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# Tools for Collecting Quantitative Data

## Topics covered in this chapter:

- Developing the conceptual framework
- Operationalizing the main variables
- Formulating your questions
- Formatting your questionnaire
- Translating the instrument
- Pre-testing the instrument

**Q**uantitative data are generally collected using a standardized questionnaire, which may be administered in a face-to-face interview or as a self-administered questionnaire. The process of developing a well-conceptualized and user-friendly instrument for collecting quantitative data is complex and time-consuming, but crucial for successful research.

Before starting, clarify what you want to know, according to the goals of your study. Next, consider whether you can obtain all of the answers you seek by questioning respondents, or if you will need to use additional techniques such as observation or analysis of records. How will you administer your questionnaire—by phone, in person, by mail, or by computer? In making this decision, consider both the literacy levels of likely respondents and the positive or negative influence each option may have on the

respondents' willingness to disclose personal information.

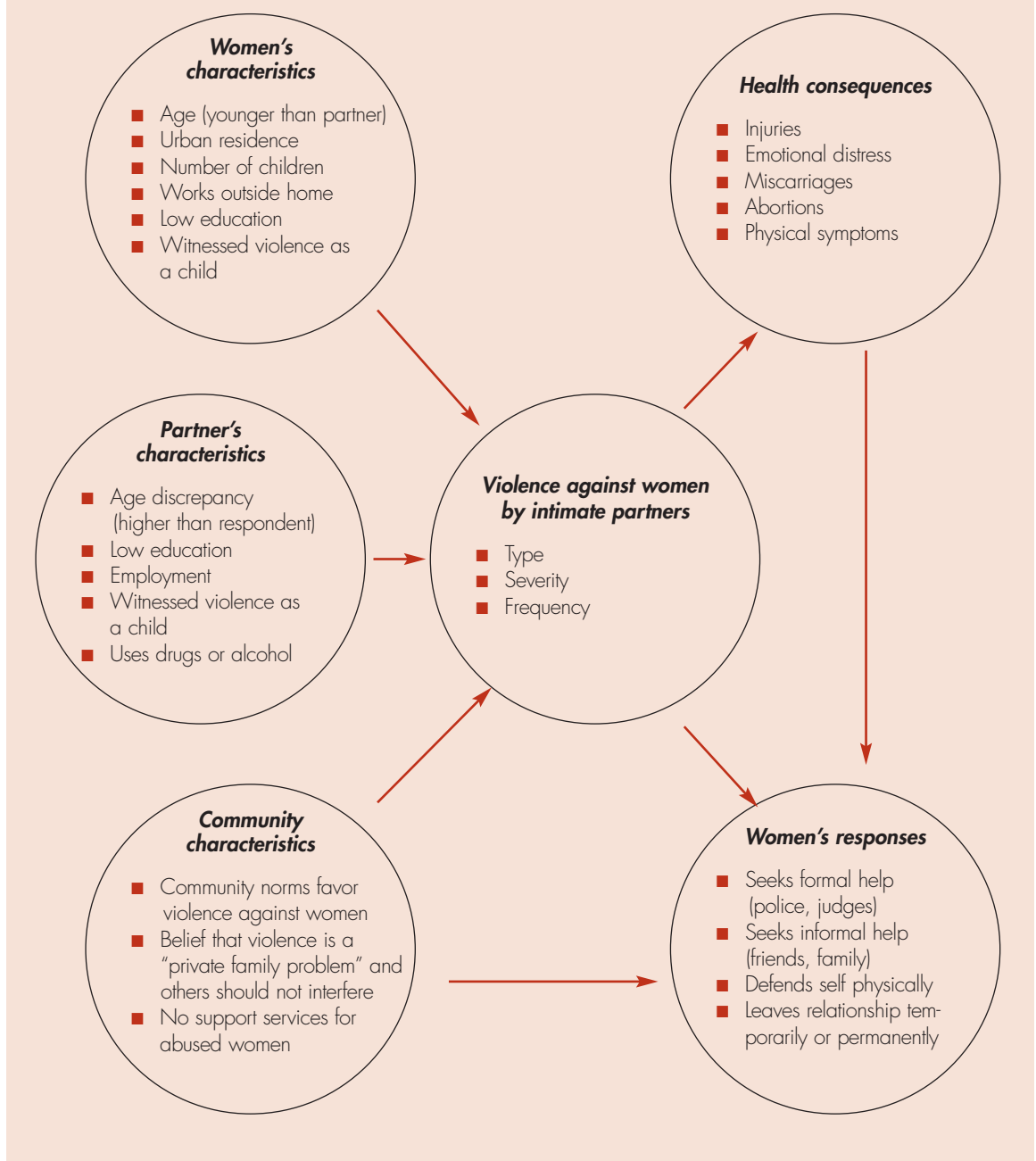
Finally, decide whether you understand the topic and setting well enough to design a questionnaire. If not, you may want to conduct some formative research to identify areas of inquiry and to refine issues of language. Chapter 9 presents a number of qualitative techniques for gathering information before you design a more structured questionnaire.

