step 4

Gather and Analyse Data

At the end of this module, you will be able to:

- Execute the logistics plan for your data collection, including pre-testing your method and assessing data collectors (Step 4a).
- Methodically review your qualitative data to determine the main findings (Step 4b).
- Use a systematic process to organise your quantitative data (Step 4c).
- Analyse your quantitative data by hand or prepare your data for analysis by computer (Step 4d).

Step 3 explained how to develop your data collection tools and offered some techniques for writing good questions and answers. Once your tool is developed, it is time to gather data. The first part of this module focuses on some of the logistical details involved in gathering data. This includes selecting data collectors, preparing instructions for data collection and training data collectors. It also discusses the importance of pre-testing your methods and assessing data collectors. The second part of the module focuses on how to analyse data once it is collected. There are two sections in this part of the module: one walks through the analysis of qualitative data and one explains the analysis of quantitative data. For data collection tools that contain only qualitative *or* quantitative data, refer to the relevant section. For tools that contain both quantitative *and* qualitative data, be sure to read all of Step 4.

STEP 4a

Gathering Data

The *Logistics Guides* and your *Logistics Worksheets* from Step 2 highlight the tasks, roles, timelines, equipment and supplies required for gathering data. You may have noticed that there are a few tasks that are important in planning the logistics for several different types of data collection tools — selecting data collectors, preparing instructions for data collection, training data collectors and pre-testing your methods and tools. Each of these important tasks is discussed in this section to help you execute your logistics plan successfully. How to keep track of your data collection activities is also discussed.

Selecting Data Collectors

The generic term data collector refers to those who are going to get the data you need; for example, a moderator for a series of focus groups or an interviewer for a telephone survey. In selecting data collectors, you need to know how many the project requires, what abilities, knowledge and skills data collectors must have and how you will recruit them for the project. This section will cover all three of these aspects.

Deciding on the Number of Data Collectors

In Step 2b, you decided on the type of person who was going to collect the data. Next you need to decide exactly how many data collectors you will need. The exact number of data collectors required depends on the type and length of your data collection tool, the number of people from whom you need to collect data and their schedules, how difficult it is to reach the people from whom you'll be collecting data, and the overall timelines of your evaluation. Keep in mind that as a general rule, it is best to involve as few data collectors as possible, for consistency's sake.

The following scenario for a telephone interview illustrates how to use these factors to determine the number of data collectors required. You have run through the interview with a colleague. You know that the interview takes about 10 minutes to complete. Then you factor in a guestimate of how long it may take to reach people by phone. You figure one interviewer can do roughly three 10-minute interviews an hour. This includes the time the interviewer is actually interviewing someone; plus the time it takes to successfully contact them. You need to interview parents who are working outside of the home; therefore, you know that the best time to reach most people is probably between 5pm and 9pm in the evenings and from about 10am to 5pm during weekends. That means you can collect data for four hours five days a week, and seven hours a day on weekends. That's 34 hours of available interviewing time a week. You need to complete 200 interviews, so based on three interviews an hour it will take about 66 hours. One person working full-time could complete the interviews in a little over two weeks. You realize that may be a bit draining and intense for one person, plus you really need to get the data gathered and analysed as quickly as possible. You decide to have two people work as interviewers instead. They can complete about 100 interviews in a little over a week. That fits well with your overall evaluation schedule.

Determining the Knowledge, Traits, and Abilities of Data Collectors

Collecting data, regardless of the type of tool, requires certain abilities, knowledge and traits, especially for focus groups and telephone or face-to-face interviews. Some characteristics of a person who would be a good focus group moderator or a good interviewer are provided on the following page.

Characteristics of Focus Group Moderators and Interviewers

Knowledge

- Understand the purpose of the evaluation and the specific evaluation questions that the focus groups or interviews seek to answer.
- Be familiar with the data collection technique and their role in it (previous experience is preferable).

