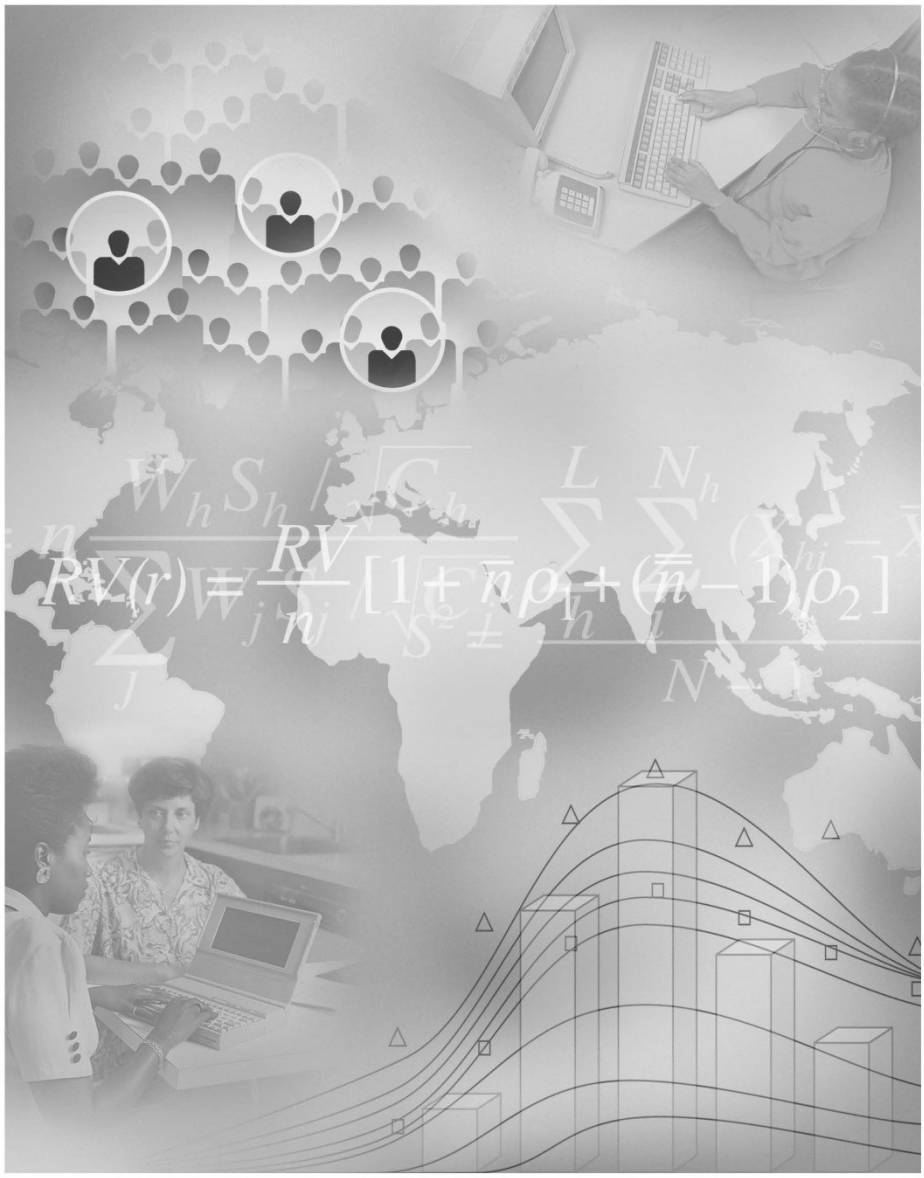
the Survey Statistician

The Newsletter of the International Association of Survey Statisticians

No. 84 **July 2021**



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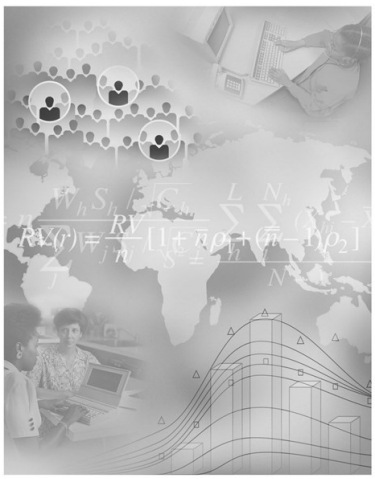

The Survey Statistician No. 84, July 2021

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In this Issue

Letter from the Editors

Dear readers,

We are glad to present you the July 2021 issue of TSS.

First of all, it includes the last *Letter from the President* by Denise Silva and the last *Report from the Scientific Secretary* by James Chipperfield. They complete their tenure, and have accomplished their duties. We thank both of them for a most pleasant cooperation during two years and for their human warmth, which helped to prepare TSS issues.

The current issue includes personal events, joyful and sad, about some members of IASS as well as material on new and timely topics. “The age of statistics is being replaced by the data era”, says W. Rademacher who presents a paper on standardisation in statistics. Similarly, the big data context is used to describe applications of Machine Learning in official statistics by P. Daas and M. Puts. A lot of relatively new methods – non-traditional for earlier sampling theory textbooks – are included in the book reviewed by J.-K. Kim. Classical survey sampling cannot escape the “data era” and they are still very topical. Results of the project initiated by Eurostat on non-sampling errors in surveys to estimate social inequality indicators are presented in the paper by P. Lynn. As usual, you will find country reports, information about the contents of other journals, upcoming conferences and workshops. Perhaps the most interesting item is the list of 18 IASS-sponsored invited sessions at the WSC 2021 included into the Report from the Scientific Secretary.

We would like to thank everybody who devoted their time in organizing and preparing material for this issue.

Two members of the editorial body are performing their tasks for the last time: IASS webmaster Harry Raymond, Australian Bureau of Statistics, updated the TSS website according to the requests of the editors and took good care of it. Technical editor Martinš Liberts, Central Statistical Bureau of Latvia updated the shape of TSS and prepared the tidy issues. Thank you, dear colleagues, it has been a great pleasure to work with you.

We would also like to wish success in future activities to Denise, James, Harry and Martinš!

At the same time, we invite new comers to join the editorial team of TSS and to become webmaster, technical editor of TSS and Editor of the section *Book and Software review*.

If you have any information about conferences, events or just ideas you would like to share with other statisticians – please do go ahead and contact any member of the editorial board of the newsletter.

The Survey Statistician is available for downloading from the IASS website at http://isi-iass.org/home/services/the-survey-statistician/.

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Letter from the President

Dear IASS members

Time flies and this is now my last letter to you as IASS president. I am grateful for your support to IASS activities in this difficult period. We had to adapt and focus on what could be done (and how), while each of us were dealing with our own challenges, worries and, many times, sadness. It is good to see that IASS has been able to provide a lively and welcoming virtual environment for the development of survey statistics, also fulfilling its capacity building role. From June 2020 until May 2021, more than 750 attendees joined the IASS webinars and short courses. Our webinar series is a well-established success and is already planned to continue. The IASS supported conferences that were postponed in 2020 are all confirmed for 2021, and a call for new requests for support to conferences was issued.

The Cochran-Hansen prize awardee, Guilherme Jacob from Brazil, was announced in April. I congratulate the winner and I express my gratitude to the 2021 Cochran-Hansen prize committee: Isabel Molina (chair), IASS Vice-President from Universidad Carlos III de Madrid, Yves Tillé from Université de Neuchâtel and Jean-François Beaumont from Statistics Canada.

IASS community members were highly active in proposing short courses and invited paper sessions (IPS) for the 2021 ISI World Statistics Congress. James Chipperfield writes about them, and the two IASS Special Invited Sessions, in his Scientific Secretary report. I want to highlight that, for the first time, there will be a special session to celebrate our newsletter The Survey Statistician, organised and chaired by Danutė Krapavickaitė.

I would like to dedicate the other traditional special session, the IASS President's and Cochran-Hansen Prize Session, to the memory of Hukum Chandra, an active IASS member, gifted researcher, winner of the 2009 C-H award, and an incredibly special person who passed away recently as one of the many lives lost to the COVID pandemic. Also, with the valuable support of Yongyi Min and Haoyi Chen (UNSD), Dennis Trewin and Paul Biemer, the invited session on "*How survey experts can contribute to the better use of citizen-generated data for public policy*" is a tribute session in honour of Lars Lyberg.

The IASS 2021-2023 officer's election is currently taking place and members can vote until July 13. Ralf Münnich chaired the Nominating Committee (NC) that was composed of Sanjay Chaudhuri, Andrés Gutiérrez Rojas, Ineke Stoop, Linda Young and Daniela Cocchi (Chair of the previous Nominating Committee). Many thanks to the NC members for their excellent work and special thanks to the candidates for their readiness to contribute in shaping the IASS future. As the current IASS Executive Committee will end its mission soon, I would like to say how pleasant it was to share the office with you. Many thanks for the teamwork and friendship. I welcome Monica Pratesi as the future IASS President and wish all the best for her term in office.

Once again, I praise the members of IASS community who devote their time to our association. The TSS is a shining star 😊. I am sure you all appreciate the excellent articles and value the work to make it happen. I thank the main editors, section editors, the authors/contributors and all those involved in its production and circulation. We are looking for a volunteer to substitute Mārtiņš Liberts who has been taking care of TSS production for the last three years, and another one to join the TSS editorial team as the Book and Software Review section editor. Also, Harry Raymond who has been IASS webmaster for two years is planning to leave this position. I am really grateful for their valuable work and commitment. IASS needs your help to recruit new volunteers willing to take these roles.

Our General Assembly will be held virtually on July 6. I wish we could all be in the same place and share hugs. On the other hand, a virtual event allows the attendance of members from all over the world without travel costs. Coming from a country that still faces inequality in digital inclusion, I hope that the new communication paradigm will lead to a reduction in social and knowledge disparities. In this challenging environment, more and more, IASS reaffirms its value, bringing together people from different places, exchanging information, bridging gaps, offering training, proposing new subjects for development, and comforting with a sense of belonging.

I wish the IASS community continues to thrive and that we succeed in attracting new members. My plan is to be part of this community for many years to come and I hope you will be as well.

Warm regards,

Denise Silva

denisebritz@gmail.com

Report from the Scientific Secretary

In this report I introduce the article in the New and Emerging Methods section, list upcoming IASS webinars and IASS-sponsored invited sessions at the WSC 2021, and reflect on the IASS.

It is not possible to include all interesting news in this report. However, the monthly newsletters are an excellent way of keeping members informed. Check them out at http://isi-iass.org/home/services/newsletters/.

As this is my final report as IASS Scientific Secretary, I would like to add that it has been a rewarding 2 years. The highlight has been making connections with other statisticians across the world. I would especially like to thank Denise, President of IASS, who has been a delight to work with (😁🤗).

New and Emerging Methods

The article in the *New and Emerging Methods* section is called *Official Statistics – Quo Vadis*, by Walter J. Radermacher. It is a philosophical article that explores the expanse between reality and statistics using, as a navigation tool, the concepts of individualisation and standardisation. From the title, which translates as "Where are we going?", Walter is challenging us to not lose sight of the fundamental precepts of statistics in this Big Data age.

The format of the *New and Emerging Methods* articles is 8–10 pages and should cover the presenting challenge, the methods and their application, and the relevance to the development of survey methods. Please contact your new IASS executive if you are interested in writing such an article for future editions of *The Survey Statistician*.

Webinars

The webinars have been popular for our members (and others!). We frequently get attendance of 50-100 people. A list of previous IASS webinars is at http://isi-iass.org/home/webinars/ and the recordings are available at https://www.isi-web.org/events/webinars. The IASS was also pleased to have its first Francophone Webinar earlier this year!

Future webinars will be advertised at https://www.isi-web.org/events/calendar, in IASS newsletters, and in emails to members. I can give you a preview of what is to come this year:

- 26th August 2021, 1:00 PM (CET): *Building a Sample Frame of SMEs Using Patent, Search Engine, and Website Data*[1] (Sarah Kelley, Sanjay K. Arora).
- September 2021: *Targeted or lagged walk sampling for estimation of finite-order graph parameters* (Li-Chun Zhang).
- Late November or early October 2021: *Implementing Adaptive Survey Design with an Application to the Dutch Health Survey*[2] (Barry Schouten and Kees van Berkel).
- 23rd November 2021 12pm (noon) CET: *Presentation by the Inter-secretariat Working Group on Household Surveys, United Nations*.
- December 2021: *To be Advised* (Ray Chambers).
- February 2022: *Three-Form Split Questionnaire Design for Panel Surveys* (Paul Imbriano).

[1] https://sciendo.com/article/10.2478/jos-2021-0001
[2] https://sciendo.com/article/10.2478/jos-2020-0031

IASS Website

I would like to thank Harry Raymond, Australian Bureau of Statistics, who has been the IASS Webmaster for the last 2 years. He has been responsible for keeping our website up-to-date. Harry is planning to leave the role very soon but I understand he will be available to help with the transition to the next Webmaster. Please contact your IASS Executive Committee if you are interested in the Webmaster role.

WSC 2021

In total 18 IASS-sponsored invited sessions have been accepted for the WSC 2021, including two Special Invited Sessions. See details below. Our association is alive and well!

Invited Sessions	**Organiser**	**Affiliation**
COVID-19 and household surveys: what have we learned and what does it mean for the future?	Haoyi Chen	Intersecretariat Working Group on Household Surveys
New Data Sources Meet Household Surveys: Scaling-up Innovation for Official Statistics	Haoyi Chen	Intersecretariat Working Group on Household Surveys
Counting People with Administrative Data instead of a Traditional Census	James Chipperfield	Australian Bureau of Statistics
The Evolution of the 21st Century Census of Population and Housing	James Chipperfield	Australian Bureau of Statistics
Model-based estimation of binary and count survey data at granular levels	Andreea Erciulescu	Westat
Recent Advances for Estimation and Imputation in Complex Surveys	Scott Holan	University of Missouri
Women's Roles in the new, post-pandemic world	Jessica Kohlschmidt	OSU CCC
Women in survey sampling research and practice	Alina Matei	University of Neuchatel
Past, Present and Future of Women in Statistics and Data Science	Guadalupe Gomez Melis	Universitat Politècnica De Catalunya – Barcelonatech
How survey experts can contribute to the better use of citizen-generated data for public policy	Yongyi Min	UNDESA
Statistical methods for assessing the effectiveness of e-learning during the COVID-19 era	Cristina Mollica	Sapienza University of Rome
Inference under non-probability samples and big data: Data integration	Isabel Molina	Universidad Carlos III Madrid
SDGs indicators: methods to analyze survey data to monitor/measure vulnerabilities	Monica Pratesi	University of Pisa – Centre Dagum
Modelling Population Nutrition Outcomes with Historical Survey Data in South Sudan	Saeed Rahman	REACH Initiative
Trusted Smart Surveys	Shari Stehrenberg	Destatis

Two Special Invited Sessions:

- *The IASS President's and Cochran-Hansen Prize Invited Session* will involve presentations by Raymond Chambers and Thomas Lumley who will talk about the blend of survey sampling and statistical modelling for the production and analysis of survey data. The organiser of the session is Denise Brtiz do Nascimento Silva.
- *Issues with big amounts of data for survey statistics* is in response to the growing interest to produce Official Statistics using non-probability sample data, such as big data or data from volunteer web surveys, either alone or in combination with probability sample data. This session is based on papers previously published in the TSS. The session will have presentations by Paul Biemer, Ashley Amaya, Jean-Francois Beaumont, Anders Holmberg, and Frauke Kreuter. The organiser of the session is Danutė Krapavickaitė.

