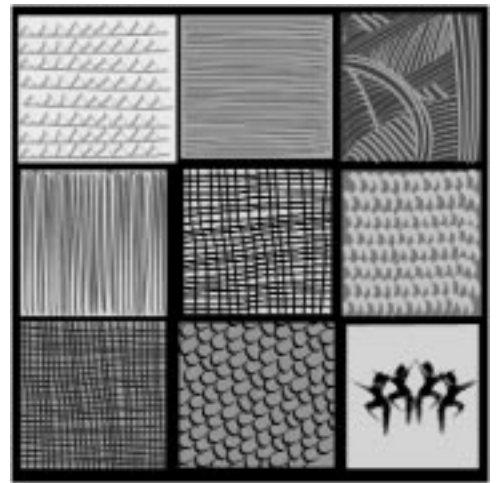


Appendix 1:

SAMPLING SCHEMES FOR CORE DATA COLLECTION STRATEGIES



This Appendix provides more detailed information on sampling schemes for commonly used data collection strategies in youth program evaluations. The following topics are covered:

- How to choose a systematic sample of clusters
- Cluster sampling for household surveys
- Alternative methods for choosing sample households, youth and parents
- Cluster sampling for school-based surveys
- How to allocate a proportional sample of students to schools
- Cluster sampling for health facility surveys
- Alternative methods for sampling service transactions and clients for exit interviews
- Sampling for peer education program evaluations
- Sampling for client follow-up surveys
- Sampling for focus groups and other “small group” data collection efforts
- Sampling for in-depth interviews

How to Choose a Systematic Sample of Clusters

Later sections of this Appendix will describe the use of cluster sampling in surveys of households, schools and health facilities. In cluster surveys, sample clusters are usually chosen using systematic sampling. Systematic sampling can be done with either *probability-proportional-to-size*, or *equal probability*.

Sampling with probability-proportional-to-size

Probability-proportional-to-size means that larger clusters are given a greater chance of selection than smaller clusters. The purpose of this method is to reduce the chance that study subjects associated with smaller clusters will be overrepresented in a sample. This method should be used when:

- the clusters (geographic areas, schools, etc.) vary significantly in size (for example, some clusters are at least two or three times larger than others), and
- you have information on the size of the clusters (in terms of numbers of elements) before beginning sample selection. This information is commonly called a *measure of size*.

Steps for selecting a systematic random sample of clusters with probability-proportional-to-size (PPS)

As you read the steps below for selecting a systematic random sample of clusters with probability-proportional-to-size, refer to Table 1 for an illustrative example.

- (1) Prepare a list of first-stage clusters (e.g., schools, geographic areas, facilities) with a corresponding measure of size for each (**Column A**).

In the example in Table 1, there are 170 clusters to sample from. The measure of size used is the number of households in each cluster.

- (2) Starting at the top of the list and moving down, calculate the cumulative measure of size. Enter these figures in a column next to the measure of size column (**Column B**). The last number in this column will be the total cumulative measure of size for all the clusters in the sampling frame. This total will be called **M**.

The total cumulative measure of size in the example in Table 1 is $M = 17,219$.

- (3) Calculate the sampling interval (**SI**) by dividing the total cumulative measure of size (**M**) by the number of clusters to be selected (**a**).¹ That is, **SI = M/a**.

Refer to the figures from Table 1 as an example:

Total cumulative measure of size: $M = 17,219$

Planned number of sample clusters: $a = 40$

Sampling interval: $SI = 17,219/40 = 430.475$

- (4) Select a random number (**RN**) between 1 and (**SI**). Compare this number with the measure of size column (**Column A**). The first sample cluster will be the one within whose cumulated measure of size the number (**RN**) falls.

*In the example in Table 1, the random number (**RN**) chosen between 1 and 430.475 (**SI**) is 73. The number 73 falls within the cumulated measure for Cluster No. 001 (see Columns B and C). Therefore, Cluster No. 001 is the first sample cluster (see Column D).*

- (5) Choose subsequent clusters by adding progressive multiples of the sampling interval (**SI**) to the random number (**RN**) identified in Step 4; that is, $RN + SI$, $RN + 2SI$, $RN + 3SI$, etc. As in Step 4, select the clusters within whose cumulated measure of size these new numbers fall.

Note: When selecting sample clusters, it is important that the decimal points in the sampling interval (**SI**) be retained. When the decimal part of the sample selection number is less than .5, choose the lower number. When the decimal part of the sample selection number is .5 or greater, choose the higher number.

¹ Determining the number of clusters to sample (referred to as “a” above) depends mostly on your resource availability for data collection. The default minimum number of clusters to sample is 30, but the validity of your results will improve if you are able to sample more than 30 clusters. The more clusters you sample from, the fewer elements per cluster will need to be sampled in order to achieve your overall desired sample size, resulting in a less-biased sample and smaller design effects. If you are not familiar with these issues, it is advised that you seek outside help in determining an appropriate and feasible number of clusters to collect data from.

In the example in Table 1, $RN = 73$ and $SI = 430.475$

$$RN + SI = 73 + 430.475 = 503.475 \text{ (rounded down)} = 503$$

$$RN + 2SI = 73 + 860.95 = 933.95 \text{ (rounded up)} = 934$$

(see Column C)

Therefore, the clusters selected (those shown in Table 1) are Clusters 001, 005, and 009 (see Column D).

