

Data quality issues in the scope of international comparison FFS surveys

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Abstract

The need to assess data quality derives from the accuracy requirements of an inference oriented study. In order to make some large scale conclusions the necessary accuracy of the estimates must be granted. Therefore the analysis of the item nonresponse and especially the identification of the nonrespondents is extremely important. Item nonresponse is a non random phenomenon as was already stated by many authors.

In this scope the main emphasis of the paper is put on the comparison of unit and item non-response rates among all participating FFS countries with available data. The unit non-response rates were taken into account as calculated by every country, while item non-response rates for the key variables or variable groups were calculated out of raw data using FFS standard data files. The descriptive comparisons were made considering countries as the units of the analysis with their non-response rates. In addition some data modeling was run in attempt to identify the item non-respondents. This part of analysis was based on the person specific item non-response rates using mainly socio-demographic variables as possible predictors. The acquired patterns were compared among the countries in order to investigate any possible similarities or dissimilarities.

1. Introduction

The notion of data quality is an important issue to raise when evaluating survey results and methodology used in the process of designing the survey, preparing a questionnaire, collecting the data and performing the analysis of the data. The best estimator when discussing data quality is the topic related to survey error. In this context survey error refers to deviation of obtained results from the true parametric values of the population (Groves, 1991). Following Groves (1991) the term survey error can be decomposed into error of (non)observation and measurement error. In the present study the primary concern is with the (non)observation error and even narrower, with one aspect of it – the respondent. The main issue in this concern is how different are the nonrespondents and how many there are in comparison to the respondents. In other words the bias is a function of nonresponse rate and the difference between respondent's and nonrespondent's mean (Groves and Couper, 1998). The nonresponse can therefore be observed on two levels:

- survey cooperation,
- ability or willingness to answer certain survey questions.

In this paper the emphasis will be made on the second one. The need to assess data quality derives from the accuracy requirements of an inference oriented study. In order to make some large scale conclusions the necessary accuracy of the estimates must be granted. Therefore the analysis of the item nonresponse and especially the identification of the nonrespondents is extremely important.

The process of answering a questionnaire is a cognitive effort on the part of respondent (Knäuper et al., 1997). It was shown that the cognitive ability deteriorates with age and thus reporting is less accurate by the

older respondents. The effect is also combined with question difficulty. Lower cognitive ability, difficult questions and hard to remember events tend to produce nonresponse.

The majority of the research on this topic has been concentrated on explaining why the incomplete answers occur and what type of respondents are the most likely to not respond to a certain question. Some of the reasons can be attributed to the nature of the topic (Kupek, 1998) and thus focusing on the salience (possession of relevant information), recall difficulties and sensitivity issues. All those factors can of course be combined with the respondent characteristics (Francis and Busch, 1975; Ferligoj et al. 1991; Grønhaug et al., 1988) and questionnaire design (Leigh and Martin, 1987; Feick, 1989). Although the findings of the authors is somewhat restrained to the same topic (Francis and Busch, 1975; Ferligoj et al. 1991) they both find gender as an important predictor of nonresponse and women to be worse respondents than men. While Francis and Busch (1975) find the females more likely to nonrespond than males, Ferligoj et al. (1991) show that although the nonresponse rate is decreasing in both groups, it decreases slower among the females than males and thus making the difference bigger.

An entirely new dimension is added when the data in question are event history data. The problem of recall bias becomes immanent (Belli, 1999). The limitations of autobiographical recall produce underreporting of the remote event of short duration especially. Furthermore the reported data about the events are often not accurate or incomplete (Belli, 1999) and thus having implications for the analytical part (Holt et al., 1991). From the analytical point of view the most important data to be reported are dates of becoming at risk of the terminal event and the date of the terminal event or end of observation (Holt et al., 1991). Therefore item nonresponse connected with this type of data is crucial for valid analytical solutions.