Traits

- Excellent memory
- Flexible
- Friendly
- Good sense of timing
- Good listener

Abilities

- Speak clearly
- Start and maintain conversations/discussions with strangers
- Read and write in "data collection" language
- Engage and encourage people to share their opinions, attitudes, ideas, etc.
- Refrain from expressing own opinions, attitudes, ideas, etc.
- Maintain confidentiality
- Deal with difficult people
- Provide consistency

Recruiting Data Collectors

There may be people within your own organisation who have the required knowledge, traits and abilities for your data collection needs. If not, you will have to hire someone from outside. You can hire a research firm that has data collectors on staff, or you can hire your own data collectors. If you decide to recruit your own data collectors, advertise in newspapers and at universities or colleges, and make sure to ask others in your health unit for the names and résumés of data collectors they have hired in the past. Be sure to have a job description prepared before you start recruiting for the position.

Preparing Instructions for Data Collection

You need a protocol to help maximise consistency in data collection. The protocol is a set of brief written instructions. The aim is to have as standard an approach as possible among all data collectors. Depending on the type of tool and the data collector, the protocol might include:

- a description of the program that is being evaluated and from whom data will be collected;
- the purpose of the evaluation and of this particular data collection tool;
- information on how to introduce and explain the tool to respondents;
- instructions on how to record answers;
- an outline of what they are supposed to do, when, why, where, with whom, and how;

- to whom to refer respondents if the subject matter is upsetting; and
- how to answer questions that respondents are likely to ask.

Even for something as seemingly simple as activity logs that program staff complete, make sure detailed instructions are included. People can understand things differently.

As an example, see the brief set of instructions for the staff handing out the self-completed questionnaires to participants in the Parenting Program.

Instructions for Administering Questionnaires After Parenting Series

AT THE END OF THE LAST SESSION

- HAND OUT the questionnaire.
- INSTRUCT participants of each the following points.
  - *The purpose of the questionnaire is to learn about participants' experience. It will help the Health Unit plan its programs better.*
  - *Do not sign your name. We won't know which questionnaire came from which participant so please **be completely honest**. Your answers will in no way affect your participation in the Parenting Series. Although completion of the questionnaire is voluntary, we would greatly appreciate your co-operation. If there are questions which you would prefer not to answer, just leave them blank.*
  - *For the first set of questions, put a check mark in the box next to the answer that best describes what you think. The very last question asks for your suggestions for improvements. Write your answer on the sheet. If you run out of room, use the other side of the paper.*
- ASK if there are any questions about the purpose or the process.
- ALLOW about 5 minutes.
- WAIT until everyone is done.
- COLLECT the questionnaires from everyone in a big envelope so that no one, including yourself, can see people's responses. Keep the questionnaires from each series separate. Mark on the envelope the date and location of the series.
- THANK people for their co-operation.

Training Data Collectors

Training sessions for data collectors generally cover all of the information contained in the protocol. It is important that everybody meets together. Start by giving a brief overview of the project. Explain the roles and responsibilities of data collectors and then walk data collectors through their tasks step-by-step. It is important to review the techniques associated with your particular data collection tool. For example, if you are doing telephone intervews, review the basics of telephone interviewing with your data collectors. After the training session, make sure you feel comfortable with the knowledge and skills of the data collectors. If not, organise additional training or replace the data collectors.

If you are conducting a survey or interviews, do a "walk through" or trial run. Give data collectors a chance to ask the Project Leader questions. Consider role playing specific scenarios — for example, how to deal with refusals to participate or what to do if a respondent becomes upset or angered by the topic of the interview. Have

interviewers do mock interviews with each other. You might want to audio or videotape these mock interviews so that interviewers can critique their own interviewing style. Be sure to provide feedback to interviewers during this training session.

