Registration System it possible to examine if the address in the application form from a potential borrowers matches the address in the national register. The PIN-number is the only tool that many finance companies have as proof that people are who they say they are.

In more general terms the register based statistical production system contains three registers; the population register, the register on buildings and dwellings and the business register. All with their own system of unique identifiers, and with the possibility to link between the registers. This means that one can link any individual to his or her dwelling and to his or her workplace.

### 2.1.2 Civil Registration System's population

People who have (or have had) their usual residence in Denmark are recorded in the Civil Registration System. The definition of usual residence in the Civil Registration System is the dwelling where a person regularly sleeps when not temporarily absent owing to holiday, business travel, illness or similar reasons, and where the person has their property and belongings.

The system therefore contains basic personal data about anyone who lives or have lived in Denmark since 1968. Finally, the register contains information about persons who have not lived in Denmark, but who have a connection with the country, for example with regard to taxation. It is for Statistics Denmark possible to extract those who are actually living in Denmark at the reference period.

### 2.1.3 Administration of the Civil Registration System

The Ministry of the Interior and Health administers, maintains and updates the Civil Registration System together with the municipalities. The municipalities are obliged to register anyone who has their usual residence in their municipality in the Civil Registration System and to ensure that persons are registered in the Civil Registration System at the address where they actually live. Anyone who has changed his or her place of residence within the country's boundaries is obliged to report this change of residence to the municipality. All changes of address within the country must be reported to the Registration Office in the new municipality of residence within 5 days. Failure to observe the deadline for reporting changes of address may result in a fine. When the municipalities receive information about change of addresses from the citizens, the Civil Registration System is updated with the changes of address. The citizen can inform of his move electronically. By informing the municipality, the person also gets free access to a doctor close to the new home.

Correspondingly new-born children are systematically registered in the Civil Registration System and assigned a PIN, while records of all dead persons are systematically deactivated and transformed to the archive. Likewise persons who immigrate to Denmark are obliged to report their immigration if they intend to stay for more than three to six months in the country. Six months is

the time limit for Nordic and EU-citizen and three months for persons with other citizenship. With few exceptions, anyone moving abroad for more than six months should report his or her departure to the municipality. A PIN is allocated for immigrants when the person first notifies immigration to Denmark. The Ministry of the Interior and Health ensures that a PIN is assigned when the conditions for receiving a PIN is met.

When a person is registered in the Civil Registration System and receives his or her PIN he or she also receives “the yellow card”. This health insurance card is crucial whilst living in Denmark. The Health Insurance Card is used as a proof of identity at the doctors, at libraries and in many other contexts. Since the card gives free access to the doctors etc. this is a big incentive to getting registered in Denmark. By getting registered, the person also gets the right of receiving tax free child benefits.

#### 2.2.4 The data quality of the Civil Registration System

As stated in the previous section information in the Civil Registration System is used by the public administration in almost all cases which are related to individual persons. This means that there are many possibilities of detecting and correcting errors and deficiencies in the register. Thus a person cannot obtain work as an employee without giving information about his PIN-number to the employer who is to withhold the employee’s provisional tax and remit it to the tax authorities. This and several other reporting channels provide a relatively safe guarantee that all persons are actually registered in the Civil Registration System, and that the most frequently used information (addresses, family relations, etc.) are being correctly registered. Reporting to the register of increases and decreases in the population as a consequence of births and deaths are done by midwives and doctors involved. This means that very reliable sources are used.

Reports on decreases as a consequence of emigrations are however less reliable, because it is the emigrant himself who is liable to notify the local population register about the emigration, and often the incentive to give this notification is minor. The Civil Registration System, therefore, has persons registered who no longer live in the country. The paper addresses this in more detail later after a discussion on the challenges that asylum seekers pose to the registration system.

