Statistiska centralbyrån
Statistics Sweden

Notes
Nov 17-18 2016

Advisory Scientific Board
Suad Elezović, PMU/MFS
Tiina Orusild, PMU/MIS

Meeting with the Advisory Scientific Board of Statistics Sweden November 17-18, 2016

Board members

Stefan Lundgren, Statistics Sweden, chair (participated on Nov 18)
Lilli Japec, Statistics Sweden, co-chair
Tiina Orusild, Statistics Sweden, secretary
Suad Elezović, Statistics Sweden, secretary
Professor Jan Björnstad, Statistics Norway & University of Oslo
Professor Sune Karlsson, Örebro University
Professor Frauke Kreuter, University of Maryland & University of Mannheim (participated on Nov 18)
Professor Lars Lyberg, Stockholm University
Professor Daniel Thorburn, Stockholm University
Professor Thomas Laitila, Statistics Sweden & Örebro University
Professor Julia Lane, Wagner School, NYU & Center for Urban Science and Progress (participated on Nov 17)
Professor Natalie Shlomo, University of Manchester
Professor Geert Loosveldt, University of Leuven

Other attendees

Folke Carlsson, Statistics Sweden
Eva Bolin, Statistics Sweden
Gustaf Strandell, Statistics Sweden
Martin Axelson
Claes Andersson
Frida Videll
Fredrik Olsson
Jörgen Brewitz
Maj Gothe Eriksson
Joakim Malmdin
Anna Hagman
Karin Valentin Asin
Jens Malmros
Alexandra Kopf Axelman
Helena Rudander
Malin Franzon

Day 1

Welcome

Lilli Japec opened the meeting by welcoming everyone.

External members present own research work

Speaker: Natalie Shlomo

Summary of presentation
Disclosure risk occurs when there is a high probability that an intruder can identify an individual in released sample micro data and confidential information may be revealed. A probabilistic modelling framework based on the Poisson log-linear model is demonstrated for quantifying disclosure risk in terms of population uniqueness when population counts are unknown. This method does not account for measurement error arising either naturally from survey processes or purposely introduced as a perturbative disclosure limitation technique. The probabilistic modelling framework for assessing disclosure risk is expanded to take into account the misclassification/ perturbation and demonstrated on sample micro data which has undergone perturbation procedures. Finally, we adapt the probabilistic modelling framework to assess the disclosure risk of non-random samples from sub-populations and show some initial results.

Topic 1: Non-response problems in the household budget survey

Speaker: Gustaf Strandell

Summary of presentation
The household budget survey is conducted every four year by Statistics Sweden on behalf of the Swedish Parliament and provides information about annual household expenditures, by major expenditure categories and type of households. The survey is conducted as a consumer expenditure diary survey.
Before the data collection for the 2016 HBS some changes were implemented to improve the overall quality of the survey. Some of these follow recommendations made in the 2015 ASPIRE review of the HBS, see (1) page 39-40. The survey was also reviewed by Clyde Tucker and Carol House in November 2015, who provided a number of recommendations for how the survey could be improved, see (2). However, the response rate for the household budget survey in 2016 was so low that Statistics Sweden decided to stop the data collection already in May 2016 and to not publish any results from the survey. The next HBS survey is planned for 2020. The main question is what changes Statistics Sweden has to make to be able to complete a household budget survey in 2020.

Questions to the board

- What methods, tools and other sources of data should we use in the future to be able to produce the HBS with satisfactory quality?
    - Better tools for measuring and handling survey error?
    - Smaller respondent burden?
    - Use of cash register and other sources of data

Discussant: Lars Lyberg

- The design must be based on user requirements. The main users, the national accounts and CPI, must formulate their data needs and their quality requirements. This dialog needs to be detailed in the sense that if data quality requirements are fulfilled the data should be fit for use. It

seems reasonable to try to broaden the user base. A service level agreement with the main users should be very helpful for both users and HBS.