## DEVELOPING THE CONCEPTUAL FRAMEWORK

Before developing your questionnaire it is essential to decide exactly what information you will need and how you will measure it. One way to do this is to map out visually all the information in your research questions and organize it according to how you think the variables are related to each



**FIGURE 8.1 EXAMPLE OF A CONCEPTUAL FRAMEWORK FOR UNDERSTANDING RISKS AND IMPACT OF INTIMATE PARTNER VIOLENCE**



other. This exercise will be informed by the review you have carried out of relevant literature and the “brainstorming” sessions that you have carried out with the research team and knowledgeable members of the community. Start out by including as broad a range of factors as possible.

Figure 8.1 shows how individual characteristics of women and their partners,

combined with community level characteristics such as norms around violence and the existence of services for abused women, might increase or decrease a woman’s risk of being abused by her partner. The characteristics of the abuse, whether sexual, physical, or emotional, and its severity and frequency, are likely to determine whether she will suffer either physical or emotional



health effects from the violence. Finally, the characteristics of the violence, the health effects, and community attitudes and the availability of support services determine the options she has for protecting herself.

If you are looking at a specific outcome for which there are already known risk factors, these risk factors should be included in the map. For example, if you want to examine the relationship between low birth weight and violence, it is important to collect information about a woman's reproductive history—such as number of pregnancies and use of alcohol or tobacco during her pregnancy.

Each concept included in the map will be translated into one or more variables. These are the components of the research question, conceptually isolated and unambiguously defined. The variables that represent specific outcomes under study are known as the **outcome** or **dependent variables**, while those variables that help explain the causes of these outcomes are known as **explanatory** or **independent variables**. Some variables, such as “violence,” can be considered as both, depending on whether one is looking at the causes or consequences of violence.

Once you map out all the possible variables, it is time to narrow the focus of the study according to what is feasible and most relevant to the study's objectives. Some of the variables may be outside the scope of the survey. These variables should be discarded; there is no point in collecting data that will not yield meaningful results.

## OPERATIONALIZING THE MAIN VARIABLES

Once you determine which specific outcomes and background variables to include in the questionnaire, it is necessary to decide how each will be defined and measured. In Chapter 6, we discussed how

different types of violence might be more precisely measured. As an example, Table 8.1 presents how the WHO VAW Study addressed different issues regarding risk and protective factors and consequences of violence.

## FORMULATING YOUR QUESTIONS

Once you identify your study variables, it is time to turn them into clearly worded questions. Survey questionnaires commonly use two types of questions:

- **Closed questions.** Respondents are asked to choose from one or more fixed alternatives. These can be **yes/no** questions (“Has your husband ever hit you during pregnancy?”) or **ordinal** categories (“Would you say that last year your husband hit you once, several times, or many times?”). Another type of closed question, the **scale item**, asks for a response in the form of degree of agreement or disagreement, or level of intensity, (“How do you feel about the following statement: Women should put up with abuse in order to keep the family together? Strongly agree, Agree, Don't know, Disagree, Strongly disagree.”)