2. Methods

2.1. Surveys

The data analysis is based on the international Family and Fertility Survey (FFS). In total 116.897 persons were interviewed in 18 countries: Austria, Belgium, Canada, Czech Republic, Finland, France, Germany, Hungary, Italy, Latvia, Lithuania, Norway, Poland, Portugal, Slovenia, Spain, Sweden, Switzerland. A variety of sampling and interviewing methods were used by different countries. Not all questions in the questionnaire were asked in all countries.

2.2. Coding and topic selection

Special emphasis had to be put on the unique coding of the questionnaire, since the standard record files were not accurately coded following the FFS code-book. The questions not included in the survey were coded as system missing values. All the skip patterns were also coded as system missing values. If the skip pattern indicated a required answer, which was not given, code 99 was coded for that question. All “don’t know” answers were coded as 97, refusals were coded as 98, while “no answers” were coded as 99.

For the analysis 3 “hard” information topics were selected: partnership, childbearing and sexual debut with contraceptive use. Additionally one event history topic (childbearing history) and a set of attitudinal questions (section 7 of the FFS questionnaire) were also selected.

For each respondent number of questions to be filled out and the count of nonresponse answers were calculated for each selected topic respectively, as well as for all together and thus estimating overall item nonresponse.

From those counts the item response rates were calculated for each individual per topic and overall using the following formula:

$$\text{item (non)response} = \left(1 - \frac{\# \text{ of non - responded questions}}{\# \text{ of applicable questions}}\right) \cdot 100 \quad (1)$$

For the modeling of the item nonresponse a new indicator was created. It was coded 1 if the response rate was under 90% (approximately corresponding to the 30th percentile – Table 1) and 0 otherwise. Respondent having value 1 of this indicator was treated as an item nonrespondent.

The variables to be included as explanatory variables in the models were the following:

- **Household size** – indicating the number of persons in the selected household (min=1, max=22);
- **Gender** – indicating of the respondents' gender (coded 1=male, 0=female);
- **Age** – indicating age of the respondent at the time of the interview;
- **Education** – indicating highest level of education of the respondent (min=0, max=6);
- **Marital status** of the respondent – consisting of 2 dummy variables: married (coded 1=married, 0=not married), single (coded 1=single, 0=not single), with separated (including divorced, widowed and legally separated) as reference group;
- **Employment status** of the respondent – consisting of 4 dummy variables: employed (coded 1=employed, 0=not employed), unemployed

(coded 1=unemployed, 0=not unemployed), housewife/man (coded 1=housewife/man, 0=not housewife/man), student (coded 1=student, 0=not student), with retired and other employment status acting as reference group;

- **Country** – consisting of 17 dummy variables, each country as its own, with Slovenia as the reference group (Finland was excluded from the models, since it was missing the question on employment status).

2.3. Analysis

Simple descriptive methods were used to describe the nature of item nonresponse across different topics and countries. Furthermore logistic regression models were used to assess the importance of covariates on the probability of an occurrence of item nonresponse.

3. Results

The item (non)responses for the topics included in the present analysis are shown in the Table 1.

Table 1 – Percentile values for item (non)response rates across different topics.

	<i>Partner</i>	<i>Child</i>	<i>Child history</i>	<i>Sex and KC</i>	<i>Attitudes</i>	<i>Item NR overall</i>
<i>Valid</i>	116895	115312	72318	107165	94099	116896
<i>Missing</i>	2	1585	44579	9732	22798	1
<i>Percentiles</i>						
<i>5</i>	71,4	100,0	85,7	33,3	66,7	73,3
<i>10</i>	75,0	100,0	92,3	40,0	76,0	81,0
<i>15</i>	83,3	100,0	100,0	62,5	81,8	85,2
<i>20</i>	85,7	100,0	100,0	70,0	84,4	87,5
<i>25</i>	100,0	100,0	100,0	80,0	87,5	89,1
<i>30</i>	100,0	100,0	100,0	87,5	90,4	90,4
<i>35</i>	100,0	100,0	100,0	90,0	91,7	91,7
<i>40</i>	100,0	100,0	100,0	100,0	92,0	92,7
<i>45</i>	100,0	100,0	100,0	100,0	94,2	93,9
<i>50</i>	100,0	100,0	100,0	100,0	95,8	95,1

As is shown in Table 1 50% of respondents have less than 5% item nonresponse and only 10% of respondents have item nonresponse rate higher than 20%, which indicates rather high data quality. Childbearing questions show the highest data quality of them all, while attitudinal questions show consistent nonresponse across the whole sample. The most difficult were the questions about sexual debut and contraceptive use, which produced very high nonresponse rates with upper 10% of the sample having nonresponse of 60% or higher.