- (6) Follow the procedure in Step 5 until the list of clusters has been exhausted.

	A	B	C	D
Cluster Number	Measure of Size— Number of Households	Cumulative Size	Sample Selection No.	Cluster Selected
001	120	120	73 (RN)	X
002	105	225		
003	132	357		
004	96	453		
005	110	563	503 (RN + SI)	X
006	102	665		
007	165	830		
008	98	928		
009	115	1,043	934 (RN + 2SI)	X
.	.	.		
.	.	.		
.	.	.		
170 (last)	196	17,219 (M)		

Sampling with equal probability

Equal probability means that all clusters are given an equal chance of selection. Sampling with equal probability should be used when:

- the clusters to be used are approximately equal in size, or
- you do not have information on the size of the clusters prior to sample selection. In other words, there is no information on the *measure of size*.

Steps for selecting a systematic random sample of clusters with equal probability

As you read the steps below for selecting a systematic random sample with equal probability, refer to Table 2 for an illustrative example.

- (1) Prepare a numbered list of sites or clusters, preferably ordered geographically (e.g., by areas of a city) (**Column A**).
- (2) Calculate the sampling interval (**SI**) by dividing the total number of clusters in the target group (**M**) by the number of clusters to be selected (**a**). That is, $SI = M/a$.

*In the example in Table 2, the total number of clusters in the target group (**M**) is 170. The planned number of clusters to be sampled (**a**) is 40. Therefore, the sampling interval (**SI**) = $170/40 = 4.25$.*

- (3) Select a random number (**RN**) between 1 and (**SI**). The cluster on the numbered list corresponding to this random number will be the first sample cluster.

*In the example in Table 2, the random number (**RN**) chosen between 1 and 4.25 (**SI**) is 2. Therefore, the first sample cluster is Cluster No. 002.*

- (4) Choose subsequent clusters by adding progressive multiples of the sampling interval (**SI**) to the random number (**RN**) identified in Step 3; that is, $RN + SI$, $RN + 2SI$, $RN + 3SI$, etc.

In the example below, $RN = 2$ and $SI = 4.25$

$RN + SI = 2 + 4.25 = 6.25$ (rounded down) = 6

$RN + 2SI = 2 + 8.50 = 10.50$ (rounded up) = 11

Therefore, the clusters selected (those shown on Table 2) are Clusters 002, 006, and 011 (see Column B).

- (5) Follow the procedure in Step 4 until the list of clusters has been exhausted.

Column A	Column B
Cluster Number	Sample Selection
001	
002	X
003	
004	
005	
006	X
007	
008	
009	
010	
011	X
.	
.	
.	
M = 170 (last)	

Cluster Sampling for Household Surveys

Many outcome indicators for youth-serving programs are measured at the level of the general population of young adults, often through household surveys. Samples of parents, communities and community leaders can also be selected from the sample clusters chosen for a household survey. This method reduces costs because all data collection can be done in one visit to each sample cluster/community.

Steps involved in cluster sampling

Step 1: Define the cluster

Geographic areas with fixed boundaries (e.g., census enumeration areas, city blocks, villages) are the most commonly used clusters for household surveys.

Step 2: Develop the sampling frame

A good source for your sampling frame is the national statistics office, as most have developed lists of geographic units (census enumeration areas) for use in census taking, as well as maps and population estimates. If for some reason official census enumeration areas cannot be used, you will have to use some other list of geographic areas covered by the program, or assemble a list yourself.

Step 3: Determine how many clusters to sample

Household surveys should cover as many clusters as resources will permit—a sample of more clusters of smaller size is preferable to one with fewer clusters of larger size. In general, at least 30 clusters should be chosen. Refer to Appendix 2 for further guidance on deciding on how many clusters to choose.

Step 4: Select sample clusters

Household surveys usually involve the following two stages of sample selection:

- ▶ Selecting sample clusters
- ▶ Selecting households from each sample cluster

First stage: Clusters are chosen using *systematic sampling*, usually with *probability-proportional-to-size*, meaning that larger clusters are given a greater chance of selection than smaller clusters. Probability-proportional-to-size is used when:

- ▶ the clusters vary significantly in size (for example, some clusters are at least two or three times larger than others), and
- ▶ you have information on the size of the clusters, usually referred to as a *measure of size*.

A *measure of size* is a count or estimate of the number of elements (e.g., number of households, estimated total population, estimated number of youth) associated with each cluster. Exact counts are not necessary for use as measures of size—rough approximations are sufficient. If measures of size are not available, sample clusters may be chosen using *systematic sampling with equal probability*.

Second stage: Choose an *equal number of households* from each sample cluster, using either simple random or systematic sampling. The number of households to be chosen per sample cluster will be determined by:

- ▶ the target sample size for the survey (discussed in Chapter 6),
- ▶ the number of clusters to be sampled, and
- ▶ the expected sample “take” of youth per household.