*A **dependent variable** refers to the specific outcome or condition under study (e.g., violence).*

*An **independent** or **explanatory variable** is one that helps explain the causes of the dependent variable.*

- **Open questions.** These do not restrict the content or manner of the reply other than the subject area (“Whom did you tell about your situation?” or “Who was present the last time you were beaten?”)

The majority of questions in the survey questionnaire will probably be in the form of closed questions. Open-ended questions are flexible and allow the

**TABLE 8.1 TOPICS INCLUDED IN THE WHO MULTI-COUNTRY STUDY ON WOMEN'S HEALTH AND DOMESTIC VIOLENCE AGAINST WOMEN****Prevalence and characteristics of violence**

- Prevalence during last year
- Prevalence ever
- Severity of abuse
- Type of abuse (physical, sexual, emotional)
- Frequency during last year
- Frequency of previous violence
- Relationship to offender
- Violence during pregnancy
- Initiation and duration of violence

**Background socio-economic information***Details of respondent*

- Age
- Education
- Marital status/marital history
- Household composition
- Socio-economic status of household
- Current or most recent employment/sources of income

*Details of current or most recent partner*

- Age
- Education and training
- Marital status
- Current or most recent employment

**Risk and protective factors for violence against women in families***About woman*

- Female access to and control of resources
- History of previous victimization
- Indicators of empowerment
- Resistance to violence
- Whether witnessed violence between parents as a child
- Whether can access support outside the household from friends
- Whether belongs to any group/association
- Use of alcohol or drug

*Details of current or most recent partner*

- Expectations, communication, and decision making in relationship
- Extent of participation in looking after family and home
- Use of alcohol and drugs
- Employment status
- Whether witnessed violence between parents as a child
- Whether physically aggressive towards other men

(From WHO, 2004.<sup>1</sup>)

interviewer to probe a subject in greater depth, but they are also more time-consuming to administer and analyze. We therefore recommend that you limit the use of open-ended questions when conducting large-scale surveys. Piloting and formative research may facilitate the use of open-ended questions by providing suggestions for standard responses that can be precoded and included in the questionnaire.

**Use of international instruments**

For many concepts, such as emotional distress, socio-economic status, or reproductive health outcomes, **international questionnaires** already exist, and may already be adapted and even validated for

use in your country. Using instruments that have already been validated makes it easier to compare the findings in your study with other national and international studies. As the example from South Africa in Box 8.1 shows, it's still important to pre-test the instruments to be sure that the concepts are clear and meaningful in your setting. Box 8.2 describes the process of developing the WHO VAW instrument.

**FORMATTING YOUR QUESTIONNAIRE**

The way the questionnaire is organized and formatted can make a big difference in how smoothly the interviews go. The main issues are:



**TABLE 8.1 TOPICS INCLUDED IN THE WHO MULTI-COUNTRY STUDY ON WOMEN'S HEALTH AND DOMESTIC VIOLENCE AGAINST WOMEN**

**Health outcomes**

- Reproductive history including pregnancies, live births, miscarriages, and still births
- Whether she wanted pregnancy with last child
- Details of last child and use of prenatal services
- Use of family planning
- Smoking and alcohol consumption in last month
- Indicators of physical health problems in last month
- Indicators of reduced mobility or functioning in last month
- Indicators of psychological distress in last month
- Suicidal thoughts and attempted suicides
- Health care utilization in last month
- Use of medication in last month
- Hospitalization and operations in last year
- Injuries resulting from physical violence
- Use of health services as a result of injuries

**Other consequences of violence**

*Impact on women's lives*

- Perception of whether affected physical or mental health
- Prevented from working
- Disruption of work/ability to earn money
- Ability to attend community meetings

*Impact on children's lives*

- Reported birth weight for last child under 5
- Child aged 5–12 had to repeat year at school
- Child aged 5–12 ran away from home
- Child has emotional problems (thumb-sucking, bed-wetting)
- Extent to which children witness physical or sexual violence

**Women's responses to violence**

*Sources of help and response*

- Who knows about situation
- Who intervened or tried to stop violence
- Use of formal and informal services
- Who got help from/forms of help provided
- Satisfaction with response
- Who she would have liked to get more help from

*Actions to prevent or reduce violence*

- Did she ever defend herself physically
- Whether she ever hit first
- Whether she ever left/frequency left

(From WHO, 2004.)