Table 2 shows the comparison of item nonresponses across different countries as well as comparison of overall item and unit nonresponse. There is no apparent nor analytical (a rank order correlation analysis was

run, which showed no statistically significant results) connection between the two measures. Poland has the highest unit response rate of all participating, while Switzerland has the lowest. Slovenia with relatively low unit response rate, shows the highest item response rate.

Table 2 – Item and unit nonresponse across the countries and questionnaire segments.

	<i>Unit NR</i>	<i>Item NR</i>	<i>Partner</i>	<i>Child</i>	<i>Child history</i>	<i>Sex and KC</i>	<i>Attitudes</i>
<i>Austria</i>		96,2	99,0	99,8	99,0	85,1	96,4
<i>Belgium</i>	68,4 ^a	87,9	95,9	100,0	97,8	87,5	83,0
<i>Canada 90</i>		94,0	90,1	100,0	95,8		
<i>Canada 95</i>	73,4	95,0	99,9	90,0	96,3	86,8	96,5
<i>Czech Republic</i>		94,1	97,0	100,0	94,6	91,9	93,6
<i>Finland</i>	81,7	88,0	64,8	100,0	95,2	75,8	98,2
<i>France</i>	83,0	93,3	98,7	100,0	99,8	83,4	
<i>Germany</i>		89,0	87,4	98,7	96,8	77,5	88,7
<i>Hungary</i>	69,5	93,9	98,6	100,0	99,7	91,9	90,4
<i>Italy</i>		94,0	98,9	100,0	95,9	85,9	93,2
<i>Latvia</i>		89,7	94,4	100,0	98,6	85,1	85,0
<i>Lithuania</i>		93,3	92,6	99,9	100,0	88,7	92,5
<i>Norway</i>	80,5	91,1	93,3	100,0	96,0	75,7	97,3
<i>Poland</i>	95,6	87,3	98,5	100,0	98,8	86,2	80,1
<i>Portugal</i>		94,2	99,9	99,8	99,6	82,3	
<i>Slovenia</i>	75,0	96,8	98,3	100,0	99,6	95,8	96,3
<i>Spain</i>	81,3	96,7	99,2	100,0	99,6	92,5	95,7
<i>Sweden</i>	77,8	93,1	85,1	100,0	98,4	88,1	93,8
<i>Switzerland</i>	37,3	89,8	99,6	100,0	99,6	90,7	85,6
<i>Total</i>		87,3	64,8	90,0	94,6	75,7	80,1

Legend: a - response rate for original sample, with included reserves the response rate was 95,8%.

Looking at the topics, childbearing section shows no great difference among the countries, while sexual debut and contraceptive questions show considerable variations in responses. Slovenia has the highest response rate (95,8%) and Norway as well as Finland have the lowest one (75,7% and 75,8% respectively).

Characteristics of the nonrespondents were also examined and the results are shown in the Table 3.

Table 3 – Characteristics of the nonrespondents (percentage of cases exceeding nonresponse rate of 10%).

