NONRESPONSE RESEARCH AT STATISTICS SWEDEN

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0   Introduction

Nonresponse issues are constantly on Statistics Sweden's agenda, since nonresponse rates in surveys of individuals and households have increased during the last two decades. The development has been especially dramatic for our Labor Force Survey. Like in many other countries, there is a general tendency towards increasing difficulties getting respondent cooperation. People refuse to participate more now than before but even more important is the fact that in many countries it has become increasingly difficult to even find the sampled persons. The proportion of households with unlisted telephone numbers is increasing continuously. Also, nowadays people are more mobile in general and more household members work outside their homes. Tracking down those "not-at-home" has become a burdensome task for the interviewers and costly for the agencies. Also, people are concerned about privacy and confidentiality.

I   Trends in nonresponse rates at Statistics Sweden

I.1   A general increasing trend

During the last two decades Statistics Sweden has experienced great variation in response rates in its surveys of individuals and households. In all surveys the nonresponse rates have increased. For instance, the nonresponse rate has increased from about 2% in 1970 to 12% in 1990 in the Labor Force Survey (LFS) and from 16% in 1974 to 22% in 1990 in the Survey on Living Conditions (SLC).

I.2   Factors causing variation in nonresponse rates

One factor affecting the response rates is the time for data collection: the nonresponse rates in Sweden are in general largest during the summer when people are on vacation.

The survey topic and its relevance for the sampled persons are also factors that affect the response rates. In the Swedish Survey of Child Care Needs, covering parents only, about 80% of the sampled persons return completed mail questionnaires, and about 65% of the remainder participate in the telephone follow-ups, i.e., the final response rate is above 90%. These figures can be compared with the response rates in the Swedish Omnibus Survey, which uses the same data collection method but where topics and questions change all the time due to the sponsors' requests. In this survey we end up with a final response rate below 80%.

Other survey-specific factors affecting the nonresponse rates are the data collection method, the respondent burden, whether proxy interviews are allowed, length of the data collection period, and number of waves in panel surveys. Furthermore, differences in the sample allocation may affect the (unweighted) nonresponse rate.

To our experience it is easiest to get participation in short continuing telephone interview surveys on topics of general interest for the society or of specific interest for the sampled persons, and most difficult in intermittent surveys that demand a lot on the part of the interviewers and the respondents.

The overall increasing nonresponse rates can, however, not be explained by changes in survey contents and survey designs only. There is a tendency of increasing nonresponse rates in all surveys. As discussed in Section II, there has been a negative change in the survey climate during the last two decades.

I.3   Nonresponse trends in five interview surveys

In this section the nonresponse rates for five continuing interview surveys are discussed. Four of those surveys are telephone surveys with just a very small number of face to face interviews. The Survey on Living Conditions (SLC) is the only one designed for face to face interviewing, although telephone interviewing is used occasionally. In Lindström and Dean (1986) time series for 1970-1985 are presented as well as a description of the surveys and a discussion of the development.

The Labor Force Survey, LFS, is conducted each month, using a rotated sample with eight panels where each panel reappears every three months. The sample size has varied between 16000 and 22000 persons a month. LFS is the base for the interviewers' work, since it stands for nearly 40% of the entire workload. The nonresponse rate in August 1990 was 11.9% of which 6.3% refers to "not-at-home" and 5.2% to "refusal". Corresponding rates adjusted for seasonal effects are 12.0%, 6.4% and 5.1%, respectively. (Hörngren, 1990).

The Party Preference Survey, PPS, is conducted twice a year, in May and November. The sample size is 9000 persons. Like the LFS, the PPS is popular among the interviewers and regarded as an "easy one". Nevertheless, the nonresponse rate was 17% in 1989, of which 7% refers to "not-at-home", 8% to "refusal", and 2% to "unable".

Until 1984 the Income Distribution Survey, IDS, was a mail survey with telephone follow-ups. Starting in 1984 the survey switched to telephone interviews which are carried out in January and February after the income year. IDS uses a rotation system with two panels, i.e., each sampled household is interviewed twice with one year intermission. The IDS is regarded as a difficult survey by the interviewers. The unweighted nonresponse rate was 14.5% in 1989, of which 5.8% refers to "not-at-home" and 8.1% to refusal. The weighted non-response rate is larger than the unweighted, 18% compared with 16% for 1988.