Sharing ideas within IASS

I wonder if IASS could provide an easy way for members to share ideas and discuss problems. For example, consider a member who is beginning a research program to develop sample selection in the BigData era. I was wondering whether the IASS' role could support someone in that position to get quick and insightful guidance from experts within our community. Perhaps a question for the next executive to consider…

James Chipperfield

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IASS Scientific Secretary

News and Announcements

Lars Lyberg obituary

Adapted from an obituary published by the Royal Statistical Society

Lars was born near Stockholm on 1 December 1944 and passed away on 9 March 2021 after a long battle with pancreatic cancer. He was President of the International Association of Survey Statisticians from 1993 to 1995.

He spent much of his early life in early Stockholm where he studied statistics at Stockholm University gaining a Doctorate under the supervision of Tore Dalenius. Like most Swedes he had a stint of military service. He started his professional work career at Statistics Sweden in 1966 and spent the next 44 years there culminating in his appointment as head of the Research and Development Department. After retiring from Statistics Sweden, he worked as a consultant in survey methods and quality management. Since 2003 he taught at Stockholm University with professorial status in recognition of his past contributions.

Although he was a very effective statistician at Statistics Sweden specialising in survey methods, he was probably best known for his external contributions. Some of his notable achievements were as follows.

- He was the Developer and Founding Editor of the Journal of Official Statistics in 1985 which continues to perform strongly with a high impact factor. He was Editor-in-Chief for 25 years.
- He was an elected member of the International Statistical Institute, a Fellow of the Royal Statistical Society and the American Statistical Association.
- He wrote or edited twelve Conference volumes on survey methods. Most have been published by Wiley for whom he also acted as an advisor. The latest was a volume on *Big Data Meets Social Science: A Collection of Innovative Methods* which was published in 2020. He completed his very significant contribution even though he was seriously ill at the time.
- He jointly wrote the highly regarded *Introduction to Survey Quality* (with Paul Biemer) and numerous journal articles on survey methods and quality.
- He represented Sweden in the development of ISO Standard 20252 on Market, Opinion and Social Research.
- He taught methodology issues in the survey field in over ten countries.
- He was the winner of the 2012 Waksberg Award for his lengthy and valuable contribution to survey methodology.
- He was a member of the European Statistical Governance Advisory Board.
- He won the 2013 American Association for Public Opinion Research (AAPOR) with his co-editors for the book on *Survey Methods in Multinational, Multiregional, and Multicultural Contexts* (2010).
- He won the 2013 AAPOR Helen Dinerman Award as well as their 2018 Lifetime Achievement Award for significant contributions to survey research methods.

- He won the Swedish Statistical Association's statistician of the year award in 2019 for extraordinary achievements in statistics to the benefit of society.

He had many interests besides statistics especially sport where he had encyclopaedic knowledge not just about Sweden. He was an excellent tennis player in his younger days. Although modest by nature, he was generous of his time especially to young survey researchers. He was always a careful listener often leaving his contribution to discussions to the end after hearing what others had to say.

I first met Lars in 1983 whilst visiting Statistics Sweden and connected immediately. We exchanged knowledge on statistical methods gained through our work in our respective statistical organisations and met regularly after this first meeting, enjoying watching live sporting contests as well as televised matches over a few beers. Lars' is survived by his partner Lilli Japec, a fellow statistician at Statistics Sweden, who became head of Research and Development subsequent to Lars' retirement. He has two adult sons, adopted from Bolivia during his first marriage. Lars was tall and blonde whereas his sons were short and dark. It made for interesting discussions at immigration posts when travelling with his sons.

Lars has been one of the giants of survey methods. He will be sorely missed by his friends, colleagues, and students across the globe.

Dennis Trewin

In memory: Lars Lyberg

Doctor of Philosophy in Statistics Lars E Lyberg, Tyresö, has, as previously announced, passed away at the age of 76 years. The closest relatives are his wife Lilli Japec and sons Luis and Carlos with families.

Lasse worked at Statistics Sweden (SCB) during the years 1966–2010. He was employed as an extra actuary and continued his doctoral studies at Stockholm University in parallel under the supervision of Tore Dalenius, whose views on statistics and quality came to characterize Lasse throughout his professional career. Lasse defended his dissertation in 1981 with the dissertation "Control of the coding operation in statistical surveys: some contributions".

In 1985, Lasse was appointed Chief Statistician by the government and the same year he founded Statistics Sweden's scientific journal Journal of Official Statistics (JOS), for which he was editor-in-chief for many years. JOS has undergone contributions to spread the statistical survey science globally. In connection with its 20th anniversary, some of the world's leading survey statisticians wrote a tribute called the *Journal of Obnoxious Statistics*, a memory that delighted Lasse a lot. During the years 1993–1998, he was director at Statistics Sweden's development department.

With his work, Lasse has contributed to developing areas such as coding, measurement and interview technology. His broad view of quality issues was expressed in, among other things, the standard work "Introduction to survey quality", which he wrote together with his friend and colleague Paul Biemer. Lasse was the initiator of Statistics Sweden's major quality investment in the mid-1990s, which then formed the basis for much of the quality work at Statistics Sweden until today. Within EU cooperation, Lasse was also active and initiated the Q2001 conference in Stockholm in 2001. It has since been followed by Q-conferences every two years.

After retiring, Lasse continued his activities within Statistics Sweden's Scientific Council. Over the years, Lasse has received many international awards. In Sweden, he became Statistics Promotion of the Year 2019.

The colleagues at Statistics Sweden through **Mats Bergdahl-Kercoff, Folke Carlsson, Joakim Malmdin and Joakim Stymne**

A tribute to Seppo S. Laaksonen

Seppo Sakari Laaksonen, ISI Elected member since 1994 and Professor Emeritus of University of Helsinki, passed away of a serious illness on December 20, 2020, in Helsinki, Finland. He was 76 years old.

Seppo Laaksonen (1944-2020)

Over the years, Seppo served the survey statistics community in many significant ways. As IASS Scientific Secretary and Vice President he contributed to the success of many important scientific events of the IASS and ISI, including the 52nd ISI Session in 1999 in Helsinki. Promoting statistical literacy among young people and adults was close to him. He participated in the IASE's International Statistical Literacy project ISLP as the Finnish country coordinator. One of Seppo's long-term activities focused on disseminating good statistical practices among students and professionals, mainly in transition economies. He was often a teacher at the annual educational events of the Baltic-Nordic-Ukrainian Network on Survey Statistics.

Seppo was an active researcher in survey statistics and applications. Good examples are his pioneering work on administrative registers for survey statistics, the treatment of missingness in surveys, and the methodology of multinational surveys. A firm basis for empirical research in these areas was provided by his strong expertise in Statistics Finland's micro-merged longitudinal population and business registers and sample survey databases. In this framework, he organized significant international conferences and workshops, including the Sixth International Workshop on Household Survey Nonresponse in 1995 at Statistics Finland and the first CAED (Comparative Analysis of Enterprise Data) conference in 1996 in Helsinki.

Before his academic career, Seppo Laaksonen worked at Statistics Finland in various positions. He also worked for Eurostat, the statistical office of the European Union. Since 1970's, he played a major role in the methodological advancement of the official statistics system of Finland. He had a significant academic career at the University of Helsinki. Several student generations enjoyed his courses on survey statistics. Seppo retired in 2012 as Professor of Social Statistics.

After retiring, he continued his international activities and research. His last book, *Survey Methodology and Missing Data, Tools and Techniques for Practitioners*, was published by Springer in 2018. The last research paper was on happiness research, a late scientific hobby. The paper entitled as *Age happiness is more complex than U-shaped* was published in Journal of Happiness Studies in 2018.

Seppo was an enthusiastic sportsman. He loved long-distance rowing on inner lakes and cross-country skiing. The tale of Southampton University from the summer of 2001 even tells of a cheerful visiting scientist from Finland who skied to the department every morning on roller skis. Our unforgettable friend and colleague Seppo was positive and open-minded. He will be missed.

Risto Lehtonen, University of Helsinki

Reija Helenius, Statistics Finland

The Survey Statistician, 2021, Vol. 84, 12–17.

Ask the Experts

Machine Learning from the Perspective of Official Statistic

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Abstract

Artificial Intelligence methods enable the extraction of information from large amounts of data. Machine learning is a sub field of Artificial Intelligence. In this paper, Artificial Intelligence and Machine Learning are introduced and discussed in the context of applying them to produce official statistics. The five quality dimensions of statistical output are used to identify the challenges for their application. The paper ends with a list of the most important research topics that need to be studied to enable the successful application of those methods for official statistics.

Keywords: Artificial Intelligence, Big data, Data science, Output quality.

1 Introduction

Before focusing on Machine Learning (ML), we will start by introducing the field of Artificial Intelligence (AI). AI is still a young field of science, with its official birth in the 1950s, of which ML is a sub field (Russel and Norvig, 2003). In the 1950s the main focus of AI research was on intelligence, especially mimicking human intelligence, and self-learning. The most important topics studied during that period make that clear. These topics were, rephrased in a modern context,: Simulating the human brain, Natural Language Processing, Artificial Neural Networks, Theory of complexity of functions, Self-improving algorithms, Abstracting from sensory data and Randomness and creativity algorithms (McCarthy et al., 1955). The research in the area of self-improving algorithms laid the foundation for ML.

In the beginning of AI research, the founding fathers were really optimistic. They expected to reach human intelligence within a couple of years (Mitchell, 2019). However, this goal has still not been achieved today. Clearly, human intelligence is much more complex than originally expected. Nevertheless, algorithms that evolved from the field of AI are currently being used in a whole range of areas for a multitude of applications and, although many scholars would argue that the field of AI as such has failed (see, for instance, Sowa, 2014), these algorithms are very successful (by)products (see, Royal Society, 2017, and Sejnowski, 2020).

Essentially, ML algorithms work by discovering structure in data, i.e. 'learn from data'. This work was inspired by statistical methods and elaborated upon by computer scientists (Russel and Norvig, 2003). ML algorithms can learn in a number of ways. The most familiar ones are i) by training them

with labelled examples, so-called supervised learning, or ii) by training them with unlabeled examples, known as unsupervised learning. In the latter case, structures are discovered by comparing the items to one-another in the data set. Advances in ML were for a long time predominantly of a technical nature; which is not unexpected considering the predominant involvement of computer scientists. Over time, ML algorithms were able to discover more and more complex relations in data. This work lay the foundation of many of the well-known successful applications of ML such as image and speech recognition, spam detection and fraud detection (Sarker, 2021). In all these cases, ML algorithms are trained on large numbers of examples that enables them, by identifying specific structures - also known as features - in the data, to successfully perform specific tasks, such as predicting classes. We are aware that these tasks also sometimes fail which have resulted in some remarkable errors (Mitchell, 2019). But in this paper we will focus on the successes.

From the above it is clear that ML algorithms are able to successfully extract information from a whole range of data sources, including those used by statisticians. However, applying ML learning algorithms to produce official statistics is still challenging (Yung et al., 2014). The most important reasons and issues are discussed in Section 2 of this paper. We will do this by looking at the quality of the output of ML algorithms because we found that this identifies the most important issues.

2 Quality of Statistics

The high quality standards of official statistics are an important reason that affect the application of ML in this area. Let it be clear that we agree that high quality standards are essential and need to be adhered, but for ML it raises a number of challenges. In this section we will identify those hurdles. To enable this we use the five dimensions defined for the output quality of official statistics in the Quality Assurance Framework of the European Statistical System (ESS, 2019). The dimensions are:

- Relevance
- Timeliness and Punctuality
- Accessibility and Clarity
- Coherence and Comparability
- Accuracy and Reliability

The dimensions Relevance and Timeliness and Punctuality are not discussed here as they do not differ when ML algorithms are applied in comparison to any other method used in producing statistics. Relevance is about the usefulness and value of the statistics for the user which is obviously not different in the ML case. Timeliness and Punctuality focus on the point in time when the results have to be published. This is also no different for ML. The real challenges are in the other dimensions of quality.

2.1 Accessibility and Clarity

This dimension indicates the need to define and fully understand the process by which results are obtained. Obviously, this is a problem for some ML algorithms and it touches the topic of explainable AI (Gunning et al., 2019). Making clear how the results are exactly obtained is challenging for many ML algorithms, in particular for Deep learning and other neural network based methods, since some of them are essentially a 'black box'. In cognitive science and neuroscience researchers work on a very similar problem. They are trying to understand the functionality of the human brain: a vast neuronal network which can also be seen as a (giant) black box. In the 1980s, David Marr (1982) describes how such a non-transparent device should be studied. According to him, to fully understand the process by which the brain processes data to come to a conclusion, it should be investigated at

three levels. These are: i) Computational theory, ii) Representation and algorithm, and iii) (hardware) Implementation. His suggestions provide valuable insights regarding the accessibility and clarity of ML algorithms.

Computational theory is concerned with the goal, the appropriateness and the logic of the process used. ML models learn or need to learn some aspects of the physical world. For instance, when we want to determine if a person on social media has, based on the messages he/she produces, COVID-19, we need to realize that this person creates its utterances in a natural language on a platform. It is the combination of the structure of the language, the meaning of the words, the limitations of the social media platform (e.g. the maximum number of words allowed in a message) and the intention of the person for sharing the message that specifies the problem the algorithm has to solve. Understanding the decisions made by a ML algorithm requires a complete comprehension of the above-mentioned properties in the 'learning from data', including its context, process.