<i>Variable</i>	<i>%</i>	<i>n</i>
<i>Household size</i>		
<i>1</i>	61,8	10639
<i>2</i>	31,0	19991
<i>3</i>	27,5	28734
<i>4</i>	23,0	35954
<i>5</i>	22,6	14179
<i>6+</i>	26,1	7398
<i>Gender</i>		
<i>Female</i>	26,0	73988
<i>Male</i>	34,6	42908
<i>Age</i>		
<i>15-19</i>	60,9	6268
<i>20-24</i>	42,1	17956
<i>25-29</i>	29,1	21787
<i>30-34</i>	22,9	21606
<i>35-39</i>	22,7	20680
<i>40+</i>	23,4	28599
<i>Highest level of education</i>		
<i>Preceding level 1</i>	22,1	1662
<i>Level 1</i>	25,6	13834
<i>Level 2, stage 1</i>	29,3	24211
<i>Level 2, stage 2</i>	31,5	48260
<i>Level 3, stage 1, vocational</i>	28,2	12158
<i>Level 3, stage 1, graduate</i>	24,2	12058
<i>Level 3, stage 2, post-graduate</i>	27,8	3707
<i>Marital status</i>		
<i>Single</i>	49,8	38919
<i>Married</i>	16,7	67852
<i>Separated</i>	32,2	9967
<i>Employment status</i>		
<i>Employed</i>	25,4	75741
<i>Unemployed</i>	28,7	7506
<i>Housewife/man</i>	14,8	13092
<i>Student</i>	53,4	9148
<i>Retired</i>	32,2	1111

<i>Other</i>	32,5	3950
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Single households are by far the worst respondents (62%). Women show more cooperation than men and also older people try harder to answer correctly than do the younger, which is not consistent with the findings of some authors (Knäuper et. al, 1997) who relate lower cognitive capacity towards the elderly and others (Francis and Busch, 1975; Ferligoj et al. 1991) who consider women as being worse respondents than men. Of course it has to be pointed out the specifics of the survey with its limitations to 45 years of age and thus findings of others cannot be fully enforced on it. Also the topic of the survey is closer to women than men and thus the following findings can be explained. Single respondents as well as students perform the worst in the sense of good reporting, while married respondents and housewives/men are the best reporters.

The results of the first logistic regression are presented in Table 4.

Table 4 – Model of item nonresponse overall.

	<i>b</i>	<i>e^b</i>	<i>95% confidence interval</i>	
			<i>min</i>	<i>max</i>
<i>Household size</i>	-0,11***	0,90	0,89	0,91
<i>Gender</i>	0,53***	1,70	1,64	1,76
<i>Age</i>	0,01***	1,01	1,00	1,01
<i>Education</i>	-0,09***	0,91	0,90	0,93
<i>Marital status</i>				
<i>Single</i>	0,88***	2,41	2,27	2,57
<i>Married</i>	-1,22***	0,29	0,28	0,31
<i>Employment status</i>				
<i>Employed</i>	-0,30***	0,74	0,69	0,80
<i>Unemployed</i>	-0,10**	0,90	0,82	0,99
<i>Housewife/man</i>	-0,05	0,95	0,87	1,05
<i>Student</i>	0,52***	1,68	1,53	1,84
<i>Countries</i>				

<i>Austria</i>	-0,01	0,99	0,85	1,16
<i>Belgium</i>	2,96***	19,24	16,85	21,97
<i>Canada 1990</i>	2,13***	8,39	7,39	9,52
<i>Canada 1995</i>	0,10	1,10	0,96	1,27
<i>Czech Republic</i>	1,44***	4,22	3,59	4,97
<i>France</i>	1,32***	3,76	3,28	4,30
<i>Germany</i>	2,27***	9,64	8,50	10,94
<i>Hungary</i>	1,36***	3,91	3,40	4,49
<i>Italy</i>	1,06***	2,88	2,51	3,31
<i>Latvia</i>	2,79***	16,24	14,17	18,62
<i>Lithuania</i>	2,25***	9,53	8,32	10,91
<i>Norway</i>	2,08***	8,00	6,99	9,15
<i>Poland</i>	3,02***	20,42	17,97	23,20
<i>Portugal</i>	0,86***	2,36	2,07	2,69
<i>Spain</i>	0,01	1,01	0,87	1,17
<i>Sweden</i>	0,98***	2,66	2,31	3,05
<i>Switzerland</i>	2,57***	13,05	11,43	14,90
<i>Constant</i>	-2,09***			

Legend: *** - $p < 0,01$; ** $0,01 < p < 0,05$; * $0,05 < p < 0,10$.

