

Subject Area Design Labour Market

—

future-proofing Sweden's official labour market statistics

Martin Axelson, Statistics Sweden, martin.axelson@scb.se

Susanne Gullberg Brännström, Statistics Sweden, susanne.gullbergbrannstrom@scb.se

Abstract

As part of the strategy adopted by Statistics Sweden in 2019, four endeavours are identified. One of these focuses on modernising and future-proofing the labour market statistics. As an important part of this endeavour, a development initiative labelled Subject Area Design Labour Market was conducted in 2019-2021. The work aimed to analyse and identify current use and needs of labour market statistics, and using this as a starting point, to provide a broad analysis of the status of these statistics. The task also included proposing new statistics that describe the Swedish labour market. The work was conducted in dialogue with central users and was carried out in cooperation with Swedish Public Employment Service, the Swedish Work Environment Authority, and the National Mediation Office.

In May 2021, Statistics Sweden presented a three-stage plan for its future labour market statistics (Statistics Sweden, 2021). The plan forms part of the agency's stated ambition to meet user needs and at the same time reduce its dependence on direct collection of data. The statistics are to meet user needs and must be of good quality, while taking into account aspects such as resource use and respondent burden. An important starting point in preparing the plan is to use, as far as possible, already collected data for the production of the statistics. Special importance is given to administrative data from other government agencies, the goal being that future statistics are to be register-based and sample-assisted, rather than vice versa.

The first part of the paper discusses the initiative Subject Area Design Labour Market and presents the main components of the plan. The second part of the paper provides information on Population by Labor Market Status, a new, register-based product which marks the first step towards implementation of the plan. The paper is concluded with reflections on the work carried out so far and the way forward.

Keywords: user dialogue, design

1. Introduction and outline

The Official Statistics Act and the Official Statistics Ordinance provide the legal framework for the official statistics of Sweden. Under the Ordinance, three government agencies are to be responsible for official statistics in a total of eight statistical areas within the subject area Labour Market.

Table 1. Official statistics in the subject area Labour Market

| Statistical agency | Statistical area |
|------------------------------------|--|
| Swedish Work Environment Authority | Work environment Work-related injuries and ill health |
| National Mediation Office | Wages, salaries and labour costs |
| Statistics Sweden | Labour Force Survey Aggregate gross wages Sick pay Employment, gainful employment and working hours Vacancies and unemployment |

In addition to official labour market statistics, other government statistics within the labour market area, not least the Swedish Public Employment Service's operational statistics, are also of great use.

Labour market statistics form an essential foundation for analysis, research, and political decisions, at both the national and international level. In the latter context, the European Union is an important user and actor, and certain parts of the labour market statistics are governed by European regulations with the purpose of making statistics comparable between countries.

Demands on the statistics, as well as the conditions for their production, have changed over time. While information needs tend to expand, both in terms of content and timeliness, the conditions for using sample surveys tend to deteriorate.¹ The world around us is changing and individuals' willingness to participate in surveys has diminished significantly. One example is the Labour Force Surveys (LFS), in which the response rate has dropped by about 30 percentage points since 2010. This rise in non-response leads to less accurate estimates and higher data collection costs. Therefore, it necessary to develop new methods as well as find other data sources that can replace, or at least reduce, the need for such data that are currently being collected directly.

In addition, each statistical agency is obliged to take the response burden into account when data are collected for official statistics, and statistical agencies are to, as far as possible, use data from existing registers in the production of official statistics. The conditions for doing so have improved recently through access to new administrative data, not the least the PAYE – Pay As You Earn – tax returns per employee (AGI). This data source holds great potential for reducing direct data collection and creating improved conditions for coherence in the labour market statistics.

Against this background, Statistics Sweden has decided that modernising and future-proofing the labour market statistics constitutes one of four so-called endeavours for the coming years. As part of the endeavour, a development initiative labelled Subject Area Design Labour Market has been conducted. An important result of the initiative was a plan that describes what Statistics Sweden wishes to achieve in the short, medium and long term.

In section 2 key aspects of the work performed and the plan produced are presented. The plan itself is presented in greater detail in section 3. Section 4 provides information on Population by Labor Market Status, a new, register-based product which marks the first step towards implementation of the plan. The paper concludes with section 5, which focuses on reflections on the work carried out so far and the way forward.