The Consumer Buying Expectations Survey, CBE, is conducted on a quarterly basis with telephone interviews in January, April, July, and October. In 1984/85 the survey switched from a rotation system of five panels to two separate systems of three panels. For financial reasons, the sample size was also reduced in 1984/85 from 6000 households each quarter to 1500 households in January and July and 4200 households in April and October. The refusal rate is rather stable while the not-at-home rate has increased dramatically, from about 4% in 1980 to nearly 10% in 1989-1990.

The Survey on Living Conditions, SLC, started in 1974 and now constitutes a data base for "social accounts" and research. The sample size has varied between 4800 and 8800 a year. Data collection is done mainly by face to face interviews lasting approximately 60 minutes. The SLC has the longest data collection period of all surveys presented, at least three months, which results in fairly low not-at-home rates. The nonresponse rate was 20.7% in 1989, of which 4.0 % refers to not-at-home, 2.2% to "unable", and 14.5% to refusal.

I.4   Nonresponse rates in mail surveys

Most of our mail surveys of individuals and households are followed-up by telephone interviews among a subsample of the initial nonrespondents, as described in section IV.5.4.

The Follow-up Surveys of Pupils, FSP, (who have left school or university) use data collection by mail with telephone follow-ups. The response rates in the mail phase differ strongly between different groups of pupils. For pupils leaving the 9-year comprehensive school the mail response rates are much lower than for those who have graduated from the university. The differences are about 15 percentage points. The differences in final responses rates are, however, much smaller, just a few percentage points. This implies that many of those who are reluctant to complete and return a questionnaire by mail are willing (or can be persuaded) to provide the information by telephone.

The Omnibus Survey is a commission based survey that has been conducted between once and five times a year since 1980. The sponsors are usually government agencies and other noncommercial agencies or organizations. Data are collected by mail with telephone follow-ups among half of the mail nonresponse. The Omnibus employs simple random sampling of about 1200 individuals aged 18-74. Like the interview surveys, the Omnibus is affected by increasing nonresponse rates. The mail nonresponse rate has increased from about 30% to nearly 40%, and the telephone follow-up does not recover the increasing loss in the mail phase. On the contrary, the nonresponse rates in the follow-ups have also increased. For instance, in a recent Omnibus Survey, conducted in early 1990, 63 % responded by mail, and 32% of the subsample responded by telephone, which yields a final response rate of 75%.

The Surveys of Child Care Needs have been conducted once a year since 1986. Data are collected by mail with telephone follow-ups among a subsample of the mail nonrespondents. Since the

survey covers parents who are motivated to cooperate, the response rates are comparably large and have not decreased during the years. In the 1989 survey 80 percent responded by mail, and 60% of the subsample responded by telephone, which yields a final response rate of 92%.

I.5   Nonresponse rates in diary surveys

Family Expenditure Surveys (FES) have been carried out intermittently at Statistics Sweden since 1907. The four most recent ones were conducted in 1969, 1978, 1985, and 1988. In these surveys data were collected through a combination of face to face interviews, diaries, and register information. In all these surveys the population consists of noninstitutional households with at least one family member not older than 74. The diary keeping period was four weeks in 1969, 1985, and 1988. In 1978 about 40 % of the sampled households were asked to register all purchases ("complete diary") during two weeks and the remaining 60 % were asked to register those purchases exceeding 50 SEK (roughly 10 U.S. Dollars) during four weeks ("partial diary").

Table 1. Response and nonresponse rates in the Swedish Family Expenditure Surveys (FES). Percent.

Result	1969	1978		1985	1988
		Complete	Partial		
Completed diary of which:	76	72	80	73	63
selected period	73	56	66	62	52
delayed	3	17	14	10	11
Nonresponse of which:	24	28	20	28	35
refusals	20	24	17	24	30
others	4	4	3	4	5
Net sample	4086	5760	7687	6001	6031

Sources: Lindström et al (1989), Lundquist (1990).