- The sequence of questions
- Appropriate answer scales
- Appropriate skip patterns

**The sequence of questions**

Keep two broad issues in mind when considering the order of your questions. One is how the order can encourage or discourage people from completing the survey. The other is how the order of questions or the order of answer choices could affect your results.

Ideally, the early questions in a survey should be easy and pleasant to answer. These kinds of questions encourage people

to continue the survey. In telephone or personal interviews, they help build rapport with the interviewer. Grouping together questions on the same topic also makes the questionnaire easier to answer.

Whenever possible, place difficult or sensitive questions towards the end of the survey. Any rapport that has been built up will make it more likely people will answer these questions. If people quit at that point anyway, at least they will have answered most of your questions.

If conducting research in a culture that is not your own, don't assume you can predict what will be considered sensitive. In

**BOX 8.1 QUESTIONNAIRE DEVELOPMENT IN SOUTH AFRICA**

In 1998, the South African Medical Research Council conducted a survey on violence against women. The survey was applied to a random sample of 750 households per province in three (of nine) rural provinces with women aged 18-49. The questionnaire for the women's survey was developed using instruments from other countries and two South African focus groups. It was tested and refined over a three-month period with abused women, other women, and NGO staff. The final revisions were made after a pilot training session for fieldworkers.

Mental health questions were particularly difficult. At the outset, researchers considered using a 20-item self-reporting questionnaire that had been tested and calibrated to similar African settings. During testing, however, informants and fieldworkers had enormous difficulty understanding the questions, and the instrument's length was problematic in an already long questionnaire. In addition, scores seemed to be improbably high.

This prompted an investigation of indigenous and lay expressions of mental ill health—a process that yielded several expressions of distress shared among all African linguistic groups in South Africa. Idioms used to describe mental distress include “the spirit is low” and, if more severe, “the spirit/heart is painful.” These expressions were incorporated into the questionnaire.

(From Jewkes et al, 1999.<sup>2</sup>)

the WHO VAW study, for example, the questions considered most sensitive varied dramatically by country. In Bangladesh, it was considered routine to ask women about family planning and this was seen as a good rapport-building topic. In Japan, questions about birth control were perceived as highly sensitive. The Japan team urged leaving these questions until later in the questionnaire.

Another strategy for increasing response rates on highly sensitive questions, or in situations where privacy is difficult to achieve, is to allow individuals to respond by pointing out the appropriate answer on response cards rather than saying an answer out loud. Keep in mind that this strategy only works with literate populations.

**BOX 8.2 DEVELOPING THE CORE QUESTIONNAIRE FOR THE WHO MULTI-COUNTRY STUDY ON WOMEN'S HEALTH AND DOMESTIC VIOLENCE AGAINST WOMEN**

The questionnaire used in the study was the product of a long process of discussion and consultation. This has involved reviewing existing literature and numerous instruments, and incorporating input from technical experts in specific areas (including violence against women, reproductive health, mental health, and drug and alcohol use) from members of the expert steering committee, and from experts in the field of conducting large population-based surveys (e.g., the DHS). Moreover, to ensure maximum comparability across studies, discussions were also held with groups such as the International Network of Clinical Epidemiologists (INCLIN) that were conducting research in related areas. For practical reasons, the questionnaire consists primarily of structured questions with closed responses.

In the development phase, the questionnaire was first translated and pre-tested in a limited number of countries on a convenience sample of women. This process was used to explore a range of issues associated with the content of the different sections of the questionnaire. At this stage, respondents were not only asked to answer questions from the questionnaire, but also were requested to provide feedback on the clarity and acceptability of the questions asked, and the way in which the questionnaire was being delivered. At the end of this first pre-test, all interviewers met with the country research team to review the questionnaire, to determine where problems were arising, and to explore possible solutions. This feedback was used to revise different modules within the questionnaire.