Representation and algorithms concern the input, the output and the ML algorithm used to perform the task. What is important here is the design pattern (among others the learning method used, transformations of data,...) used in creating the model. It focuses on the entire process from the input, metadata, architecture and output perspective. The whole processing pipeline needs to be reviewed and fully understood. The choice of the algorithm is important. On the one end, choosing a more transparent and simpler algorithm may result in a better explainable model, but maybe the problem at hand is so complex that a more complex approach, like a (deep) neural network, is actually required to achieve a better result.

Implementation concerns the physical implementation of the ML algorithm. At this level, all things mentioned above are combined and implemented. Of course, the implementation consists of a program, but this program is limited by the hardware architecture and software programming language(s) used. Regarding the hardware, ML algorithms can be implemented on single core processors, multi core processors, Graphics Processing Units, Field Programmable Arrays and maybe, in the (near) future, on quantum computers. With this, we also need to make implementation decisions, and these are, of course, crucial for our understanding of the process being developed. Without understanding there is no transparency. Regarding the software, ML algorithms are often implemented in C/C++ or Java to make them run as fast as possible. Other programming languages, such as R and Python, use these implementations by deploying them. As mentioned before, the choice of algorithm is important. However, the choice for a less explainable model makes it more challenging to determine what the model has actually learned. Models can be studied in a mechanistic way (open box), by investigating what happens inside the model, or in a more functional way (black box). We suggest that it is always good to use a functional approach, maybe extended with a mechanistic approach, and determine what happens when the model is 'fed' small chunks of data.

2.2 Coherence and Comparability

In the context of ML this dimension is about how well the model is able to give a stable result over time and the correlations it has found. We will first talk about stability over time of the model, followed by a short discussion on correlation and causation.

Concept Drift. Stability of the way by which a concept is measured is very important for any model-based statistics. Because of this stationary nature, a model is able to detect changes in the number of occurrences of the concept in the population. However, when the detection of the concept is affected - because of changes in the way the concept is expressed by the population - the outcomes of the model are also affected. When this is happening, the measurements can no longer be trusted. Suppose we measure the sentiment on social media by looking at the ratio of a limited number of words with a positive and negative connotation. The measurement of this concept can be affected

by a change in the use of (one or more of) the words in a totally different context. This leads to a phenomenon called concept drift, i.e. the concept originally measured can no longer be measured in exactly the same way (Gama et al., 2014). It is important to be able to discern both type of changes: i) those resulting from an actual change in behaviour of the population included and those due to concept drift. The latter should, where possible, be corrected for. Increasing the amount of data to train the model and including new, more recently, classified cases certainly help (Daas and Van der Doef, 2020).

Correlation and causation are very important topics when applying ML. In principle ML algorithms pick up the relation between the values of variables in the data set and those of the target variable. Because of this most algorithms simply look for variables that correlate with the target variable. If this is a spurious or causal relation it is not considered. This shows a very big problem in ML (and statistics), the difference between correlation and causation. The fact that we find a correlation between two variables does not mean that there is a causal link between them and, hence, we can use one as a proxy for the other. Proving a causal relationship between two variables is quite hard. There are, however, some ways to get a clue over the causality between two variables (Pearl, 2009). Downside of some of these approaches are that they require to randomize, experiment or intervene in the data being used. When the data is given, which is for instance the case in many big data sources, such approaches cannot be used. However, natural experiments also occur and may provide new insights, for instance by comparing the situation before and during COVID. More on this topic can be found in Pearl (2009) and Schöllkopf et al. (2021).

2.3 Accuracy and Reliability

This dimension is about how far the finding is from the true value in the population. Bias and variance are the major components that affect accuracy. For official statistics it is important to have an unbiased estimator. If large amounts of data are being used, which is often the case when ML algorithms are applied, variance is usually not the major concern. Bias can be introduced in each step of the statistical process. When ML algorithms are used the most obvious causes of bias are the annotated data set used for training (and testing), the representativity of this data set and misclassification bias introduced by the model developed.

Annotated data and representativity. An important aspect in creating a ML-based model is the data used to train (and test) the model and how it was obtained. Many decisions are made in this process that may introduce a bias. Basically, designing an annotated data set is comparable with designing a sample survey; errors similar to those affecting the Total Survey Error (Groves and Lyberg, 2010) apply to the training data used. The inter-comparability and perceptual and perception bias of human annotators are also important contributors [1]. Also, the better the structures (features) in the training data represents those of the target population, the better the model is expected to perform. Within AI, this is known as the *closed world assumption* (Russel and Norvig, 2003): the model works the best in exactly the same context as it was trained. Any deviations of this context can lead to biases. However, since the data selection process will obviously affect the features included, this is far from a trivial task. It may even be an advantage to over represent particular examples (i.e. features or classes) in the training data. This is similar to taking a stratified sample in survey design with the aim to over represent particular groups of units. This is especially important when studying rare cases (i.e. small areas).

Misclassification will introduce a bias when the ratio between the false positives (type I error) and false negatives (type II error) of the trained model deviates from the actual data. This can be corrected

[1] Perceptual bias refers to biases introduced by the perceptual system (e.g. visual illusions) and perception bias refers to the social context, where the annotator could be biased.

for by posing a constraint on it (Meertens, 2021). In addition, binary classifiers trained on a certain proportion of positive items can also introduce a bias when the model is applied to (real-world) data with a different proportion of positive items. Since the latter proportion is generally unknown, it often is the target variable, a maximum likelihood estimator has been developed by which the true proportion of positive items in data sets can accurately be determined (Puts and Daas, 2021).

3 Conclusions

From the above its clear that ML is an interesting application for official statistics. An overview study conducted in 2018 at NSI's worldwide, lists a large number of potential applications of ML algorithms of which the majority are ideas (Beck, Dumpert and Feuerhake, 2018). In a more recent report, the most mentioned applications of ML for survey data are stratification and outlier detection (Yung et al., 2014). In the area of administrative and big data, the better scalability, the less sensitivity to outliers and erroneous data and the ability to capture non-linear relationships are mentioned as the major advantage of applying ML compared to traditional statistical methods (Yung et al., 2014). Because ML algorithms are particularly well suited to extract information from texts and images, it is clear that in these areas they should certainly be applied within the realm of official statistics. Examples of experimental statistics making use of these kind of sources can be found in (Daas et al., 2020). However, to fully enable the use of ML algorithm in official statistics a number of challenges need to be solved. According to us, the following topics need to be studied within the realm of official statistics:

- Methodology concerning the human annotation of data
- Sampling the population to obtain representative training sets
- Using stratification in the context of Machine Learning
- Data structure engineering and selection to increase the transparency of models
- Reducing spurious correlations
- Methodology for studying causation
- Correcting the bias caused by the ML model
- Dealing with concept drift (representativity over time)

For a number of those topics, expertise is available at methodology and statistics departments at Universities and National Statistical Institutes. For some, however, cooperation between ML experts and statisticians is required. These could, for instance, be studied in a joint European or Global research project.

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Reducing non-sampling errors to improve the measurement of poverty and social exclusion in Europe

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Abstract

Non-sampling errors can seriously influence statistical estimates based on survey data. A recently-completed initiative has attempted to map out the influence of non-sampling errors, and to identify ways in which they could be reduced, on EU-SILC. This article provides a overview of the work that has been carried out.

1 Introduction

The European Union Statistics on Income and Living Conditions (EU-SILC) instrument is the reference source for comparative statistics on income, wellbeing and social inclusion in the EU. EU-SILC takes the form of a survey carried out in all EU member states, with both cross-sectional and longitudinal components, though some data items are collected directly from registers in some countries. Data are collected from over a quarter of a million households across Europe each year. For the longitudinal component, households are asked to participate in each of four consecutive annual waves.

The third Network of EU-SILC Researchers (Net-SILC3) was funded by Eurostat to carry out a programme of research activities and to disseminate best practice to National Statistical Institutes (NSIs) over a 4-year period (2016 to 2020). One of the two clusters of Net-SILC3 activities focussed on sources of non-sampling errors in EU-SILC. This article focuses on the activities of that cluster.

Non-sampling errors are systematic or variable errors that arise from aspects of the survey process other than sample selection. These include errors due to frame under-coverage, non-response, field work, measurement and processing. Such errors are important as studies in various contexts have shown them to often be at least as influential as sampling error, and sometimes more so. They can, however, be reduced through a combination of improved data collection practices and post-survey adjustment methods, but this requires understanding of the nature of the sources of error. The Net-SILC3 cluster of 11 work packages was designed to identify the main sources of non-sampling errors in EU-SILC, to describe the nature and impact of each type of error, and to produce guidance on reducing them. Ten of the work packages were to deliver original research on various aspects of non-sampling errors, while the eleventh was to organise a series of best practice workshops. The network involved six NSIs (Austria, Finland, Latvia, Netherlands, Serbia, UK) and six academic and independent partner organisations (University of Essex, University of Antwerp, University of Manchester, GESIS, Sciensano, Lyberg Survey Quality Management). Additionally, two other NSIs (Sweden and Slovenia) participated voluntarily in one of the work packages.

The remainder of this article summarises some of the main findings and conclusions arising from the ten work packages. It should be noted that the conclusions are those of the authors of the research and do not necessarily reflect the views of Eurostat. Further details of the research can be found in the forthcoming book arising from the project, the contents of which are summarised in Box A. Chapters 3 through to 26 of the book report the work carried out by the members of Net-SILC3, while

the last three chapters are invited contributions from researchers working on other international surveys whose research has implications that are transferable to EU-SILC. The following summary indicates the chapter number for each study mentioned, allowing the reader to identify the author of the research by referring to Box A.

2 Population Coverage

EU-SILC covers only the private household population. Those living outside of private households consist mainly of residents of institutions of various kinds. The size of the institutionalised population varies between countries but is generally below 2.5% (amongst EU countries, this proportion is exceeded only in Slovakia and Sweden). Their characteristics also vary: they are disproportionately male in Greece and Lithuania but female in Germany and Belgium. In most countries, the institutionalised population is older and less educated than the household population. A case-study in Finland found the non-household population to have substantially lower levels of income than the household population. If viewed as estimates of the characteristics of the total population, EU-SILC estimates may therefore suffer from non-coverage bias (Chapter 3).

Within the private household population too there may be under-coverage if some households are missing from the sampling frames. It turns out that many of the sampling frames used for EU-SILC have high levels of coverage. What little under-coverage of this kind can be detected tends, in register countries, to be related to delays in the registration of recent immigrants. However, there is a severe paucity of information about under-coverage in many countries and research in this area could be warranted (Chapter 4).

3 Survey Nonresponse

EU-SILC survey response rates vary considerably between countries, and between years within countries, from less than 50% in some cases, to over 90% in others. Mean response rate has declined from 70% in 2006 to 60% in 2017. Consequently, there is scope for nonresponse bias to affect survey findings, and particularly comparisons between countries.

The composition of EU-SILC responding samples was compared to comparable Census findings (Chapter 5). The extent to which the sample appeared representative of the Census population varied greatly between countries and seemed only weakly related to response rate. Samples were generally less representative in terms of economic activity, education level and citizenship than in terms of age and sex. But again there were big differences between countries with high levels of education-related nonresponse bias in Belgium and the UK, but very low levels in Italy and the Netherlands.

Panel attrition across the waves of data collection was found to be associated with survey variables related to income, health and wellbeing, but the associations varied greatly between countries. However, the magnitude of the resultant nonresponse bias was generally rather small (Chapter 6).

Allowing survey data to be collected from a proxy respondent can reduce the level of nonresponse, but it can involve a trade-off between nonresponse error and measurement error. For EU-SILC, proxy response is supposed to be used only in exceptional circumstances but it was found that one in five interviews were in fact carried out by proxy, with prevalence varying greatly between countries, from below 6% in Greece, Slovakia, Switzerland and Sweden to over 40% in Denmark, Finland and Croatia (Chapter 7). There are several countries in which the extent of proxy responding has been steadily increasing over the years, while in others it has decreased. Over the waves of a panel the extent of proxy responding tends to increase, while in some countries the level seems to peak at wave 2. Proxy reporting is particularly common for young adults (aged 16 to 24), students and those undertaking military service.

The extent to which best practice in procedures for limiting nonresponse (bias) is implemented varies between countries. An example is interviewer training in nonresponse avoidance skills. Some good

practices, such as the use of targeted nonresponse procedures, drawing upon information from the sampling frame or from wave 1, seem hardly to be used at all (Chapter 8).

4 Weighting and Imputation

Statistical adjustment through weighting can reduce the impact of both nonresponse bias and sampling variance. For a comparative survey, it may be particularly important that this is done in a comparable way in each country. For EU-SILC, responsibility for the production of weights lies with the national teams, but guidance is provided on the approaches and methods that should be used. In general – but not universally – EU-SILC weighting was found to be done according to the guidance. But practices still vary considerably (Chapter 9).

A study of data from five countries - Finland, Latvia, The Netherlands, Slovenia, and Sweden – examined whether the addition of registered income data improves the performance of the weight calibration (Chapter 10). The gain in precision varies was found to vary between countries (being particularly high in the Netherlands) and between estimates (being better for estimates of poverty or social exclusion than for employment-related estimates).

Two approaches to weighting in the context of a modular design were compared: composite and two-phase calibration (Chapter 11). Modular design refers to describe surveys which have a common (or core) set of questions administered in the same way, plus multiple modules of questions each administered to separate sub-sample. UK data, in which one of the modules contains the EU-SILC questions, were used in the comparison. It was found that either approach improved precision, compared to ignoring the modularity and treating the EU-SILC module as a stand-alone survey. The composite method may be preferable if the design has only two modules.

The longitudinal component of EU-SILC effectively results in a rotating panel design, with a new 4-year panel starting each year. There are several possible ways to adjust for attrition in the production of cross-sectional weights for a rotating panel design. Four such methods were compared for 27 countries (Chapter 12). It was concluded that the choice of predictor variables in nonresponse models may be more important than the choice of modelling method. All of the methods performed considerably better for estimating low income than for estimating poor health. This was most likely a result of the predictors chosen for the models being more pertinent to income than to health.

While EU-SILC weighting practices are generally good, best practice is not always used (Chapter 13). Furthermore, there is considerable variation in approaches between countries, particularly in the choice of auxiliary variables and the assumptions made about eligibility. It is suggested that EU-SILC might benefit from recommending a specific (standardised) approach to be used for imputation of eligibility status, for nonresponse modelling, and for combining multiple panels in nonresponse adjustment – rather than allowing countries to choose an approach.

