



8. Questionnaire design and administration

Päivikki Koponen¹, Johanna Mäki-Opas¹, Hanna Tolonen¹

¹ National Institute for Health and Welfare (THL), Helsinki, Finland

This chapter considers issues that need to be taken into account when preparing the national HES questionnaire and planning the questionnaire administration. The questionnaire design has impact on participation rate and validity of the obtained data. Questionnaire administration mode has an effect on survey budget but it may also affect on participation rate, item non-response and validity of the answers.

Timing of the questionnaire data collection in the national HES is discussed in Part A, Chapter 6 of the EHES Manual.

8.1 Questionnaire design

Every national HES should also include a questionnaire. Questionnaire design affects the participation rate as it gives the participant an impression of how easy, convenient and time-consuming it is to take part in the survey. It also affects the reliability and accuracy of the information obtained by the questions. Therefore, enough time and resources for planning the questions and preparing the questionnaire should be available (Tolonen 2005). Often, after the pilot survey, the questionnaire is at least slightly modified and improved based on the experiences obtained during the pilot.

Language, wording of the questions, selection of the response alternatives, formulation of sensitive questions, recall bias, order of questions, jump rules and the length of the questionnaire are the main elements of questionnaire design.

8.1.1 Language and wording

The proper wording of the questions is essential; the questions should be simple and straightforward. This ensures that respondent understands the questions correctly. When formulating the questions the effort must be devoted to avoiding ambiguity in the wording. Professional or highly technical terms, slang, abbreviations or words which may be considered as insulting should be avoided. In each question only one thing should be asked. All the questions should be available in the native language of respondent. (Rea 2005.) In many European countries, several language versions should be considered. The translations should be prepared with a careful validation process. EHIS questions are usually translated to the national language(s) by the national Statistics Office and at least for some sets of questions, cognitive validation has been done. These should be used when ever possible.

8.1.2 Recall bias

When formulating the questions it is good to remember that people tend to forget events. It is usually easier to remember things that happened recently than for example a year ago. When the recall period is longer the accuracy is often worse. Recall can become a source of bias (de Bruin 1996). Therefore recall of the events should be assisted by adding aids to the questionnaire and by ordering of the questions. For example holidays and national festivals can be used or the respondents can use a calendar. (Tanur 2004.)

8.1.3 Order of the questions

The order of the questions in the questionnaire is also important. A poorly organized questionnaire may confuse respondent, bias the responses, has an effect on response rate, as well as willingness to answer sensitive questions. (Rea et al. 2005, Tanur 2004, Biemer et al. 1991.) The questionnaire should start with the easy questions. When more difficult questions are placed at the end of the questionnaire and if respondent stop answering, at least some data for earlier questions have been collected. During the interview by asking the easy questions first may lead to trusting relationship between interviewer and respondent and then the respondent may be more willing to answer more difficult questions in the end. All the questions should be grouped by the topic. This makes answering easier. Also filtering questions should be used. This reduces the respondents burden. By using the jump-rules in questionnaire avoids respondent answering irrelevant questions. Also the order of the response alternatives can greatly influence the obtained results (Biemer et al. 1991).

Each national HES should include at least EHES core questions (see Part B, Chapter 5 of the EHES Manual). If the national questionnaire includes several additional items, it is recommended to keep the EHES core questions early in the questionnaire to make sure that the participants give valid responses to all of them. However, the structure of the whole questionnaire needs to be taken into account.

8.1.4 Length of the questionnaire

The length of the questionnaire affects to the response rate as well as reliability of the data. A short questionnaire increases the response rate but may lack important questions for the indicators. With the longer questionnaire the respondents often get careless towards the end and the reliability of the answers suffers (Biemer et al. 1991). The ideal length for a self-administered questionnaire is 15 minutes and for the face-to-face interview 30 minutes. In practice, questionnaires which are designed for these lengths, may require about 15 minutes longer for most respondents. (Rea et al. 1997.)

8.1.5 Layout of the questionnaire

Issues to be considered when using paper questionnaires include e.g.:

- font size and font layout feasible for persons with some problems in visual capacity (especially for the elderly);
- number of questions in each page;
- number of pages needed;
- if some questions can be skipped, clear advice to jump to next questions;
- using colours and pictures.

Issues to be considered when using web questionnaires include e.g.:

- font size and font layout;
- number of questions visible at each screen;
- jump rules to be followed (controlled by the programme, not the respondent);
- using colours and pictures;
- downloading the file in respondent's own computer not too time consuming.

