

Post MDA Survey Design

Monitoring treatment coverage of neglected disease control programs

A toolkit developed for USAID Neglected Tropical Disease Control Project

May 2009

BACKGROUND

Why this toolkit?

The U.S. Agency for International Development supports a program to control a number of Neglected Tropical Diseases (NTDs), including schistosomiasis, onchocerciasis (river blindness), intestinal worms, lymphatic filariasis (elephantiasis), and trachoma. The program provides support to countries to deliver regular, large-scale treatment for at-risk populations, usually given once a year. These treatments are distributed by community-based distributors through a method called mass drug administration (MDA). Regular monitoring of drug treatment coverage is essential to monitor progress towards program goals and to identify communities with poor or insufficient coverage in order to permit timely and appropriate actions to improve coverage. The higher the coverage of intervention, the greater the chance of achieving desired health gains. In areas of low coverage, appropriate corrective action can be taken to improve coverage.

This protocol presents a simple, easy-to-use yet accurate population-based survey method to assess drug treatment coverage. The objectives of the presented survey are to:

- 1. Validate reported coverage rates at the national level;**
- 2. Determine age- and gender-specific coverage; and**
- 3. Collect important information on why people do not take part in MDAs;**

A generic tool is presented below. This tool can be used by country programs to develop their own coverage assessment tool, which includes country-specific information on drug package and sampling parameters.

Who is this toolkit for?

The monitoring treatment coverage toolkit aims to provide NTD Control Program grantees with practical up-to-date information to monitor treatment coverage of NTD. Users will be able to use this toolkit to implement a cluster survey in order to assess treatment coverage.

What are its contents?

The toolkit presents information to help program staff develop and implement a survey to assess treatment coverage following community-based administration of several NTD drug packages, and will help users:

- Understand definitions of coverage
- Know how to implement a population-based cluster survey
- Decide on appropriate corrective action following analysis of results

Estimating treatment coverage

Drug coverage is defined as the proportion of eligible individuals who actually ingested the drugs. It is calculated as (WHO, 2005):

$$\frac{\text{Total number of individuals identified by household surveys as having ingested the drugs}}{\text{Total number of individuals residing in all the surveyed households on whom information on drug ingestion could be assessed}} \times 100$$

Therefore *both persons eligible and not eligible* for treatment are surveyed.

Population-based survey methods are the gold standard method to validate coverage and to provide grounds for evidence based decision making.

Survey Design

The post-MDA coverage survey is conducted on a subset or sample of the population that received treatment during the last MDA round. The most statistically efficient design would be based on a single stage selection of households. However, for a variety of reasons – especially time and cost – it is not feasible to survey a random single-stage sample of households. Therefore, the NTD Control Program bases the post-MDA coverage survey on a national, **cluster sample** methodology. Clusters are chosen separately for each drug package (“stratum”) and must be chosen in proportion to their population or “population-proportionate sampling” or PPS.

The combination of drug packages used in any one NTD MDA varies between countries according to the presence and distribution of different diseases. Coverage should be assessed for each of the different drugs used.

A PROTOCOL FOR POPULATION-BASED SURVEYS

Implementation

When implementing the survey it is important to consider the following aspects:

- It is recommended that the survey is implemented as soon after the MDA as possible to minimize recall bias, we recommend that the survey be implemented within three months of completion of the MDA.
- Keep implementation and evaluation separate such that:
 - Interviewers should never be the same persons who implemented the MDA
 - Consider further separation of implementation and evaluation as follows:
 - Where district levels implemented MDAs and sent in reported coverage rates, then national level should evaluate.
 - Use an organization not involved in program implementation (e.g. a local university) to implement the survey.

Sampling Methodology

The following is a generic guide which should be modified for each country setting. Assistance with country specific sampling is provided by the NTD Control Program M&E Specialist at RTI.

Sample frame

It is proposed that the sample frame be developed at the national level. National in this case refers to all areas in the country that were targeted with treatment with USAID funding in the last MDA. This strategy will allow the validation of reported coverage rates at the both the national and district levels.