The main burden of explaining the overall item nonresponse (Table 4) lies on the country specifics. In comparison with Slovenia nearly all countries have greater probability of incidence of item nonresponse. Poland, Belgium and Latvia have the highest probability of a no answer outcome, while Austria, Spain and Canada (1995) show no statistically significant differences from Slovenia. The characteristics of the respondents are also important. The highest influence is shown within marital status, where married respondents have much lower probability (69%) for an item nonresponse then do the separated ones. Men show a greater tendency (76%) not to answer then women.

A very similar picture then in overall item nonresponse can also be seen when examining item nonresponse within a part of the questionnaire dealing with sexual debut and contraceptive use (Table 5). The influence of respondents' characteristics is less obvious though still statistically significant. The country specific patterns are similar as above with

Belgium (28 times higher odd than in Slovenia), Poland and Latvia showing the worst quality of data, while Norway and Canada (1995) show strong inclination towards very high quality data, since the probability for an item nonresponse is 59% and 31% respectively lower than in the case of Slovenian data.

Table 5 – Model of item nonresponse in questions about sexual debut and contraceptive use.

	<i>b</i>	<i>e^b</i>	<i>95% confidence interval</i>	
			<i>min</i>	<i>max</i>
<i>Household size</i>	-0,01	0,99	0,98	1,01
<i>Gender</i>	0,05***	1,05	1,02	1,09
<i>Age</i>	0,01***	1,01	1,01	1,01
<i>Education</i>	-0,07***	0,93	0,92	0,95
<i>Marital status</i>				
<i>Single</i>	0,24***	1,28	1,19	1,37
<i>Married</i>	-0,62***	0,54	0,50	0,57
<i>Employment status</i>				
<i>Employed</i>	-0,26***	0,77	0,72	0,83
<i>Unemployed</i>	-0,12**	0,89	0,81	0,98
<i>Housewife/man</i>	0,15***	1,16	1,06	1,26
<i>Student</i>	0,24***	1,27	1,15	1,39
<i>Countries</i>				
<i>Austria</i>	0,08	1,09	0,95	1,24
<i>Belgium</i>	3,33***	28,05	24,91	31,59
<i>Canada 1995</i>	-0,37***	0,69	0,61	0,79
<i>Czech Republic</i>	1,14***	3,12	2,72	3,59
<i>Germany</i>	1,76***	5,82	5,21	6,51
<i>Hungary</i>	1,68***	5,37	4,78	6,04
<i>Italy</i>	0,99***	2,69	2,39	3,03
<i>Latvia</i>	2,71***	14,96	13,27	16,86
<i>Lithuania</i>	1,69***	5,44	4,83	6,12
<i>Norway</i>	-0,89***	0,41	0,35	0,49
<i>Poland</i>	2,62***	13,69	12,24	15,31
<i>Spain</i>	0,23***	1,26	1,11	1,43
<i>Sweden</i>	0,70***	2,01	1,77	2,28
<i>Switzerland</i>	2,35***	10,53	9,39	11,82

<i>Constant</i>	-1,92***
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*Legend: *** - $p < 0,01$; ** $0,01 < p < 0,05$; * $0,05 < p < 0,10$.*

Event history data are even more exposed to nonresponse than ordinary cross sectional data due to recall bias. The results of the analysis are presented in Table 6.

Table 6 – Model of item nonresponse in event history questions – case of childbearing.