Issues to be considered when using computer aided questionnaire administration (CAPI or CATI or CASI) include e.g.;

- possibilities for layout when using different programmes;
- visibility of instructions for the interviewer;
- jump rules to be followed (controlled by the programme, not the interviewer);

8.2 Questionnaire administration

Survey questionnaires can be filled in either by the respondent (i.e. self-administration) or by an interviewer. Both self-administration and interview have several alternatives how then can be organized and all of them have advantages and disadvantages, see Table 8.1 (Franklin & Walker 2003, Czaja & Blair 2005, Tolonen 2005). The questionnaire administration mode may affect participation rate and the accuracy and reliability of the responses. Thus it is recommended that the core EHES questions are collected through face-to-face interview. Other administration modes could be considered for additional questions and when the person does not respond to the first contact attempt. Use of mixed-mode and several phases of questionnaire administration may avoid participant's burden and selection bias.

Table 8.1 Comparison of different questionnaire administration methods (adapted from Franklin & Walker 2003, Czaja & Balir 2005, Tolonen 2005)

Aspect	Self-administered paper questionnaire	Self-administered electronic questionnaire	Interview Telephone	Interview Face-to-face
Cost	Low	Low*	Medium	High
Length of questionnaire	Medium	Short	Medium	Long
Complexity of questionnaire	Must be simple	May be complex	May be complex	May be complex
Control of question order	Poor	Fair	Very good	Very good
Use of visual aids	Good	Very good	Not possible	Very good
Sensitive topics	Good	Poor	Fair	Fair
Control of response situation	Poor	Poor	Fair	Good
Language version	Poor	Very good	Good	Very good
Socially desirable answers	No	No	Yes	Yes
Item non-response	High	High	Medium	Low
Response rate	Low	Low	Medium	High
Needed literacy level	High	High	Low	Low
Verifying the respondents identity	Low	Low	Medium	High

* Setting up the electronic questionnaire may be costly but after that costs of data collection are low

8.2.1 Self-administration

Self-administration of the questionnaire is cost effective but assumes that participants are not visually impaired and have a good literacy level. In paper forms it also requires separate data entry. The self-administered questionnaire should be relatively short and all questions need to be completely self-explanatory; format and question wording must be simple, without complex skip patterns. Self-administration eliminates the interviewer effect but may result in missing data as a result of uncertainty about the question. The self-administered questionnaire can be either a paper form or an electronic version. The electronic questionnaire can be at the internet or on stand alone software on computer. The electronic questionnaire can be more complex (with skip patterns) than the paper format. In the computer program it is possible to have built-in checks for responses.

In HES, a self-administered questionnaire can be delivered to the participant before the clinical examination. In this case, the questionnaire is filled in at home before the examination and checked by field work staff at the examination site. The possibilities to motivate participation to examinations are poor if questionnaires are mailed before examinations. It is also known that response rates tend to be low when self-administration is used. Alternatively, the questionnaire can be given to the participant when he/she arrives to the examination site and he/she fills in the questionnaire at the examination site. In this case, the participant can ask help from the field work staff if he/she has any problems with the questionnaire. Also in this case, the completed questionnaire should be checked by the field work staff for completeness before the participant leaves the site.

Self-administration provides more privacy for the respondent and is particularly suitable for sensitive questions (e.g. drug use, sexual behavior, income). The questionnaire can contain printed reference materials and pictures (visual aids), e.g. pictures can be useful for showing portions in questions on alcohol intake and food consumption/diet. But when the computer is used for self-administration sensitive questions may become problematic, because the respondents do not always trust in data security.

Web-based questionnaires can be considered as one form of self-administration which may be easy for certain groups in the population. However, they may result in participant selection because it requires easy access to Internet. Therefore it should in most European countries be used as an alternative to the traditional paper forms, rather than as an exclusive mode of data collection.

The use of web-based questionnaires also requires extra efforts to ensure privacy.

8.2.2 Interviews

Interviews are time consuming and carry additional personnel costs, but they eliminate the issues of literacy level and visual impairment and they provide an opportunity for clarifying the questions if needed. The protocol for such clarifications has to be precisely prescribed to avoid biased responses and standardization of questionnaire administration. Interviews can be conducted either by telephone or face-to-face. In both methods the questionnaires can be quite long and complex, because the skip patterns and jump rules are used and followed by the interviewer (e.g. by computer assisted interview) and not by respondent. This reduces the burden of the respondent. Automatic built-in checks for responses are possible and data entry by the interviewer may reduce errors in computer assisted interviews.