Pre-testing the Method

Despite the most careful and detailed planning, there are things that inevitably get overlooked which can jeopardise the quality of your data. It is imperative that your data collectors try out the tool and methods on a small subgroup before you launch into the real thing. This crucial step in the data collection process is called a pre-test. A pre-test is the continuation of the assessment of the quality of your data collection tool from Step 3c. While the assessment in Step 3 focuses on the tool itself, a pre-test assesses the feasibility of the data collection tool *and* methods.

A pre-test is a dry run of your data collection methods. It is also called a pilot test. A pre-test simulates the real thing, in advance and on a smaller scale, to detect and correct errors so there aren't any detrimental or expensive surprises later on.

It is important to conduct your pre-test using the same format and data collectors, with the same type of respondents in the same setting as you will with the real thing. For example, if you are pre-testing a self-administered survey of youth in high schools, you must make sure that:

a) the survey for the pre-test is self-administered — don't have an interviewer *ask* the questions instead;
b) the respondents are youth — select the youth in the same way as you plan to select them in the real thing; and
c) the setting is high schools — don't go to a mall or community centre instead.

Besides assessing the quality of your tool addressed in Step 3c, a pre-test looks at the following issues.

- How much time does it take?
- Are there any problems in selecting the sample?
- How many people participate?
- How disruptive is administration of the tool?
- Do data collectors understand and execute their tasks well?

The number of respondents with whom you pre-test varies tremendously; it depends on the type of tool, the methods and their complexity. You must decide what will make you feel confident that there will be no unanticipated problems in the real thing; plus, you may have to do another pre-test if there are significant changes after the first one. A general rule of thumb for self-completed questionnaires is 10 respondents, but you may need more if your questionnaire has a lot of skips. Make sure that at least two people go through each question on your tool. You may only have to pre-test with 5 people if the questionnaire is very simple and your respondents are very homogeneous. Interview at least 10 people for a telephone survey. If you are doing face-to-face interviews, do 3 or 4 as a pre-test. Often with focus groups, the first focus group is considered the pre-test.

With self-completed questionnaires, you usually don't include the responses from the pre-test in the real test. For interviews or focus groups, if there are no changes (or they are only minimal), you can include the responses from the pre-test.

Assessing Data Collectors

In addition to pre-testing the method, it is important to assess your data collectors to determine how consistently data are being collected. *Intra-rater reliability* is assessed by having each data collector take measures for the same case at different times (e.g., for a telephone survey, the same interviewer calls back the same respondents and asks the same questions). This reveals how consistently each individual data collector is asking questions and recording responses. When a number of data collectors are involved in administering a tool (e.g, telephone survey or chart review), it is also important to determine how well the data collected by different collectors correspond. This involves asking different data collectors to complete the same tool for the same case (e.g., telephone survey respondent or chart). This is called *inter-rater reliability* and refers to how consistently different data collectors ask questions and record responses. Consult with your epidemiologist or evaluator for more details on inter-rater and intra-rater reliability.

Keeping Track of Data Collection

It is always important to keep track of your data collection activities. With mail surveys, for instance, there should be a log of how many surveys are mailed out, how many surveys are returned each day and when reminders or follow-ups are made.

For telephone or face-to-face interviews, it sometimes takes several attempts to reach a potential interviewee. Decide in advance when attempts should be made and how many there should be in total. Attempts to contact interviewees should be made at different times of the day over the course of a few days or weeks. There is no hard and fast rule for the number of attempts. It depends on a variety of factors. Consult your evaluator or epidemiologist. It is important to keep track of attempts and to record when an interview is finally completed. A log sheet is a useful way to record the date, time and result of each attempt. It also helps provide a sense of the response rate, that is, the level of response or the degree to which people are agreeing to be interviewed. A sample interview record is provided. Feel free to use it as is or make modifications to suit the purpose and details of your project.

If your response rate is low, consider re-contacting those who refused. You may consider inviting them to participate one last time. You should also ask them their reasons for refusing, as this will help pinpoint problems with your method that need to be addressed.