Sampling youth

Youth can be sampled within sample clusters using a variety of methods:

- ▶ *Listing method:* Prepare a list of households in each sample cluster and choose a random or systematic sample. This method is preferable if you are able to develop a complete list of households in sample clusters.
- ▶ *Segmentation method:* Divide the sample cluster into “segments” of equal size, choose one segment at random and interview all youth found in the sample segment.
- ▶ *Random walk method:* Choose a household in the sample cluster at random as the starting point. After interviewing all youth in the household, choose the nearest household as the second sample household. Continue this process until you have interviewed the target number of youth.

The “Alternative Methods for Choosing Sample Households, Youth and Parents” section on page 250 provides a detailed explanation of how to use the above approaches.

Sampling parents of youth

To sample parents of youth, follow the same steps as outlined above—from “Define the cluster” to “Select sample clusters.” Once you have chosen a sample of clusters, you can then select samples of both youth and adults within these clusters. There are two possible ways of doing this:

- ▶ Choose a sample of households and interview both youth and parents in the same sample households (less costly, and preferable if privacy can be assured).
- ▶ Choose separate samples of households in which to interview youth and parents respectively.

Sampling community leaders

Community leaders can be sampled either independently of or in conjunction with household survey efforts. If you decide to sample community leaders *separately*, you should develop a list of all community leaders and choose either a simple random or systematic sample from that list. If your sampling of community leaders is *linked* to the household survey sampling, you should select a sample of clusters for the household survey component (following the steps above) and either:

- ▶ include all community leaders from the sampled clusters, or
- ▶ take a simple random sample of community leaders in each sample cluster/community.

An advantage of the linked strategy is that it enables you to relate indicators for community leaders to indicators for youth or parents at the cluster or community level during data analysis.

Sampling to measure community-level indicators

Community-level indicators (e.g., levels of community support or mobilization for a program) may be measured through:

- general population surveys,
- interviews with key informants or community leaders, and
- observations of community activities.

As when sampling community leaders, you can sample communities located within the geographic scope of a program being evaluated, either:

- independently of other evaluation activities, or
- in conjunction with ongoing household surveys.

The advantage of the second strategy is the same as with sampling community leaders (above).

Figure 1–1 Illustrative Application of Cluster Sampling to a Household Survey of Youth

In Romania in 1996, a Young Adult Reproductive Health Survey was conducted, which required that information be gathered from independent samples of male and female youth. A two-stage cluster sample design was used.

First stage of sample selection: Choosing the clusters

- One hundred fifty-four Census Sectors were chosen as the sample clusters, using a systematic random selection procedure with probability-proportional-to-size. The measure of size used was the number of households recorded for each sector in the 1992 Census. Only female respondents were to be chosen from these sample sectors.
- Male respondents were to be selected from a separate 154 Census Sectors, which were chosen by taking the next sector in the sampling frame. Therefore, the total number of sectors chosen was 308.

Second stage of sample selection: Choosing sample elements (male and female respondents)

- It was estimated that 5.4 households would have to be contacted in order to obtain one completed interview. This estimation was reached based on 1992 Census data on the proportion of households containing one or more persons 15–24 years of age, and assuming a response rate of 90 percent.
- After the list of households in the 1992 Census was updated, a systematic random sample of households was chosen from each cluster. All eligible respondents found in sample households were included in the sample.

Comments

- The sample size for the survey in this example is much larger than would be needed for most program evaluations.
- In this example, sample households were chosen after completing an updated list of households within sample clusters (listing method). However, either the segmentation or the modified random walk method could have been used to reach the same number of households (i.e., around 80 households per sector).

Source: Serbanescu and Morris, 1997.

Alternative Methods for Choosing Sample Households, Youth and Parents

As mentioned in the previous section, the “preferred” procedure for choosing a sample of youth or households in household surveys is the *listing method*. In this method, you can use simple random or systematic sampling to choose a sample of persons or households from a complete list of all persons/households in each sample cluster.

Creating complete lists of households in sample clusters can be time-consuming, however. Therefore, this section describes two recommended alternatives: the *segmentation method* and the *modified random walk method*.

Segmentation method

In the *segmentation method*, you divide sample clusters into smaller “segments” of approximately equal size and then choose one of these segments at random from each cluster. All youth found in the households in the chosen segment are then interviewed.

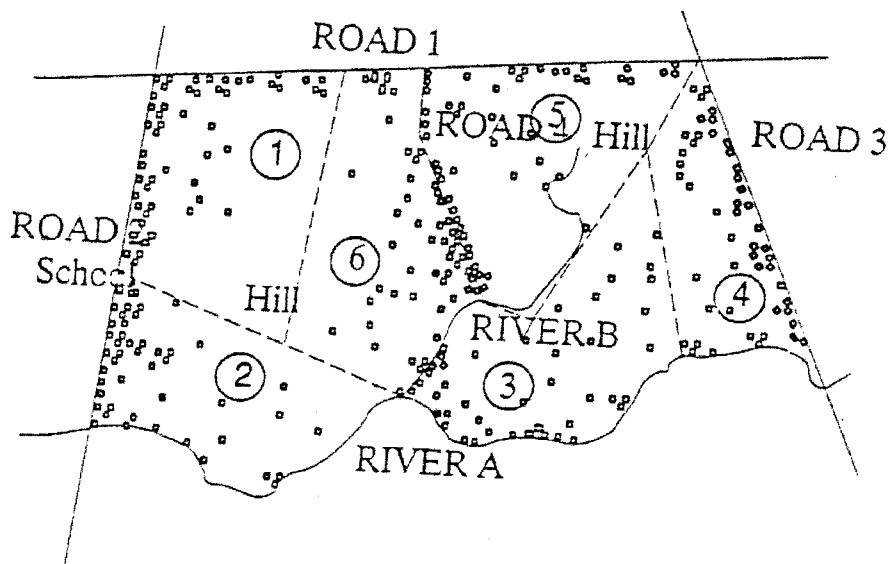
The advantages of this approach are:

- ▶ you do not have to create a list of all households in each cluster, and
- ▶ a sample is produced in which all respondents have an equal probability of selection (that is, a self-weighting sample).