Levels of item nonresponse to income questions on EU-SILC are generally low, and are extremely low (sometimes even zero) in countries that collect this information from registers rather than through survey interviews. However, practices vary in terms of how countries use flag variables to indicate the nature of missing data and in terms of the information published regarding item nonresponse in quality reports. This makes it hard to make comparisons (Chapter 14).

Imputation methods used to deal with item nonresponse vary between countries (Chapter 15), with many different kinds of methods in use. Four countries do no imputation as all income values are taken from official registers. Surprisingly, several countries use mean or median imputation. Others use regression methods or donor methods such as hot deck or nearest-neighbour. Only three countries use some kind of repeated imputation (Switzerland, Italy and Croatia). The effect of imputation on estimates was found to differ between countries. A simulation study showed broadly similar estimates arising from a number of different imputation approaches. Documentation of the

imputation methods used was found to need improvement. Some degree of harmonisation of the strategies used could also be beneficial.

Most countries use only cross-sectional imputation methods, even for the EU-SILC longitudinal data. The advantages of longitudinal methods such as as 'Last value carried forward' - with or without uprating - or the row and column method of Little and Su (1989) would seem to be worth exploring. A simulation study showed that longitudinal imputation performed well, though effects on estimates were small in magnitude (Chapter 17).

For EU-SILC, some countries collect gross income, some net income, and some both. This results in a need to convert reported amounts from net to gross or vice versa, in order to be able to carry out analysis on a consistent basis and make comparisons. This can be done in a deterministic way if sufficient knowledge is available regarding the country's systems of taxes and social insurance contributions and if sufficiently detailed data has been collected to establish for each household and individual the taxes and contributions that should apply. This is not always, or often, the case, so stochastic statistical methods are often used instead. These methods vary between countries, as do the proportion of cases for which net-gross conversion is needed (Chapter 16). Some countries use micro-simulation methods but none use EUROMOD, the tax-benefit microsimulation model for the European Union and UK. Use of EUROMOD would aid consistency of approach between countries.

5 Comparability and Validity of Measures

The form of survey questions can also affect measurement, and hence comparability between countries. Practices regarding how EU-SILC income questions are asked, the examples that are given, and the level of detail (and number of questions) with which the information for target variables is collected vary greatly between countries (Chapter 18). As a result, variables may not be comparable. Additionally, some countries have moved from using survey measures to register data without evaluating the impact on longitudinal measures or time series.

Some questions on health and health care too are asked in ways which vary between countries. For example, the number of visits to a health care provider is asked as an open or closed question, with or without filters. Questions about basic functions may or may not specify that difficulties walking or climbing steps should be assessed without the use of any assistance or device. But body mass index and the consumption of fruit and vegetables are measured in an almost identical way in all countries (Chapter 19).

With regard to housing measures (Chapter 20), some difficulties were identified with the measure of number of rooms. Explanations of which types of rooms to include, and of how to treat shared rooms, vary between countries and there is no explicit guidance on how to treat open-plan spaces. This measure is important as the official indicator of over-crowding is based upon it. The details collected about mortgages also vary, including whether or not interest payments are collected separately from capital payments. In principle, this distinction is important as interest is a form of expenditure while capital payments constitute savings.

The production of goods for a household's own consumption (mainly food, but also some other things such as wood for fuel) is in principle an income and can be an important component of poverty alleviation. Some countries attempt to measure this for EU-SILC while others do not. Those that do, differ in how the income is measured (monetised): some ask households to assess the total value while others (Cyprus, Spain, Czechia, Slovakia) record the quantity of goods produced in each of several categories and subsequently convert this at market prices (Chapter 21).

The percentage of households reporting own consumption goods exceeds 20% in ten countries but the percentage of total income accounted for by own consumption is much smaller, exceeding 1% in only four countries (Latvia, Croatia, Estonia, Portugal). The inclusion of own consumption goods in household income makes very little difference to key estimates, even for subgroups such as rural

populations and households in the lowest income quintile. There is not therefore a strong case for amending the EU-SILC measure of total disposable income to include own consumption goods (Chapter 22).

6 Survey modes and Survey Processing

The data collection modes, and mixes of modes, used for EU-SILC vary considerably between countries and have changed over time within countries. Modes are known to affect both participation and measurement, so this may be a concern for comparability. Various strategies can be used to prevent (minimise) mode effects and to adjust for them. There are a number of steps that could be taken to enhance knowledge of mode issues amongst NSI teams responsible for EU-SILC, to reduce differences in approaches and to facilitate adjustment (Chapter 23).

Considerable variation between countries was identified in the data collection modes used, interviewer workloads, interviewer training, field quality control procedures, coding systems and editing systems (Chapter 24). Greater standardisation of interviewer training and fieldwork quality control procedures is suggested along with co-ordination and co-operation in a proactive move towards more widespread adoption of web data collection (in 2018 only 6 of 30 countries used web data collection, with those 6 using it in different ways and at different stages).

A series of studies in the UK tested whether a general population sample would engage with an online survey of finances and whether design features such as telling them in advance that they would need to refer to financial documentation are helpful. Results were broadly positive and can help inform a move to online data collection for EU-SILC (Chapter 25).

A cost-benefit analysis using Dutch EU-SILC data (web and CATI) suggests that the use of a re-interview design to produce estimates of mode-specific selection and mode-specific measurement biases may improve accuracy if estimates are subsequently adjusted for measurement biases. The study should be replicated for other countries and designs that include face-to-face (Chapter 26).

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Box A: Contents of Forthcoming Book

Title: Improving the measurement of poverty and social exclusion in Europe: reducing non-sampling errors
Editors: Peter Lynn and Lars Lyberg
Publisher: Publications Office of the European Union
Contents:

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1. *Handling non-sampling errors in comparative surveys*, Lars Lyberg (Demoskop Inc, Sweden)
2. *Investing in statistics: EU-SILC*, Emilio Di Meglio, Didier Dupré and Sigita Grundiza (Eurostat)

Population coverage and survey nonresponse

3. *The effect on EU-SILC of exclusions from the target population*, Tara Junes (Statistics Finland)
4. *Frame errors in the EU-SILC: Under-coverage*, Tara Junes (Statistics Finland)
5. *Representativeness of first wave EU-SILC response and response rates over time*, Natalie Shlomo (University of Manchester, UK), Annemieke Luiten, (Statistics Netherlands) and Barry Schouten (Statistics Netherlands and Utrecht University)
6. *Impact on representativeness of EU-SILC panel attrition*, Barry Schouten (Statistics Netherlands and Utrecht University) and Annemieke Luiten, (Statistics Netherlands)
7. *The effect of proxy responses on non-response error*, Peter Lynn (University of Essex, UK)
8. *Current best practice in minimising nonresponse error in panel surveys*, Peter Lynn (University of Essex, UK)

Statistical adjustment: weighting and imputation

9. *Review of EU-SILC weighting methods*, Mārtiņš Liberts (CBS Latvia)
10. *Use of registers in calibration*, Mārtiņš Liberts (CBS Latvia)
11. *Weighting for a modular structure*, Andy Fallows (Office for National Statistics, UK)
12. *Weighting together panels for cross-sectional estimation*, Olena Kaminska (ISER, University of Essex, UK)
13. *Current best practice in weighting for a rotating panel*, Gareth James (Office for National Statistics, UK), Mārtiņš Liberts (CBS Latvia) and Peter Lynn (ISER, University of Essex, UK)
14. *Item non-response in EU-SILC income variables: levels, characteristics and documentation*, Richard Heuberger (Statistics Austria)
15. *Imputation for income variables in EU-SILC*, Sophie Psihoda (Statistics Austria), Nadja Lendle (Institute of Applied Statistics, JKU Linz), Richard Heuberger (Statistics Austria) and Thomas Glaser (Statistics Austria)
16. *Methods for net-gross conversion in EU-SILC*, Richard Heuberger (Statistics Austria)
17. *Longitudinal imputation of EU-SILC income variables*, Nadja Lendle (Institute of Applied Statistics, JKU Linz, Austria) and Matthias Till (Statistics Austria)

Comparability and validity of measures

18. *Lessons and recommendations regarding the comparability of the EU-SILC income variables*, Tim Goedemé (University of Antwerp, Belgium and University of Oxford, UK) and Lorena Zardo Trindade (University of Antwerp, Belgium)
19. *The validity and comparability of EU-SILC health variables*, Stefaan Demarest (Sciensano, Belgium) and Rana Charafeddine (Sciensano, Belgium)
20. *Comparability and validity of the EU-SILC housing variables*, Ross Bowen, Callum Clark and Paola Serafino (Office for National Statistics, UK)
21. *Methods for collecting data on production for own consumption*, Tijana Čomić (Institute of Economic Sciences, Serbia)
22. *The impact of own consumption on income distributions and key EU income-based indicators*, Tijana Čomić (Institute of Economic Sciences, Serbia)

Survey modes and survey processing

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24. *Preventing and mitigating effects on data quality generated by mode of data collection, coding and editing*, Sophie Psihoda (Statistics Austria), Nadja Lamei (Statistics Austria) and Lars Lyberg (Demoskop Inc, Sweden)
25. *The potential role of EU-SILC as part of an integrated social survey: The case of ONS*, Ria Sanderson and Pete Betts (Office for National Statistics, UK)
26. *A cost-benefit analysis of EU-SILC mode effect decomposition: Three case studies*, Barry Schouten (Statistics Netherlands and Utrecht University)
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28. *Interviewers and their impact on survey quality: lessons for EU-SILC from the European Social Survey*, Geert Loosveldt (KU Leuven, Belgium)
29. *The importance of occupation coding quality: lessons for EU-SILC from SHARE and other international surveys*, Kea Tijdens (University of Amsterdam, Netherlands)

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New and Emerging Methods

Standardisation and Statistics

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Abstract

An infinite amount of data and a variety of ways to use it promise an individualisation of statistics; the tools, algorithms and (artificial) intelligence of data science are available to everyone. The age of statistics is being replaced by the data era. There is a promise in this, similar to that for the internet as a whole, of an equal and thus democratically organised basis of technology and access to quantitative information, and perhaps even knowledge. The article deals with the question of whether and to what extent this individualisation is beneficial or detrimental to the democratic discourse. For this objective, the concept of information quality is introduced and used, which is oriented towards the principle that statistical products should be fit for purpose. It is shown that individualisation and standardisation are two alternative approaches to statistics, the choice of which ultimately depends on the application and its intended function. As a language for public discourse, standardisation is of vital importance.

Keywords: Standardisation, official statistics, quality, epistemology, facts, public discourse

1 Introduction

The question of what statistics actually is would probably be answered by most people with a mixture of respect and fearful distance on the one hand and a good portion of cynicism on the other. If given the choice of the alternatives presented in Figure 1, their gaze and preference would probably oscillate back and forth.

It would certainly be worthwhile to explore the views on the relationship between reality and statistics among professional statisticians and among data scientists. Unfortunately, we have not come across any empirically valid findings on this; all that remains, therefore, is anecdotal observation. However, it is not unreasonable to fear that only a few have dealt with this question in depth and even fewer will attach a significance to it on the basis of which a scientific debate is required. However, this is a mistake for two reasons: Firstly, one must address this topic if one wants to understand the core of statistics, its nature and DNA. Secondly, addressing this issue and answering the questions it raises is a prerequisite for seriously and successfully tackling the issues of our time, such as the rejection of expertise and science and the questioning of facts or the juxtaposition of so-called “alternative facts”.

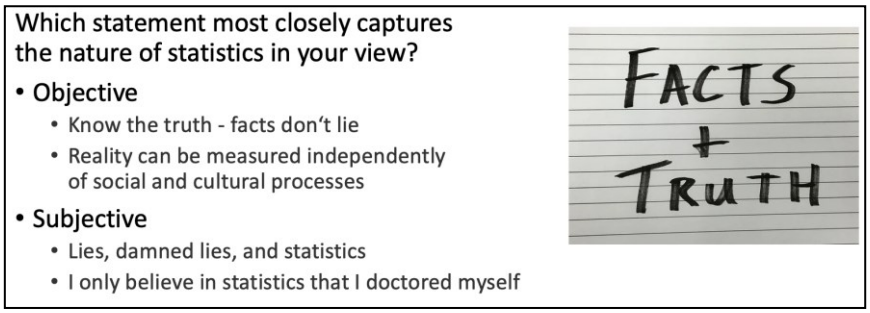

Figure 1: *Statistics: the truth or only lies?*

The solution to the puzzle is that statistics are not actually reality itself, but merely provide images of it, which of course have to depict reality undistorted and as accurately as possible. When dealing with model-like images, however, we have to ask ourselves which influences affect the model itself in such a way that it is of good quality, which in turn raises the core question of what we mean by quality. In summary, statistics is not about the dichotomy between truth and falsehood, but about good or bad quality of the quantitative image of reality, and of course only a section of it at a time.

Statistical information is a product that is designed, produced and "sold". Such products are not wrong or right. In the best case, they meet pre-established and openly communicated minimum standards, such as methodological or ethical standards (a guarantee for users), and they must be measured against international best practice (also openly visible). In addition, the crucial question is whether the product portfolio as a whole provides an adequate (caution: not "right"!) answer to the question of social progress, Sustainable Development, and so on.

2 Quantification, quality and statistical evidence

2.1 Quantification of social phenomena

What is it that characterises the relation of statistics to reality and truth (This is an extract from "Official Statistics 4.0" (Radermacher, 2020b))? The answer to this question leads to fundamental disputes between positions and schools of thought in the philosophical and sociological sciences. Can our knowledge and understanding of reality be considered objective or does it depend on the construction of the models we need in order to form a picture of natural or social phenomena? To what extent does science as a whole carry us with its findings and where are the limits? (Latour, 1987; Benessia et al., 2016) Figure 2 gives us an overview of different epistemological positions.

Of course, it is not the case that this topic is of great importance in the daily work of statistics. Once the design and the measurement regime are decided for one statistic, i.e. when it is known which nomenclature is used, which population is included in the survey, how the sample is drawn, etc., then a technical-methodological orientation is in principle sufficient for the conduct of a high-quality production process. Whenever new information needs to be poured into new statistical form or when the design of existing statistics is changed, when statisticians are faced with *"situations marked by controversy, crisis, innovation, and changes in economic, social and administrative contexts,"* (Desrosières, 2001: p 349) decisions must be taken that ultimately require awareness and profound knowledge of the epistemological issues mentioned. In the design process (as well as in communication), it is part of the statistician's professionalism to be aware of the limitations of measurability, to reflect on the impact of statistics on society and to develop a basic understanding of complexity (and the role of statistics).