Subsequent drafts were informed by qualitative research in the culturally diverse countries and were field-tested again in a second pre-test in the remaining participating countries. This experience resulted in extensive revisions to improve accuracy and cross-cultural comparability, and in the final content and structure. The final revisions to the questionnaire were made following the fourth research team meeting. The revised questionnaire was then sent to each country research team for a final pre-test. This resulted in version 9.9, which was used in the first eight countries of the multi-country study.

Each country could add only a limited number of relevant country specific questions, and adapted certain response codes to reflect local circumstances.

Between 1999 and 2002, the final questionnaire was used in 13 languages during the implementation of the WHO multi-country study in Bangladesh, Brazil, Japan, Namibia, Peru, Samoa, Tanzania, and Thailand. Additional studies in Chile, China, Serbia, New Zealand, Ethiopia, and Indonesia have also used this questionnaire. The questionnaire and a manual with the question-by-question description of the questionnaire is available from WHO at [genderandhealth@who.int](mailto:genderandhealth@who.int). A shortened version of the instrument can be found in Appendix I of this guide.

(From WHO, 2004.<sup>1</sup>)





The other way question order can affect results is habituation. This problem applies to a series of questions that all have the same answer choices. After being asked a series of similar questions people may give the same answer without really considering it. One way to avoid this is by asking some questions so

that positive attitudes or beliefs are sometimes scored with a yes answer or a high number on a scale and on other questions with a no answer or a low number.

Box 8.3 presents an example of questions asked in the WHO VAW study about women’s attitudes toward gender roles.

**BOX 8.3 QUESTIONS FROM THE WHO VAW STUDY ON GENDER ROLES**

In this community and elsewhere, people have different ideas about families and what is acceptable behavior for men and women in the home. I am going to read you a list of statements, and I would like you to tell me whether you generally agree or disagree with the statement. There are no right or wrong answers.

A good wife obeys her husband even if she disagrees.	Agree	_____
	Disagree	_____
	Don't Know	_____
	Refused/No Answer	_____

Family problems should only be discussed with people in the family.	Agree	_____
	Disagree	_____
	Don't Know	_____
	Refused/No Answer	_____

It is important for a man to show his wife/partner who is the boss.	Agree	_____
	Disagree	_____
	Don't Know	_____
	Refused/No Answer	_____

A woman should be able to choose her own friends even if her husband disapproves.	Agree	_____
	Disagree	_____
	Don't Know	_____
	Refused/No Answer	_____

It's a wife's obligation to have sex with her husband even if she doesn't feel like it.	Agree	_____
	Disagree	_____
	Don't Know	_____
	Refused/No Answer	_____

If a man mistreats his wife, others outside of the family should intervene	Agree	_____
	Disagree	_____
	Don't Know	_____
	Refused/No Answer	_____

(From WHO, 2004.)





In some cases, such as a woman choosing her own friends, a respondent who agrees with the statement would be expressing views in favor of women's autonomy, whereas in the question about the importance of a man showing his wife who is the boss, agreement would indicate acceptance of traditional values.

### **Appropriate answer scales**

Questions related to attitudes, frequency of events, or opinions usually require participants to answer based on some form of scaled response. In the developed world, such scales usually allow for at least five distinct answers. Such complex scales, however, can be difficult for some populations to understand and interpret. Moreover, certain cultural patterns and expectations can influence how individuals reply to different response options. For example, researchers in Nicaragua found when using a five-point scale to measure perceptions of childhood experiences that respondents almost invariably answered that they “strongly agreed” or “strongly disagreed.” Almost no responses indicated that they “somewhat” agreed or disagreed. In contrast, in other countries, particularly in Asia, researchers have found that respondents are reluctant to express a very strong opinion, for fear of seeming rude. Therefore, responses tend to be more neutral.<sup>3</sup>

### **Appropriate skip patterns**

The **skip patterns** in a questionnaire determine the order of specific questions that will be asked according to answers that are previously given. They help make the interview flow smoothly and avoid annoying mistakes, such as asking a woman the age of her children when she has already indicated that she has no children, or asking women who have never had sexual relations whether they use birth control. Special care should be taken to ensure that the skip patterns are correctly placed and

that women are not inadvertently excluded from being asked important questions.