Steps for choosing sample persons/households using the segmentation method

- (1) **Calculate the number of segments to be created.** Divide the number of households recorded in the last census by the target segment size. The target segment size is the number of households you anticipate having to contact in order to find the desired number of youth in each cluster. The resulting number will be the number of segments to be created. For example, if the last census indicated that there were 250 households in the cluster and the target segment size was 40 households, then you would need to create 6 segments. (Note: In performing this calculation, decimal numbers of segments should be rounded to the nearest whole number.)
- (2) **Update the cluster map.** Using a map of the cluster, verify/update the external boundaries of the cluster and add any internal features that may be useful for dividing the cluster into easily recognizable segments (e.g., roads, streams, etc.)
- (3) **Count the number of households and indicate their location in the cluster on the map.** This allows you to divide the cluster into segments with approximately equal numbers of households.
- (4) **Based on the cluster map, divide the cluster into equal-sized segments.** The number of segments to be used is the number determined in Step 1 above.
- (5) **Choose one segment at random.**
- (6) **Interview all households located within the boundaries of the randomly chosen segment.** Note: It is possible that the segments formed using the segmentation method might correspond to sub-groupings of the population in terms of economic status, religion, ethnicity, etc. While there is a danger that this may bias the survey results, it is to be anticipated that the various sub-groups will be appropriately “represented” over a sample of 30 or more segments.

Figure 1-2
Example of a Hypothetical Cluster that Has Been Divided Into Six Segments



Source: UNICEF. 1995. *Monitoring Progress Toward the Goals of the World Summit for Children: A Practical Handbook for Multiple-Indicator Surveys*. New York: UNICEF.

Modified random walk method

In the *modified random walk method*, sample persons/households are selected by randomly choosing a starting point, interviewing all youth/parents in the nearest household and then moving on to neighboring households until you have reached the target sample number. A map of a sample cluster is used to indicate a number of possible starting points at various, easily identifiable locations in the cluster (see Figure 1-3 for an illustrative example). This method may be familiar to many readers as the sample selection method used in Expanded Programme on Immunization (EPI) Cluster Surveys.

The primary advantages of this variant over the more commonly used EPI sampling procedure are:

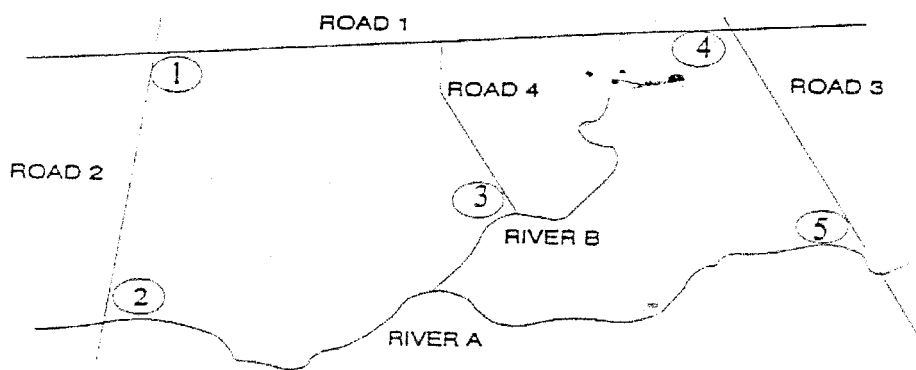
- the selection of starting points is truly random (and can be performed in advance of survey field work by supervisory personnel), and
- it does not always start in the center of the cluster, a practice often followed in EPI cluster surveys.

Note: The modified random walk method may be further strengthened by randomly choosing two or more starting points, and dividing the target sample size equally among these points.

Steps for choosing sample persons/households using the modified random walk method

- Randomly choose a starting point and direction of travel within a sample cluster.
- Choose the nearest household to the starting point as the first sample household.
- After completing the interview(s) in this first household, choose the household whose front door is nearest the first sample household as the second sample household.
- After each interview, continue to choose the next nearest household until the target number of youth/parents has been identified.

Figure 1–3
Map of Hypothetical Sample Cluster Showing Possible Starting Points



Source: UNICEF. 1995. *Monitoring Progress Toward the Goals of the World Summit for Children: A Practical Handbook for Multiple-Indicator Surveys*. New York: UNICEF.

Cluster Sampling for School-based Surveys

Several data collection protocols may be used to measure program design, system functioning and program implementation indicators for school-based programs, such as:

- curricula reviews,
- reviews of program records/statistics,
- facility assessment questionnaires or checklists, and
- surveys of students, teachers and administrators.

School surveys of students are typically used for measuring program outcome indicators.