"Therefore, it is imperative for a student or a researcher of science to differentiate between the computational tool and what it computes, to distinguish the map from the territory it represents. 'The

map is not the territory', remarked Alfred Korzybski. There are multitudes of maps that we use to 'represent' the reality out there. They differ both in form and substance. The scientist in this sense resembles a cartographer. Only a cartographer knows how hard it is to represent a map of the earth on a sheet of paper. Every step towards perfecting the map involves a sacrifice – adding some feature to the map that does not have any intuitive or direct correspondence with the territory or ignoring many complexities of the territory." (Wuppuluri, and Doria, 2018: p vii)

Epistemological position	Key questions
Naïve realism: Reality is an objective phenomenon that exists and can be measured independently of social and cultural processes. Perceptions of reality may be distorted or biased through social and cultural frameworks of interpretation	What realities exist? How should one measure and manage them? How should information about realities be effectively communicated to the public? How to reduce 'bias' in the responses? How do people respond to questionnaires? What worldviews shape their responses?
Critical realism: Reality is an objective phenomenon, the measurement of which is inevitably mediated through social and cultural processes and can never be known in isolation from these processes	What is the relationship of reality and the measurement of reality to the structures and processes of 'late modernity'[3]
Relativism: Nothing is a reality in itself – what we understand to be a 'reality' is the product of historically, socially and culturally contingent 'ways of seeing'	How do the discourses and practices around reality operate in the construction of subjectivity, embodiment and social relations? How does reality operate as part of governmental strategies and rationalities?

Figure 2: *Epistemological approaches in social sciences (adapted from Lupton (2013: p 49-50))*

In the following, a middle course between realism and relativism is chosen (i.e. critical realism), on the one hand recognising a reality that exists independently of our perception, on the other emphasising that direct access to this reality is not possible, but requires methods of quantification, which inevitably contain simplifications and decisions. Statistical information is produced with two main ingredients: methodology and conventions. On the one hand, *"the notion of statistics as a primarily mathematical discipline really developed during the 20th century, perhaps up to around 1970, during which period the foundations of modern statistical inference were laid."* (Hand, 2009) On the other, the final products of statistical processes depend essentially on their conceptual design, which, as for other (manufactured) products, depends on whether the questions raised by stakeholders can be answered by statistics and whether they are answered in a satisfactory manner.

In order to be prepared for the following explanations with the necessary terms and their definitions, Desrosières is followed, who separates three *"aspects of statistics, 1) that of quantification properly speaking, the making of numbers, 2) that of the uses of numbers as variables, and finally, 3) the prospective inscription of variables in more complex constructions, models."* (Desrosières, 2010: p 114) Interestingly, the verb "to quantify" is here defined and used differently from that of the verb to "measure". *"The idea of measurement, …, supposes implicitly that something real, already existent, analogous to the height of the Mont Blanc can be "measured" ... In contrast, the verb to quantify implies a translation, i.e. a transformative action, resulting from a series of inscriptions,*

codifications and calculations, leading to the making of numbers. This contributes to expressing and giving existence to, in a numerical form, something that before was only expressed by words and not by numbers." (Desrosières 2010: p 115)

2.2 Conventions and evidence for decision-making

Statistical analysis begins by examining an issue and developing an adequate methodology for quantifying it. In a learning cycle, this ideally leads to applications for decisions and communication, which in turn are used for design improvements, and so on (see figure 3).

Figure 3: *Data informed decision-making cycle (Schüller, 2020: p 16)*

This phase of the cycle is of great importance for the later statistical product and its quality. Here the course is set for whether the most important facts are approached with the right questions, whether the collection or evaluation of existing data is methodologically well planned, and so on. This is where it is decided whether the product that will be provided with the statistical analysis will be fit for purpose (see figure 4).

In view of this great importance, it is at least surprising that comparatively little can be found in the statistical library about this design process itself.

In any case, a very important consequence of what has been said so far is that there are, or at least can be, several and alternative solutions and results for statistics, which do not have to be better or worse, wrong or right, but are each in themselves the result of a different kind of convention.

We have been able to follow this for some time in the discussion on the use of other data sources instead of data generated by the statistical institutions themselves through surveys. Particularly in the case of the population census, but also concerning the potential use of so-called "big data", it is a matter of weighing up all the criteria mentioned in order to best meet them under new framework conditions. If one opts for a new mixture in comparison to the traditional one, a different convention, this may bring advantages in terms of timeliness and repeatability, but for which one has to accept losses in terms of the regional granularity of the information, breaks in time series and other aspects. Even the headline figures and main aggregates and indicators may change as a result of a change in the convention.

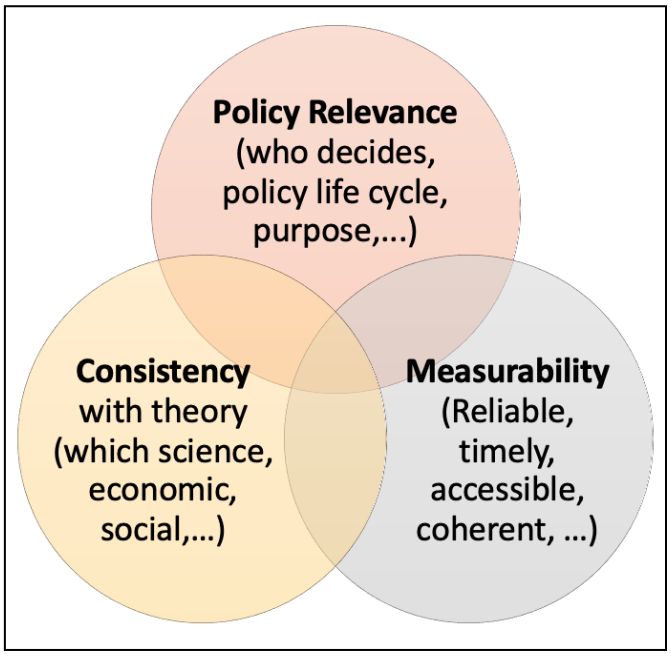

Figure 4 *Quality: fitness for purpose*

In principle, there may be different backgrounds and purposes for the aim of a statistical analysis:

- Statistics for individual information and decision making
- Statistics for information and decision making in a company, municipality etc.
- Statistics for the public discourse

Depending on the purpose, it may be helpful or even necessary to commit to certain parameters in advance when defining the design, so that time series can be established, comparability nationally and internationally is ensured, etc.

2.3 Statistics – language for the public discourse

In the Corona pandemic, it has become clear how important reliable statistics are for political debates and decisions. Since its onset, the crisis has been accompanied by an "infodemic", a flood of data, some of varying quality, that confuses rather than informs the layperson. In the past, a crisis would have led to new information needs being directed towards official statistics as the preferred provider. This seems to have changed. On the one hand, reference is made to the opportunities presented by data revolution, data-sciences and learning algorithms (so-called AI) as an alternative to official statistics (which are perceived as too slow, too inflexible, and too expensive). On the other hand, after decades of austerity policies, official statistics find themselves in a similarly defensive situation as the health sector. There is a lack of financial reserves, personnel, competences and know-how for much-needed innovations.

In January 2017, six months after the Brexit referendum and at the beginning of Donald Trump's presidency, William Davies published a widely acclaimed article "How statistics lost their power - and why we should fear what comes next". In it, he expresses his concerns that nothing less than the end of a statistical era has arrived, with serious consequences for public discourse, trust in experts as well as politics, and with options for populist politicians to use this for their purposes. With ubiquitous amounts of data and almost infinite possibilities of use, informational ecosystems are fundamentally changing; statistical logic is being replaced by data logic. *"With the authority of statistics waning, and nothing stepping into the public sphere to replace it, people can live in whatever imagined community they feel most aligned to and willing to believe in. Where statistics*

can be used to correct faulty claims about the economy or society or population, in an age of data analytics there are few mechanisms to prevent people from giving way to their instinctive reactions or emotional prejudices." (Davies, 2017).

The term "statistics" has the same linguistic roots as "state". Since the Enlightenment, statistics has been closely married to the nation state, to democracies of various kinds and, unfortunately, also to dictatorships. In the neo-liberal governmentality that has prevailed since Margaret Thatcher came to power, and at the latest since the fall of the Berlin Wall, official statistics find themselves in the paradoxical position that the appetite for facts for evidence-based decision-making is steadily increasing, while at the same time they have fallen into disrepute with all state actors. When official statistics appear in the front ranks of political priority, it is mainly when it comes to reducing supposedly useless bureaucracy or saving money in the public sector.

For some years now, a resistance to evidence-based governance has been growing; scepticism towards all forms of experts does not stop at scientists or statisticians. Coupled with a lack of statistical literacy and the impression of being at the mercy of the representatives of a supposed technocratic regime, the counter-position is forming in which the existence of neutral facts is negated or relativised. The reduction of social and economic questions to numerical aggregates and averages no longer seems acceptable, unless the results come from one's own calculations and correspond to the 'truths' that demagogues deliver about what is going on in society.

After a year in a state of pandemic emergency, it is time to return to the discussion initiated by William Davies. Obviously, there are still and again government services that seemed to have disappeared from our radar screen. These include - along with public health care - the provision of statistical information of sound quality, comprehensibility, and trustworthiness. It is necessary to ask the fundamental question, as we did after the fall of the Berlin Wall, whether we need official statistics as the backbone of democratic decision-making, and if so, what their tasks are and how they should be financed and anchored in the political system.

Statistical information, in the sense of the "*Économie des Conventions*" (Diaz-Bone, and Salais, 2011), are artefacts that are designed and produced. The same rules apply to such informational products as to other products: their design must be suitable to provide factual answers to users' questions; they must be produced with good quality; educated clientele with a sense for quality is a prerequisite. The public infrastructure that provides society, politics and the economy with elementary facts is official statistics. Where would we be without GDP, inflation rates, mortality tables, population figures, etc.? Facts on the basis of which momentous political decisions are made are based on international methodological standards (e.g., consumer price index for Central Banks' monetary policy). Official statistics must perform their tasks with great efficiency and continuity: they work with long lead times, industrial production lines, international standards and democratically decided work programmes. In this way, internationally, nationally, and temporally consistent indicators of high quality are provided (Radermacher, 2020b).

Let us use the example of transport: data strategies aim at promoting and regulating individual (data) mobility. In addition, there is public rail transport with data and statistics, which must also be made fit for the future. This requires investments, because new areas are to be established on which modern high-speed trains are to run. Individual data use alone can be inefficient and ineffective. In the 1960s, we thought that promoting individual transport was the best option. Today we know that this one-sidedness has led us into congested cities and roads because rail expansion was not pushed with enough verve. If the infrastructure of public statistics is not modernised, geared to new technologies (high-speed statistics) and new terrains are not opened up (COVID, biodiversity, ...), there will be parallel infrastructures in both the public and private sectors that will develop their own

standards. Or, more precisely: We will have an outdated, unattractive public (data) railway with multiple rail widths (partly public, partly private) and incompatible industry standards; a setback for trust, transparency, and public discourse. To prevent such a situation, the integration of a country's different producers under one roof into a well-coordinated statistical system is crucial. Roles must be assigned, responsibilities defined, so that citizens can rely on the highest quality standards being met. To make it easy for users to obtain information, a certificate should be introduced that provides trustworthy information about the quality profile of an information product. Certification requires a neutral and trustworthy institution that sets and verifies quality standards.

The fact that initiatives to improve data literacy are gaining momentum, supported not only by business but also by politics and science, is very welcome. Data literacy serves to promote maturity in a modern digitalised world and is important for all people - not just specialists. This education, like other education, is about several competence dimensions: Knowledge, skills, and values (Schüller, 2020). However, a broad, balanced, and situational approach is rarely found in practice. Rather, the focus seems to be on teaching technical skills of data science, mathematics, and IT, reminiscent of the do-it-yourself wave of the 1970s, in which screwing, repairing, and constructing by anyone was propagated, sometimes even in cases where a good craftsman would have done the job better and cheaper than an amateur. For the citizen, the entrepreneur, the teacher, the student who wants to understand and apply the indicators of public statistics, sophisticated skills of data science (e.g., own analysis of raw data, knowledge of algorithms) are just as irrelevant as in-depth knowledge in the mathematical field of stochastics. Rather, they should know enough about the informational product and its properties to be able to assess its quality regarding personal application goals and questions. This requires basic mathematical knowledge as well as experience in dealing with quantitative information; knowledge of descriptive statistics and its application in the processes of economic and social statistics is required. What the consumer price index says (or doesn't say) about inflation should be taught in school and adult education; everyone should understand the indicators of sustainable development. For advanced users, microdata are also available as “public use files” to experiment with their own statistical evaluations and gain experience (e.g. https://ec.europa.eu/eurostat/web/microdata/public-microdata).

Official statistics require an adequate policy framework because they embody a public infrastructure maintained by public institutions with a public mandate financed by taxpayers' money. Most countries have statistical governance, consisting of a body of laws, rules, principles, codifications, and work programmes. The European Statistics Code of Practice defines: *“Institutional and organisational factors have a significant influence on the effectiveness and credibility of a statistical authority developing, producing and disseminating European Statistics. The relevant Principles are professional independence, coordination and cooperation, mandate for data collection, adequacy of resources, quality commitment, statistical confidentiality, impartiality and objectivity.”* (Eurostat, 2018) For official statistics to develop successfully, the preconditions in terms of finances, personnel, organisation must be right. Beyond the canon of already existing criteria of the current Code of Practice, future demands arise, e.g., those regarding the introduction of quality labelling and certification of statistical information as well as with regard to initiatives to improve statistical education.

Compliance with these quality standards goes beyond the statistical institutions’ own sphere of influence. If there is a lack of political attention and will to address this issue, public statistics will sooner or later fall behind and will no longer be able to meet the requirements. The “Tragedy of the Commons” particularly affects public infrastructure. If bridges, roads, sewers (and public statistics) are not maintained for a certain period, it is hardly noticeable at first. In the long term, however, the resulting damage and repair costs are all the higher.

3 Summary: Individualisation vs. standardisation – a question of purpose

For statistical products, in a similar way as for other products, there are arguments for or against industrial production as well as for customised craft production (see Figure 5).