### 3. Asylum seekers

According to the EU definition of usual residence an asylum seeker should be included in the population if his or her application of asylum will be granted or if he or she will be rejected asylum but the process from coming to Denmark to leaving would last at least 12 months. Deaths of asylum seekers shall also be included, given the 12 month criterion. The same goes for births, a birth in an asylum center shall be included if the mother will stay for at least 12 months. An alternative would be to include those who have an actual, rather than intended stay, of more than 12 months.

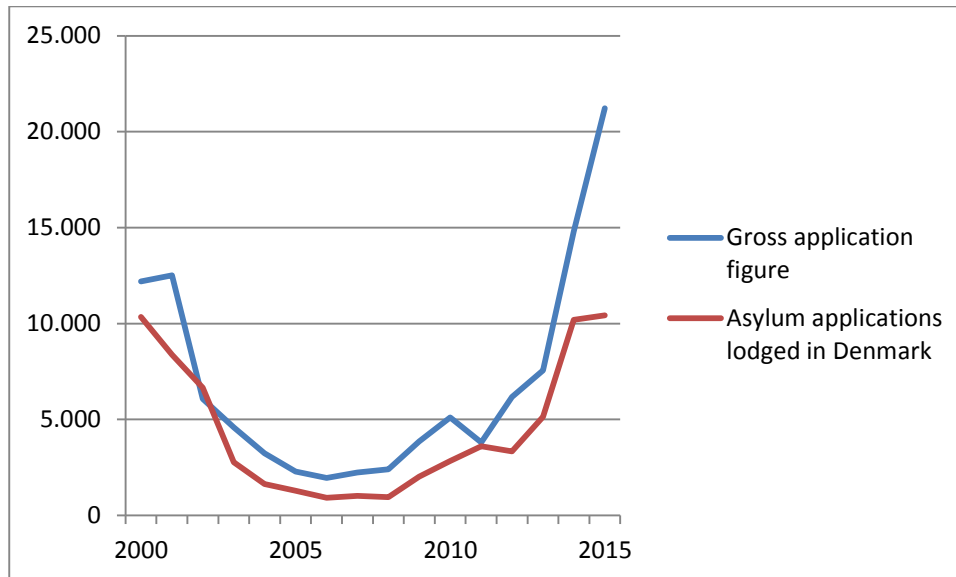
Asylum seekers are not included in the Danish population register. The Danish population register only includes those with a permission to stay in the country. To include asylum seekers in the statistics on the population and in the birth/death statistics would cause some issues discussed below.

It should be noted that the average time spent from seeking asylum to a first decision in the first half of 2016 was 165 days, which is far below the one year limit. A mere 548 out of 10,846 cases was decided after more than 350 days. In the first half of 2016, 1,067 cases were appealed and therefore will have a longer stay as asylum seeker in Denmark.

The number of asylum seekers coming to Denmark has varied a lot over the years. The graph below shows the gross application figure and the asylum applications lodged in Denmark. The gross

application figure includes all persons who have applied for asylum in Denmark, regardless if their case is processed in Denmark or not, hence including people who have returned to a safe third country, been transferred or re-transferred to another EU Member State under the Dublin Regulation as well as disappearances and withdrawals etc. during the preliminary asylum procedure. The registration figure includes persons whose asylum case is processed in Denmark.

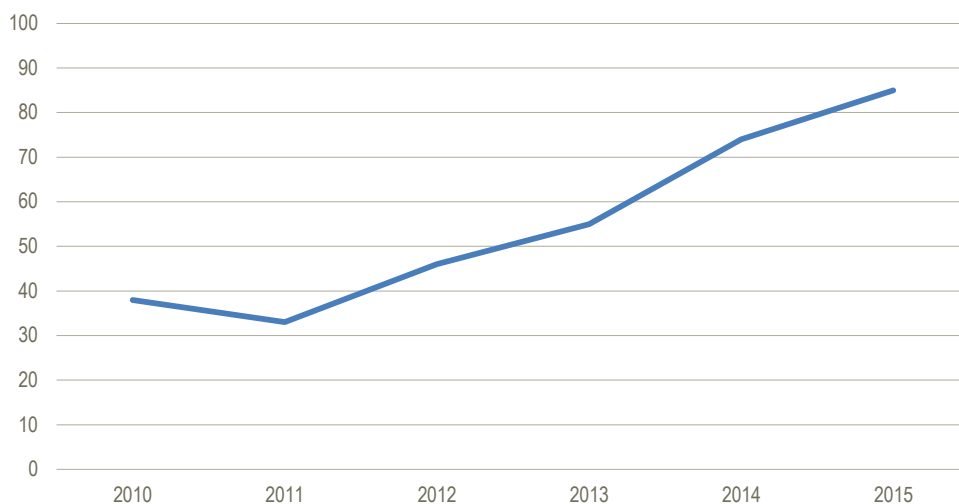
Diagram 1- Number of gross and net asylum applications



