

Main Methodological challenges at Statistics Sweden

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Abstract

National statistical institutes are navigating a rapidly changing world, where new data sources, technical advances, increased non-response rates and shifting user expectations reshape the conditions for producing official statistics. At Statistics Sweden (SCB), we have identified a set of methodological challenges that we believe are central in our work to reshape production in line with our long-term strategic goals. A compilation of these challenges will guide the organization's methodological development works over the next five years.

Grouped into three themes, the development areas span the full production process: Data Capture and Use of Data, Efficient and Modern Design in Production, and Producing Statistics. Challenges are interconnected, and progress in one domain inevitably influences—and depends on—progress in others. For example, declining response rates and increasing reliance on administrative and alternative data sources enhance the need for flexible, multi-source designs. In this work we highlight the importance of strengthening SCB's capacity to evaluate new and existing data sources, develop harmonized and respondent-centred data collection methods, and expand the use of machine learning and AI—both for automation and for new analytical opportunities. We also emphasize the need to improve methods for handling non-response and bias, enhance quality assessment beyond sampling error, and support the growing use of statistical models in production. In our presentation, we outline the development areas and critical enablers. We discuss how this work can support SCB navigating an increasingly complex world.

Keywords: Future challenges, statistical methodology, Data Capture and Use of Data, Efficient and Modern Design in Production, and Producing Statistics.

1. Introduction: The Need for Change

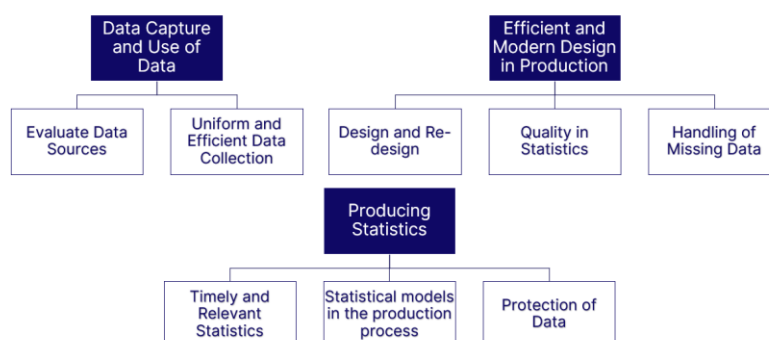
Due to changing social values, technological leaps in AI, and economic diversification, the global landscape for National Statistical Institutes (NSIs) is shifting rapidly.

For our methodologists, the mission is to ensure that statistics remain relevant, timely, and reliable despite these challenges. This paper details the "Methodological Development Areas" designed to bridge the gap between current production and the future production of statistics at Statistics Sweden.

2. Strategic Methodological Areas

To enable progress toward Statistics Sweden's strategic objectives [1] over the coming five-year period, we have identified the methodological areas that we consider having the biggest impact on our ability to meet future demands on statistical production. Areas and sub-areas are displayed in figure 1. For a full version, we refer to the original report [2].

Figure 1: Methodological Development Areas



a. Data Capture and Use of Data

Managing the shift towards re-use of existing data requires improved methods for assessing and documenting the quality of new data sources. For this purpose, we need a systematic evaluation of data content and quality, including a thorough description of how the data was generated, by whom, for what purpose, and with which quality controls.

Statistics Sweden has strong expertise in quality assessment of data when the use case is known, but we now need a system to evaluate data before a specific use is defined. Work on this has been initiated. The next step is to operationalization supported by standardized templates.

Survey data collection will continue to be an integral part in the production of statistics; therefore, it is important to create a more sustainable data-collection process. We do this by focusing on contact methods, respondent burden, and respondent behavior.

Machine learning offers new opportunities for increased automation in coding, editing, and imputation. Statistics Sweden already applies ML models in production – for example in the coding of occupation and education – and more applications are being developed.

AI also presents interesting possibilities for improving data collection by making it possible to handle unstructured data, such as text or image files. While AI can reduce manual work, its impact on statistical quality is not always straightforward. Training data may contain bias, and model development choices matter.