¹See, for example, Luiten, Hox and de Leeuw (2020).

2. Future labour market statistics – drivers for change

2.1. Focus on the relevance of the statistics

Relevance, which is one of the main components in the concept of quality as regulated by Statistics Sweden's Ordinance on the quality of official statistics, has been the starting point for much of the work on Subject Area Design Labour Market.

Understanding users' information needs

Only with good insight into and an understanding of users' needs can Statistics Sweden fulfil its commitment as an agency responsible for official statistics. Accordingly, dialogue with users has been an important dimension of the work on Subject Design Labour Market and for drafting the plan.

Clarifying the purpose of the statistics

Different users have different needs. Statistics Sweden is responsible for evaluating and prioritising among those needs and for specifying the purpose of the statistics. Clarifying and communicating this has been an important part of the work on the subject area design.

When the purpose and quality requirements have been drawn up and specified, costs and respondent burden also need to be considered. The link between quality and cost is essential, although it can seldom be stated explicitly. The respondent burden is to be kept low by primarily using existing data and digital direct collection.

Comparability is an important consideration

The user dialogues held highlight that comparability over time – as well as between groups – is a core user need that must be considered when specifying the purpose of the statistics. Hence, future labour market statistics should enable comparisons over long periods of time for central target characteristics. When implementing the plan, this is an important aspect to consider.

2.2. The statistics are modernised and future-proofed

Design based on new conditions

To ensure that Statistics Sweden uses existing resources efficiently, and at the same time reduces the respondent burden, it is essential to establish an approach that, over time, leads to an increasing element of register-based statistics. The goal is to establish an approach that ensures fully developed register-based labour statistics at any given time, based on the prevailing conditions. This approach includes regularly evaluating the applied solutions, according to a set schedule, and actively working to increase use of existing data² with a view to:

- improving the quality of the statistics;
- increasing resource efficiency; and
- reducing the respondent burden.

Smart data capture

Systematic efforts to ensure and increase access to data, including administrative data, is an important task for Statistics Sweden. Central elements include external monitoring and cooperation with existing and potential data suppliers. Ultimately, it is a matter of taking responsibility for the use of resources and the respondent burden. Such an approach calls for Statistics Sweden to work actively with other government agencies to increase access to relevant administrative data. This may involve new data as well as existing data that becomes available at a higher frequency. Revising existing, as well as establishing new, forms of cooperation is part of the plan.

Direct collection of data also needed in the future

Despite an increasing focus on register-based statistics, direct collection of data will still be needed in the future as a basis for:

- evaluating the quality of register-based statistics;

²This also includes data that are *not* used today in the scope of the production of official statistics.

- estimating models that can be used to produce statistics; and
- producing statistics concerning information needs that cannot be met using register data.

Sample sizes, survey scope and frequency of the statistics will be determined by and adapted to access to register data, prioritised user needs, and Eurostat and International Labour Organisation requirements. However, the overarching aim is that the future labour market statistics are to be register-based and sample-assisted, rather than sample-based and register-assisted.

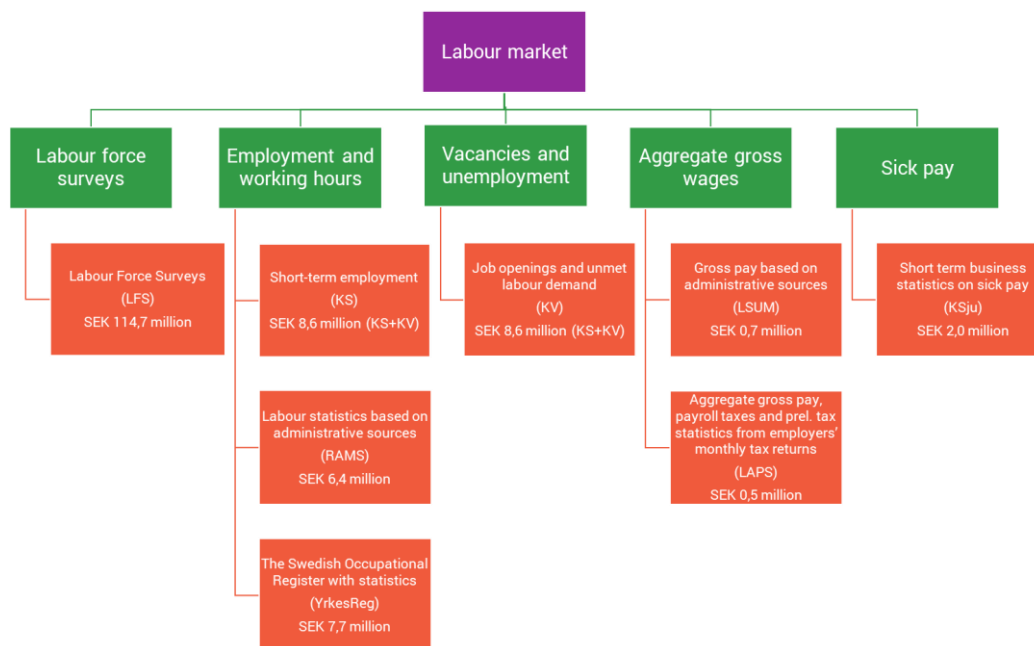
More analysis – expanded content and improved capacity