On the 15th of August 2016, 9,316 persons had a pending application for asylum in Denmark. Of these 223 persons had applied for asylum more than one year ago. This indicates that the number of asylum seekers that should be included in the population under the EU definition is very low; if these 223 persons would be included in the population that would increase the Danish population by a minimal 0.004 percent. The number of persons that are staying as asylum seekers for more than one year can of course differ over time.

The share of granted asylum applications has varied a lot. In 2015 85 percent got a positive decision in the 1st instance whereas only 33 percent got a positive decision in 2011.

Diagram 2-Percentage of positive decisions (1st instance)



Those persons not granted asylum should leave Denmark. At the end of 2015 1,393 persons had not been granted asylum and were waiting to leave the country.

There were 2,380 Dublin cases in 2015. Out of these 1,607 were accepted by another EU member state. The persons in the Dublin-category could be expected to stay for less than 12 months in the country given that the receiving country does accept the person. To these groups, persons denied asylum but from countries to which Denmark cannot send the person should be added. On the 1st of January 2016 244 persons from Iran or Iraq were in this position.

The share of positive decisions varies heavily with citizenship and over the years; in 2015 98 percent with an Eritrean citizenship got asylum, whilst only 9 percent of persons with a Russian citizenship got asylum.

Table 1- Share of positive decisions on asylum by citizenship

	2009	2010	2011	2012	2013	2014	2015
<b>Afghanistan</b>	53%	41%	26%	26%	42%	37%	38%
<b>Eritrea</b>	75%	61%	47%	70%	86%	96%	98%
<b>Iraq</b>	47%	23%	13%	15%	18%	11%	37%
<b>Iran</b>	63%	63%	48%	65%	73%	42%	73%
<b>Russia</b>	73%	65%	45%	55%	47%	27%	9%
<b>Serbia</b>	0%	0%	0%	0%	0%	0%	0%
<b>Somalia</b>	52%	32%	22%	93%	58%	54%	44%
<b>Stateless</b>	34%	13%	53%	51%	76%	89%	90%
<b>Syria</b>	69%	58%	64%	59%	96%	97%	98%
<b>Other</b>	12%	9%	6%	9%	9%	7%	8%
<b>Total</b>	<b>44%</b>	<b>38%</b>	<b>33%</b>	<b>46%</b>	<b>55%</b>	<b>74%</b>	<b>85%</b>

To try to estimate the number of persons that will, in the future, stay for 12 months means also to try to estimate the level of positive decisions per citizenship. This is a very difficult task that would impose a very high level of uncertainty. For example the share of Afghans that got asylum was 53 percent in 2009 and only 26 percent two years later.

During 2015 a total of 94 children were born by parents that were in the asylum seeking process. Given the fact that the asylum seeking process for most was shorter than one year, it can be assumed that a majority of these children were born by parents who had not stayed for a year in the

country. Out of the 223 cases, that on the 15th of August 2016 had been going on for more than one year 28 were women between 20 and 39 years old. This indicates that the number of births in Denmark by persons staying for at least one year would not be affected if also including births by asylum seekers.

It can be concluded that the inclusion of asylum seekers to the statistics would not affect the estimation of the total population.