Another important efficiency measure is to process data as early as possible in the production flow, thereby reducing duplication of work. This requires extensive theoretical and practical considerations as Statistics Sweden develops new register systems to support the entire statistical production process.

b. Efficient and Modern Design in Production

Historically, large-scale redesigns have been limited, as they have not been a strategic priority. To strengthen redesign capacity, Statistics Sweden needs to build on previous design experiences, broaden and deepen methodological expertise, enhance the ability to assess and compare alternative designs, and strengthen competences related to multi-source statistics. This includes developing multi-source statistics, particularly methods for integrating data sources that lack unique identifiers.

Flexible design facilitates adjustments such as increased use of specific data sources or the introduction of measurements for new phenomena without requiring

a complete redesign. Greater flexibility also increases the need to link time series, ensuring that users can analyze developments over time even when statistical designs change.

Quality will greatly affect the usability of statistics. An important development area is extending quality assessments beyond the traditional sampling error. This need has been highlighted in repeated A System for Product Improvement, Review and Evaluation (ASPIRE) [3] evaluations and becomes increasingly urgent as register data and other existing data sources are more widely used. Key uncertainties related to non-response, coverage errors, measurement error, and model use must be made visible and actively managed.

New data sources introduce new forms of uncertainty that must be evaluated and communicated in quality documentation. Also, when experimentation with new technologies, methodological frameworks are needed to assess the quality of AI-based applications and to ensure compliance with the requirements of official statistics.

Statistics Sweden must furthermore develop methods to adjust for bias when collected data do not reflect the target population. Non-response is particularly pronounced in hard-to-survey groups, increasing the risk of biased estimates. There is a clear need for shared, end-to-end approaches to managing these uncertainties throughout the entire statistical process, from design to analysis.

c. Producing Statistics

Statistics Sweden must meet growing user expectations and provide statistics that are more timely, accurate, and that gives a detailed picture of our changing society. This must be done underpinned by robust legal, ethical, and secure data handling, in order to maintain public trust in official statistics. Statistics Sweden needs to further develop new applications of statistical methods to reduce the production time, particularly methods to handle high-frequency time series and irregularly collected data. This together with incorporating these methods by using new types of data sources in a larger extent in the production.

Statistics Sweden see potential to increase the use of models in several phases in our production such as the design, processing, and analysis. We have a solid foundation to build on, but continued broadening and deepening of methodological expertise is essential to maximize the benefits from using models appropriately applied within the framework of official statistics.

Developing our production by, in a larger extent than today, re-use of data for different purposes and using new types of data, together with the expectation to publish statistics on a more granular level, leads to new need for solutions when it comes to disclosure control. SCB has the recent years implemented noise-based methods, primarily through the Cell Key Method (CKM) for this purpose. The next step is to further develop and expand the use, including noise-based methods for magnitude tables.

3. Success Factors

For these developments to succeed, several key conditions need to be in place.

Internal collaboration, across methodological-, subject-matter-, data-, and IT-functions, as well as external collaboration, with data providers and international partners, is essential for successful knowledge exchange and shared learning.

Statistical production must be flexible and supported by working methods, tools, and routines that enable agile testing and development. A strategic approach to skills development is needed to secure critical competencies over time. In addition, robust technical infrastructure, including suitable programming environments and test facilities, is fundamental.

Methodologist should take an active leadership role in assessing and communicating sound methodological choices.

Finally, clear priorities and resource allocation is necessary to ensure impactful and sustainable development.

4. Conclusions

Further development in these methodological areas is needed to support the transformation outlined in Statistics Sweden's strategy. At the core of this work lies the area of Design and Redesign, as well-conceived design forms the foundation of efficient statistical production and provides the basis for progress across all other areas.

The identified development areas are intended to guide methodological work over a five-year horizon. To remain relevant in a changing environment, they are subject to continuous review. Direction and priorities will be assessed regularly, as part of the annual planning process.

Appendix: List of references

- [1] Statistics Sweden's strategic objectives, [scbs-strategi-2025-2030-uppdaterad-25-02-26.pdf](#) (scb.se).
- [2] SCB:s metodutvecklings områden, Internal rapport Dnr2025/923, 2025.
- [3] A System for Product Improvement, Review and Evaluation (ASPIRE), [Quality work](#) (scb.se).