The following sections describe the procedures for selecting a sample of schools and sample elements within them (e.g., students, teachers, teacher-student transactions, etc.).

Selecting a sample of schools

Step 1: Define the cluster

Schools (or *classes*) are the most commonly used clusters for school surveys.

Step 2: Develop the sampling frame

The sampling frame will be a list of all schools covered by the program.

Step 3: Determine how many schools (clusters) to sample

If you have decided that you need to sample schools, you will then need to determine how many schools to include in your sample:

- ▶ In large programs, 30 or more schools should be included in the sample.
- ▶ In programs covering fewer than 30 schools, as many as possible should be included in the sample.

If you are going to sample *fewer than 20 schools*, there will be little advantage in selecting schools randomly. In this case, a sample of schools that is “representative” with regard to factors such as size, location, socioeconomic level of the student body, etc. will generally be just as valid as a random sample.

Step 4: Select sample clusters

If it is not possible to include all schools in the evaluation (for example, in the case of national or regional FLE programs), you will need to limit the evaluation to a sample of schools. How many stages of sampling you will need depends on:

- ▶ the number of schools covered by the program,
- ▶ the size of schools in terms of numbers of students and classes, and
- ▶ the resources available for the program evaluation.

A cluster sampling scheme similar to that used in household surveys is the most common sampling method for school surveys. You should select schools using systematic sampling with *probability-proportional-to-size*, using data on school enrollment as your *measure of size*. (Refer to “Cluster Sampling for Household Surveys” section on page 247 for details.)

Sampling students

Step 1: Determine how many students to select from each school

If you have decided to sample students within sample schools, you will then need to determine how many students from each school to include in your sample. In school surveys, you should *not* select an equal number of students per sample school. Instead, the sample size should be *proportional* to the number of students in the school. In other words, larger schools should receive a larger sample allocation and smaller schools a smaller allocation. This is because the purpose of program evaluations is to measure program performance and outcomes for program schools as a whole, not per individual school. See the next section on page 255 for a detailed explanation of how to allocate a sample of students to schools.

Step 2: Select a sample of students in each sample school

If you are planning to use self-administered questionnaires, it may be possible to include all students in the sample schools. If the sample schools are too large to collect and process data from every student, you will need to sample the students through one of the following methods:

- ▶ Select a simple random or systematic random sample from a list of students at each sample school, or
- ▶ Choose a simple random or systematic random sample of classes from each school, and include *all* students in these sample classes. This option is simpler, especially if self-administered questionnaires are to be used.

The recommended procedure for sampling classes (Option 2) is as follows:

- ▶ Create a list of the classes in each sample school, ordered by grade.
- ▶ Then, assuming that classes within schools are of approximately equal size, use systematic sampling with equal probability to select a sample of classes.

If you choose Option 2, the number of classes or sections to be chosen in a given school will be determined by:

- ▶ the target sample size for the school, and
- ▶ the size of classes in the school.

For example, if a school has been allocated a sample of 100 students, and each class at the school averages 25 students, then four (4) classes should be chosen for the survey. An illustrative example of this procedure is provided in Section 1.5.

Sampling teachers or school administrators

Indicators related to teacher knowledge, attitudes, perceptions and performance in implementing a program may be measured through self-administered questionnaires or personal interviews with teachers.

Selecting a sample of teachers

If the number of schools in the program being evaluated is small, you can include all teachers at sample schools in teacher surveys. For larger-scale programs, the two possible ways to select a sample of teachers are:

- ▶ using simple random or systematic random selection to select teachers from a list of all teachers at each sample school, or
- ▶ choosing teachers associated with the sample classes/sections selected for student surveys. One advantage of this strategy is that indicators for students and teachers can be directly related to one another during analysis.

When measuring indicators related to *administrators*, all administrators in sample schools should be included, as their number per school is usually quite small.

Sampling parents of students

If you are already planning to conduct household surveys of youth (and if more than 50 percent of school-aged youth in the general population have been exposed to the program being evaluated), one possibility is to interview parents of school-attending youth found in sample households. Two other, more efficient approaches are to:

- select a simple random or systematic random sample of students from a list of students at program schools (or a sample of schools), and interview the parents of these students, or to
- choose a simple random or systematic random sample of classes from program schools, and interview parents of *all* students in the sample classes.

As with other stakeholders, you have the option of sampling parents independently of or in conjunction with your samples of students. The advantage of the latter strategy is that it allows you to relate indicators measured for students with those for their parents. Figure 1–4 provides an illustrative application of some of the sampling strategies described above for an evaluation of a school-based FLE program.

Figure 1–4 Illustrative Example of an “In-Class” School Survey of Youth

As part of an evaluation of the national sex education/family life education program recently implemented in public schools in Peru, a KAP-type survey was conducted in a sample of public-sector secondary schools.

Selecting sample schools (clusters): A total of 34 schools—10 from Metro Lima and 24 from cities in the interior of the country—were selected, using a systematic random selection procedure with probability-proportional-to-size.

Selecting sample classes/sections within each school: In each sample school, one class/section from each of the five grades at the secondary level of the education system in Peru was chosen to be included in the survey, using simple random sampling.