There is no real standard when it comes to response rates. The acceptable level of response depends on the evaluation questions, the type of tool, the source of the data, the type of design, the timeframe and the resources available. Discuss this issue with your evaluator or epidemiologist. If you anticipate that there will be a problem with low response rates, consider offering incentives for participation.

Once your logistics plan is executed and your data is collected, the next step is to analyse it. If your tools contain open-ended questions, work your way through Step 4b. If your tools do not involve any open-ended questions, skip to Step 4c.

Interview Record

Telephone Number:		Name or identification number:		
Contact Attempt	Date	Time	Result Code (see below)	Name of Interviewer
1				
2				
3				
4				
5				

Notes:

Result Code

Telephone interviews:
C Completed interview
R Refusal
N No answer
B Line busy
A Answering machine
S Number not in service
W Wrong number

Setting up appointments by telephone for face-to-face interviews:
N No answer
B Line busy
A Answering machine
S Number not in service
W Wrong number

Once appointment is set:
C Completed interview
R Refusal
NS No show
CL Cancellation
RS Rescheduled

STEP 4 b

Analysing Qualitative Data

This section explains how to analyse qualitative data by hand. Qualitative data is data collected from focus groups, interviews, observation and chart reviews, plus the data collected from open-ended questions on questionnaires and surveys. An open-ended question from the self-completed questionnaire from the evaluation of the Parenting Program will serve as an example. If your tools do not involve any qualitative data (i.e., open-ended questions), skip to Step 4c.

There are computer programs for analysing qualitative data (e.g., QSR NUD.IST and the Ethnograph). The approach suggested in this section simulates the type of analysis computer programs are capable of. Factors to consider when exploring the use of computer programs include:

- the availability of both hardware and software;
- your comfort with computers;
- your familiarity with qualitative data analysis software packages;
- the amount of data to be analysed;
- the form of the data (i.e., tape-recorded, hand-written, or already in an electronic format such as a word processing document); and
- the time available for the analysis.

If you are interested in exploring computer-assisted qualitative data analysis, check out Eben Weitzman and Matthew Miles' book *A Software Sourcebook: Computer Programs for Qualitative Data Analysis* published by Sage in 1995. A good general resource on qualitative analysis is Matthew Miles and Michael Huberman's *An Expanded Sourcebook: Qualitative Data Analysis* published by Sage in 1994.

Here's what you'll need if you're going to analyse your data by hand.

- Several highlighters — a different colour for each of your evaluation questions. (If you don't work well with colour codes, don't worry about the highlighters. You can use symbols or code words.)
- One photocopy of the *Qualitative Data Analysis Worksheet* for each evaluation question.
- Your completed *Methods Worksheet*.
- All of your data including notes, transcripts and/or tapes from all interviews or focus groups and all of the individual tools for self-completed questionnaires, registration forms, observations or chart reviews.

Here's how to prepare.

- Reserve at least two blocks of time, ideally about a half day each, for this process.
- Find a quiet place where you can "spread out" your materials and focus on your analysis without any interruptions or distractions.
- Take a deep breath. It is easy to feel overwhelmed by the amount of data collected.

- Write the evaluation question in the space provided at the top of each *Qualitative Data Analysis Worksheet*. Pick a colour, symbol or code word for each evaluation question and record that on the *Worksheet* below the evaluation question.
- In the "Points" column, write down each expectation that pertains to this particular evaluation question. Leave a space between each expectation because you will be keeping track of all of the points raised in the data that pertain to each expectation.

Here's how to do it.

a) Read all completed tools or notes and transcripts in one sitting. Use your highlighter, symbol or code word to mark the parts that deal with each evaluation question.
b) Listen to the tapes (if applicable).
c) Go back and carefully read through all of the data that pertains to the first evaluation question (the relevant pieces of data should already be indicated by the same colour, symbol or code word). In the "Points" column on the *Worksheet*, write down each opinion, idea or feeling that pertains to the expectations for that evaluation question. If a point has already been mentioned, don't rewrite it (even though it may have been expressed in a different way or using different words). Instead, keep a tally of the number of times this opinion, idea or feeling is mentioned. Quotes sometimes help illustrate or substantiate points. In the column provided on the *Worksheet*, write any quotes that express a point particularly well.
d) Look at the tallies for each expectation. Take the points that are mentioned by the majority of respondents and write them in the "Findings" column. Organise them by expectations. Don't report precisely how many respondents agreed with each point. Instead, use phrases like:
   - most people felt that...
   - there was a strong feeling that...
   - the majority view was...