Face-to-face interview is usually the most expensive method for questionnaire administration. But it has many advantages: the interviewer has a possibility to check the personal records (e.g. medication), personal contact may increase the response rate and the use of printed reference materials (visual aids) is possible. Telephone interviews are less expensive but provide no control over the environment in which the interview is conducted. Question wording needs to be simple and it requires good hearing capacity from the respondent. There is a risk that interviewers introduce bias by not asking the questions verbatim, modifying the questions or by incorrect prompting. This risk can be reduced, but not fully eliminated, by proper training. In interviews the sensitive questions may be problematic, because the respondent may reply as he is expected.

8.2.3 Mixed method

When there are several additional topics and many questionnaire items, a mixed method should be considered: e.g. a short self administered questionnaire mailed before examinations, interview during examinations, and another questionnaire given to be filled in later at home. Several modes of data collection can also be used for the same questionnaire to obtain better response rates, e.g. self-administered questionnaires are mailed as a paper version to all subjects, but a possibility to fill this in as a web-based questionnaire is given in the cover letter. In addition, interviews during the examination may be offered to those who have been unable to fill in the questionnaires by themselves. In this case the mode of questionnaire administration should be recorded to allow comparison of responses by different administration modes.

8.3 Use of proxies

In EHES data collection, proxy use during the interviews is only allowed when the selected person him/herself is unable to respond due to major limitations in communication skills and/or cognitive ability. The reason for proxy use (why the selected individual was unable to respond on his/her own behalf) and type of proxy (spouse, child or other relative/significant other, or nurse for e.g. institutionalized persons) should always be recorded. When the use of proxy is considered, special attention should be paid for the decision if the person him/herself is capable to provide informed consent (see Part B, Chapter 2 of the EHES Manual). Proxy use can be avoided by proper resources during data collection and scheduling adequate time to contact all selected persons.

There is a lot of evidence that the use of proxies introduces systematic biases, affecting national disability estimates and the incidence of several chronic conditions as well as their trends in repeated surveys (Shields 2004, Todorov & Kirchner 2000). Proxy responses and self-reports differ significantly depending on the type of questions, age and gender of both the proxy and the selected person, and relationship between the selected person and the proxy (Neumann et al 2000, Todorov & Kirchner 2000, Shields 2004, Snow et al 2005). For younger persons there is evidence on proxy respondents under-reporting chronic conditions, disability and medication use, while for older persons the bias may be opposite, proxies reporting more impairment than self-respondents.

References

- Biemer PP, Groves R, Lyberg LE, Mathiowez N, Sudman S, editors. Measurement errors in surveys. New York: John Wiley & Sons, Inc.; 1991.
- Czaja R, Blair J. Designing surveys. A Guide to Decisions and Procedures. 2nd edition, Sage Publications, Inc., California, USA, 2005.
- de Bruin A, Picavet HSJ, Nossikov A. Health interview surveys. Towards international harmonization of methods and instruments. WHO Regional Publications. European Series. 1996: No 58.
- Franklin S, Walker C (eds). Survey methods and practices. Statistics Canada. Social Survey Methods Division, 2003.
- Neumann PJ, Araki SS, Gutterman EM. The use of proxy respondents in studies of older adults: lessons, challenges, and opportunities. J Am Ger Soc 2000; 48(12):1646-54.
- Rea LM, Parker RA. Designing and conducting survey research. A comprehensive guide. San Francisco: Jossey-Bass; 2005.
- Shields M. Proxy reporting of health information. Health Reports 2004; 15 (3): 21-33.

- Snow LA, Cook KF, Lin P-S, Morgan RO, Magaziner J. Proxies and Other External Reporters: Methodological Considerations. *Health Services Research* 2005;40(5):1676-1693.
- Tanur J. Questions about questions. Inquiries into the cognitive bases of surveys. New York: Russell Sage Foundation; 1992.
- Todorov A, Kirchner C. Bias in Proxies' Reports of Disability: Data From the National Health Interview Survey on Disability. *American Journal of Public Health* 2000; 90(8): 1248-1253.
- Tolonen H, Kuulasmaa K, Laatikainen T, Wolf H, for the European Health Risk Monitoring Project. Recommendations for indicators, international collaboration, protocol and manual of operations for chronic disease risk factor surveys. 2002 cited 13 2008; Available from: <http://www.ktl.fi/publications/ehrm/product2/title.htm>
- Tolonen H. Towards the High Quality of Population Health Surveys. Standardization and Quality Control. National Public Health Institute A27/2005, Helsinki