Total sample size: The estimated average class size was 30 students. Therefore, the expected sample size per school was $n = 150$ (5 classes \times 30 students per class). The total expected sample size was $n = 5,100$ students (34 schools \times 150 students per school).

Self-administered questionnaires were used in the survey.

Source: Ministry of Education, Peru, and FOCUS on Young Adults Program, 1998.

How to Allocate a Proportional Sample of Students to Schools

As mentioned in the “Cluster Sampling for School-based Survey” section, the target sample size of students from each sample school should be proportional to the size of the school, rather than sampling an equal number of students from each school. This means that a larger sample of students will be taken from large schools and a smaller sample from small schools, which will allow you to measure program performance and outcomes for program schools as a whole, rather than per individual school.

Table 3 Illustrative Example of Proportional Sample Allocation to Schools			
A	B	C	D
School	Number of Students Enrolled	Proportion of Students in Sample School	Target Sample Size (Sample Size = 2,000)
001	296	.015	30
002	845	.043	86
003	692	.035	70
004	399	.020	40
005	908	.046	93
.	.	.	
.	.	.	
.	.	.	
030	773	.040	79
Total	19,565	1	2,000

Steps for allocating a proportional sample of students to schools

As you read the steps below for allocating a proportional sample of students to schools, refer to the illustrative example in Table 3.

- (1) Prepare a list of sample schools (**Column A**), preferably ordered geographically (e.g., by areas of a city), showing the number of students enrolled at each school (**Column B**).
- (2) For each sample school, calculate the proportion of the total number of students in all sample schools enrolled in that school (**Column C**). This number is found by dividing the number of students in each particular school by the total number of students in all the schools combined (**Total of Column B**).

For example, take School 002 from Table 3:

$$845 \text{ (number of students in School 002) divided by } 19,565 \text{ (total number of students)} = .043 \text{ (the proportion of total number of students in School 002)}$$

- (3) Multiply the proportion for each school obtained in Step 2 (**Column C**) by the target sample size for the survey. The result will be the target sample size for each school (**Column D**).

Again take School 002 as an example:

$$.043 \text{ (proportion of students in School 002) times } 2,000 \text{ (target sample size for the survey)} = 86 \text{ (target sample size for School 002)}$$

Cluster Sampling for Health Facility Surveys

For health facility-based programs, the measurement of most program design, system functioning and implementation indicators will require visits to the program facilities. The data collection protocols that may be used during such visits include:

- reviews of program records/statistics,
- facility assessment questionnaires or checklists,
- interviews with service providers and administrators,
- observations of transactions between service providers and youth clients, and
- interviews with clients.

Unlike school programs, follow-up surveys of clients will normally be required to measure program outcome indicators, since client contact with program facilities is for a much briefer period of time. Such surveys are discussed in a separate section later in this chapter.

Sampling facilities

Step 1: Define the cluster

Health facilities are the most common cluster for health facility surveys and assessments.

Step 2: Develop the sampling frame

The sampling frame will be a list of all health facilities covered by the program.

Step 3: Determine how many facilities (clusters) to sample

As in the case of household and school surveys, as many facilities as possible should be included in the sample. In large programs, 30 or more facilities would ideally be covered. In programs with fewer than 20 facilities, a sample of facilities that is “representative” of all facilities in terms of size, location, socioeconomic level of the catchment area served, etc. will suffice.

Step 4: Select sample clusters

For small-scale programs, it may be possible to include all facilities in the sample. For larger-scale programs covering multiple facilities, it may be necessary to limit the evaluation to a sample of facilities. A two-stage cluster sampling scheme similar to that used in school surveys is the most common sampling method for health facility surveys. You should select facilities using systematic sampling with *probability-proportional-to-size*, using the volume of youth clients at health facilities as your *measure of size*. (Refer to the “Cluster Sampling for Household Surveys” section on page 247 for details.) If information on client volume is not available, facilities should be chosen using either simple random or systematic random sampling (with equal probability).

Sampling service providers

Indicators related to service provider knowledge, attitudes, program implementation practices and perceptions about the program may be measured through self-administered questionnaires or personal interviews with service providers.

Selecting a sample of service providers

If the number of program facilities and personnel involved is small, you should include all service providers who serve youth at sample facilities.

In larger-scale programs, you can choose a sample of service providers, either:

- ▶ by using simple random or systematic random selection to choose providers from lists of service providers at each sample facility, or
- ▶ by interviewing all service providers who happen to be present on a randomly chosen day that a sample facility is visited.

The latter strategy is often used when *several data collection protocols are to be used* (e.g., facility assessment checklists, interviews with service providers and youth clients and observations of service transactions), as all may be conveniently administered during a one- or two-day visit to each sample facility.

Sampling service transactions

The most common method of observing service transactions is to deploy trained observers at sample facilities. The *observation period* can either be:

- ▶ a fixed time interval (e.g., one or two days per facility), or
- ▶ the length of time necessary to observe a pre-determined number of service transactions (e.g., 10 transactions per facility).

Selecting observation days

In either case, you should randomly choose the day(s) of the week on which observations are made at each sample facility to ensure that observations are spread out over different staff. The challenge of this measurement approach is that the data collection schedule depends entirely on when and how often youth come to the clinic for services. If youth clients visit the facility infrequently, using the *fixed time interval* may result in relatively few transactions being observed, while the *service transaction quota approach* may require several days of observation for quotas to be reached. The use of these observation protocols is made somewhat easier when facilities have special hours for youth clients, as service transactions with these clients are concentrated into shorter time intervals.