- The House/Tucker document can serve as a blueprint for the redesign. It also contains a large part of the relevant literature.
- The redesign should be an SCB project with external assistance.
- Many major design decisions need to be tested and piloted before implementation.
- HBS staff must have a reasonable control of the data collection through monitoring of interviews and nonresponse follow-up.
- All interviewers monitoring must be unannounced. This is important for understanding the cognitive processes that are happening during the interview. Announced monitoring is a waste of resources.
- The size of the noncontact group makes it necessary to analyze this group further since, in many surveys, this group may differ more from the response group than the refusals and therefore may cause larger bias.
- To get higher quality data it is vital to reduce the number of noncontacts. The increase of this nonresponse group may be a function of level of effort and therefore with proper redesign could be mitigated.
- The telephone mode is probably not the best mode for an HBS and SCB should explore introducing face to face interviewing. Mode effects should be studied.
- Cash incentives should be considered. Respondents have to put in a lot of work and consequently burden is considerable. If there are internal policies that prevent cash these policies should be changed or an exception made for HBS.
- All survey materials should be tested and piloted for usability and comprehension.
- 6-7 hours of interviewer training seems totally inadequate. HBS should train the interviewers on substantive issues and there should be processes in place to handle interviewer attrition, vacations and new interviewers.
- Para-data related to the implementation should be collected and acted upon.
- Interviews should take place on all days of the week and in different timeslots. A random allocation of the sample over time will allow the reduction of the recall period for expenses over 500+ SEK, for example from one year to 3 months.
- A new design should try to take a new world of consumption behavior into account, explore new data sources, and use effective mode combinations.
- Focus groups should be assembled to shed light on households' views on how purchases are made in a rapidly changing consumption world.
- Responsive design might have to be put on hold since SCB does not have a "dashboard culture" yet.
- The design should have a total survey error perspective. The measurement errors in HBS are likely to be large and should be prevented.
- It would be good to upgrade the system for automated coding of purchases and consider innovations such as digital diaries.

Discussion

Some points made during the discussion

- Quality issues important: You must know when the users think that the quality is good enough.

- It would be great to see if there's enough use of this survey in order to justify future work.
- Non-response is a big challenge: Without response you cannot do anything. There is not a quick fix, instead you have to redesign.
- Respondent burden:
  - 99 pages of questions.
  - Reducing the burden not possible in a noticeable way but perhaps some changes such as cash incentives. If you want a good quality then you have to spend some more money.
  - Observe that the respondents rarely read the instructions very carefully.
  - People don't like to go to computers with this kind of survey.
- Question: Is telephone survey possible?
- Any design decision must be based on data ant not on try & error principle.
- Monitoring of interviews is necessary.
- Seek external assistance. Find out some other data sources.
- Question: Do we really need this kind of statistics? For what reason?
- Non-contact increased: Probably major cause of low response rate.
- A team of methodologists should be involved from the very beginning.

Topic 2: Variance estimation for estimators of change in the Swedish LFS

Speaker: Martin Axelson

Summary of presentation
In the Swedish LFS, variance estimates for monthly statistics are calculated according to theoretical, closed form expressions. For quarterly and annual statistics, which are derived combing point estimates for the months constituting the period in question, variance estimates are derived using monthly variance estimates in combination with estimates of the correlation between estimators defined at the monthly level. Even though the used method has theoretical merit in general, its practical implementation can be questioned for at least the following reasons:

- the correlation estimates in use are not based on an estimator which properly reflect the point estimator and sampling design in use,
- domain estimation is only reflected to certain extent in the correlation estimates in use,
- The correlation estimates in use are based on empirical data from the early 1990'ies, thus lacking in timeliness.

Against this background, a project team at Stats Sweden has derived an alternative procedure for variance estimation over time. The work, the result of which is presented to the scientific council, was in part financed through a European Commission Grant Agreement. Although derived independently, the derived approach shares some important features with the approach presented in Qualité and Tillé (2008), which in turn draws heavily on Tam (1984).

During the project work, an obvious possible extension of the derived approach was identified. The basic idea will be presented to the scientific council, who

will also be asked for advice on whether or not the idea is worth pursuing any further.

Finally, the scientific council will be asked for advice on how to implement the newly derived approach. In this regard, an important question is to what extent, if any, variance estimates should be based on historical data rather than up-to-date variable information?

Discussant: Daniel Thorburn

Question 1: *Does the proposed estimator have a stronger theoretical support?*

- Yes!
- With the large data sets, there is no reason whatsoever to believe that a smoothed estimator is better (one using previous estimates of the covariance).
- If there were such reasons, a smoothed estimator should be used also for the level estimates.

Question 2: *Can the proposed method be used for production? To what extent (if any) should the variance be based on historical data rather than up-to-date variable information?*

- I suppose ”used for production” means ”be published regularly”.
- In that case, yes. Do not use historical information (other than from follow ups).
- But if changes are important it is better to improve the estimates of change, with smaller variance. (This may imply using historical information for estimating the bias of the subsamples´).
- Continue to study the subject to get a better picture for internal use in improving the design.
- Question 3: *Ought Statistics Sweden to develop better methods? using that*
    - *Individuals respond independently of each other at all times;*
    - *The response behaviour for each individual follows a Markov Chain;*
    - *With transition matrices common to (other) response homogeneity groups.*
- I do believe that the suggested method builds on independence (given stratification and B_i'x).
- But I believe that Statistics Sweden should try to find better methods
    - E.g. a better use of the AMS-auxiliary and its changes.
    - e.g. to identify turning points or trends
- For publication Statistic Sweden should focus on the figures for level and change. The precision figures are of secondary importance to users.
- For internal use this variance figure is not enough.
- If Statistics Sweden turns to Markov chain models, they should be used primarily for the level. Do not develop such models for estimation of change only.
- If different response models are used for the ordinary LFS and the variance estimator, it implies that the level estimates will also be affected and that your variance estimator refers to some other estimator.
- It is not simple to combine Markov chain models with GREG-calibration. It is probably simpler with other ways to reduce non-response like some propensity based methods.