Stratification by drug package

Because distribution of the different drugs generally varies geographically within the country, it is proposed that selection of communities to survey be stratified by drug or drug package. This will ensure that an adequate sample size is drawn to validate drug package specific coverage rates. Drug packages are defined as follows:

- IVM+ALB
- DEC+ALB
- IVM alone
- PZQ+ALB

- PZQ alone
- Zithro (+Tetra)

However, the areas receiving each drug package overlap and this calls for a strategy that is practicable and yet respects basic sampling principles. The proposal is to first list all areas that have received the most widely distributed drug package. We would draw the desired sample from this stratum, calling it Sample 1 from Stratum 1. We would then turn to Stratum 2, consisting of areas with the next most widely distributed drug package and identify those areas in Sample 1 that belong to Stratum 2. We would select an additional sample of areas in Stratum 2 from those areas not in Sample 1. We would continue repeating this process until we had the desired sample size in each stratum.

Sampling Units

The **primary sampling units (PSUs) / clusters** are normally districts. Approximately 20 districts should be sampled for each drug package delivered. Villages are the second stage sampling units. We suggest that about 5-7 villages should be sampled for each district. Households are the third and final sampling units. Approximately 10 households should be sampled for each village.

a) Stage 1: Select the PSUs

Select 20 PSUs using population-proportionate sampling (PPS), with total population as the measure of size (see appendix 1).

b) Stage 2: Select 5-7 Villages within each PSU

As in Stages 1, villages within each selected PSU should be selected using systematic PPS sampling.

c) Stage 3: Select 10 Households per Village

Select 10 households per village. It is important that households be sampled at random and not selected by the village chief, drug distributor nor chosen for convenience. Various methods may be used to make a random selection. The main goal in the process is to ensure that the selection is random and to avoid the introduction of systematic selection bias. The following are two different methods, either one of which could be used..

1. Make a list of all households in the selected villages by sitting down with key informants such as village leaders and community health workers. Suggested steps:
 - i) Ask for the number of quarters/ sectors of the village,
 - ii) Divide up the audience by origin of quarter,
 - iii) Proceed to ask for name of chief of household.
 - iv) Select a systematic sample of 10 households from the list of all households in the village.
2. A simpler approach, like random walk, can also be used to implement the random sample. However, in such cases, exceptional care must be taken to ensure that selection bias does not enter into the process. Each and every household in the village should have a known probability of selection and these probabilities should be in almost all cases be equal.

d) Conduct interviews in ALL of the households selected.

- i) If everyone in the household refuses to answer the questionnaire record this as one of the 10 houses selected and note refusal to participate
- ii) If nobody is home at the time of the survey return at another time to interview persons. This house should be counted and notes as a house included in the survey.
- iii) If all the people moved in after the distribution, skip the house and don't count it as a house.
- iv) If nobody lives in the house (abandoned house), skip it and don't count it as a house.
- v) Several families who are living together in a compound: consider as 1 household where they 'eat together'

e) *Make sure to list all the members of the household, whether present or absent.*

All household members living in the selected households, who were living in the household during the drug distribution, should be interviewed.

- Ask for the head of the household or an other person who can speak for the household
- Information for children aged 1-10 years will be collected from their primary caretakers, except where drug were given out in a school based distribution. In this case the children themselves should be asked if they received the drugs at school.
- Interviewer completes the coverage questionnaire.

Data Collection

Questionnaire:

The questionnaire should be designed to include the following minimum set of information.

Additional questions can be added by program managers as they see important (see attached example of questionnaire – Appendix 2).

- Interviewer
- Date of interview
- PSU
- Village
- Household ID
- Person ID
- Whether person participated in the survey (Yes/No). Make sure that ALL persons who resided in the household at the time of the MDA and who still live there are listed on the questionnaire, regardless of whether they participate in the survey. (Possible reasons for non-participation in the survey include absence and refusal but it is not necessary to capture why they did not participate).
- Age
- Sex
- Whether the drugs were taken (please make sure that the question is not whether they received the drugs but rather, did they actually swallow the drugs).
- Where 2 drugs are given in one drug package persons should be asked separately whether they took each drug. E.g. IVM+ALB package – did you take the ALB tablet? Did you take the IVM tablet?
- Reasons for not taking the drug. Make sure to have a separate code for all possible exclusion criteria (e.g. pregnant, first week of breast feeding, too sick, too young). Record reasons for not taking the drugs separately for each drug, e.g. for ALB and for IVM.

Sampling Frame Information

In addition to the information collected from the respondents on the questionnaires the following information should also be registered for purposes of calculating the weights:

- For the country:
 - List of PSUs targeted with treatment in MDA
 - List of drugs used and total population by PSU

For example:

District	Population	IVM+ALB	PZQ	ZITHRO
A	xxxxx	yes	0	yes
B	xxxxx	yes	yes	0

- For each selected PSU:
 - Total population
 - Total number of villages

- Total number of villages selected
- For each village selected
 - Total number of households selected
 - Number of selected but non-responding households

Data Entry and Analysis

An Epi-Info data entry template is provided with this protocol for data entry. Country programs are free to add further questions to this template, however if changes are made please make sure to submit a data dictionary listing the meaning of the variable and value codes used.