Diary surveys are considered to be especially laborious for the respondent and it is difficult to achieve large response rates in these surveys, no matter what preventive measures are taken. Diary surveys are the only ones where Statistics Sweden uses incentives to motivate the respondents. Nevertheless, the response rates are in general lower in the diary surveys than in other surveys of individuals and households.

The response rate in the 1984/85 Swedish Time Budget Survey, where the respondents were to keep a time diary for 24 hours, the proportion of completed diaries was 63%, of which 47% were diaries kept on the selected date and 16% were diaries kept on a later date than the selected one (Lyberg, 1990).

The 1989 Swedish Family Food Expenditure Survey was combined with a survey on food consumption. Besides registering all food purchases during four weeks, one member of the household was to record everything he or she ate during a week! Intensive measures were taken to educate and encourage the interviewers, and the responding households were offered incentives (among other things, kitchen scales). The response rate became 70% of which 10 % refers to participation during a period later than the selected one (postponement).

We believe that the response rates in our diary surveys would have been unacceptably low, had we not permitted postponements. We strongly encourage our interviewers to persuade the respondents to keep the diaries during the selected period, and explain that postponements are equivalent to nonresponse in

the time dimension and probably cause biased estimates.

I.6 Respondent characteristics and propensity to participate in surveys

In most surveys of individuals and households the nonresponse rates are calculated for different sociodemographic subgroups identified through register information, like sex, age, household size, and region. Of these variables, region is usually outstanding as a predictor of response behavior. In all surveys, no matter what the topic and data collection mode are, the nonresponse rates are largest for the major cities.

There is also a positive correlation between household size and propensity to participate. This correlation is found in spite of the fact that the register variables do not measure household size accurately (unmarried cohabiting couples, a large group in Sweden, are not linked in the register, and children aged 18 and over are not linked to the parent(s) they live with.) This means that the correlation between real household size and response behavior is probably stronger than available data can show. In the same way the correlation between family situation and response behavior is probably stronger than investigations based on register variables can reveal. Nevertheless, such investigations show quite strong relationships.

In the 1985 Swedish Survey on Men and Fatherhood, the response rate was substantially lower among never married men in the ages 40-44 than among married men in the same ages (60% compared to 82%) (Lyberg, 1988). The subject of the survey might explain why the bachelors hesitated to participate. The 1984/85 Swedish Time Budget survey shows the same pattern, however. In this survey the response rate was 52% among unmarried (never married and divorced) men in the ages 35-49 compared to 69% among married men in the same ages (Lyberg, 1990).

Besides region and household size no substantial differences between the respondents and the nonrespondents were found in reviewing a number of Swedish surveys (Lindström, 1983 and 1986). In these reviews, however, all studies, with a few exceptions, investigated single correlates of nonresponse. Since there may be interactive effects on the response behavior, such as those found for age and marital status, a multivariate approach may reveal stronger relationships between the available covariates and the response behavior.

II General measures taken by Statistics Sweden

II.1 The survey climate and the Swedish Data Act

Since 1970 Statistics Sweden has noted a steady increase in nonresponse rates in its surveys of individuals and households. This negative trend started with the 1970 census of population and housing, where the media took an interest in aims and methods of the census. The data collection operation admittedly used doubtful procedures, since in some apartment buildings the forms were collected by the janitors. The media interest and protests from individuals started an enormous public debate on invasion and privacy. This debate eventually led to the Swedish Data Act.

The contents of the Data Act have had direct effects on Statistics Sweden's surveys and the storage of data on individuals; advance letters must emphasize that participation in a survey is voluntary, stored data (on individuals) must be "correct", which has implications on the use of imputation and proxy interviews, and registered individuals have a legal right to get comprehensive excerpts of their own files. Furthermore, since 1970 Statistics Sweden has on occasions suffered from highly adverse publicity. Some leading newspapers have even propagated for stalling and noncooperation. There is also an increasing part of the population having unlisted telephone numbers which have contributed to increasing "not-at-home" rates.