To realise the potential of greater use of existing data, Statistics Sweden needs to consider an increased use of more complex methods – and models – in its statistical production. The more complex methods are used, the greater the capacity and capability for analysis need to be. Thus, the capacity and capability partly need to be dimensioned based on the type of methods and models that Statistics Sweden intends to use going forward. In addition, Statistics Sweden intends to carry out more analysis-related activities to better explain the statistics and put them into context, as well as adding other statistics and analysis as needed.

3. A plan for future labour market statistics

This section includes a description of the plan the initiative Subject Area Design Labour Market resulted in. The starting position for Statistics Sweden in terms of official statistics in the subject area Labour Market is shown in Figure 1.

Figure 1. Statistics Sweden’s current statistical areas and products within the subject area Labour Market (appropriations income 2020)



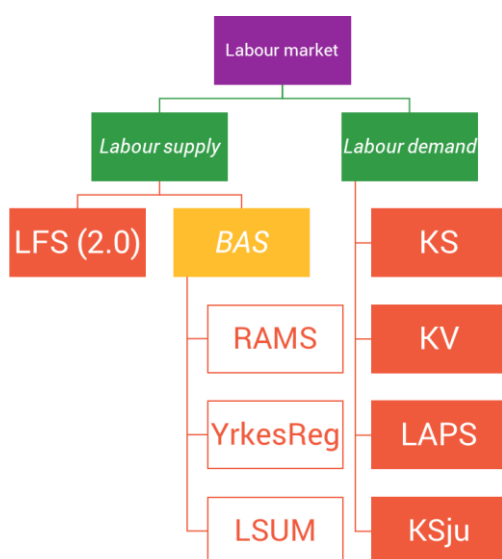
Green rectangles in Figure 1 indicate the statistical areas³ for which Statistics Sweden is responsible today, while orange rectangles indicate the products that make up official statistics. The statistics are reported *yearly* for Labour statistics based on administrative sources (RAMS), Gross pay based on administrative sources (LSUM), and the Swedish Occupational Register with statistics (YrkesReg), *quarterly* for Aggregate gross pay, payroll taxes and preliminary tax statistics from employers’ monthly tax returns (LAPS), Short-term business statistics on sick pay (KSju), Job openings and unmet labour demand (KV), and Short-term employment (KS), and *monthly* for the LFS. In addition, for the LFS, statistics on the reference periods’ quarter and year are reported quarterly and yearly.

³ A review of all statistical areas is under way; Subject Area Design Labour Market has taken part in the process of proposing the statistical areas for which Statistics Sweden should be responsible.

The plan for the future labour market statistics is therefore divided into three stages. Each stage of the plan is illustrated by a figure that shows the intended product structure at the end of the stage. At each stage, settling quality requirements, e.g., in terms of content, accuracy and comparability, for the statistics will constitute an important part of the work needed to implement the plan.

Plan in the short term

Figure 2. Statistics Sweden’s statistical areas⁴ and products in the subject area Labour Market in the short-term⁵



- *Population by Labour Market Status – future register-based labour market statistics on the supply side*

In the short term, a new, mainly register-based statistical product will be established in the labour market area – Population by Labour Market Status (BAS). This product will form the basis of register-based statistics regarding individuals in the labour market. As part of its content BAS will include the

⁴ The statistical areas in the figure are based on a future breakdown in the statistical areas. Until the new statistical areas are determined, BAS is handled in a way that works with today’s statistical area breakdown.