Individual Statistical Analysis	Standardised Statistical Analysis
Pro • Flexibility in the design and choice of methods • Quality responsibility and sovereignty • Relevance for the individual information need • Competence through acquired factual knowledge	**Pro** • Homogeneity through standards • Comparability (time, region) and consistency with scientific frameworks • Efficiency, sustainability • Quality standards • Low level of statistical literacy required (equality)
Contra • Heterogeneity of solutions • Costs • Risk of inequality due to digital and social gaps • Comparability and consistency with other analysis not guaranteed	**Contra** • Industrialised production, small room for customisation to individual needs • Fixed statistical programme and methods, slow adaptation and limited flexibility • Technocratic power limiting transparency and participation

Figure 5: *Benefits and limitations of individualisation and standardisation*

Which of the two variants is preferred, depends on the circumstances and purposes. In all cases, however, the aim must be to soften and reduce the contrasts by creating transitions and intermediate measures, such as smaller and flexible experimental statistics in addition to the standardised but cumbersome official statistics (Radermacher, 2020a).

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Book and Software Review

Changbao Wu and Mary E. Thompson (2020) Sampling Theory and Practice, Springer, ISBN 978-3-030-44244-6

Jae-Kwang Kim

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Survey sampling is a fundamental area in statistics. This book, with foreword by J.N.K. Rao, provides a nice balance between theory and practice, and between classical topics and modern developments. The book consists of three parts: (1) classical topics in survey sampling, (2) selected advanced topics in survey sampling, and (3) practical issues and special topics in survey sampling.

Part one consists of five chapters. It contains basic concepts in survey sampling (Ch. 1), simple single-state sampling methods (Ch. 2), stratified sampling and cluster sampling (Ch. 3), general theory and methods of unequal probability sampling (Ch. 4), and model-based prediction and model-assisted estimation (Ch.5). These topics are overlapping with other textbooks in survey sampling but the presentation is more concise. The materials in the first part can be used for a one-term introductory course in survey sampling for students with a solid background in statistics.

Part two consists of six chapters. It includes calibration weighting and estimation (Ch. 6), regression analysis and estimating equations (Ch. 7), empirical likelihood methods (Ch. 8), methods for handling missing data (Ch. 9), resampling and replication methods (Ch. 10), and Bayesian empirical likelihood methods (Ch. 11). These topics reflect the research areas of the authors and the materials form a cohesive body that is not available from other textbooks in survey sampling. In addition, several computational algorithms are implemented in R with codes provided in the appendix. The materials in part two, supplemented by some basic materials from part one, can be used for a one-term advanced survey sampling course for senior undergraduate students or graduate students in statistics.

Part three consists of six chapters. It covers area frame household surveys (Ch. 12), telephone and web surveys (Ch. 13), natural resource inventory surveys (Ch. 14), adaptive and network surveys (Ch 15), dual frame and multiple frame surveys (Ch. 16), and non-probability survey samples (Ch. 17). The materials in part three provide a nice introduction to survey sampling practices and some specialized topics of practical and theoretical importance, which makes the book very unique and useful for both survey sampling researchers and survey practitioners. The materials in parts two and three can be used for a seminar course for the graduate students in statistics.

The book contains a concise introduction to basic sampling theory and methods, a detailed coverage of selected topics that reflect the current state of the art in survey methodology research, and a useful resource and pragmatic guide to survey design and implementations as well as survey data production and analysis. I plan to use it as a textbook for the survey sampling course at Iowa State University.

Country Reports

ARGENTINA

Reporting: **Verónica Beritich**

Argentina was appointed for the first time as the representative of Latin America on the Governing Board of the International Comparison Program

In March 2021, Argentina was incorporated for the first time as a member of the Governing Board representing Latin American countries in the International Comparison Program (ICP), an international statistical project managed by the World Bank and the United Nations Statistics Division (UNSD), which has among its main objectives to estimate the purchasing power parities that are used to compare the production of the countries' economies and the material well-being of their inhabitants. The director of the National Institute of Statistics and Censuses (INDEC), Marco Lavagna, will be the representative of the region.

The director of the Statistics Division of the Economic Commission for Latin America and the Caribbean (ECLAC), Rolando Ocampo, officially informed the UNSD of the appointment of the head of the Argentine National Statistical Office to represent Latin American countries on the Governing Board during the next three years. In December of last year, the Commission had consulted INDEC about its interest in joining as a member due to the role that Argentina plays within the region and its active participation in the initiatives convened by ECLAC.

The incorporation of our country and INDEC to the ICP is framed within two of the strategic axes of the Institutional Work Program that focus on institutional strengthening, especially through participation in the global statistical field, and on the introduction of quality leaps in statistical production and dissemination processes.

According to the UNSD definitions, the Governing Board is made up of the highest statistical authorities of 11 national offices that represent their respective regions. The members of the Council are geographically distributed as follows: Africa (2), Latin America (1), Asia (2), Western Asia (1), Caribbean (1), Commonwealth of Independent States (1), Pacific Islands (1), country of the Organization for Economic Cooperation and Development (OECD) not belonging to the European Union (1), and European Union (1).

The program promoted by the United Nations and the World Bank was born in 1968 and is currently one of the largest statistical initiatives in the world, based on an association of international, regional, subregional and national organizations.

For more information about ICP 2021, please consult ICP 2021 Cycle: Global Perspective[4] (https://www.cepal.org/).

General information can be found at www.indec.gob.ar.

For further information, please contact ces@indec.gob.ar.

[4] https://www.cepal.org/sites/default/files/presentations/icp-global-office-2021-cycle-global-perspective.pdf

CANADA

Reporting: **Beatrice Baribeau**

The 2021 Census of Population: Delivering high-quality data in a pandemic

Every five years the Census of Population provides a detailed and comprehensive statistical portrait of Canada; an essential tool for understanding Canada. The 2021 Canadian Census has the added importance of providing the most detailed data to-date on key socio-demographic variables of Canadians during the ongoing COVID-19 pandemic.

Prior to the pandemic, many improvements were made for the 2021 Census. Content changes included a new gender question for enhanced gender-based analysis, new questions on veterans, on linguistic minorities and the use of administrative data to obtain content related to immigration. As with the 2016 Census, administrative data will also be used for income variables to reduce response burden. For the first time, all Census questionnaires are available online. This will promote online self-response, which is targeted at 80%. To improve data interpretability, Census tables will now include confidence intervals (for estimates comprised from the sampled portion of the Census) and new quality indicators will also be provided. These quality indicators will separate total non-response from item non-response and indicate imputation rates and the rate of the use of alternative data sources (ex., for income and immigration) by question.

To ensure reliable statistical information is produced despite challenges wrought by the pandemic, numerous other adaptations have been made. Contactless collection has been maximized by adding an additional mailed reminder and by allocating additional resources for telephone follow-up activities. The collection methodology for collective dwellings was redesigned to encourage online self-response (with telephone follow-up) and to avoid in-person visits to places where vulnerable populations reside. With these mitigation plans in place, a 98% response rate for the Canadian 2021 Census of Population remains the target. However, an additional statistical contingency plan to use administrative data to impute, if needed, key variables of age, sex and usual resident counts has been developed to safeguard the reliability and integrity of Census data.

JAPAN

Reporting: **Dr. Ryozo Yoshino**

Sharing data on humanities and social sciences

For many years, Japan has lagged behind in making individual-level (micro-level) survey data available to the public. In the last few years, remarkable progress has been made under the Japan Society for the Promotion of Science (JSPS), and a project to release data in the humanities and social sciences has been launched to provide full-scale support to several existing universities and institutions (https://www.jsps.go.jp/english/e-di/torikumi.html), “This (JSPS) program aims to promote joint researches domestically and internationally, thereby promoting humanities and social sciences through building a comprehensive system that researchers can utilize to share data on humanities and social sciences research across disciplines and countries while fostering a shared culture” (https://www.jsps.go.jp/english/e-di/index.html).

See the homepages of JASDA of Tokyo University (https://csrda.iss.u-tokyo.ac.jp/english/), Keio University (https://www.research.keio.ac.jp/external/org/karc/endcenters/center-72.html [in Japanese]), Hitotsubashi University (http://rcisss.ier.hit-u.ac.jp/English/database/index.html), Osaka University of

Commerce (https://jgss.daishodai.ac.jp/english/data/dat_top.html), and Historiographical Institute (https://www.hi.u-tokyo.ac.jp/index.html).

For official statistics, a variety of anonymized microdata are available at the National Statistics Center (https://www.nstac.go.jp/en/index.html).

For the data archive, see https://www.nstac.go.jp/services/archives.html.

Collecting census data using a web-entry approach

Meanwhile, the revelations of fraud in official statistics over the past decade or so and the falsification of telephone survey data by some media outlets have undermined confidence in Japan's highly reliable public opinion polls and official statistics.

With regard to the national census, the government is promoting a shift from a distribution and collection type survey to a distribution and web-entry survey, but there is undeniable concern that insufficient attention has been paid to ensuring the quality of the data (https://www.stat.go.jp/english/index.html).

Collecting survey data during Covid-19

Public surveys in Japan have traditionally used face-to-face surveys, but some have temporarily changed to mail surveys in response to Covid-19.

LATVIA

Reporting: **Zane Matveja, Ruāna Pavasare, Baiba Zukula, Sigita Šulca, Ance Ceriņa, Mārtiņš Liberts**

Population and Housing Census 2021 in Latvia – Data Sources

There will be a solely register-based census in 2021 for the first time in Latvia. The census reference date for Latvia is the first of January 2021. The decision to do a fully register-based census in 2021 was made in 2015 for economic (high cost of the traditional census) and social reasons (decreasing response in social surveys).

Preparation for the census 2021 started in 2012. The Central Statistical Bureau of Latvia (CSB) has studied the availability, quality and reliability of different registers and administrative data. All administrative data are evaluated annually according to the European Statistics Code for Practice and census requirements since 2017. The CSB has established a collaboration with register holders that ensures data exchange and coordination between institutions.

The CSB has concluded that the state's administrative registers alone cannot provide all the information required for the census. Therefore, data from non-governmental institutions (e.g., artist unions) and private companies (e.g., water and sewerage service companies) are gathered. More than 40 different registers serve as data providers for the census.

Statistical Imputation and Editing

Although census 2021 will be register-based, it is not possible to obtain all required information about all residents of Latvia from administrative data. For this reason, it is necessary to apply the statistical imputation and editing methods for various census variables. The development of the census imputation and editing methodology has been underway since 2016. Imputation and editing methods are evaluated and improved every year. Two methods are currently used: k-nearest neighbours and the classification tree method (*rpart*).

The classification tree method is used to edit the status of economic activity because it is not possible to determine unregistered employment and unemployment from administrative data. Labour Force Survey data is used as training and benchmark data for this task. The classification tree method is used also to impute the status of employment and the location of the workplace (Latvia or abroad). The imputation of occupation, industry and education variables is carried out using the *k*-nearest neighbours method.

Housing Census

The primary source for the housing census is the Cadastre (in Latvia – the State Immovable Property Cadastre Information System). However, after the data quality and coverage testing, it was concluded that the housing census in Latvia cannot be conducted solely on the Cadastre data.

The most prominent issues are the over-coverage of conventional dwellings and the under-coverage of conventional dwelling`s utilities. Therefore, the information from the Cadastre is complemented with additional data; for instance, data on a dwelling's utilities is improved by adding data from water and heating supply companies, the previous census (2011), the Household Budget Survey and EU-SILC. Conventional dwelling over-coverage is addressed by adding information on demolished and disused buildings from the Building Information System and additional lists from the municipalities. In addition, there is a small under-coverage of the data on dwelling ownership. This issue is addressed by using additional data from The Office of Citizenship and Migration Affairs.

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LITHUANIA

Reporting: **Andrius Čiginas** and **Inga Masiulaitytė-Šukevič**

Statistics Lithuania as a state data steward

The need to make important decisions for the state and society during the Covid-19 crisis gave impetus to develop the State Data Management Information System. Existing state information systems and administrative data are integrated into this system, which will allow the simultaneous use of data from various sources in the analysis and the preparation of statistical production. Moreover, it will allow statistical information to be produced more quickly and at a more detailed level. Other advantages of the information system will be data exchange and opening up to business and science using specialized analytical spaces - sandboxes. For sample surveys, this means greater modeling capabilities using administrative and alternative data sources.

Population census

The 2021 population and housing census are conducted for the first time based on administrative data. Only data on ethnicity, mother tongue, proficiency in other languages, and religion are collected by a sample survey. The latter study consists of two parts: a voluntary online survey was conducted first, and non-participants are surveyed through a probability sample with face-to-face or telephone interview, depending on the pandemic situation. The latter option is possible due to existing agreements between Statistics Lithuania and mobile operators.

Statistical population register

The development of the State Data Management Information System and the ongoing population census led to the creation of a statistical population register for the purposes of sample surveys and the production of detailed demographic, social statistics. This statistical register includes personal data on residents and non-residents. The aims are to identify, merge each person correctly, to

update in real-time all necessary characteristics with vital events, movements, to evaluate the quality of administrative data, and to prepare daily and more detailed statistics.

Experimental statistics

Statistics Lithuania started compiling experimental statistics. The purpose of such statistics is to provide users with more detailed information with higher frequency using auxiliary data from administrative and alternative sources. The first two attempts are experimental predictions of poverty indicators at the municipality level using small area estimation models, and estimates of the shadow economy in economic activity groups. The new statistics will complement and provide an alternative to official statistics.

European Conference on Quality in Official Statistics (Q2022)

Statistics Lithuania is organizing in partnership with Eurostat the European Conference on Quality in Official Statistics, which is due in Vilnius on 8–10 June 2022 with a one-day training course on the 7th of June 2022. This Conference is the 10th in the series of biennial conferences dedicated to enforcing the dissemination of knowledge, recent research, and good practices on emerging new challenges related to Quality in Official Statistics. A specialized website http://q2022.stat.gov.lt will be open for more information and registration to the Conference by September 2021.