   Most times you won't report opinions that are expressed by only a minority of respondents. Occasionally, however, the minority view is important. Use your judgment, but always make it clear that only one or a few respondents expressed that opinion. If it is meaningful and won't jeopardise any guarantees of anonymity, note any distinguishing characteristics of this minority that are relevant.
e) Repeat the above two steps (c and d) for each evaluation question.

Now you have the findings from your qualitative data. If you only collected qualitative data, you can skip to the end of this module. Step 5 will continue on from here. If you have also collected quantitative data (i.e., closed-ended questions), continue on with Steps 4c and d.

Qualitative Data Analysis Worksheet

Evaluation Question: *Were participants satisfied with the series? (Question number 4 from Methods Worksheet)*

Colour, code or symbol: *Yellow*

Points (ideas, opinions, feelings, etc.)	Quotes which illustrate points	Findings
Expectation 4c Some suggestions for improvements:		
Length and timing of sessions avoid having sessions run over supper time / would prefer sessions to start earlier // could go longer than 2 hours ///		*Topics of discussion* There was a strong feeling that parents should be involved more in the choice of topics. Many participants thought there should be more time for discussion.
Location bathrooms were filthy / it was always hard to find parking // too far from bus routes /		
Topics of discussion parents decide on topics 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 cover a couple of topics per session / not enough time spent on each topic 𝍸 𝍸 𝍸 𝍸 𝍸	I think the process of deciding on the topics as a group would be very valuable. Sometimes we'd just get into a really interesting discussion and boom it was time to leave or move onto something else. I think there should be more time for discussion.	
Other cancel the session when it falls on Halloween night // encourage more fathers to attend /// provide list of participant names and numbers /		

Unexpected findings:

Preparing for the Analysis of Quantitative Data

This section explains how to prepare to analyse quantitative data, that is, data collected from the closed-ended questions on activity logs, administrative records, registration forms, interviews, surveys and records of observations. Preparing for analysis involves determining the mode of analysis (i.e., by hand or computer), organising the data, and screening for missing data and other problems.

Determining the Mode of Analysis

Sometimes quantitative data can be analysed by hand, other times it is necessary to use a computer. The first step is to decide if the analysis will be done by hand or by computer. This depends on what your evaluation questions are seeking to answer, plus the amount and type of data that has been collected.

The analysis of outcome evaluation data requires statistical tests which are best done on a computer, using special programs for statistical analysis such as Epi Info or the Statistical Package for the Social Sciences (SPSS, for short). You should also consider computer-assisted analysis if you are collecting a lot of process data, say for instance, you are asking 50 or more people to answer 10 or more questions on a survey. Analysis by hand with this amount of data is tedious and prone to error.

If you are not familiar with using a computer for data entry or analysis, look into getting help from:

- the evaluation specialist, epidemiologist or planner at your health unit or another staff person who has training in research methods;
- an evaluation consultant;
- university faculty; or
- a graduate student.

Always consult with the people who are going to assist with data entry and analysis BEFORE you collect any data.

If you are going to have someone else analyse the data, read the first part of Step 4d which will help you fill out the first four columns of the *Quantitative Data Analysis Worksheet*. Give your raw data and the *Quantitative Data Analysis Worksheet* to the analyst and ask them to fill in the last three columns of the *Worksheet*. If you are going to analyse the data yourself, continue reading the rest of Step 4c.

