

DISCUSSION OF SESSION ON CENSUS METHODOLOGY

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Key Words: undercount, census accuracy, postcensal estimates, census evaluation

I am pleased to be invited to discuss such an interesting group of papers about census taking. I commend all the authors for presenting such high quality work. The combination of these topics in one session provided something for everyone.

Although all the papers in this session are about census taking, the topics are widely varied. I think that the variety illustrates how complicated census taking really is. It is complicated even for a small country like Switzerland. This is true for the U.S., which has a large population that is very diverse and dynamic.

We have a range of purposes in the analysis of census data presented here today. They range from using the census to evaluate a small area estimates program to sample design for evaluating the census itself. Then we have papers on census operations, one about predicting where the hard-to-enumerate households will be and the other is about fixing an unanticipated problem during the enumeration.

I think that this range of topics describes how large the size of a census operation really is and from a very practical point of view, shows the pressures on census taking and their implications.

The theme running through all of these papers is accuracy. One paper focuses on evaluating the accuracy of the census through a post enumeration survey while another looks at the impact of an unduplication process on the accuracy of the census. Another uses the census to evaluate the accuracy of a small area estimates program. The last examines models for predicting where the hard to enumerate will be which could be used in improving accuracy of a census.

Order Selection, Random Effects, and Multilevel Predictors in Modeling Decennial Census Response

First I will talk about Eric Slud's paper on modeling response by mail in the 1990 Decennial Census. Someone might ask 'why

would anyone want to model census response?' That is a suggestion I have for the paper is to expand on the answer to this question, and in addition to improve the interpretation, synthesis, and context.

This modeling is important for several reasons. One is that using the results of one census should facilitate the operations of the next. Effectively predicting the areas that are hard- to-enumerate would permit focusing special resources on these areas. This could be an effort before and during the census in the form of special advertising campaigns directed at these people, or special community outreach. As for the operation of the census, this information would aid the field managers in planning their workloads. If they were able to identify in advance where the hard-to-enumerate areas are, they could arrange their staffing to meet this need, rather than finding out at the last minute that they need additional staff.

Better field operations usually improve the quality of the data being collected both in terms of accuracy and timeliness. My suggestion for the next step with this work is to apply the model to the 2000 Census to determine how well it predicts the hard-to-enumerate households. Next, then is using the same techniques to fit mail response to the 2000 census data. Examining how much improvement is possible over applying the 1990 model to the 2000 data will be very interesting and provide insight on how characteristics influencing census response change from one census to the next.

The other reason that the modeling is important is that it illustrates that predicting who and where the hard-to-enumerate are is not simple. In fact, it is very complicated. This modeling uses sophisticated techniques using mixed effect logistic regression and diagnostics. The result demonstrates that the characteristics of the hard-to-enumerate are a combination of the geographic characteristics of where the person lives and the household characteristics where the person lives.

Methodology of the Swiss Census 2000 Coverage Survey

I found Anne Renaud's paper about the sample design of the Swiss Census Coverage

survey very interesting. I was intrigued to read about the design of a census and coverage evaluation survey in a country other than the United States.

One observation I have upon reading this paper is that the sample design is fairly complicated. Census coverage measurement is complicated even in a country much smaller than the U. S.

A question I have is: Why did they not use a self-weighting sample if they have reasonably accurate measures of size? They could have reduced the variation in the sample weights and reduced the effect the weights have on the variance. Their weights range from 4 to 328 vary by a factor of almost 100. In comparison, the weights for the 2000 coverage evaluation survey in the U. S., the A.C.E. vary a similar factor, about 200, but are larger by a factor of approximately 10.

After the 1990 experience with dual system estimation, the staff at the U. S. Census Bureau became convinced that the large variation in the weights of the 1990 post enumeration survey contributed to some anomalies that were never adequately explained. The 2000 A.C.E. sample design used a double sampling scheme to reduce the variation in the weights. Bob Fay played a large roll in instituting that sample design.

One suggestion I have for the paper is to add some motivation for the choices in the sample design. Does it incorporate any thing known about census error in Switzerland? Possibly this is the first investigation of census error because there seemed to be a large reliance on measurements in the U. S., the U. K., and Australia. If this is the case, include that in the paper because doing it for the first time is definitely noteworthy.