⁵ Text in italics refers to proposed designation. The figure shows which products remain (orange rectangles), which products are new (yellow rectangles) and how existing products (white rectangles) fall under these.

statistics that are currently presented in the context of three existing statistical products. BAS is discussed in more detail in section 4 below.

- *LFS 2.0 – further work to improve accuracy*

Statistics Sweden will continue to develop the sampling design and estimation procedure in the LFS to improve accuracy. As an initial step, an EU-financed project will be carried out with the goal of completing the alignment of the LFS to the new European legislation that applies as of 2021. This task includes an review of the LFS from a sampling and estimation perspective. Work on the sampling design aims to utilise existing register data, in particular AGI, to adapt it to the precision requirements resulting from the new legislation. Work on the estimation procedure involves investigating the composition of the auxiliary vector that is used to determine whether it is possible to further improve the solution introduced in 2021.

These efforts aim to ensure that existing resources are used even more efficiently. A considerable share of LFS costs is related to data collection, which is currently carried out via telephone interviews. As it has become increasingly difficult to reach, and conduct interviews with, selected persons, more resources have been allocated to efforts aimed at increasing the response rate. Since such efforts tend to be more resource-intensive than carrying out interviews, the non-response trend has led to higher costs for LFS data collection.

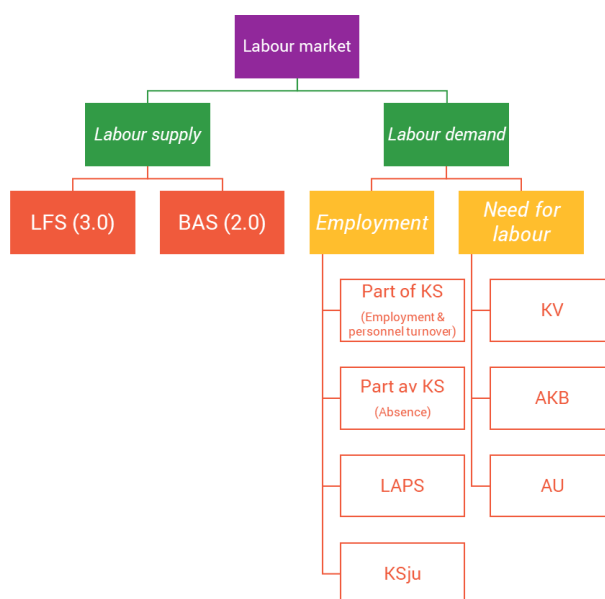
- *BAS and LFS – coherent analysis and communication*

The introduction of BAS, which contains target characteristics that touch on some of the target characteristics included in the LFS, as well as the Swedish Public Employment Service's operational statistics, places high demands on Statistics Sweden's ability to coherently analyse various statistical sources. In addition, the analyses that will be performed need to be clearly communicated, so that the various purposes of the statistics are clarified to users. Thus, procedures and working methods will be drafted for both coherent analysis and the communication of results. This work is an ongoing task that will remain in place over time.

Plan in the medium term

In the medium term focus will be on exploiting the opportunities provided by AGI in the statistical area Labour demand. This means that an even larger part of the labour market statistics will be register-based, and that the amount of directly collected data will be reduced.

Figure 3. Statistics Sweden’s statistical areas and products in the subject area Labour Market in the medium term⁶



Also at this stage the products will be adapted, resulting in fewer products. In total six products on the demand side, two of which are currently not classified as official statistics, will be replaced by two new products. One of these will make use of the opportunities provided by AGI, while the other product will provide a comprehensive approach on information needs concerning employers’ demands for labour. The two can be considered to represent met and unmet demand for labour.

- *Employment*

Statistics will introduce a new statistical product in the labour market area, with the working name Employment. This is a hybrid product that will replace the current statistical products KS, LAPS and KSju.

⁶ Text in italics refers to proposed designation. The figure shows which products remain (orange rectangles), which products are new (yellow rectangles) and how existing products (white rectangles) fall under these.

The periodicity will initially be quarterly, but in the long term, both periodicity and reporting will follow BAS. Investigation work carried out in the scope of Subject Area Design Labour Market points to the potential of replacing parts of the data currently directly collected in KS with data from AGI, although some key issues remain to be investigated. The product Employment assumes that these have been addressed satisfactorily and will reduce the amount of direct data collection. Furthermore, the need for direct collection has been coordinated in the scope of a single sample survey, rather than today's two, with a main focus on data on absence.