Organising the Data

For most tools, if you are going to do the analysis by hand, you first need to fill out the *Quantitative Data Organisation Worksheet*. Then you can complete the *Quantitative Data Analysis Worksheet*.

If you are analysing attendance sheets, you do not necessarily need to complete the *Data Organisation* or *Data Analysis Worksheets*. Tally up the attendance for each event. These are your findings. Proceed to Step 5 and record your findings in the *Interpretation of Findings Worksheet*.

The *Quantitative Data Organisation Worksheet* allows you to summarize the answers to the questions on your data collection tool. It is a table with several rows and columns. The rows represent each completed tool and the columns represent each question on the tool. It looks like something you would see in a computer spreadsheet program such as Excel, Quatro or Lotus. It also resembles the way statistical software packages organise your data for computer-assisted analysis.

Here's how to get ready to fill out the *Quantitative Data Organisation Worksheet*.

- Check that you have all of your raw data (i.e., all your completed data collection tools that people have filled out).
- Make one copy of the *Quantitative Data Organisation Worksheet* for each data collection tool that contains quantitative data.
- Write the type of tool at the top of each *Worksheet* (e.g., self-completed questionnaire).
- In the columns under the header "Questions on the Tool," indicate how many questions are on your tool by writing a number in each column. For example, if you have a self-completed questionnaire with a total of five questions, write the numbers 1 through 5 in the first 5 columns under "Questions on the Tool."
- Make one copy of the *Worksheet* for every 15 completed tools. For example, if you got 75 questionnaires back, you will need to make 5 copies of this *Worksheet*.

Here's how to complete the *Quantitative Data Organisation Worksheet*.

- Start with any one of your completed tools (e.g., pick the questionnaire at the top of your pile of questionnaires that people have filled out and given back to you).
- Mark the number 1 in the top right-hand corner of the completed tool.
- Write the number 1 in the first column under the header "Respondent."
- In the next column, record the *response* to question 1 under the column header "1." If there is no response, just leave it blank. Then record the response for question 2 under the column header "2" and so on for each question. If you don't want to write out the whole response long-hand, you can assign a number to represent each response category (e.g., 1 = Yes and 2 = No). This is called coding.
- Once all of the responses on that tool have been recorded, set it aside and pick up another completed tool.
- Mark the number 2 in the top right-hand corner.
- Write the number 2 in the first column (under the header "Respondent") of the next blank row. Then record the response to question 1 under the column header "1." Then record the response for question 2 under the column header "2" and so on for each question.
- Set this completed tool aside and pick up another completed tool.
- Repeat this process until the data from all completed tools has been recorded. To double-check this, make sure that the number of completed tools matches the number of respondents on your *Worksheet*.

Screening the Data

Whether you are doing the analysis by hand or with a computer, screening for problems in the data is an important step in preparing for data analysis. This involves identifying missing data and other problems.

Missing Data

One of biggest challenges in gathering and analysing data is missing data. Missing data means that one or more respondents did not answer one or more questions on your data collection tool.

Missing data occurs for any number of reasons. Respondents might either intentionally or unintentionally skip questions, they may not have completely understood the question, or perhaps they simply refused to answer. It is possible they didn't know the response or couldn't recall the information required to answer the question. Missing data is also sometimes a result of boredom, fatigue or irritation.

The reasons for missing data underscore the importance of thoroughly assessing the quality of data collection tools and pre-testing methods. Instructions, skip patterns, questions and answers must be clear. The format must be easy to read. The tool has to capture and hold people's interest but it can't be too long.

When organising your quantitative data, missing data will be apparent. There will be blank spaces on your *Quantitative Data Organisation Worksheet*. It is important to decide whether or not missing data should be included in your analysis. In most situations, you will likely exclude the cases with the missing data in the denominator for the calculation of your final percentage or number. All of the decisions you make about how to handle missing data should be clearly documented. If more than 10 per cent of respondents do not answer any given question, there is a serious problem. The quality of your data may be jeopardised. Consider excluding the entire question from your analysis.