II.2 Nonresponse research groups

Statistics Sweden has twice made extensive efforts to deal with increasing nonresponse rates. In 1977 a project was launched involving 15-20 workers directly and many more indirectly. For a couple of years methodology and research resources were concentrated on the project. When the project was finished in 1981 the nonresponse rates had gone down compared to the situation in 1975.

The stable period ended in 1982. Again, it was a census that triggered off a new debate that affected participation in our surveys of individuals and households. The suggested data collection methods for the 1985 census included various forms of collection from administrative registers. These were not popular suggestions and even though the 1985 census eventually was carried out in a conventional way, the damage was a fact.

In early 1986 more wood was thrown on the fire. It was revealed that a longitudinal study of a sample of individuals born in 1953 had been going on for years without the sample persons' consent (prospective data were collected from registers). The study, called Metropolit, was not conducted by Statistics Sweden but that did not help much. The census and the Metropolitan debate resulted in increasing non-response rates in our surveys. Many people and the media questioned Statistics Sweden's ability to provide privacy and confidentiality safeguards. The alarming situation called for immediate action on Statistic Sweden's part. A group was formed to analyze the acute problems and to propose remedial measures.

The research groups formed in 1977 and 1986 both came up with a number of suggestions, based on methodological studies and general know-how (Statistics Sweden, 1981, and Lundgren, 1987).

II.3 The Nonresponse Barometer

In 1986 the first Nonresponse Barometer was compiled at Statistics Sweden (Lindström and Dean, 1986). It presented and discussed time series of nonresponse rates for the period 1970-1985. It was also suggested that a nonresponse barometer should be produced yearly in order to monitor the survey climate in Sweden. The first barometer has indeed been followed by new barometers that have been improved each year. The first barometer contained information on five interview surveys of individuals and households. The fifth barometer (printed in October, 1990) contained information on 29 surveys, of which eight were surveys of individuals and households.

It takes some time to compile the barometer. The updates for a specific year are usually not published until the fall of the following year. Therefore, the barometer cannot be used for detecting any changes

in the survey climate. Recently, however, the Labor Force Survey has started to produce a monthly barometer that is completed simultaneously with the survey results, i.e., less than a month after the data collection. In this barometer not only the observed rates are calculated and plotted. The rates are also analyzed by time series analysis methods in order to separate seasonal effects from real changes in the trend (Hörngren, 1990). Separate analyses are performed for new and old panels, for the major cities and the rest of the country, and for not-at-home and refusal. This barometer will be a very useful tool for measuring any changes in the survey climate due to the 1990 census conducted in November 1990.

III The role of the interviewers

The typical interviewer at Statistics Sweden is a middle-aged woman who has worked 6-15 years as an interviewer, and who in 1988 had a guaranteed salary of 40% of full-time salary (but worked much more).

The UBIS project presented some statistics on the interviewers workload and response rates in order to illustrate how such statistics could be used (SCB, 1981). For instance, the correlations between the response rates for different surveys were presented. Those results showed that the correlations varied between different pairs of surveys which would indicate that individual interviewers performed differently in different surveys. For instance, some interviewers who had the largest response rates in the Family Expenditure Survey had the lowest response rates in the Survey on Travelling, and vice versa. The statistics also showed that the variation in LFS' response rates for a specific interviewer could be very large.

The median value of hours worked was 997 in twelve months 1989-90, which is about 70% of full time. This figure refers to all work reported, including interviewing, administration, general education, union work, etc. The variation between the interviewers in hours worked is rather large, half of the corps worked between 608 and 1282 hours, which is 40% to 85% of full time. Since those who quit the job and those who were recruited during the year are included, the working rates for those on duty the full year are larger than Table 2 shows. The Labor Force Survey, LFS, stands for 39% of all paid

work. LFS also provides the largest workloads defined as number of sampled persons, the median value is 981 and the maximum value is 2300!

Table 2. Interviewers' performance at Statistics Sweden during twelve months (July 1989-June 1990). Response rates (%) and total minutes worked/sampled person.