In addition to reducing the respondent burden, Employment will create better conditions for coherence between the various components of the statistics. When the statistics produced today in the scope of various products will be combined into a single product, there will be a need for a comprehensive description of the statistics, with a focus on coherence and numerical consistency. The use of AGI also creates conditions for numerical consistency between parts of the supply and demand side of the statistical description of the Swedish labour market.

- *Need for labour*

Three existing sample surveys directed at employers will be merged into a single sample survey concerning the need for labour. This survey will address the main user needs that are currently met by KV, the Labour Market Tendency Survey (AKB), and the Swedish Public Employment Service's employer survey (AU). A merger will reduce the respondent burden and free up resources for both Statistics Sweden and the Swedish Public Employment Service.

As a result of the introduction of the products Employment and Need for labour, Statistics Sweden will need to continue to work on questions linked to coherent analysis and communication of official statistics that concern the demand side of the labour market.

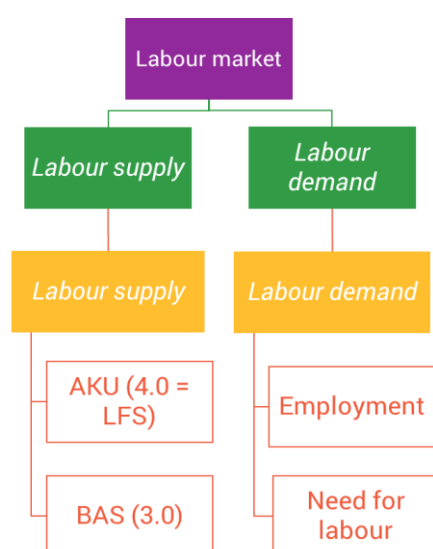
The plan for the medium term also foresees initiatives related to BAS and LFS. Regarding BAS, focus will be on further development of BAS in terms of content. For

LFS, emphasis will be on further investigating and gradually introducing changes with the aim of reducing costs primarily for data collection. During the period, mixed mode data collection, introducing an online questionnaire as an alternative to a telephone interview, will be introduced in LFS.

Plan in the long term

Figure 4 shows a summary of the plan in the long term.

Figure 4. Statistics Sweden’s statistical areas and products in the subject area Labour Market in the long term⁷



In the long term the labour market statistics for which Statistics Sweden is responsible will consist of two products, one per statistical area. Both products are hybrid products, i.e., some statistical values will be based on register data, while others will be based on directly collected data. As each product comprises internally coherent and consistent statistics, the boundary between register-based and sample-based statistics becomes less relevant. This indicates a clear shift from today’s statistics that are mainly sample-based with register-based elements, to statistics that can be described as register-based with sample-based elements.

Conditions for coherence and co-analysis of various elements of the statistics have improved and value added can be created for users, for example in the form of

⁷ Text in italics refers to proposed designation. The figure shows which products are new (yellow rectangles) and how existing products (white rectangles) fall under these.

expanded content or improved descriptions of the statistics. The respondent burden has decreased significantly. Given the circumstances, the statistics are fully developed in terms of the use of existing register data.

4. Population by Labour Market Status – the first step towards implementation

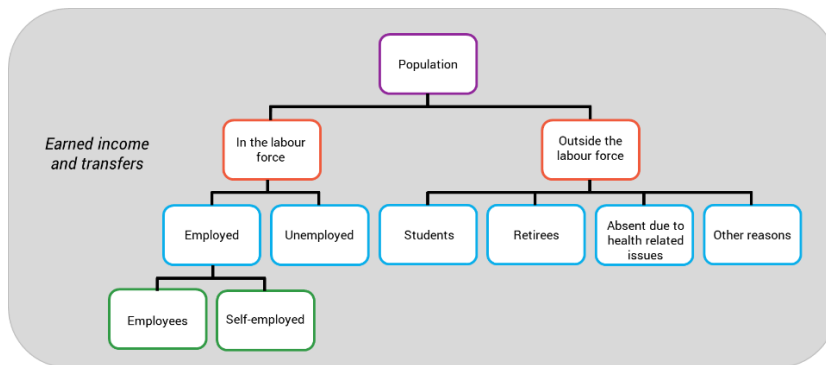
Population by Labour Market Status, which goes under the name Befolkningens arbetsmarknadsstatus (BAS) in Swedish, marks the first step towards implementation of the plan. BAS is a statistical product which provides register-based statistics on the supply side of the labour market. The product BAS was introduced in May 2022, when monthly and quarterly estimates for the period January 2020 – March 2022 were published.

