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**REGISTER-BASED STATISTICS IN THE NORDIC COUNTRIES -
DOCUMENTATION OF BEST PRACTICES**

submitted by Statistics Norway^{*}

1. This paper presents some preliminary results from an on-going project on documentation of best practices in the use of registers for statistical purposes. The NSOs in Denmark, Finland, Norway and Sweden are participating in this project. A final report will be published in 2006.

Purpose

2. The Nordic statistical offices have been working with register-based statistics for some 35 years. A number of reports and papers have been presented on this subject. The purpose of the present project is to collect the main experiences from this work in *one* report. Comparisons between the Nordic countries are included when relevant.

3. The target group is statisticians and decision makers in countries that are developing register-based statistics or are planning for this type of statistics production. The report will cover all types of register-based statistics, but the focus will be on statistics used in population and housing censuses.

Contents of the report

4. This section gives an overview of the contents of the report. In the following sections some selected topics are further discussed.

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Why register-based statistics?

Historical development of register-based statistics

General preconditions

Definitions

- Register: Systematic collection of *unit-level data* organised in such a way that *updating* is possible
- Administrative registers and statistical registers
- Basic registers and specialised registers
- Registers on persons (population register)
- Registers on addresses, real estates, buildings and dwellings
- Business registers
- Activity registers

From administrative data to register-based data system

- Requirements to data from administrative sources
- Coverage
- Units and identifiers
- Time references
- Stability
- Editing
- Use of multiple sources
- Creation of new variables
- Corrections of data
- Prioritisation and consistency

Developing a register-based statistical system

Products and dissemination

- Statistics for small groups
- Longitudinal data
- Flow statistics
- Micro data for researchers

Standardisation and quality

- Quality
- Metadata
- Coordination

Combining register data and surveys

- Direct use of register data
- Register data supplemented by survey data
- Surveys supplemented by register data

Advantages and disadvantages of register-based statistics

Historical development - step by step

5. In the period 1964 to 1969 Central Population Registers were established in all Nordic countries, introducing unique personal identification numbers. In the following years several other registers were established. Registers as a data source in production of statistics were introduced in the early 1970thies. Registers were first used in several subject matter statistics, beginning with population statistics and income statistics. Subsequently new register-based statistics were developed, and in 1981 Denmark was the first country in the world to conduct a totally register-based census and Finland followed in 1990. From 1980 the censuses in Norway and Sweden have been partly register-based. In 2010 Norway and Sweden are planning for their first register-based censuses. The main difference between the countries is that Denmark and Finland had dwelling registers in 1980, while dwelling registers in Norway and Sweden has been established more than 20 years later¹.

6. The step-by-step development is however the same in all countries: First subject matter statistics were tested and published in different areas. Register-based variables were introduced in the census as soon as the quality was considered sufficient. When statistics had been developed for all areas relevant for censuses, a totally register-based census could be conducted.

General preconditions

7. In the light of the Nordic experience there are certain key preconditions that facilitate the extensive use of register sources in statistics production.

Legal base

8. Legislation provides a key foundation for the use of administrative data sources for statistical purposes. In all the Nordic countries there exists a *national statistics act* that gives the NSO the right to access administrative data on unit level with identification data and to link them for statistical purposes. Furthermore, the statistics act provides a detailed definition of data protection. All the Nordic countries have an *act on Processing of Personal Data*, which contains provisions on the processing of personal data. According to this act processing of data for statistical purposes is allowed even if it was not the chief aim of the data collection. Once data have been processed in a NSO, they must not be used for other purposes than statistics and research.

Public approval

9. It is very important that the general public appreciates and understands the benefits of using register sources for statistical purposes. In all the Nordic countries an open discussion and debate has always been considered a key principle. It is also important that the national register legislation is up-to-date and that the work of the register authorities is open and transparent. Cost efficiency, a reduced response burden on the population and the avoidance of overlap in data collection seem to be good arguments for the statistical use of administrative data. However it is important that the statistical agency always remains on guard in this respect. It is very easy to loose confidence of the general public, but a major effort indeed to rebuild it.