	<i>b</i>	<i>e^b</i>	<i>95% confidence interval</i>	
			<i>min</i>	<i>max</i>
<i>Household size</i>	-0,62***	0,54	0,52	0,55
<i>Gender</i>	1,50***	4,48	4,17	4,82
<i>Age</i>	0,06***	1,06	1,05	1,06
<i>Education</i>	-0,11***	0,89	0,87	0,92
<i>Marital status</i>				
<i>Single</i>	0,13**	1,14	1,01	1,30
<i>Married</i>	-0,46***	0,63	0,57	0,69
<i>Employment status</i>				
<i>Employed</i>	-0,15*	0,86	0,73	1,01
<i>Unemployed</i>	0,08	1,08	0,88	1,34
<i>Housewife/man</i>	-0,22**	0,80	0,66	0,97
<i>Student</i>	0,17	1,18	0,86	1,62
<i>Countries</i>				
<i>Austria</i>	0,95***	2,59	1,84	3,64
<i>Belgium</i>	1,96***	7,11	5,08	9,95
<i>Canada 1990</i>	2,52***	12,37	9,02	16,98
<i>Canada 1995</i>	1,59***	4,89	3,54	6,74
<i>Czech Republic</i>	3,86***	47,35	34,12	65,69
<i>France</i>	-1,24***	0,29	0,18	0,46
<i>Germany</i>	1,77***	5,87	4,24	8,12
<i>Hungary</i>	-0,38*	0,68	0,44	1,06
<i>Italy</i>	2,91***	18,41	13,30	25,47
<i>Latvia</i>	1,37***	3,92	2,79	5,51
<i>Lithuania</i>	-5,10***	0,01	0,00	0,13
<i>Norway</i>	2,55***	12,79	9,24	17,71
<i>Poland</i>	1,84***	6,28	4,39	9,00
<i>Portugal</i>	-0,35*	0,70	0,48	1,04
<i>Spain</i>	0,19	1,21	0,80	1,81

<i>Sweden</i>	1,52***	4,55	3,25	6,37
<i>Switzerland</i>	-0,17	0,84	0,56	1,26
<i>Constant</i>	-3,90***			

Legend: *** - $p < 0,01$; ** $0,01 < p < 0,05$; * $0,05 < p < 0,10$.

The effect of recall bias manifesting in high probability of nonresponse is clearly visible in the male part of the sample, where the probability for a nonresponse in the comparison to a response was 4.8 times higher than in the female subpopulation. The country specifics seem to work in a different fashion than before. The worst data were recorded in the Czech Republic, Italy, Norway and Canada 1990, while the data with the least probability of a nonresponse derives from Lithuania and France.

For the final analytical model attitudinal questions were chosen. There are two main reasons for that: expressing attitudes is less factual and thus “softer” data have greater error margin and probability of no opinion or refusal to answer and the other is the fact that a “don’t know” option was offered explicitly to respondent. The results are shown in the Table 7.

Table 7 – Model of item nonresponse in attitudinal questions.

	<i>b</i>	<i>e^b</i>	<i>95% confidence interval</i>	
			<i>min</i>	<i>max</i>
<i>Household size</i>	-0,01	0,99	0,98	1,01
<i>Gender</i>	0,05***	1,05	1,02	1,09
<i>Age</i>	0,01***	1,01	1,01	1,01
<i>Education</i>	-0,07***	0,93	0,92	0,95
<i>Marital status</i>				
<i>Single</i>	0,24***	1,28	1,19	1,37
<i>Married</i>	-0,62***	0,54	0,50	0,57
<i>Employment status</i>				
<i>Employed</i>	-0,26***	0,77	0,72	0,83
<i>Unemployed</i>	-0,12**	0,89	0,81	0,98
<i>Housewife/man</i>	0,15***	1,16	1,06	1,26
<i>Student</i>	0,24***	1,27	1,15	1,39