AGI from the Swedish Tax Agency is a central data source for BAS. These data are supplemented by other register data from several other government agencies. BAS is intended to meet information needs that until recently were met by the products RAMS, YrkesReg and LSUM. Thus, in the initial step, Statistics Sweden's official statistical products within the subject area Labour Market will be reduced from eight to six.

The introduction of BAS has resulted in an expanded register-based content with more target characteristics and a higher frequency than today's register-based labour market statistics. The latter, in particular, is a major change compared to the previous situation. In the short term, BAS means a raised level of ambition for Statistics Sweden's production of labour market statistics.

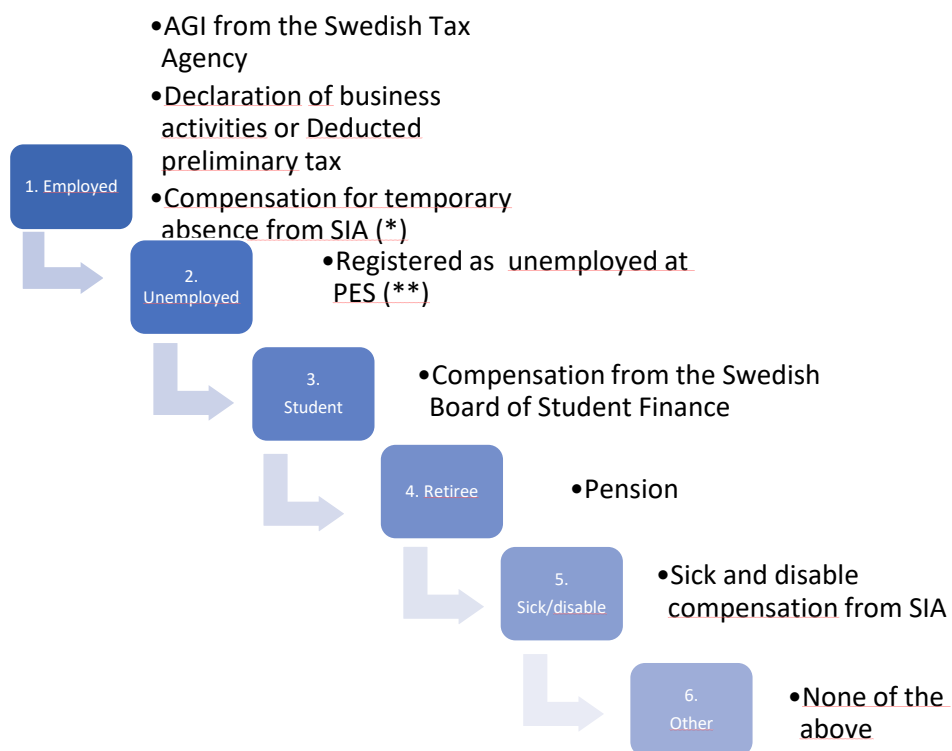
In BAS, the Swedish population is subdivided into six different categories through combining monthly administrative data from seven authorities with the national population register. The categorisation is done for the reference period month. The categories are represented by the blue boxes in figure 5.

Figure 5. Main Target Variables in Population by Labour Market Status



Labour Market Status is the main target variable in BAS. Production wise, the variable is derived monthly, using administrative data as described in Figure 6.

Figure 6. Establishing Labour Market Status – a schematic description



(*) SIA: The Swedish Social Insurance Agency

(**) PES: The Swedish Public Employment Service

For individuals having the status Other after the steps in Figure 6 have been carried out, an additional step is added. In this step, tax declaration data from the other Nordic countries is used to identify individuals who most likely have been employed abroad. Consequently, part of the individuals having the status Other after the steps described in Figure 6, end up having the status Employed after the final, additional, step, has been carried out.