Sampling for mystery client observations

In the *mystery client observation approach*, youth are recruited to visit health facilities in the role of clients, after which information on what transpired during service contacts is recorded. Mystery client observations are preferable to the observation approach described above when:

- ▶ it may be difficult to observe sufficient numbers of service transactions with youth clients during visits on randomly chosen days, and/or
- ▶ the observation of service transactions by third parties may influence what happens during the transaction.

Selecting mystery client observation days

Once a sample of facilities has been chosen, randomly choose days of the week and times of day for mystery client visits to be made. Mystery clients should be asked to play out a variety of scenarios, so that different types of services can be observed. Note, however, that the youth recruited as simulated clients should not have to undergo invasive procedures at health facilities (e.g., pelvic examinations or blood tests). To avoid this risk, mystery client observations should be used to assess only limited types of services.

Sampling for client exit interviews

Another way to measure program implementation- and client response-type indicators is through interviews conducted with youth as they leave health facilities after having received services. The primary sampling objective is to obtain feedback on a random sample of service transactions. This is typically accomplished by choosing random samples of facilities and days of the week for conducting interviews with clients. As was the case for direct observation of service transactions, however, the time required to obtain a target number of interviews depends entirely on when and how often youth come to the facility to receive services.

Figure 1–5 provides an illustrative application of a sampling strategy for evaluating a health facility-based program.

Figure 1–5 Illustrative Application of a Sampling Strategy for Evaluating a Health Facility-Based Program

In 1998, the Moroccan Ministry of Health conducted an assessment of the quality of services being provided to both youth and older adults at MOH facilities.

Methods of data collection: Data were gathered using facility inventory checklists, observations of service transactions and exit interviews with clients.

Selecting a sample of facilities: A sample of facilities was chosen by first choosing a sample of six provinces, and then choosing a sample of facilities within these provinces. Sample facilities were chosen with probability-proportional-to-size, using the estimated daily client volume for reproductive health services as the measure of size. A total of 96 sample facilities were chosen.

Collecting data in each sample facility: Each sample facility was visited for one randomly chosen day, during which a team of three persons undertook the various data collection tasks. The number of teams assigned to each facility was based on the expected client volume, with high-volume facilities being assigned more than one team. All transactions involving reproductive health services conducted on the day of the visit were observed, and all clients were interviewed as they left the facility.

Alternative Methods for Sampling Service Transactions and Clients for Exit Interviews

When conducting observations of client service transactions or client exit interviews in facility surveys, it is not always feasible to create a list of subjects from which to choose a sample. In these situations, you can use either *quota sampling* or a *take-all strategy* as alternative approaches for the second stage of sample selection.

Quota sampling

In *quota sampling*, service transactions are observed or clients are interviewed at sample facilities until a pre-determined quota of observations or exit interviews has been reached. These interviews or observations are conducted at randomly chosen points in time (e.g., days). This strategy will result in a fixed number of observations per facility, but the length of time required to reach the quota will vary across facilities, depending on how often and how many youth come to the facility for services.

The take-all strategy

In the *take-all strategy*, all clients who happen to appear at a particular facility on a randomly chosen day are included in the sample (irrespective of how many clients there are). This strategy will result in a variable number of sample elements per cluster. In order for this approach to work, you will need reasonably accurate information on the typical or average number of sample elements associated with the sites or clusters for a particular target group. This information is needed in order to ensure that, on the one hand, a sufficient number of clusters have been chosen for the survey, while, on the other hand, the overall target sample size is not grossly exceeded.

Figure 1–6
Summary of Alternative Second-Stage Sample Selection Procedures

Sampling Approach	Advantages	Disadvantages
Quota sampling	<ul style="list-style-type: none"> ▶ Tight control of sample size ▶ No need for a list of sample elements 	<ul style="list-style-type: none"> ▶ May require multiple visits to a site to reach sample size quota ▶ Higher danger of bias
Take-all approach	<ul style="list-style-type: none"> ▶ Number of visits to sample sites limited to one ▶ No need for a list of sample elements 	<ul style="list-style-type: none"> ▶ No control over sample size ▶ Higher danger of bias

Sampling for Peer Education Program Evaluations

Process evaluation efforts for peer education programs are usually intended to assess how well peer promoters are prepared (i.e., their recruitment, training and supervision), as well as peer promoters' own knowledge, attitudes, communication skills, etc. The methods often used to conduct this assessment are:

- interviewing random samples of peer educators (to gather the bulk of the information in process evaluation efforts),
- referring to records maintained by peer educators, or conducting surveys of youth in the appropriate target audience (to assess outputs of peer education efforts, in terms of numbers and characteristics of peers reached), and
- conducting survey interviews with clients (to assess outcomes of peer promotion activities).

Peer education interventions differ from other types of youth-serving programs in that:

- the setting or medium through which “contacts” are made between peer educators and clients varies across different types of program models (e.g., schools, community settings, youth organizations or facilities, outreach activities or the mass media);
- contacts with clients are often made on the basis of opportunity, as opposed to regular service schedules or training plans; and
- in some forms of peer education (e.g., through the mass media), there is no direct contact between peer educators and clients.

