SURVEY WORKING GROUP

Advisory 05 –
Surveys based on Sampling

Purpose

This advisory explains the procedure for conducting a survey based on sampling

Terminology

- The Level One General Mine / UXO Survey is now called the Landmine Impact Survey (LIS).

Attachments

None

Editing

Original documents were written 99 04 23

Edited by Dann Naseemullah 03 01 13

Protocol for the Sample Survey Component of the Level One Survey of the Global Landmine Survey In Yemen

Lawrence H. Moulton and Alan Ross
Departments of International Health and Biostatistics
The Johns Hopkins University
School of Hygiene and Public Health
April 23, 1999

Introduction

This document is limited to the sample survey aspects of the conduct of Level One Surveys. It concentrates on how to obtain in a relatively quick manner estimates of the number, location, and characteristics of landmine fields and their impact on the communities. The methods for the actual conduct of the survey, and acquisition of data, in a given community have been given in the January 1999 document by Aldo Benini: *Yemen—Village Survey Protocol* [**precursor to the LIS protocols]**. It is anticipated that this protocol will be followed closely in some other designated countries as well.

Rationale for the Sample Survey Approach

There are three potential benefits of beginning a complete Level One Survey of a country with a sample survey. These are:

1. With a quick estimate, better planning could be made for the total resources and time required to complete the survey.
2. Information may be available in time to help meet the reporting needs of the Ottawa Treaty as of September 1999.
3. In the event civil unrest or natural catastrophe interrupts operations, at least a good estimate of the total extent of the problem can be made based upon the sample.

It is possible to undertake a preliminary survey based on the scientific principles of statistical sampling that will have a high degree of validity. By gathering information on a small fraction of selected communities, a precise estimate of the country's total affected communities, with the various characteristics of the impact of their minefields, can be made in a timely and cost-effective manner. This is a standard approach to the efficient gathering of information on populations; in this case, it is the population of affected communities that is the target population.

Simplified Plan

In a previous version of this document, a much more complex approach had been proposed for the sampling of communities. Because of the difficulties involved in obtaining necessary data and designing the final sampling scheme in the current time frame, it appears more practical to use a greatly simplified approach that is better integrated into the overall Level One Survey, but can still have a good chance of achieving the specified goals.

Activities Necessary to Implementing a Sample Survey of Communities Potentially Affected by Landmine Fields

The following activities are given in approximate chronological order.

1. *Acquire Maps and Population Data*

The most important preliminary information to be obtained is a map that shows all the relevant administrative designations: in our situation this (or a series of maps) will have province lines and district lines, and perhaps roads and communities. A listing (gazetteer) of all the communities, with their location with respect to political boundaries, would be useful as well.

2. *Determine the Boundaries of the Sampling Frame*

Informed opinion must be obtained as to the geographical distribution of landmines in a country prior to interview activities. This is perhaps best done at the provincial level. The provinces should be divided into two groups: those deemed to have a near-zero chance of having any landmines within their borders, and those that may have landmines. It is the latter group of provinces upon which the sample survey will be based.

A slight modification of this strategy should be implemented when, within a province, it is known that certain districts have zero chance of containing any landmines. Then for the purposes of the remaining part of this manual, we shall consider a province to refer to a modified province consisting of the set of those districts with a non-zero chance of containing mine-affected communities.

If informed opinion is divided on whether an area should be included, discretion should be used. Further suggestions on designation of the levels of assurance are made in the accompanying document on controlling 'false negative' rates through lot quality assurance sampling (LQAS) techniques.

3. *Devise the Sampling Plan*
This means determining which and how many districts to select in each province.

4. *Organize and Train the Survey Teams*
Currently, an estimated 20 teams will be constituted.

5. *Conduct the Survey*
In each sampled district, the entire district should be covered, according to the full Level One Survey procedure. Communities designated as mine-affected by expert opinion at the district level will be visited, as well as neighbouring communities identified in the interviews. False-negative sampling should be conducted on the non-suspected districts as well.

Sampling Design Recommendations

It is recommended that a sample of 20 districts, chosen from all potentially affected districts (perhaps as many as about 120, perhaps fewer depending on local reports), be made, and one team sent to each.

District Sample Procedure

Within each relevant province, we recommend that no more than half of the districts be randomly sampled for inclusion in the survey, and probably many fewer. For a given province, numbers should be assigned the districts in geographic order (spiral, horizontal back-and-forth, etc.), and a systematic sample taken according to instructions and sampling interval given below.

Sampling Interval Determination

Sampling of Districts

It is assumed that approximate population data are available at the province level. Let d_i be the number of inhabitants of the ith province, i=1, … I. Then for the ith province, the number of districts to select is given by the integer greater than or equal to: $(d_i/\Sigma d_i)\times 20$, where 20 is the total number of districts to be selected; call this integer s_i. Within the ith province, the sampling interval is thus S_i/s_i, rounded down to the next lowest integer, where S_i is the total number of districts in the ith province. Slight adjustments may need to be made to this interval number, call it x_i for each province in order to achieve a total of 20. Then a random start is made from the first x_i districts, and every x_ith district taken after that.

Estimation of the Number of Affected Communities

In each province in which there has been sampling of districts, the number of affected communities in the sampled districts is multiplied by: the total number of districts from which the sampled districts were obtained, divided by the number of sampled districts. This gives the estimated number of affected communities for that province. These numbers then are summed for all the provinces from which there was sampling.

Special Instructions for Conduct of the Survey

Documentation

It is vitally important that every relevant data item and decision be recorded in some physical manner. In particular, data on the numbers of provinces and districts and communities in all the relevant areas should be recorded, along with at least province-level population sizes. Any exclusion of provinces or districts at the start of the survey, due to informed opinion that they have no chance of containing landmines, should be noted, as well as the source of the information and the reasons supporting it. Numbering of the districts and communities should be retained, as well as the sampling intervals employed and the starting values. If there is any deviation from the sampling protocol, explicit information and reasons should be recorded.