Survey	#	Minimum	Q1	Median	Q3	Maximum
			Response rates %			
LFS	210	0	87	92	95	100
PPS	190	0	82	88	92	100
CBE	193	23	78	85	90	100
IDS	165	14	76	84	90	100
SLC	195	14	63	73	81	100

The response rates are largest for the Labor Force Survey (LFS), followed by the Party Preference Survey (PPS), the Consumer Buying Expectations Survey (CBE), and the Income Distribution Survey (IDS). The respones rates are lowest for the Survey of Living Conditions, SLC. The variation between the interviewers' response rates follows the levels of the nonresponse levels, i.e., the variation is lowest for the LFS and largest for the SLC.

Individual interviewers perform differently in different surveys. Some interviewers with large response rates in one survey have low response rates in another survey. Thus specialization would be one way to increase the response rates.

The correlations (Pearson's) for the response rates achieved in different surveys, however, are, as would be expected, positive. These correlations reflect both within interviewer correlations and within region correlations. Lundström (1987) has investigated to what extent differences in response rates between different interviewer areas can be explained by differences in the demographic structure of those areas. His study is based on the Labor Force Surveys conducted in January through March 1986. Among ten potential predictors, the three that were best in explaining the differences in response rates were: percentage cohabiting, large cities/other areas, and percentage immigrants (the last two interacting). By means of these predictors, expected response rates were calculated for each interviewer area and compared with the observed rates. It turned out that for some interviewer areas the differences between the expected rate and the observed rate were very large, up to 15 to 20 percentage points. Other factors than those accounted for in the prediction model must be sought. It is reasonable to believe that the interviewer's competence is one such factor.

IV   An overview of nonresponse studies

IV.1   The public's opinion on official statistics and Statistics Sweden

Statistics Sweden has conducted four surveys on people's attitudes toward our agency. In those surveys, questions are asked on attitudes towards invasion of privacy, the Data Act, the exchange of information between agencies and institutions, the importance of statistics, knowledge of Statistics Sweden, potential participation in surveys, and storage of information on individuals. The nonresponse rates in these surveys are around 25 %. (Thus, one would expect the results to give a too positive picture of the public's opinion.) Furthermore, the results from these surveys are not fully comparable since the mode of data collection, and also the questions, have differed over time.

Although the results from these surveys must be interpreted with some care, they seem to show that

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people think that statistics are (rather) important for planning purposes, but the figures on potential participation in surveys are rather low. See Table 3.

Table 3. Potential participation ("If you were asked would you consider to provide Statistics Sweden with information about ..."). Percent.

	Health	Leisure	Occu-pation	Income, expendi-tures	Party prefer-ences	Working condi-tions
1988	62	72	71	48	42	75
1990	62	69	66	48	49	66

Source: Hinzte and Uhlén (1990)

IV.2   A public relation manual

Statistics Sweden has compiled a public relations manual for survey designers. The manual covers many different aspects of the relationship with respondents. The manual provides examples of advance letters, information on how to obtain media cooperation, and how to conduct pretests and evaluations of information material exposed to the respondents.

IV.3   Data collection strategies

IV.3.1   Negatively coordinated samples

There are reasons to believe that respondent burden, including repeated survey participation, can increase nonresponse rates.

Rough calculations indicate that approximately 15000 persons might be selected for Statistics Sweden's surveys at least twice during a twelve month period. The number of households where at least one member is selected at least twice during the same year is approximately 38000. To avoid duplicate selection Statistics Sweden has developed schemes for negatively coordinated samples. For instance, individuals selected to the Survey of Living Conditions are not selected again to this survey within a period of eight years. There is also negative coordination between surveys, but this possibility is hardly used today. Negative coordination requires that we store registers of sampled persons for many years, and we have to have a separate permission for each such register from the Data Inspection Board. Besides the costs and administration involved in storing registers, our current policy is not to keep any register longer than necessary.

IV.3.2   The use of incentives and other strategies in diary surveys

Cash, small gifts, statistical summaries, lottery tickets - they all seem to increase response rates. The increase is not dramatic, usually a few percentage points, but the pattern is clear.