#### 4. A description of the non or late deregistration of emigrants

##### 4.1 Late deregistration

Around 17 percent of all emigrations in year X will be reported to the Civil Registration System later than February in year X+1. Thus producing statistics on emigrations by time of occurrence would underestimate the figures to a large extent. Therefore the statistics on emigrations and immigrations is counted by year of registration at the Civil Registration System and not year of occurrence. The statistics by year of registration can be seen as an estimate of the number of migrations that takes place every year.

Table 2- Year of occurrence and year of registration of emigrations

		Year of occurrence							
		2008	2009	2010	2011	2012	2013	2014	2015
Year of registration	2008	43,490							
	2009	4,010	44,874						
	2010	1,173	3,812	45,882					
	2011	1,114	1,873	4,530	46,802				
	2012	346	697	1,127	4,091	47,988			
	2013	382	488	637	1,505	4,569	48,394		
	2014	257	423	590	972	1,639	5,491	49,218	
	2015	79	121	196	329	506	1,166	4,759	48,940

By publishing statistics by year of occurrence, there would have been 46,802 emigrations in 2011 noted in February 2012 (the date of publishing). By publishing the same statistics by year of registration a further 1,114+1,873+4,530+possible earlier figures would have been added. This could be seen as an estimate for the emigrations that took place in 2011 but will be registered years later (4,091+1,505+972+329+possible even later registrations).

##### 4.2 Non deregistration

It can be assumed that the population register does have a slight level of overestimation in the form of persons still registered in the register but having been away for several years. The above section showed the late deregistration, in this section the discussion will be on the non-deregistration. A non-deregistration is more problematic than a late deregistration, therefore focus should be on non-deregistration.

The idea behind the study in this section is that a person living in Denmark will make “marks” in the registers if he or she is actually living in the country. If there are no signs of life in the registers the person can be assumed to be a potential overcoverage.

In this paper, signs of life has been grouped into three groups; demographics, health and socio-economic status. The activities have been chosen since they require, to a large extent, that the person is in Denmark. The persons have been studied from 31st of December 2007 until 31st of December 2015, or until their death, their first emigration or disappearance in the period. A person can by the authorities be noted as disappeared and therefore be deregistered from the register. In this study only those that are disappeared for at least one year are seen as disappeared.

A person that during several years have had none of the below mentioned activities can be seen as a potential overcoverage.

The population registered in the Danish population on the 31st of December 2007 has been studied. A total of 68,500 persons had had no activity in 2008. However, having just one year with no signs of life must be seen as not being suspicious. It can be noted that this group contains a large number of children who do not have an income of their own and who do not go to the doctors or dentists every year. Having two or more years with no signs of life can on the other hand be seen as an indication of overcoverage. Some could of course be sponsored by their spouse but it is likely that a portion of these persons are not actually living in Denmark. Out of the population from 31st of December 2007 a total of 28,355 does not have any of the above mentioned signs of life for the two years 2008 and 2009.