Other Problems with the Data

In addition to missing data, there are a host of other potential problems with the data. Sometimes respondents who are supposed to skip past a certain block of questions answer them instead. Other times, more than one response category is selected when the instructions specify to pick only one. Occasionally, there are hand-written notes scribbled next to a question that provide additional information or explain a response. It is necessary to screen each completed tool for these types of issues while organising the data. Try to make sense of any logical inconsistencies and make adjustments to the data as necessary. If you cannot make sense of them, deal with the data as if they were missing.

Quantitative Data Organisation Worksheet

Type of Tool: *Self-completed questionnaire*

	Questions on the Tool									
Respondent	1	2	3	4	5					
1	good	yes, a lot	yes, a little	yes	completed high school					
2	excellent	yes, a lot	no	yes	some college or university					
3	good	yes, a little	yes, a lot	yes	completed high school					
4	fair	no	yes, a lot	yes	completed high school					
5	good	yes, a lot	yes, a lot	yes	completed high school					
6	good	yes, a lot	yes, a little	yes	completed high school					
7	excellent	yes, a lot	yes, a little	yes	completed high school					
8	poor	yes, a little	yes, a lot	yes	elementary school					
9	excellent	yes, a little	yes, a lot	no	completed high school					
10	excellent	yes, a lot	yes, a lot	yes	some college or university					
11	good	yes, a lot	yes, a little	yes	completed high school					
12	excellent	yes, a lot	no	no	some college or university					
13	good	yes, a little	yes, a little	yes	completed high school					
14	good	yes, a lot	yes, a lot	yes	completed college or university					
15	good	yes, a lot	yes, a lot	no	some high school					

STEP 4 d

Analysing Quantitative Data

The first part of this process involves filling out the *Quantitative Analysis Data Worksheet*. This *Worksheet* will eventually contain the findings from this data collection tool.

Start by making one copy of the *Quantitative Data Analysis Worksheet* for each type of tool that has closed-ended questions, for example, if you have a self-completed questionnaire and a telephone interview, make two copies. On each *Worksheet*, indicate the type of tool in the space provided (e.g., self-completed questionnaire).

For each type of tool, copy the expectations from the *Methods Worksheet* into the first three columns of the *Quantitative Data Analysis Worksheet* by doing the following steps.

- Put the number part of the expectation in the first column. Expectations are often stated as percentages (e.g., at least 70%). Sometimes they are just stated as straight numbers (e.g., minimum of 250).
- Put the group or thing the expectation applies to in the second column (e.g., all participants or parents with high school education or less).
- Put the response category from that particular question on the tool in the third column called "Response Category" (e.g., excellent or good).

Finally, put the question number from the tool in the fourth column called "Question Number" (e.g., 1, 2, 3).

If you are having someone else analyse the data, give them your raw data and the *Quantitative Data Analysis Worksheet*. Ask them to fill in last three columns of the *Worksheet* and then skip to Step 5. If you are analysing your data by hand, here's how to complete the analysis.

- Find the column on the *Quantitative Data Organisation Worksheet* that corresponds to the "Question Number" on the *Quantitative Data Analysis Worksheet.*
- Count from top to bottom the number of times the response category occurs (for example, count the number of "goods" or "excellents"). Be sure the respondent matches the description in column 3 from your expectations (e.g., parents with high school education or less versus all parents). Write this number in the "Count" column.
- If your expectation is a straight count, copy the number in the "Count" column to the "Final Percentage or Number" column and move on to the next expectation.
- If your expectation is stated as a percentage, you need to know how many people this count is based on. Count the total number of responses in this column. Write this number in the "Total" column.
- Then divide the "Count" by the "Total" and multiply it by 100 to find the percentage. Write this number in the "Final Percentage of Number" column. Indicate that it is a percentage (%).