BAS will also hold information about Earned Income and Transfers in the population, as indicated by the grey background in figure 5. The variable provides information on whether or not the person receives economic aid, etc. In combination with Labour Market Status, Earned Income and Transfers provides information on the person's attachment to the labour market.

As BAS allows for the statistics to be presented for several domains, some of which are very small in terms of number of people, it was necessary to find a method for disclosure avoidance that would work for many table outputs. The method chosen was the Cell Key Method (CKM), originally developed for frequency tables by the Australian Bureau of Statistics and designed to achieve a balance between necessary protection and a minimum of information loss. With CKM, random noise is added to table cell frequencies in a controlled manner. The implementation of the method included choice of parameters, practical considerations, concerns about how to communicate the used method to the users, and adaptation to the specific circumstances of the new product. CKM guarantees consistency between table outputs, that is every time the same table is produced, or the same cell appears in a table, the same noise is added. The method does not guarantee additivity, implying that users should be aware that further processing of published tables might increase the noise in a manner not intended by the producer.

If the development goes according to plan, BAS will be classified as official statistics as of 2023. By then, BAS will include the statistics that are currently presented in the scope of RAMS, YrkesReg and LSUM. Statistics Sweden will present monthly estimates for the reference period month.

Over time, the content in BAS will be expanded gradually, with more statistics mainly based on register data. This will lead to more comprehensive reporting, and may include supplementary employment measurements, statistics on economic

compensation combined with labour market status, and, hopefully, model-based statistics on hours worked. Statistics Sweden will strive to establish cooperation with other actors, with a view to increasing access to relevant data. Other government agencies and their administrative data constitute a central element. Statistics Sweden will also work actively to make it easier for employers to supplement data from their administrative systems through so-called machine-to-machine solutions. Examples of such data that Statistics Sweden, based on users' needs, would like to have access to and include in BAS are:

- Type of employment
- Hours worked
- Working period that the salary payment refers to
- Agreed working hours
- Agreement form
- Holidays and other time off work and related remuneration
- Sick leave and related remuneration
- Extent of employment
- Agreed wages or salary

5. Concluding remarks

As indicated by the title, the development initiative Subject Area Design Labour Market was launched with the intention of future-proofing Sweden's official labour market statistics. This is by no means an easy task. The plan presented in this paper is the result of work conducted in 2019-2021. During this period, a number of activities were carried focusing on the next step – the implementation of the plan, All in all, more than 50 people participated to some extent, in deriving the plan or in preparing for the next step. Taking this into account, the term endeavour seems appropriately chosen.

When the plan was presented in May 2021, some categorised it as ambitious and others as bold. Others still claimed it was unrealistic. However, the work carried out until May 2021 only marked the beginning of a journey. Since then, several steps have been taken in order to implement the two first stages of the plan. The

introduction of BAS, which was discussed in some detail in section 4, marks a huge step towards implementation of the first stage. The first statistics, presented in May 2022, were well received by the users. Resources have also been allocated to prepare for implementation of the second stage of the plan, aiming for introduction of the new products Employment and Need for labour already in 2023.

In moving forward, an increased use of existing data, in particular administrative data from other government agencies, has been a very important component of the work carried out. Such data provide an opportunity to reduce respondent burden and lower the cost of data collection, while maintaining quality at a desired level. In fact, using administrative data to a larger extent may increase the quality, as it improves the conditions for coherency. Thus, Statistics Sweden will continue to strive for increased access to relevant data. Other government agencies and their administrative data constitute a central element. Moreover, Statistics Sweden will work actively to streamline collection of data increasing the amount of data that can be collected using “machine-to-machine” technology. An important dimension of this work involves ensuring that the requested data as far as possible correspond to the data present in, or in connection to, administrative systems, that many respondents use.

6. References

Luiten, A., Hox, J. and de Leeuw, E. (2020). Survey Nonresponse Trends and Fieldwork Effort in the 21st Century: Results of an International Study across Countries and Surveys. *Journal of Official Statistics*, vol.36, no.3, 469–487.
<https://www.sciendo.com/article/10.2478/jos-2020-0025>, accessed 2022-06-17.

Statistics Sweden (2021). Subject Area Design Labour Market – Final report. Statistiska centralbyrån.
<https://www.scb.se/contentassets/4151635ea4b74b22a3ba8ecc0c81874f/subject-area-design-labour-market-final-report-may-2021.pdf>, accessed 2022-06-17.