#### Socio-economic status

Self-employed

Assisting spouses

Top managers

Employees - upper level

Employees - medium level

Employees - basic level

Other employees

Employees - not specified

Unemployment

Subsidized employment without salary

Persons receiving holiday benefits

Guidance and activities upgrading skills

Unemployment benefit

Parental leave from unemployment

Maternity absence from unemployment

Sickness absence from unemployment

Cash benefit (passive)/cash benefit for foreigners

Rehabilitation

Specially arranged scheme

Job clarification program

Enrolled in education

#### Demographics

Giving birth

Immigration

Change of marital status to married or divorced

Change of citizenship

Migration within the country

#### Health

General medical treatment

Specialist

Dentist/Dental hygienist

Chiropractor

Physiotherapist

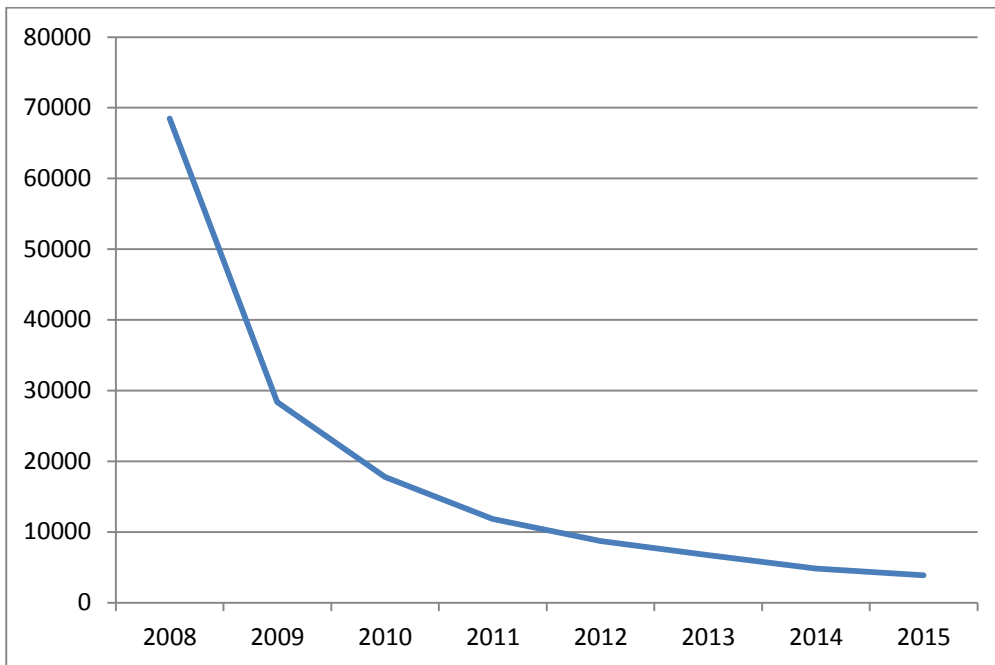
Chiropodist

Psychologist

Other

The number of persons with three year of consecutive lack of signs of life is 17,765. Two thirds of these are Danish citizens.

Diagram 3- Number of persons with no signs of life, by year



The Nordic system of migration registration, does impact the numbers. A mere 1 percent of the population with three years of no signs of life is Nordic citizens excluding Danes. This can be explained by the Nordic system of migration. It can be assumed that most non-Danish but Nordic citizens, who leave Denmark, will be returning to their country of citizenship. Since there is an automatic deregistration if registered as an immigrant in another Nordic country, it will not be possible for these persons to stay registered in Denmark.

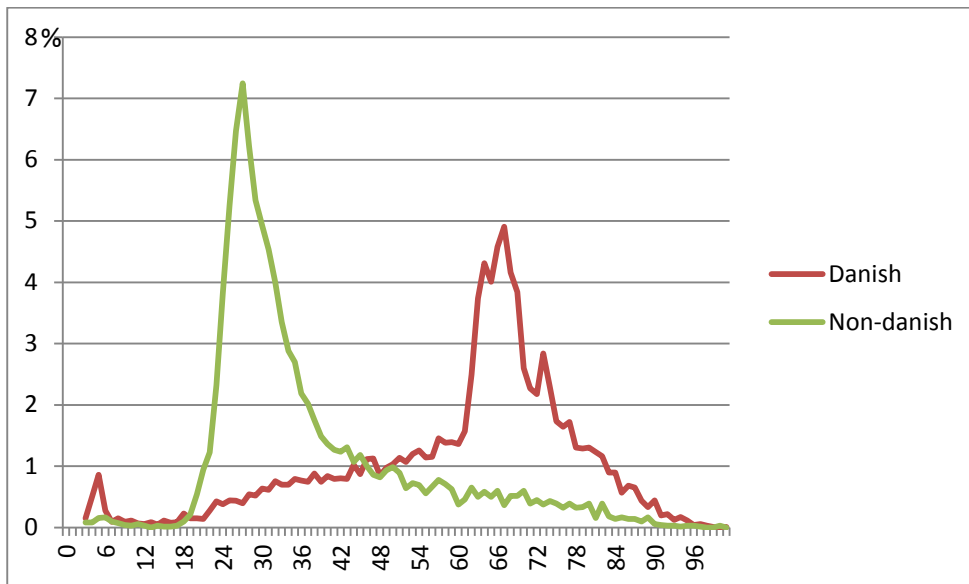
Table 3- Persons having no signs of life by their status the following year