Statisticians have determined that the results calculated from cluster samples are less precise than those based on random samples. Since many analytical programs (eg. ANALYSIS in EPI-INFO) assume random sampling, they overstate the precision of conclusions. Specialized programs must be used to calculate results from cluster sample surveys. Analysis can be done using Epi-Info C-Survey program or databases of results can be sent to RTI for assistance with analysis.

Submitting a Report

Once the survey and data entry is complete the following should be submitted to the NTD Control Program M&E Specialist at RTI :

- A copy of the questionnaire used
- Sampling Frame Information as detailed above
- Completed database and data dictionary
- Short summary report. An outline of information to include in the report is attached as appendix x. Data may be sent for analysis to RTI and on receipt of the results the report country programs can then finalize reports.

Appendix 1: Population-proportionate sampling (WHO, 2005).

PSU= Primary Sampling Unit. This should be a geographical areas about the size of 10-20 villages which all received the same drug package(s) and for which estimations of population data are available.

Step 1: List all PSUs within the region to be surveyed. For each drug package given, make a complete list of all PSUs in the region. If one PSU received two different drug packages then it should appear on two different lists. The list does not need to be in any particular order, but must include all the PSUs within the region.

****Steps 2-7 should be carried out separately for each drug package (stratum)****

Step 2: List the population for each PSU. In a column next to the name of the PSU, list its estimated population. The source of the population figures is not critical as long as the same source is used for each area. Usually census figures (with appropriate correction if the census is old) are used.

Step 3: Calculate the cumulative population for the list of PSUs. In a third column, successively add the population for each PSU, providing a cumulative population figure of all PSUs receiving this drug package within the region. This can be done using a computer spreadsheet.

Step 4: Calculate the sampling interval. To calculate the sampling interval, divide the total population for all PSUs in your list by the total number of PSUs to be selected (10).

Step 5: Randomly select the starting point. Using a table of random numbers (or computer generated random numbers), select a number between 1 and the sampling interval; make a note of this number.

Step 6: Calculate populations from which to select the subsequent PSU. Add the sampling interval to the starting point; record this number below the starting point number. Continue to add the sampling interval successively until the total population for the area is reached. As you are selecting a total of 10 PSUs you will have 10 numbers in this list.

Step 7: Select remaining PSUs. Using the list of numbers that you have just generated, determine if a PSU is to be included in the survey as follows. If the first random number (the starting point number) recorded includes the cumulative population of the first PSU listed (in the third column), then that PSU is selected as the first of the total number of PSU to be selected. If the random number is larger, then the first PSU for which the cumulative population includes this random number is selected as the first PSU.

Using the next number in your list, determine the next PSU that is included in that number, and continue making selections until the total number of PSUs that you intend to survey are selected. In some instances, an area will have a large population, and it is possible that it will be selected more than once.

APPENDIX 2: Example Household Survey Form – Complete one questionnaire per household

District: _____ Village: _____

Interviewer Code: _____

HH No: _____

Date of interview (dd/ mm/yyyy): _____/_____/_____

Ser. No	Sex (M/F)	Age (Years)	Participated in survey (Y/N)	IVM+ALB				ZITHRO/TETRA		PZQ	
				Swallowed the drugs?		Reason if not taken*		Swallowed the drugs? (Y/N)	Reason if not taken *	Swallowed the drugs (Y/N)	Reason if not taken*
				IVM (Y/N)	ALB (Y/N)	IVM	ALB				
1											
2											
3											
4											
5											
6											
7											
8											
9											
10											
11											
12											
13											
14											
15											

*** REASON:**

If treatment was not received, indicate the reason:

- | | | | |
|------------------------------|------------------------------------|----------------------------------|--|
| 1 =Underage; | 2 =Pregnant; | 3 =Breast feeding; | 4 =Too Sick; |
| 5 =Absent; | 6 =Not heard about program; | 7 =Drugs finished; | 8 =Drug distributor did not come; |
| 9 =Is healthy; | 10 =Medicine does not work; | 11 =Fear of side-effects; | 12 =Rumors |
| 13 =Too many tablets; | 14 =Bad smell; | 15 =Too old | 16 =Other (specify) |