Quantitative Data Analysis Worksheet

Type of Tool: *Self-completed questionnaire*

Expectations				Findings			
% or number (copy from *Methods Worksheet*)	**Of whom / what** (copy from *Methods Worksheet*)	**Response Category on Tool** (copy from *Tool Worksheet*, if applicable)	**Question Number on Tool** (if applicable)	**Count**	**Number Missing**	**Total**	**Final Percentage or Number**
4a - 70%	*all participants*	*good or excellent*	*1 (rating)*	*77*	*4*	*96*	*80%*
4b - 70%	*parents with high school education or less*	*good or excellent*	*1 (rating)* *5 (education)*	*34*	*3*	*40*	*85%*
4d - 70%	*all participants*	*yes*	*4 (recommend to a friend)*	*83*	*2*	*98*	*85%*
5a - 70%	*all participants*	*very or somewhat positive*	*2 (knowledge)*	*77*	*7*	*93*	*83%*
6a - 70%	*all participants*	*very or somewhat positive*	*3 (skills)*	*69*	*8*	*92*	*75%*

Unexpected findings:

Let's walk through the example from the evaluation of the Parenting Program as described in the *Quantitative Organisation Worksheet*. As indicated in the *Methods Worksheet*, a self-completed questionnaire was administered to a stratified random sample of 100 participants at the end of the series. It addressed expectations 4, 5, and 6. Data from 100 questionnaires were summarised on the *Quantitative Data Organisation Worksheet*. The first expectation (4a) stated that at least 70% of all participants should rate the series as good or excellent. This happened to be the first question on the questionnaire. That first question was answered by 96 of the 100 participants who completed the questionnaire; data were missing for 4 cases. Of those who answered the question, 77 rated the series as good or excellent while 19 said the series was fair or poor. Therefore, the final percentage is 80% (77/96 x 00).

For the next expectation (4b), at least 70% of parents with high school education or less should rate the series as good or excellent. This expectation is similar to the first one mentioned above, but instead of pertaining to all participants, it relates specifically to parents with a high school education or less. There were 43 questionnaires completed by parents with a high school education or less. The first question on the questionnaire was answered by 40 of the 43 parents; data were missing for 3 cases. Of those who answered, 34 rated the series as good or excellent, while 6 said the series was fair or poor. Therefore, the final percentage is 85% (34/40 x 100).

There is a large body of literature on the analysis of quantiative data. If you are interested in learning more, ask your health unit's epidemiologist or evaluator for suggested readings.

Key Points

- In thinking about selecting data collectors, you must decide on the number of data collectors, what knowledge, traits and abilities they should possess, and how to recruit them.
- A brief set of instructions for data collectors should be prepared to help maximise consistency in data collection.
- It is vital that data collectors are thoroughly trained in all aspects of data collection.
- Keeping track of data collection activities is another important consideration.
- It is important to pre-test the method and tools and assess data collectors.
- The analysis of both qualitative and quantitative data involves a systematic, step-by-step process.
- Sometimes data can be analysed by hand, other times it is necessary to use a computer.
- Screening for problems (such as missing data) is an important step in preparing for the analysis of quantitative data.

Quiz Yourself

- List three things data collectors should be told during their training.
- What is the minimum number of respondents that should be included in the pre-test of a self-completed questionnaire?
- Who could you consider getting help from for data analysis?
- What is the purpose of the *Quantitative Data Organisation Worksheet?*

References:

Feuerstein M.T. *Partners in Evaluation: Evaluating Development and Community Programmes With Participants.* MacMillan, 1986.

Frey J.H., Mertens Oishi, S. *How to Conduct Interviews by Telephone and In Person.* Volume 4 in the Survey Kit Series edited by Arlene Fink. Sage, 1995.

Krueger R. *Focus Groups: A Practical Guide for Applied Research.* Sage, 1994.

McKenzie J.F., Jurs J.L. *Planning, Implementing, and Evaluating Health Promotion Programs.* Macmillan Publishing, 1993.

July 1997