	2008	2009	2010	2011	2012	2013	2014	2015
<b>No signs of life</b>	68,500	28,355	17,765	11,826	8,726	6,706	4,822	3,892
<b>Active</b>		32,372	7,867	3,620	1,922	1,196	800	512
<b>Late emigrations</b>		4,078	1,491	1,600	672	454	733	236
<b>Emigrations</b>		1,634	438	270	179	115	160	47
<b>Late disappearance</b>		80	70	73	29	27	23	5
<b>Disappearance</b>		661	25	25	43	22	16	7
<b>Unknown</b>		309	220	38	52	64	38	25
<b>Deaths</b>		1,011	480	313	203	142	114	98

Out of the population that in 2008 had no activity, a total of 13,213 have been registered as emigrants or disappeared persons during the period 2009-2015.

Diagram 4- Persons having no signs of life 2008-2010 by age and citizenship in 2010





The persons that have had a three year period, 2008-2010, of no signs of life do have a very specific age pattern. The Danish citizens in this group are to a large extent around 65 years old. Some of these can be healthy newly retired persons that do not visit the doctors or dentist. But it is also a possibility that these persons have retired and gone abroad. The non-Danish citizens in the suspected overcoverage are, to a very high extent, young adults. A possibility is that these persons have studied or worked in Denmark for a short period and forgotten to deregister when they left.

It is not possible to say who, of the persons without signs of life that are overcoverage. It is however more likely that a higher proportion of the ones with many year of consecutive lack of signs of life is a part of the overcoverage. The graph above clearly indicates that the problem of overcoverage is not cumulative but is something that gets addressed by the municipalities. It is not likely that a person can stay as overcoverage for many years without being deregistered. If assumed that all persons with three or more years of consecutive lack of signs of life is a part of the overcoverage, a total of 17,765 persons would be overcoverage of the population register. This means an overcoverage of 0.32 percent. It is however not likely that all these persons form the overcoverage. This fraction of only 0.32 percent illustrates the very high quality of the population register.

This study indicates that the non-deregistration will be dealt with by the authorities and that the non-deregistration does not accumulate over time.

To conclude, the population register has a very small overcoverage and most non-deregistration by the person will be reported at a later stage by the authorities, therefore making the non-deregistration into a late deregistration. Furthermore using emigrations and immigrations by year of registration is a good estimate of emigrations and immigrations by year of event.

## 5. Conclusions

There are opportunities and challenges in the production of migration statistics based on admin data. An often mentioned challenge has to do with the quality of data. As this paper shows the quality issue in this as in other areas where admin data are used as input to the production of statistics is heavily related to the use of data in the administrative procedures. Population data are as is shown in this paper widely used in administrative procedures by different branches of government from the central to the local level as well as by private organizations not least in the financial sector. This results in admin data of high quality and Statistics Denmark performs virtually no quality work on population data<sup>i</sup>.

Migration statistics has its own challenges. This paper has dealt with two of these; asylum seekers and late deregistration.

As the concrete calculations in relation to asylum seekers show there is no major difference between the present way of including – or more specifically not including – asylum seekers in the population statistics and an approach where they were included.

The analysis shows that the population statistics has a small degree of over-coverage due to late deregistration – but for one it is small and secondly it is in most cases solved later on making the term ‘late deregistration’ an quite precise term to capture what is going on in the statistical system.

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<sup>i</sup> This is definitely not the case in all the areas where Statistics Denmark produce statistics based on admin sources e.g. statistics on social welfare based on data from municipalities is often of meagre quality as is the case with data from other areas of the administrative systems.