- Stationary Markov Chains should not be used. The chains should at least be state dependent. Becoming unemployed probably affects the response probability.
- Since the response probabilities vary between the eight interview times the process cannot be stationary.

Discussion
Some additional points made during the discussion

- There are probably some better estimators of change than those presented. Try using some bootstrap estimator (or jackknife). Purely automatic variance estimation would then be possible.

Day 2

Current issues at Statistics Sweden

Speaker: Stefan Lundgren, Director General

Summary of presentation

New things since last meeting

- Government regulations have been completed
  - SCB has new regulations- clear improvement in the sense of mandate
  - No any decision-making board outside Statistics Sweden
  - SCB has become (formally) Sweden's NSI (National Statistical Institute)- we have been informally treated as the NSI until now.
  - Clear mandate to issue regulations and quality standards
- Reorganization of Statistics Sweden in order to centralize all resources:
  - Back to original philosophy- Research Department and Process Department joined. Reassigned units:
    - Individuals & Households
    - Business & Enterprises
    - Process & Architecture
    - Portfolio & Project
  - Centralized budget

Topic 3: Redesign of the EU-SILC, Living Condition Survey (LCS) and Children's LCS

Speakers: Anna Hagman & Karin Valentin Asin

Summary of presentation
The three surveys are partly integrated and the design of the surveys is quite complex. Some simplifications and improvements have been implemented in recent years but there is a need to continue this work.

The samples for the EU-SILC and the LCS are overlapping and some of the questions are the same in both surveys. A rotating panel design is used in the

EU-SILC, in LCS the samples for different years are selected independently (over time) and the sample for the Children's LCS consists of children to sampled individuals in the LCS. The sample size for the Children's LCS is usually quite small and the number of respondents is even smaller. Since the number of respondents is small estimates are produced for two years i.e. the respondents from two survey rounds are used in the estimation even though the survey is conducted annually. The same applies for LCS.

Some changes will be introduced in the EU-SILC, e.g. the data collection period will be shortened from about 10 months to 3-4 months and the number of times the sampled individuals are participating in the survey will probably be increased from 4 years to 6 years.

A project team will consider design issues in the three surveys, including sample design, estimation, data collection period, questionnaire design, integration of the surveys etc. Implementation of any changes will be done in the coming years.

Discussant: Frauke Kreuter

- Questions for clarification
  - What are the noncontact (NC) rates for parents vs. kids? NC seems to be the biggest problem.
  - What are the cost differences for the different scenarios? And what is the biggest cost driver?
  - Are NC re-approached if they are not part of wave 1, 2 etc.?
  - What determined your reference period?
  - Who is the stakeholder for LCS?
- Alternative Designs
  - Standard of Living Surveys collected via mobile phones through World Bank (Dabalen et al. 2016)
  - Smart phone use and texting on the rise among children and teenagers (Pousher 2016, Pew)
  - Among children mobile/digital modes seem advantageous (Flanagan et al. 2015, BMC Research Notes)
  - If mode is moved, shorter intercept surveys could be asked and the reference periods be reduced.
- Experiences with EU-SILC and a "national LCS" or other "similar" systems of surveys
  - Children of Immigrants Longitudinal Survey in Four European Countries (CILS4EU)
  - Experience with teenagers and mobile data collection
- What would be the best way to measure living conditions in Sweden
  - Given mode stays same
    - Matrix survey sampling (J. Gonzales, J. Drechsler, T. Merouris)
  - Dynamic questionnaires (K. Early, J. Mankoff, S. Fienberg)
- Different sets of one-year estimates and the two types of two-year estimates.

Discussion
Some points made during the discussion

- The same questions to children of 12 and 18 years are inappropriate. They have different perceptions.
  - Question: What could be done to measure in a better way than CATI? Web is one alternative. Other ways?

- Experiences from other countries should be analyzed. E.g. SILC in Norway does not separate living conditions. U.K. has some kind of a longitudinal study.
- Can we trust the results from the children's survey?
- Question: Who are the main users except those who are paying?
- Noncontact rate is very high. Question: How do you make contacts?