Sampling peer educators and their clients

The primary sampling concern for evaluating peer education program efforts is to ensure that “representative” samples of peer educators and clients are selected. You can choose a *sample of peer educators* by doing *simple random sampling* from a list of peer educators associated with the program being evaluated. If you want to assess the performance of different categories of peer educators, you can take simple random samples of peer educators in each of the different categories.

The preferred strategy for *sampling clients* (in order to measure outcome indicators) will depend on both the type of peer education program and the coverage/reach of the program. There are several options:

- *For mass media-based programs*, general population surveys of youth are the preferred means of measuring program outcomes. The relevant sampling strategies are the same as those described earlier for conducting household surveys.
- *If the program reaches more than 50 percent of the intended target audience*, target audience surveys will usually be the most efficient method of evaluation. Such general audience surveys will be more feasible in programs implemented in schools, youth organizations, workplace-based programs and other settings where the target audience congregates in one location (at least occasionally).

- ▶ *If the expected program coverage level is moderate or low (less than 50 percent), or for programs where clients do not congregate in fixed locations (e.g., community-based programs), client follow-up surveys are the only way to measure program outcomes. Sampling strategies for such surveys are discussed in the next section.*

Sampling for Client Follow-up Surveys

If you want to measure medium- and long-term outcome indicators for youth program evaluations, you need to have a mechanism for maintaining or re-establishing contact with program clients. This task is somewhat easier in school- or workplace-based programs, since at least some clients will maintain contact with schools or workplaces over time. However, a follow-up mechanism for such programs is still needed in order to be able to measure outcomes for clients who have either changed schools, graduated, dropped out of school or left a place of employment. This is especially important, as the reason for having left school or work may be related to adverse reproductive health outcomes (e.g., female students or workers experiencing an unwanted pregnancy).

In a *follow-up survey*, you will:

- ▶ choose a sample of program clients,
- ▶ establish contact with them, and
- ▶ conduct a survey interview. (Note: Qualitative data collection methods could also be used.)

Sampling clients for follow-up surveys

To sample clients for follow-up surveys, you can do one of two things:

- ▶ Use simple sampling schemes, such as simple random sampling from a list of program clients. This method will be sufficient in most cases.
- ▶ Choose a sample of peer educators, and then choose a sample of their contacts in a second stage of sample selection.

If you want information about specific sub-groups of clients, you can classify them on the basis of characteristics that may be important to program outcomes (e.g., age, gender, ethnic group, economic status) and take samples from each group. However, if you want to compare outcomes for sub-groups of youth, it will be necessary to ensure that an adequate sample size has been obtained for each group. This issue is addressed in greater detail in the discussion of sample size requirements in Chapter 6.

Length of the observation period

One challenge of client follow-up surveys is being able to establish contact with and successfully interview a sufficient number of clients. In order to measure long-term effects, an observation period of three to five years may be needed. However, the longer the observation period, the greater the proportion of clients that you will not be able to locate. Therefore, for practical purposes, follow-up periods should be limited to two to three years (unless a program evaluation has sufficient resources to track clients for longer periods).

Adjusting sample size to anticipate drop in follow-up rate

Since you might not be able to re-establish contact with some clients in follow-up surveys, sample sizes for follow-up surveys should be increased (usually by around 25 percent) in order to at least partially compensate for this expected loss. This increase will compensate only for the loss of sample size, but not for bias. It is therefore important to try to keep follow-up loss rates as low as possible.

Sampling for Focus Groups and Other “Small Group” Data Collection Efforts

Use non-probability sampling methods

Non-probability sampling methods are more commonly used than probability methods when choosing respondents for focus group discussions and related small-group data collection methods (e.g., pile sorts and free-listing). As mentioned in Chapter 6, assembling randomly chosen respondents in a given location to conduct focus groups or other small-group methods is difficult.

Focus groups based on sub-groups in the target population

Stratification or market segmentation is a key aspect of sampling for small-group methods. At least one focus group is formed for each of the key sub-groups in the population under study (this could pertain to different sub-groups of clients, as well sub-groups in the general population). For example, for youth-serving programs, relevant sub-groups might consist of youth of different ages, genders and economic-status categories, parents and community leaders.

Focus group participants should also be sufficiently well “spread out” regarding other characteristics that might influence discussion responses. You might want to hold focus group discussions in different parts of a geographic area covered by a program, at different times of the day, etc. and—to the extent feasible—randomly choose eligible participants. Although this will add to the cost of data collection, it will result in data that can be more reliably generalized than the data reached through convenience sampling.

Sampling for In-Depth Interviews

In-depth interviews involve a less structured approach to survey data collection, allowing respondents to answer questions in detail and in their own words. As with focus groups, respondents for in-depth interviews are often chosen using *non-probability sampling methods*. The advice concerning “spreading out” the sample across key categories of respondents in focus group surveys also applies to in-depth interviews. If you are using probability sampling for other program evaluation data collection purposes, you may have an opportunity to use more rigorous sampling methods for in-depth surveys through sub-sampling. For example, if you are conducting household, school or facility surveys using probability sampling methods, a small proportion (i.e., 5 or 10 percent) of respondents might then be chosen for in-depth interviews.