POLAND

Reporting: **Tomasz Żądło**

The ceremony of awarding the title of doctor honoris causa of the University of Economics in Katowice to Professor Malay Ghosh

The ceremony of awarding the doctor honoris causa title to Professor Malay Ghosh took place on the 14th of May 2021 at the University of Economics in Katowice in Poland in the virtual form. Professor Malay Ghosh, Distinguished Professor at the University of Florida is known as a world authority in statistics, the author and co-author of more than 300 publications including highly cited papers in “Annals of Statistics”, “Journal of the American Statistical Associations”, “Biometrika” and “Journal of the Royal Statistical Society, Series B”, the supervisor of 60 PhDs, the Principal Investigator and Co-principal Investigator of 30 grants. He is also the Elected Fellow of the American Statistical Association, the Elected Fellow of the Institute of Mathematical Statistics, the Elected Member of the International Statistical Institute and the Elected Fellow of the International Society for Bayesian Analysis. He received numerous awards including the Jerzy Spława-Neyman Medal bestowed by the Polish Statistical Association in 2012, the Lifetime Achievement Award given by the International Indian Statistical Association in 2017 and the Small Area Estimation Award in 2019.

More details:

https://www.ue.katowice.pl/no_cache/en/university/news/article/ceremony-of-awarding-the-title-of-doctor-honoris-causa-of-the-university-of-economics-in-katowice-to-1.html

The commemorative book:

https://www.ue.katowice.pl/no_cache/en/university/news/article/publication-on-the-occasion-of-conferring-the-doctor-honoris-causa-degree-upon-professor-malay-ghosh.html

The recording of the ceremony is available at: https://tv.ue.katowice.pl

SPAIN

Reporting: **Antonio Argüeso**

A register-based 2021 population and housing Census in Spain

In 2021, Spain will join the small group of countries that carry out the population and housing census based exclusively on administrative registers, probably becoming the largest country in the world that conducts a census following a system like this.

The 2021 Census is the result of a process started in 1996 with the creation of a continuous population register. This made it possible to stop conducting a classic population census in 2011: questionnaires were sent only to a sample of 10% of households and that information was combined with the content of the population register to complete the census information.

The 2021 census no longer needs to collect information from households but is built exclusively by combining data from dozens of administrative sources on population and dwellings. It is, therefore, the culmination of a long 25-year journey. It can be done because in Spain three fundamental elements converge that only occur in a few countries: good population and housing registers, which serve as the skeleton of the operation, abundance of administrative data for the census variables and a clear legal basis to access those records.

The 2021 census will refer to the date of January 1. The product that is built is similar to the one that would be available if the questionnaires of all households in Spain were processed through a classic Census: a file containing approximately 47 million people, and another one with around 26 million dwellings, 19 of them occupied (of course the real figures are the product of the Census itself).

The census project will be complemented by conducting a specific survey, called the Survey of Essential Characteristics of the Population and Housing (ECEPOV-2021). Developed during the first half of 2021, it will improve the imputation of some census variables and will provide some complementary information, which is not found in administrative records. It is a sample survey directed at 1% of the population.

One of the most outstanding elements is the use of information on the electricity consumption of the dwellings to be able to offer a classification of the use of the dwellings, an alternative to the traditional classification (occupied, secondary, empty) with much more objective information.

The research on sources and methods developed to construct the 2021 census has also resulted in very novel satellite projects. This is the case of information on commuting (measurement of daily flows between place of study and work). At the end of 2019, INE developed a pioneering project worldwide on measuring daily mobility using its own methodology, with data from the three main mobile phone operators in Spain. The objective was to produce information on commuting, highly demanded in previous censuses whose quality in administrative records might not be sufficient. The covid-19 outbreak that began in March 2020 in Spain led the project to refocus to provide daily information on population mobility, which INE has been providing promptly during 2020 and 2021.

The 2021 census should be the last census in Spain, in the sense of offering a detailed photo of the territory once every ten years; Work is underway to design a strategy to offer information with the same level of detail but on a more regular basis. The census will give way to continuous exploitation of an updated population register, opening the door to a new system of continuous longitudinal population and household statistics.

Reporting: **John Glaser**

U. S. Labor Productivity: Adjusting first quarter 2020 to account for the effects of COVID-19

U.S. Bureau of Labor Statistics (BLS) quarterly estimates of labor productivity—defined as real output per hour worked—combine output data published by the Bureau of Economic Analysis (BEA) with hours data primarily from the BLS Current Employment Statistics (CES) survey. The reference period for the March 2020 CES data, the pay period that includes the 12th of each month, largely predated many of the COVID-19-related job losses and business closures that occurred in the latter part of March 2020. To capture these job losses, adjustments were made to employment and hours estimates in the first quarter of 2020 using data primarily from the weekly reports on the number of initial claims for unemployment insurance (UI) benefits from the Department of Labor's Employment and Training Administration. Hours worked and related measures—including labor productivity—for the first quarter of 2020 reflect these adjustments. (Additional information is available on the BLS website.)

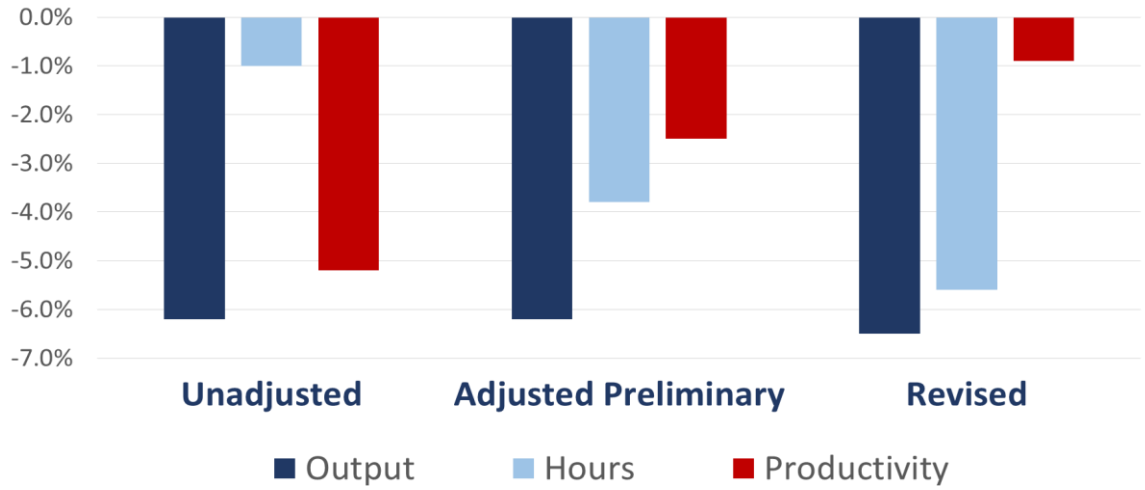


Figure: *COVID-adjusted labor productivity growth, U.S. nonfarm business sector, 2020 Q1. Annual average percent change from previous quarter*

Output growth for the preliminary estimate of 2020 Q1 from BEA was -6.2 percent. BLS adjustments to preliminary estimates, based on supplementary data on employment, reduced 2020 Q1 hours growth by 2.7 percentage points from -1.0 percent to -3.8 percent. (All quarterly percent changes are seasonally adjusted annual rates.) In turn, these adjustments to hours worked increased estimated labor productivity growth by 2.7 percentage points from -5.2 percent to -2.5 percent.

For the revised estimate, BEA revised output growth downward by 0.3 percentage points from -6.2 percent to -6.5 percent. BLS revisions to the preliminary estimates, which added adjustments to average weekly hours based on CES data for April, reduced 2020 Q1 hours growth by 1.8 percentage points from -3.8 percent to -5.6 percent, and increased labor productivity growth by 1.7 percentage points from -2.5 percent to -0.9 percent. These data were published in Productivity and Costs, First Quarter 2020, Revised, on June 4, 2020.

The data have been further revised since that time, incorporating the annual revision to the National Income and Product Accounts affecting output, the annual CES benchmark revision affecting employment and average weekly hours, and new seasonal adjustment methods affecting hours worked. Current results for 2020 Q1, published March 4, 2021 are as follows: labor productivity -0.8 percent, output -6.4 percent, and hours worked -5.6 percent—nearly identical to the June 2020 revised estimates.

Upcoming IASS-Supported Conferences in 2021

ICES VI – The International Conference on Establishment Statistics will take place 14–17 June 2021 in New Orleans, U.S. Website: https://ww2.amstat.org/meetings/ices/2020/conferenceinfo.cfm/

EESW21 – European Establishment Statistics Workshop 2021 will take place virtually 14–17 September 2021. Website: https://statswiki.unece.org/display/ENBES/EESW21

SAE2021 – BigSmall – Conference on Small Area Estimation, with the theme "Big Data for Small Areas", will be held virtually 20–24 September 2021, as a satellite conference to the World Statistics Conference in 2021. Website: https://sae2020.org/

11e Colloque International Francophone sur les Sondages **– 11th International Francophone Conference on Surveys** will take place 6–8 October 2021 in Brussels, Belgium. Website: http://sondages2020.sciencesconf.org

Summer School on Survey Statistics 2021

The Summer School on Survey Statistics 2021 is fully virtual and offers educational sessions in English on Friday 3, 10, 17 and 24 September at 15-18 and sessions in Russian on Saturday 4, 11, 18 and 25 September (exact times TBA).

Website: https://wiki.helsinki.fi/display/BNU/Summer+School+on+Survey+Statistics+2021.

The summer school is free of participation fee and is open for anyone interested. Registration required. Information on registration and contributed paper submission can be found on the event web site.

The main aim of the summer school is to promote scientific and educational cooperation in survey and official statistics between statisticians interested in new trends in the area.

Educational sessions include keynote lectures, invited lectures and contributed papers. Main topics are Data integration, Machine Learning and Small area estimation. Topics related to survey and official statistics are welcome in contributed papers.

The summer school is organized by the Baltic-Nordic-Ukrainian (BNU) Network on Survey Statistics. Today, the network involves partners from eight countries: Belarus, Estonia, Finland, Latvia, Lithuania, Poland, Sweden and Ukraine.

The Summer School on Survey Statistics 2021 is the 24th of the scientific or educational events organized by the network since 1997. The event is sponsored by the International Association of Survey Statisticians (IASS).

More information of the network activities can be found at https://wiki.helsinki.fi/display/BNU/Home.

Other Conferences on survey statistics and related areas

Statistics in the Big Data Era will take place 2–4 June 2021 in Berkeley, USA. Website: https://simons.berkeley.edu/workshops/statistics-big-data-era

Symposium on Data Science & Statistics is planned to take place June 2–5 2021 in Missouri, USA. Website: https://ww2.amstat.org/meetings/sdss/2021/

ANZSC 2021 – Australian Statistical Society and New Zealand Statistical Association Conference will take place 5–9 July 2021, Gold Coast, Australia. Website: https://anzsc2021.com.au/

Conference and Special Issue of Journal of the Royal Statistical Society Series A in memory of Fred Smith and Chris Skinner will be held in Southampton, UK, 7–9 July 2021. Website: https://www.southampton.ac.uk/s3ri/news/events/2021/07/08-conference-for-fred-and-chris.page

63rd ISI World Statistics Congress will take place 11–16 July 2021 and will be virtual. Website: https://www.isi2021.org/

Joint Statistical Meetings 2021 will take place 7–12 August 2021 in Seattle, USA. Website: https://www.amstat.org/ASA/Meetings/Joint-Statistical-Meetings.aspx

2021 Women in Statistics and Data Science Conference will take place 7–9 October 2021 in Pittsburgh, USA. Website: https://ww2.amstat.org/meetings/wsds/2021/

2021 International Methodology Symposium, "Adopting Data Science in Official Statistics to Meet Society's Emerging Needs", will take place virtually from October 15 to November 5. Website: https://www.statcan.gc.ca/eng/conferences/symposium2021/index

Information on activities of the **Survey Research Methods Section of the American Statistical Association** are available at: https://community.amstat.org/surveyresearchmethodssection/home

In Other Journals

Journal of Survey Statistics and Methodology

Volume 9, Issue 1, February 2021

https://academic.oup.com/jssam/issue/9/1

Survey Methodology

Optimal Response Formats for Online Surveys: Branch, Grid, or Single Item?
Matthew Debell, Catherine Wilson, Simon Jackman, Lucila Figueroa

Re-Examining the Middle Means Typical and the Left and Top Means First Heuristics Using Eye-Tracking Methodology
Jan Karem Höhne, Timo Lenzner, Cornelia E Neuert, Ting Yan

The Dynamics of "Neither Agree Nor Disagree" Answers in Attitudinal Questions
Miriam Truebner

Language Proficiency Among Respondents: Implications for Data Quality in a Longitudinal Face-To-Face Survey
Alexander Wenz, Tarek Al Baghal, Alessandra Gaia

Survey Statistics

Population Size Estimation Using Multiple Respondent-Driven Sampling Surveys
Brian J Kim, Mark S Handcock

A Sampling Design for Ordered Populations
Xiaofei Zhang, Wayne A Fuller

Tools for Selecting Working Correlation Structures When Using Weighted GEE to Model Longitudinal Survey Data
Philip M Westgate, Brady T West

Applications

The Impact of Nonsampling Errors on Estimators of Catch from Electronic Reporting Systems
S Lynne Stokes, Benjamin M Williams, Ryan P A McShane, Shalima Zalsha

The Pseudo Maximum Likelihood Estimator for Quantiles of Survey Variables
Jing Wang

Volume 9, Issue 2, April 2021

Special Issue: Disability Measurement and Analysis

https://academic.oup.com/jssam/issue/9/2

Preface

JSSAM Special Issue on Disability Measurement and Analysis: Preface
Kirk Wolter, Claudia Cappa, Elena A Erosheva, Jennifer H Madans, Kristen Miller, Paul Scanlon, Julie D. Weeks

Applications

Risk of Workforce Exit due to Disability: State Differences in 2003–2016
Yonatan Ben-Shalom, Ignacio Martinez, Mariel McKenzie Finucane

Survey Statistics

Many Classes, Restricted Measurement (MACREM) Models for Improved Measurement of Activities of Daily Living
Brian P Flaherty, Yusuke Shono

Survey Methodology

Who Counts? Measuring Disability Cross-Nationally in Census Data
David Pettinicchio, Michelle Maroto

Usefulness of Internet Surveys to Identify People with Disabilities: A Cautionary Tale
Andrew J Houtenville, Kimberly G Phillips, Vidya Sundar

Collecting Objective Measures of Visual and Auditory Function in a National in-Home Survey of Older Adults
Mengyao Hu, Vicki A Freedman, Joshua R Ehrlich, Nicholas S Reed, Catherine Billington, Judith D Kasper

Differences in Proxy-Reported and Self-Reported Disability in the Demographic and Health Surveys
Mahmoud Elkasabi

Survey Methodology

Statistics Canada Statistique Canada Canada

Survey Methodology, June 2020, Vol. 46, no. 1

https://www150.statcan.gc.ca/n1/pub/12-001-x/12-001-x2020001-eng.htm

Are probability surveys bound to disappear for the production of official statistics?
Jean-François Beaumont