Cash compensation has been used in the Swedish Family Expenditure Surveys (FES) a number of times. In the last two surveys the cash compensation has been replaced by a set of gifts. It became too expensive to continue with cash compensation that kept pace with inflation (and for which the respondents sometimes had to pay tax). In the 1988 FES the incentive consisted of a consumer journal subscription for a year, a lottery ticket (Sweden has a national lottery agency), and a ruler with a calendar. This was commensurable with the compensation provided in the 1985 survey. However, during the first months of the 1988 FES the response rates became much lower than the corresponding response rates in the 1985 FES. In fact, the situation was critical and special actions had to be taken (Lindström, 1988). One of those was to give an additional gift, a pocket calculator, to all sampled households.

The pocket calculator was sent in the advance letter with no obligations to participate. To be able to study the effect of this gift, it was introduced on an experimental basis. During a couple of months only a subsample of the households received the pocket calculator. The final difference in response rate

between those who were sent a calculator and those who received just a regular advance letter, was six percentage points. Also, the results suggest that those who received a calculator were easier to get to keep the diary without delay.

Statistics Sweden has also experimented with other types of incentives. According to the Data Act each individual has the right to receive a printout from his or her data files stored at Statistics Sweden (and any other agency keeping person registers). Many people avail themselves of this right. In an experiment conducted in connection with a mail survey we tried to find out what would happen to the response rate if Statistics Sweden made printout offers directly to the respondents, together with a more informal type of information material. Thus, one half-sample received the standard advance letter and nothing else and the other half-sample got the informal material and the chance to request their own file excerpts. It turned out that 50% asked for excerpts and the overall nonresponse rate was 20.5% compared to 23.3% in the standard letter group.

IV.3.3 Subsampling among the non-respondents

Most of our mail surveys on individuals and households are followed-up by telephone interviews among a subsample of the initial nonresponse, according to the so called Hansen-Hurwitz plan (1946). This technique provides unbiased estimates under the assumption of total response in the subsample. This assumption is of course not fulfilled in practice. At Statistics Sweden we have therefore developed a technique to account for nonresponse in the follow-up (Lyberg, 1983 and Swensson, 1983). We have developed computer programs for optimal allocation of the sample both for PCs and for the mainframe.

In connection with the 1977 Survey of Pupils Leaving the 9-Year Comprehensive School 1976, we conducted an experiment in order to investigate how the relationship between costs and mean squared error was affected by mode of data collection. For a sample of about 3600 pupils we used the regular collection procedure, i.e., mail collection followed-up by telephone interviewing among a subsample. For another sample of about 410 pupils we tried to collect data by telephone interviews only. This design made it possible to estimate the nonresponse

rates for three different designs, i.e., mail collection only, telephone interviews only, and a combination of these modes.

Furthermore, by means of register information it was possible to estimate the bias of each design. The conclusion was that the mixed mode design always would yield smaller mean squared error, at a given budget (at least for sample sizes exceeding 500.) The larger budget, the more favorable the mixed mode design was compared to the single mode designs. Telephone interviews turned out to yield the largest mean squared error, at any given cost, since the nonresponse bias involved was almost as large as the nonresponse bias produced by mail collection only. Since some people who are reluctant to complete a mail questionnaire might participate by telephone there are probably also some who cannot be reached by telephone but who might complete a mail questionnaire. By using a mixed mode design both these categories are covered. The study is described in Lyberg (1983b).

IV.3.4 Some experiments with mail surveys

Statistics Sweden has conducted experiments in mail surveys regarding the effects of timing and wording of reminders. The experiments revealed similar results:

- A brief reminder (a "thank you-and-reminder-card" (TYR-card)) sent out just a few days after the initial mailing results in a faster inflow of questionnaires.

- Various intense callback procedures administered early in the data collection period do not have an adverse effect on later follow-up attempts.

- Brief reminders and concentration on early and intensive callbacks (rather than spreading the callbacks in the more conventional way) do not result in lower final nonresponse rates. There are positive cost effects, though.