As an example of how important information may be lost through errors in skip patterns, the León, Nicaragua, survey only asked questions about problems in pregnancy to women who had suffered abuse. This made it impossible to compare the rates of miscarriages and abortions among abused and nonabused women. A similar problem occurred when questions about physical injuries as a result of abuse were asked of women who had only suffered emotional and not physical violence.

## **TRANSLATING THE INSTRUMENT**

Now that you've developed your test instrument, how do you translate it into the local language? You need an accurate and precise translation, but professional translators may not be familiar with the terms women use to talk about violence and intimate relationships.

Several steps can enhance your translation efforts. First, involve activists or service providers in translating the test instrument. You may find that formative research helps you identify the appropriate terms and expressions to describe the issues under study. Researchers often use a technique called **back-translation** (having someone unfamiliar with the study translate the questionnaire back into English) to ensure that the instrument has been properly translated. However, researchers in South Africa and Zimbabwe found that back-translations were not a reliable way to check the accuracy of questions on violence and its consequences. They achieved better results when someone who understood the purpose of the study and who could compare the English version with its translation checked the translated questionnaire.<sup>2</sup> Box 8.4 describes the steps that were taken in translating the WHO VAW questionnaire.



## PRE-TESTING THE INSTRUMENT

Before beginning the fieldwork, it is essential to pre-test the questionnaire thoroughly. The many errors or unforeseen situations you will find are fairly easy to correct at this stage, but would be quite costly to repair later. To pre-test, try the questionnaire on women who do not live in the research area, but who are similar to the women you are planning to study (this does not have to be a random sample). This step enables you to detect any problems in terms of the content or wording of questions as well as interview length. Try the test on women of different ages and backgrounds, including women who are known to be experiencing different forms of abuse. The women's organizations participating in your advisory group may be helpful in identifying women who are willing to be interviewed about their experiences of violence.

If the questionnaire is to be translated into different languages, pre-test the translated versions too. In addition, asking respondents to answer questions from the questionnaire, invite them to provide feedback: "Are the questions asked clear and acceptable? How do you feel about how the interview was conducted?" At the end of the pre-test, all interviewers should meet with the research team to review the questionnaire, to pinpoint problems with the questions and coding categories, and to explore possible solutions. Box 8.5 gives some examples of the kinds of questions you might ask in the pre-testing stage.

### BOX 8.4 TRANSLATING THE WHO QUESTIONNAIRE

The working language for the development of the core questionnaire was English. Before pre-testing, each country questionnaire was professionally translated into each of the local languages used by the study population. The formative research was used to guide the forms of language and expressions used, with the focus being on using words and expressions that are widely understood in the study sites. In settings where there are a number of languages in use, it was necessary to develop questionnaires in each language.

The translated questionnaire was first checked by local researchers involved in the study who could compare the English version with its translation. Lengthy oral back-translation sessions with step-by-step discussion of each question were conducted with people not familiar with the questionnaire but fluent in the language and with people who understood the questionnaire and violence issues. The main purpose was to identify differences in translations that could alter the meaning and to establish cognitive understanding of the items in the questionnaire. Adjustments were made where needed. Once the translated questionnaire had been finalized during the interviewer training, questions were discussed using the manual with explanations for each question. Having interviewers from various cultural backgrounds aided in ascertaining whether wording used was culturally acceptable. During the training itself, further revisions to the translation of the questionnaire were made. Finally, usually during the field pilot in the third week of the interviewer training, final modifications to fine tune the translated questionnaire were made.

#### *Pitfalls in Translation*

In a Zimbabwe study, a series of questions were used to define the time frame during which women had attended health services. In English the question was, "In the last year (1995), have you attended a clinic or hospital because you were sick?"

In Shona, the question was translated as, "In 1995, did you attend..." Since the survey was conducted in May 1996, this question only obtained information about the previous calendar year.

In Nbele, the question was translated as, "In the last year (12 months) have you attended..."