Local polynomial estimation for a small area mean under informative sampling
Marius Stefan and Michael A. Hidiroglou

Small area estimation methods under cut-off sampling
María Guadarrama, Isabel Molina and Yves Tillé

Model-assisted sample design is minimax for model-based prediction
Robert Graham Clark

Considering interviewer and design effects when planning sample sizes
Stefan Zins and Jan Pablo Burgard

A new double hot-deck imputation method for missing values under boundary conditions
Yousung Park and Tae Yeon Kwon

Survey Methodology, December 2020, Vol. 46, no. 2

https://www150.statcan.gc.ca/n1/pub/12-001-x/12-001-x2020002-eng.htm

Estimation and inference of domain means subject to qualitative constraints
Cristian Oliva-Aviles, Mary C. Meyer and Jean D. Opsomer

Bayesian hierarchical weighting adjustment and survey inference
Yajuan Si, Rob Trangucci, Jonah Sol Gabry and Andrew Gelman

Firth's penalized likelihood for proportional hazards regressions for complex surveys
Pushpal K. Mukhopadhyay

Probability-proportional-to-size ranked-set sampling from stratified populations
Omer Ozturk

Semi-automated classification for multi-label open-ended questions
Hyukjun Gweon, Matthias Schonlau and Marika Wenemark

Survey Methodology, March 2021, Vol. 47, no. 1

https://www150.statcan.gc.ca/n1/pub/12-001-x/12-001-x2021001-eng.htm

Waksberg Invited Paper Series

Science and survey management
Roger Tourangeau

Regular Papers

Integration of data from probability surveys and big found data for finite population inference using mass imputation
Shu Yang, Jae Kwang Kim and Youngdeok Hwang

Sample empirical likelihood approach under complex survey design with scrambled responses
Sixia Chen, Yichuan Zhao and Yuke Wang

A method to find an efficient and robust sampling strategy under model uncertainty
Edgar Bueno and Dan Hedlin

Bayesian predictive inference of small area proportions under selection bias
Seongmi Choi, Balgobin Nandram and Dalho Kim

Small area benchmarked estimation under the basic unit level model when the sampling rates are non-negligible
Marius Stefan and Michael A. Hidiroglou

Estimation of domain discontinuities using Hierarchical Bayesian Fay-Herriot models
Jan A. van den Brakel and Harm-Jan Boonstra

Bayesian pooling for analyzing categorical data from small areas
Aejeong Jo, Balgobin Nandram and Dal Ho Kim

Short note

A note on multiply robust predictive mean matching imputation with complex survey data
Sixia Chen, David Haziza and Alexander Stubblefield

Journal of Official Statistics

Volume 37 (2021): Issue 1 (March 2021)

https://sciendo.com/issue/JOS/37/1

Building a Sample Frame of SMEs Using Patent, Search Engine, and Website Data
Sanjay K. Arora, Sarah Kelley, Sarvothaman Madhavan

Optimal Reconciliation of Seasonally Adjusted Disaggregates Taking Into Account the Difference Between Direct and Indirect Adjustment of the Aggregate
Francisco Corona, Victor M. Guerrero, Jesús López-Peréz

Panel Conditioning in the U.S. Consumer Expenditure Survey
Stephanie Eckman, Ruben Bach

Weighted Dirichlet Process Mixture Models to Accommodate Complex Sample Designs for Linear and Quantile Regression
Michael R. Elliott, Xi Xia

Identifying Outliers in Response Quality Assessment by Using Multivariate Control Charts Based on Kernel Density Estimation
Jiayun Jin, Geert Loosveldt

Can Smart City Data be Used to Create New Official Statistics?
Rob Kitchin, Samuel Stehle

An App-Assisted Travel Survey in Official Statistics: Possibilities and Challenges
Danielle McCool, Peter Lugtig, Ole Mussmann, Barry Schouten

Measuring and Modeling Food Losses
Marco Mingione, Carola Fabi, Giovanna Jona Lasinio

Survey Mode Effects on Objective and Subjective Questions: Evidence from the Labour Force Survey
Joachim Schork, Cesare A.F. Riillo, Johann Neumayr

Generalised Regression Estimation Given Imperfectly Matched Auxiliary Data
Li-Chun Zhang

Volume 37 (2021): Issue 2 (June 2021)

Special Issue on New Techniques and Technologies for Statistics

https://sciendo.com/issue/JOS/37/2

Survey Practice

Vol. 14, Issue 1, 2021

https://www.surveypractice.org/issue/2728

Articles

Using "Don't Know" Responses in a Survey of Oncologists Regarding Medicinal Cannabis
Dragana Bolcic-Jankovic, Eric G. Campbell, Jessica L. LeBlanc, Manan M. Nayak, Ilana M. Braun

The effect of a web-push survey on physician survey responses rates: a randomized experiment
Cristine D. Delnevo, Binu Singh

COVID-19 Infection Rates and Propensity to Self-Respond in the 2020 U.S. Decennial Census
Nancy Bates, Joe Zamadics

Web survey entry selection by a mailed invitation letter
Arto Selkälä, Leena Viinamäki, Asko Suikkanen, Ulf-Dietrich Reips

Using Randomization to Learn About Framing Effects on LGBTQ Rights Questions
Daniel Greenberg, Ian Huff, Natalie Jackson, Diana Orcés

Response, Willingness, and Data Donation in a Study on Accelerometer Possession in the General Population
Vera Toepoel, Annemieke Luiten, Robbert Zandvliet

Survey Research Methods

Journal of the European Survey Research Association

Vol 15 No 1 (2021)

https://ojs.ub.uni-konstanz.de/srm/issue/view/225

The Role of Time, Weather and Google Trends in Understanding and Predicting Web Survey Response
Qixiang Fang, Joep Burger, Ralph Meijers, Kees van Berkel

Have You Ever Seen the Rain? It Looks Like It's Going to Rain! The Causal Impact of the Weather Situation and the Season on Survey Participation in a Multi-Wave Panel Study
Rolf Becker

Studying the Context Effect of Family Norms on Gender Role Attitudes: an Experimental Design
Angelica Maineri, Vera Lomazzi, Ruud Luijkx

The Relationship Between Response Probabilities and Data Quality in Grid Questions
Tobias Gummer, Ruben Bach, Jessica Daikeler, Stephanie Eckman

Using Response Times to Enhance the Reliability of Political Knowledge Items: An Application to the 2015 Swiss Post-Election Survey
Lionel Marquis

How to Reconstruct a Trend when Survey Questions Have Changed Over Time. Methods for Scale Homogenization Applied to the Case of Life Satisfaction in Japan 1958-2007
Tineke de Jonge, Akiko Kamesaka, Ruut Veenhoven

Other Journals

- **Statistical Journal of the IAOS**
  - https://content.iospress.com/journals/statistical-journal-of-the-iaos/
- **International Statistical Review**
  - https://onlinelibrary.wiley.com/journal/17515823
- **Transactions on Data Privacy**
  - http://www.tdp.cat/
- **Journal of the Royal Statistical Society, Series A (Statistics in Society)**
  - https://rss.onlinelibrary.wiley.com/journal/1467985x
- **Journal of the American Statistical Association**
  - https://amstat.tandfonline.com/uasa20
- **Statistics in Transition**
  - https://sit.stat.gov.pl

Welcome New Members!

We are very pleased to welcome the following new IASS members!

Title	First name	Surname	Country
MR.	Tarek	Abou Chabake	Switzerland
MR.	Rafael	Bassegio Caumo	Brazil
DR.	Bakhodir	Begalov	Uzbekistan
DR.	Sanjay	Chaudhuri	Singapore
MR.	Michael J.	Colledge	Australia
DR.	Jill Marie	DeMatteis	United States
DR.	Andreea Luisa	Erciulescu	United States
MR.	Caio César Soares	Gonçalves	Brazil
DR.	Andrés	Gutiérrez	Chile
PROF	Willem Jan	Heiser	The Netherlands
MS	Luna	Hidalgo	Brazil
PROF. DR.	Eva	Laczka	Hungary
DR.	Johanna	Laiho-Kauranne	Finland
MR.	Achraf	Mrabet	Tunisia
DR.	Adalbert	Nshimyumuremyi	Mali
MR.	Guilherme Anthony	Pinheiro Jacob	Brazil
MR.	Robert	Santos	United States
PROF. DR.	Besa	Shahini	Albania
DR.	Jiraphan	Suntornchost	Thailand
DR.	Antonio Etevaldo	Teixeira	Brazil
MS	Laura	Tirlea	Australia
MR.	Xiaoning	Wang	China
PROF. DR.	Elena	Zarova	Russian Federation
DR.	Jiwei	Zhao	United States

IASS Executive Committee Members

Executive officers (2019 – 2021)

President:	Denise Britz do Nascimento Silva (Brazil)	denisebritz@gmail.com
President-elect:	Monica Pratesi (Italy)	monica.pratesi@unipi.it
Vice-Presidents:		
Scientific Secretary:	James Chipperfield (Australia)	james.chipperfield@abs.gov.au
VP Finance:	Lucia Barroso (Brazil)	lpbarroso@gmail.com
Chair of the Cochran-Hansen Prize Committee and IASS representative on the ISI Awards Committee:	Isabel Molina (Spain)	imolina@est-econ.uc3m.es
IASS representatives on the World Statistics Congress Scientific Programme Committee:	Cynthia Clark (USA) in 2017-2019	czfclark@cox.net
	Monica Pratesi (Italy)	monica.pratesi@unipi.it
IASS representative on the World Statistics Congress short course committee:	Nadia Lkhoulf (Morocco)	n.lkhoulf@hcp.ma
Ex Officio Member:	Ada van Krimpen	an.vankrimpen@cbs.nl

IASS Twitter Account @iass_isi (https://twitter.com/iass_isi)

Institutional Members

International organisations:

- Eurostat (European Statistical Office)

National statistical offices:

- Australian Bureau of Statistics, Australia
- Instituto Brasileiro de Geografia e Estatística (IBGE), Brazil
- Statistics Canada, Canada
- Statistics Denmark, Denmark
- Statistics Finland, Finland
- Statistisches Bundesamt (Destatis), Germany
- Israel Central Bureau of Statistics, Israel
- Istituto nazionale di statistica (Istat), Italy
- Statistics Korea, Republic of Korea
- Direcção dos Serviços de Estatística e Censos (DSEC), Macao, SAR China
- Statistics Mauritius, Mauritius
- Instituto Nacional de Estadística y Geografía (INEGI), Mexico
- Statistics New Zealand, New Zealand
- Statistics Norway, Norway
- Instituto Nacional de Estatística (INE), Portugal
- Statistics Sweden, Sweden
- National Agricultural Statistics Service (NASS), United States
- National Center of Health Statistics (NCHS), United States

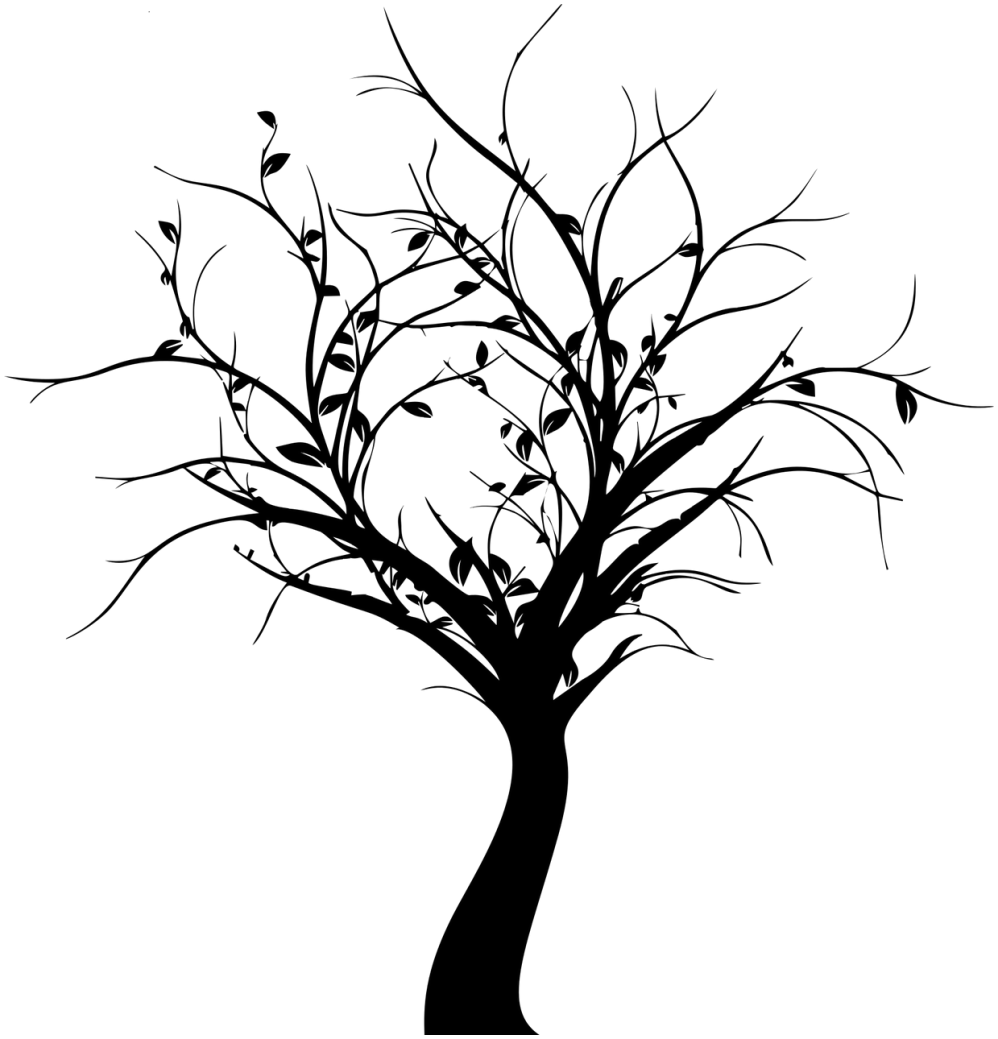
Private companies:

- Westat, United States

Save a tree!

Read *the Survey Statistician* online!

http://isi-iass.org/home/services/the-survey-statistician/



Please contact Margaret de Ruiter-Molloy (m.deruitermolloy@cbs.nl)
if you would like to cancel receiving paper copies of this Newsletter.