I also was interested in noting how administrative lists were used in the Swiss census and coverage survey. For the Coverage Survey, they used the Swiss directory of buildings built from previous censuses of the population and businesses. Municipalities checked this list prior to the 2000 population census. Another interesting feature of the Swiss census is that each municipality could choose the method of taking the census in their area. The choices ranged from the traditional method of having enumerators visit and interview everyone, to mailing questionnaires based on a register of inhabitants with or without a followup by enumerators.

My question is which list is believed to be more accurate: the list of buildings or the list of inhabitants?

In contrast in the U. S., the list for mailing the census questionnaires came from the merging of the previous census address with the post office list followed by a field check and a check by local governments that chose to do so. The A.C.E. had interviewers construct a list of addresses in the blocks selected for the sample.

An Early Comparison of Postcensal County Population Estimates with Results from the 2000 Census

Now I will turn to the paper presented by Signe Wetrogan and co-authored with Sam T. Davis, Josephine D. Baker, and Marc J. Perry. This paper gives us a look at the postcensal estimates and the 2000 census estimates for counties.

Estimating the population using components of change is a tough job. Births and deaths appear to be recorded fairly well. Race/ethnicity is fairly good on births, but not as good on death certificate. Internal migration for counties is tough. Linking tax records from one year to the next provides some estimates. As for immigration and emigration, there really is no good data.

As we look at the county estimates we find that the 2000 series is closer to the 2000 census with regards to the mean absolute percentage error than the 1990 series was to the 1990 census. The difference was that the 1990 series was too high while the 2000 series is too low. So, they sound of comparable quality.

However, the question is whether the error is a systematic bias or a random error.

The analysis we have seen today examines the data one dimension at a time. What we would like to see is whether there is an interaction between size, growth, and percentage Hispanic. The next step would be to perform a regression analysis to obtain a more structured answer to this question.

The analysis we have seen raises a concern about a systematic bias because the national total as well as the state totals is too low, with the exception of West Virginia that is slightly positive. This leads one to be concerned that the problem is in the level of the estimates as well as the distribution.

Another question is: If there is a systematic error, is it large enough to affect the conclusions or actions by those using the data?

The components of change methodology have an underlying assumption that the structure of the change is stable. However, in this decade, the economic boom in the U. S. has brought more immigration, particularly undocumented immigration.

The estimates program needs to find better ways to monitor change in immigration patterns during the decade. Possibly the American Community Survey will be able to provide data to check some assumptions about immigration. Another approach may be to monitor differences between surveys of population and economic surveys. Maybe we will not be able to measure the size of any new phenomena, but we may be able to obtain information prior to the census that they are occurring. An example is the analysis by Juhn and Potter (1999) that compares of the number of jobs from the current population survey and a survey of employers. This analysis showed new patterns in the estimates of the number of jobs.

The 2000 Housing Unit Duplication Operations and Their Effect on the Accuracy of the Population Count

Bob Fay's paper on the operation to identify duplicated housing units during the 2000 Census is a prime example of what occurs when in the midst of the data collection, the Census Bureau discovers a source of very large error in its operations. The Census Bureau has to respond quickly and very carefully to protect the accuracy of the census.

Having a census as accurate as possible is in the best interest of the country. If errors are found and they can be corrected in the time frame, then they should be corrected.

However, this operation was not tested although the Census Bureau certainly has excellent expertise in this type of matching with clerical review in the A.C.E. and other projects.

My question is how can one reconcile this operation with the requirements of pre-specification of the operations for the A.C.E.,

which produced the estimates considered for use in adjustment of the census.

It seems somewhat contradictory to me that alterations in the specifications could be made for one census program but not for another. The number of duplicates that were removed is approximately the same size as the estimated net undercount.

On a different tack, I have a concern about the reporting of the duplicated people that were knowingly left in the census because the housing unit was designated as occupied. These are essentially imputations. But, are they reported as census imputations? Since they did not go through the hot deck algorithm, they may not be.

Concluding remarks

I want to wrap up my remarks by saying that these papers combine to illustrate the wide range of research topics that remain about census taking and evaluation. They demonstrate the interesting challenges that lie ahead in the planning for future censuses.

Reference

Juhn, Chinhue and Potter, Simon (1999) "Explaining the Recent Divergence in Payroll and Household Employment Growth." *Current Issues in Economics and Finance*, Volume 5, Number 16, Federal Reserve Bank of New York, New York, 1 – 5.

* This paper reports the results of research and analysis undertaken by Census Bureau staff. It has undergone a Census Bureau review more limited in scope than that given to official Census Bureau publications. This report is released to inform interested parties of ongoing research and to encourage discussion of work in progress.