In the 1988 mail survey of pupils leaving high school an experiment on timing and wording of reminders was carried out. One half-sample received reminders in the conventional way, i.e., one TYR-card a few days after the initial mailing and then two standard reminders including new copies of the questionnaire. For the other half-sample the second

standard reminder was replaced by a new TYR-card, i.e., this half-sample received two postcard reminders and one standard reminder with a questionnaire. Furthermore, in the third reminder (including a questionnaire for all) the wording was tested experimentally. One half-sample was told that one of Statistics Sweden's interviewers might telephone them if they did not complete and return the questionnaire. For the other half-sample there was no such "threat".

The study comprised some 12000 pupils and showed that the "threat" in the last reminder had no significant effect on the response rate. The inflow after the second reminder was larger for those who received a standard reminder with a new questionnaire compared to those who just received a postcard. There was, however, no difference in the final response rates.

IV.4   Estimating nonresponse bias

A number of studies have been conducted at Statistics Sweden aiming at assessing the nonresponse bias. Some of these studies are of an indirect nature. It is very common to perform nonresponse calculations for breakdowns so that differences in rates between subgroups can be assessed. Such studies can call survey results in question but never acquit them as bias-free. The main reasons for calculating group-specific response rates are rather to identify groups for which special actions should be taken, either in an ongoing survey or in a future survey, and to identify any need to weight to reduce the nonresponse bias.

Another indirect method to assess the nonresponse bias is to compare results from two surveys covering the same variables. For instance, results from the Labor Force Survey (LFS) regarding employment can be compared with corresponding results based on census data. In such comparisons, however, it is seldom possible to distinguish between differences caused by nonresponse and differences caused by varying definitions and measurement errors. For instance, in the 1981 Swedish Fertility Survey, a face to face retrospective interview survey, the women were asked if they had undergone any induced abortion, and if so, when the abortion(s) occurred. (Since 1975 Swedish women have a legal right to abortion up to the tenth week of pregnancy.) The results from the survey were compared with the

official statistics based on hospital records. Not surprisingly the comparison showed that the survey underestimated the year- and age-specific abortion rates with up to 50 % (Lyberg, 1984). We thought, however, that this bias was a result of underreporting rather than differential nonresponse. (The overall response rate was 87%, ranging from 72% among women aged 35-39 without children (=no children below age 18 at home) to 91% among women aged 25-29 with children.)

A better way to assess the nonresponse bias in a survey by means of register data is to use the register data and calculate separate estimates for the whole sample and for the survey respondents only. This was possible in the 1981 Fertility Survey, since we had access to the Swedish Fertility register that contains fertility and nuptiality data for all Swedish women who lived in the country during 1960. By means of those register data the effects of nonresponse (and sampling) on cross-sectional estimates as well as on estimates of transition intensities were investigated (Lyberg, 1983a and 1983b).

Statistics Sweden has lots of administrative and statistical records that can be used for estimating the nonresponse bias. Examples of such records are the Total Population Register (TPR), the Social Security Register, the Taxation Register, and the Election Register. We are not allowed, however, to match register data and survey data on the individual level without special permission from the Data Inspection Board.

Lindström (1983 and 1986) reviews a number of nonresponse bias studies in surveys of individuals and households. The estimates concern employment, cases of illness, income and property, voting, and household size. No examples of very large biases have been found. Moreover, no relationship has been established between nonresponse rate and nonresponse bias, even though the overall nonresponse rates vary from 7% to 29% in the studies mentioned. (In the mail surveys followed-up by telephone interviews, we have, however, quite clear evidence that the follow-up really results in a reduction of the nonresponse bias.)

However, the variables under study have not been very sensitive ones. Furthermore, the bias estimates have been confined to the entire population or major

subgroups. If we had access to records for variables reflecting, say, social desirability, or if we were able to estimate smaller subgroup or small area biases, the picture might be a different one. Unfortunately, the records cover just a few variables. If a nonresponse bias is discovered (or perhaps found to be negligible) for a certain variable it is difficult to assess its bearing on other variables in the survey.

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