¹ In Sweden a dwelling register is currently being established

Unified identification code systems

10. One major factor that facilitates the statistical use of administrative data records is the application of unified identification systems across different sources. In the absence of such unified systems it is a lot more difficult and laborious to link different registers, which is absolutely central to register-based statistics production. In the Nordic countries unified personal identity codes are currently present in all major registers used in production of statistics. Similarly, almost equally unified identification systems are in use for other basic registers like the business register and the registers on addresses, buildings and dwellings.

Comprehensive and reliable register systems developed for administrative needs

11. The establishment of administrative data registers has been closely tied up with the development of social security, taxation systems and other administrative needs. These are mostly systems ruled by the state, and therefore it has been necessary to establish registers on a state level. Both the citizens and the authorities in the Nordic countries have always shown high confidence in the accuracy of register sources, which after all are the basis for many individual rights and duties. It is in the interest of the individual to make sure that all the data within administrative register systems are indeed accurate. Such factors speak for the reliability of register data for statistical purposes.

Cooperation among administrative authorities

12. The governments in the Nordic countries have given political support to the NSOs' efforts in developing a register-based statistical system. The collaboration between the NSOs and the register authorities often take part in the frame of a national forum of register keepers, but also bilateral.

Developing a register-based statistical system

13. In all Nordic countries a system of register-based information has been developed. This means that all the statistical registers are regarded as being a part of the same system and not as individual registers. Such a view has implication for all stages in statistical production: data collection, data processing, quality control and dissemination. The cornerstones are the existence of basic registers keeping track of the target populations and the fact that all major registers can be interlinked. In this way statistics in different areas may be based on the same data sources. For instance, demographic variables produced from the population register are used in all kinds of social statistics.

14. By 2010 all Nordic countries will, at least according to our plans, have a total register-based population and housing census system. Even if we call it a census system, the same data sources are used in all relevant subject matter statistics: population statistics, family and household statistics, regional employment statistics, buildings and dwelling statistics, housing conditions statistics, statistics on education and income statistics. The register-based census data system is used for a lot more than census statistics, and consistency between census statistics and the individual subject matter statistics is improved.

Advantages and disadvantages of register-based statistics

Advantages

15. The particular advantage of register-based statistics is that they may provide total coverage even if collection and processing costs are relatively low. Compared to traditional censuses **lower costs** are without question the biggest advantage of using administrative register sources.
16. The **reduced response burden** on the population is another significant advantage.
17. A further key advantage of administrative sources is that the need for **processing is confined to those data items that have changed**. In general it is cheaper to collect information just once and to process that information only if and when it changes.
18. Census type of statistics on employment may be compiled on an **annual basis**, giving more up-to-date statistics.
19. Register statistics are obtained for **all geographical areas**. Since registers cover the target population in its entirety, and since detailed geographical information can be obtained even for small areas.
20. Registers are very suitable for creating **longitudinal data** that could be used for flow statistics and also offers new opportunities for researchers (longitudinal micro data).

Disadvantages

21. Register-based censuses have to rely exclusively on the information contents that can be formed on the basis of the registers available. This imposes some **restrictions with respect to the topics that are available** and may also undermine international comparability. Some (non-core) topics may not be available from a register-based population census system, for instance *mode of transport to work* and *computer literacy*.
22. Statisticians are to a large extent dependent on the definitions and administrative practice of the authorities responsible for the registers. This means that register-based statistics is more vulnerable to **changes in legislation** and administrative practices. It is therefore crucially important to have close collaboration with the relevant register authorities.
23. The census is **no longer a collection tool for ad hoc needs**. In many countries the population census system is an important tool for data collection that is used to meet emerging information needs. This flexibility is lost when data are no longer collected by means of questionnaires.

Concluding remarks

24. The aim of this project is not to advise other countries whether or not to develop register-based statistics. What we offer is a comprehensive documentation of the Nordic experiences in producing statistics based on administrative register over the last 35 years. We hope that the report may bring some "realistic aspiration" to countries planning to use administrative sources in official statistics. We also hope that the report may inspire other countries with some practice in the field to bring their experiences to others.