<i>Countries</i>				
<i>Austria</i>	0,08***	1,09	0,95	1,24
<i>Belgium</i>	3,33***	28,05	24,91	31,59
<i>Canada 1995</i>	-0,37***	0,69	0,61	0,79
<i>Czech Republic</i>	1,14***	3,12	2,72	3,59
<i>Germany</i>	1,76***	5,82	5,21	6,51
<i>Hungary</i>	1,68***	5,37	4,78	6,04
<i>Italy</i>	0,99***	2,69	2,39	3,03
<i>Latvia</i>	2,71***	14,96	13,27	16,86
<i>Lithuania</i>	1,69***	5,44	4,83	6,12
<i>Norway</i>	-0,89***	0,41	0,35	0,49
<i>Poland</i>	2,62***	13,69	12,24	15,31
<i>Spain</i>	0,23***	1,26	1,11	1,43
<i>Sweden</i>	0,70***	2,01	1,77	2,28
<i>Switzerland</i>	2,35***	10,53	9,39	11,82
<i>Constant</i>	-1,92***			

Legend: *** - $p < 0,01$; ** $0,01 < p < 0,05$; * $0,05 < p < 0,10$.

Respondents' characteristics though statistically significant don't show any great impact on the probability of a nonresponse. Regional differences play a major role once more. Belgium, Latvia, Poland and Switzerland show the probability of the least accurate and complete data.

4. Discussion

The intention of this paper was not to criticize some of the countries for not performing very good when looking at the data quality but to point out possible survey and questionnaire design flaws that should be corrected in the future research. Although not shown in this analysis major problems were encountered in the process of coding the data for the analysis. The prime problem was in the non-unified coding of skip patterns, the questions that were not included in the survey by some countries and last but not least important the nonresponse codes. It has to be stressed out that with the participation in a large international project general guidelines should be followed when preparing the questionnaire and coding the results. With this objective not quite met in this FFS survey it is also possible to put some doubt on the present analysis, since some of the coding solutions had to be made on intuitive grounds following the original questionnaires and code-books prepared by FFS project committee in Geneva.

Due to some differences in coding major nonresponse flaws in some countries (e.g. Belgium, Latvia, Poland) may be contributed to the above mentioned phenomenon. On the other hand even good quality (e.g. Slovenia) of the data may be doubted since there is no indication about interviewer behavior. Specially there is no information on the intensity or directionality of the probing used when confronted with a nonresponse. It has been suggested that intensive probing reduces nonresponse by quite a margin (Sanchez and Morchio, 1992).

However not every reason for high item nonresponse should be sought within the design. Respondents characteristics (Ferligoj et al., 1991; Leigh and Martin, 1987; Francis and Busch, 1975; Kupek, 1998) and questionnaire topics as well as data nature (event history data in

comparison to general cross sectional data) (Kupek, 1998) can also affect the level of item nonresponse. For the sake of the present analysis some basic respondent characteristics were analyzed, which all proved to be important in predicting the possible nonrespondents. Gender proved to be the strongest among them as was already suggested by others (Francis and Busch, 1975; Ferligoj et al. 1991). Men tend not to respond at much higher rate than do women. The impact of gender is closely related to the topic involvement as shown by the analysis where in the attitudinal questions gender plays a marginal role, while in childbearing history the probability of nonresponse among male respondents is 4 times higher than among women.

5. Conclusions

At the end something must be said what should be done in future studies and in international projects to avoid high item nonresponse:

- Unique coding and questionnaire design should be adopted for all participating countries within the international project and data should be thoroughly cleaned according to the commonly agreed code-books in order to secure comparability and facilitate international comparison analysis.
- The salience of certain topics should be assessed beforehand and introductory and explanatory texts should be included in the questionnaire in order to overcome problems with the lack of understanding, sensitivity, recall or social desirability.
- Some alternative methods should be used when dealing with event history data such as event history calendars (Belli, 1999) or panel design or even both to improve retrospective reporting.

In order to evaluate the quality of gathered data some steps need to be taken in future research:

- More information should be gathered on the respondents involvement in the topics being surveyed and thus enabling the evaluation of given answers.
- More information should be gathered on the interviewers their techniques and characteristics, since they also play a major role in securing high quality survey data (Hox et al., 1991).

It can be concluded that following the works of other authors the majority of the findings are similar, but present analysis adds a new dimension and that is country diversity. More data should be gathered about different design features used in all the participating countries in order to explain observed differences and to unify methodology in future surveys.

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