Topic 4: Methodological issues of web panel surveys

Speaker: Jörgen Brewitz

Summary of presentation

Web panel surveys have received a widespread use among market and public opinion researchers. It is not clear, however, if web panel surveys are plausible for high quality statistical products. Can these surveys be adapted in their design to meet the quality requirements of an agency producing official statistics? The Advisory Scientific Board already addressed this topic at its spring meeting in 2012. Since then, however, much has happened. Statistics Sweden has taken several initiatives to further explore the potential of web surveys; initiatives which have provided new insights and given rise to new questions. This is why we propose a renewed discussion on methodological issues of web panel surveys at the Advisory Scientific Board meeting in November 2016.

Since 2012, a report on methodology for web panel surveys has been written by Statistics Sweden on commission from the Swedish Agency for Economic and Regional Growth. A seminar on the same topic has been given for authorities responsible for official statistics. Dr. Michael Brick, Westat, has written a report regarding research on panels and non-probability sampling on commission from Statistics Sweden. Professor Daniel Thorburn, Stockholm University, has written a discussion on Brick's report including possible uses of web panels at Statistics Sweden. A co-operation with the Laboratory of Opinion Research at University of Gothenburg is discussed.

We propose that the Board addresses issues such as the scientific foundation of web panel surveys, empirical results, and sampling and estimation issues for web panel surveys (e.g. possibilities with calibration, sample matching, combinations of web panel surveys and traditional surveys, and Bayesian modeling.) Also, input from the Board on probability-based web panels that could be suitable for Statistics Sweden is very welcome. Measurement issues are not intended to be covered.

Discussant: Geert Loosveldt

- Previous work:
  - Recommendations from the Scientific Advisory Board on Web Panel Surveys (with replies and comments from Statistics Sweden) (2012)
  - Michael Brick (2015)
  - Brewitz (2015)
  - Daniel Thorburn (2016)
- Recommendations:
  - The web offers many new possibilities for statistics production
  - The web is a new mode and its advantages should be used
  - Use probability based web panels

    - Use calibration as a weighting procedure
- Current paper 'Methodological issues of web panel surveys'
    - Openings question: Can web panels be used or adapted to produce official statistics?
- Hesitation to start?
- The current questions for the board:
    - a suitable limited target population 'worth trying'
    - most appropriate estimations methods 'worth trying'
    - Are these questions responsible for hesitation?
- Shift to more complex designs is stimulated by technological innovations
    - Implementation of web panel survey seems to be in line with this trend
- A new data collection mode in an old uniform design with new problems
- Is the implementation of a web panel survey a mode problem or a design problem?
- The assessment of both representativity and measurement quality is necessary
    - Representative weighted sample with large measurement bias?
- More complex designs to tackle new problems
- Integrate a web panel survey in the current data collection activities at Stats Sweden.
- General objectives: improvement and assessment of representativity and measurement quality
- Informative to make an evaluation of selection effects and measurement effects
    - (Mode related) measurement effect: difference between the distribution of Y measured by different modes, but observed on the same (comparable) group of respondents
        - Comparable groups and difference between modes (measurement)
    - Selection effects: difference between the distribution of Y measured by the same mode but observed on two different groups of respondents
        - Same mode (measurement) but different groups
- Example integrated design: Face-to-face survey combined with a web panel survey.
- Implementation
    - Step 1: Random sample with auxiliary variables for all sample units
    - Non probability samples are not an option
    - Step 2: Split the sample into two parts: A and B
    - Step 3: Implement a current cross sectional survey in part A
    - Mixed modes: web and face-to-face follow up
    - Step 4: implement a web panel survey in part B
    - Mixed modes: web and face-to-face follow up
    - Special attention for coverage and difficult to reach groups
        - Create access to the internet for all units
- Discussion
    - Create an integrated and informative design
    - 'procedures for a web panel survey' → 'implementation of a complex design with mixed modes'
    - Design is more important than the selection of the estimation method
    - What design is most informative to apply a particular estimation method?
    - Evaluation of selection effects→ most relevant variables related to participation and content of the survey→ estimation method
    - Measurement problems must be taken into account

- Comparable groups of respondents
- General population more appropriate than specific groups
- Feasibility study
- List of appropriate current surveys for which the web panel survey is an alternative
- Reasons to start with a web panel survey:
- Cost and speed?
- Specification of the integrated design
- Overview of added information
- Specification of the implementation strategy
- Specification of the analytical procedures
- What information is used and how to evaluate selection effects and measurement effects
- Pilot study of an integrated design
- Translate hesitation into wise action

Discussion
Additional points made during the discussion

- A comparison between alternative designs should be done.
- Large nonresponse rates are likely to occur.
- Question: Could a web panel survey be used as a complement to the traditional (or some other) surveys?
- Measurement issue is a big problem- be aware of this!
- Use mobile phone interviews with a few questions.
- There's a mode effect. Also an issue: How do we estimate? Traditional survey approach probably not fully relevant.
- Combining probability sampling with non-probability sampling techniques.

After the general discussion, Stefan and Lilli closed the meeting by thanking everyone for participating.