Therefore, the information obtained from the two translated versions referred to different periods.

*(From Watts, 1997.<sup>4</sup>)*

**BOX 8.5 SUGGESTIONS FOR PRE-TESTING THE QUESTIONNAIRE**

1. During the interview, the interviewer should jot down observations about any questions that seem to be problematic.
2. After the interview, take another 15-30 minutes to ask the respondents their own views about the interview:
  - What do you consider the main topics of the survey?
  - Are there any questions you feel are inappropriate, too personal, or that people would not be likely to answer truthfully?
  - Do you feel comfortable with the informed consent process (i.e., were you adequately informed about the nature of the study)?
  - Were there any questions that you did not understand or that you thought were confusing?
  - Is the length of the interview acceptable or too long? (You may want to ask how long they thought the interview lasted and compare this to the actual duration.)
3. After each interview, take detailed notes of both your own and your respondent's observations.
4. After each researcher/interviewer has performed several interviews, it is useful to sit down and analyze the responses to the questionnaire. The following issues might be explored in this discussion:
  - Are there any questions that are particularly sensitive, or that women seem reluctant to answer?  
*In the Nicaragua survey, a question about the last time a couple had intercourse caused a lot of discomfort among respondents, and women often asked why we wanted to know this.*
  - Are there questions women seem to answer almost automatically? Are they telling us what they think we want to hear, rather than drawing from their own experiences?  
*Researchers in some Asian countries have found that women are unlikely to report violence between their parents and in-laws, as it is considered disloyal to speak ill of relatives.*
  - Are there questions for which the women give unusual answers, or seem not to understand the purpose of the question? For example, does the interviewer need to explain it several times, or use different language so that the women understand the question? What wording would be easier to understand?
  - Are there questions for which it is difficult to code the response, or where it seems that the questionnaire is missing important data?  
*In one pre-testing exercise, it became clear that many women have been abused by a spouse prior to their current partner. Therefore it was necessary to collect some basic information about former spouses.*
  - Do the skip patterns seem to flow smoothly, so that no women are left out of questions they should be asked? Conversely, are women made to repeat the same answers? Are they asked inapplicable questions?
  - Is there a fairly broad range of responses to most of the questions?  
*Too much uniformity may indicate that women are answering in a way that they believe is expected, or that they don't really understand the question, or that it is simply not a useful or relevant question.*
  - If we ask hypothetical questions such as, "Do you think a woman should accept being beaten in order to keep her family intact?" do women seem to understand that we are asking about opinions and not experiences? *Women who are not used to this kind of question may find it difficult to respond, and may give answers such as, "I can't speak for anyone else."*
  - Are there questions where similarly coded answers might mean two very different things? Do we need to add additional responses or improve the wording of the question to enhance clarity?
  - Do the initial sections allow the interviewer to develop sufficient rapport before asking about violence? Would the questions on violence fit better at an earlier point? Does the order of the questions seem to flow logically and smoothly?
  - Is the questionnaire too long? Do women seem tired or restless by the end of the survey? Does the average duration of the interview correspond to what you have told respondents in the consent form? *Consent forms usually give the respondent an estimate of how long the questionnaire will take to complete. If the average interview during the pre-test is substantially longer than what the consent form suggests, then you may have to revise either the estimate or the questionnaire.*
  - Is it difficult to achieve privacy? Do the procedures for ensuring confidentiality work?
  - Are there differences in the way that women responded in the versions that are translated into other languages? Are there specific problems with the wording or translations?



1. World Health Organization. *WHO Multi-country Study on Women's Health and Domestic Violence: Study Protocol*. Geneva, Switzerland: World Health Organization; 2004.
2. Jewkes R, Penn-Kekana L, Levin J, Ratsaka M, Schriber M. *He Must Give Me Money, He Mustn't Beat Me: Violence Against Women in Three South African Provinces*. Pretoria, South Africa: Medical Research Council; 1999.
3. Yoshihama M. Personal Communication. Ann Arbor, Michigan; 2004.
4. Watts C. Violence in Zimbabwe. Personal Communication. London, UK;1997.