

Measuring  
Landmine  
Incidents &  
Injuries and  
the Capacity to  
Provide Care

A Guide to Assist  
Governments and  
Non-governmental  
Organizations in  
Collecting Data about  
Landmine Victims,  
Hospitals and  
Orthopaedic Centers



March 2000

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Printed in the United States of America.

ISBN 1-879707-32-2

Design: Glenn Ruga/Visual Communications

Cover photos: Eric Stover

# PHYSICIANS FOR HUMAN RIGHTS

Physicians for Human Rights (PHR) mobilizes the health professions and enlists support from the general public to protect and promote the human rights of all people.

Since 1986, PHR members have worked to stop torture, disappearances, and political killings by governments and opposition groups; to improve health and sanitary conditions in prisons and detention centers; to investigate the physical and psychological consequences of violations of humanitarian law in internal and international conflicts; to defend medical neutrality and the right of civilians and combatants to receive medical care during times of war; to protect health professionals who are victims of violations of human rights; and to prevent medical complicity in torture and other abuses.

PHR conducts educational and training projects for health professionals, members of the judiciary and human rights advocates on the application of medical and forensic skills for the investigation of violations of human rights. PHR bases its actions on the Universal Declaration of Human Rights and other international human rights and humanitarian agreements. The organ-

ization adheres to a policy of strict impartiality and is concerned with the medical consequences of human rights abuses regardless of the ideology of the offending government or group.

As one of the founding members of the steering committee of the International Campaign to Ban Landmines, Physicians for Human Rights shared the 1997 Nobel Peace Prize, awarded to the Campaign and its coordinator Jody Williams. PHR currently serves as coordinator of the US Campaign to Ban Landmines.

Leonard Rubenstein, J.D., is Executive Director and Susannah Sirkin is Deputy Director. Robert Lawrence, M.D., is President and Holly Atkinson, M.D., is Vice President.

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# ACKNOWLEDGMENTS

This manual was written by Adam Kushner, M.D., M.P.H. and James Cobey, M.D., M.P.H., FACS with the assistance of Ronald Waldman, M.D., M.P.H. of the Program on Forced Migration and Health, Center for Population and Family Health, Joseph L. Mailman School of Public Health, Columbia University; Gilbert Burnham, M.D., Johns Hopkins University; and Etienne Krug, M.D., World Health Organization.

It was edited by Barbara Ayotte and Susannah Sirkin of Physicians for Human Rights.

This project was funded with the assistance of the Department of Foreign Assistance and International Trade (DFAIT) of the government of Canada and from Landmine Monitor.

# LIST OF ACRONYMS

AP mines	Antipersonnel mines
AT mines	Antitank mines
ED	Emergency department
ICBL	International Campaign to Ban Landmines
ICRC	International Committee of the Red Cross
IDP	Internally displaced person
IMSMA	Information Management System for Mine Action
NGO	Non-governmental organization
OR	Operating room
ORS	Oral rehydration salts
PHR	Physicians for Human Rights
UNMAS	United Nations Mine Action Service
UNOCHA	United Nations Office of Coordination of Humanitarian Affairs
UXO	Unexploded ordnance
WHO	World Health Organization

# 1 EXECUTIVE SUMMARY

Despite an international treaty banning the use of landmines, tens of thousands of people are killed or injured by these weapons every year. Epidemiological-based surveys are essential for properly quantifying the public health consequences. The results of such studies facilitate the allocation of resources and aid in evaluating the impact of interventions. The development of standardized survey tools will help to ensure that data collection proceeds according to appropriate scientific methods and allow the comparison of data between differing regions and countries. We hope you will use these tools. They can be found in the back of this manual and are perforated so they can easily be removed and photocopied for repeated use.

An instrument for hospital-based surveillance and a community survey tool were developed by:

- World Health Organization (WHO)
- Physicians for Human Rights (PHR)
- International Committee of the Red Cross (ICRC)
- Injury Center-Uganda
- London School for Hygiene and Tropical Medicine

These core tools measure the morbidity and mortality associated with landmine injuries and collect information on demographics, device type, pre-hospital care, transportation time and treatment. The first tool is an instrument for hospital-based surveillance that integrates into a broader WHO injury surveillance system. The second tool is a community survey undertaken with WHO disease specific sampling techniques. The data collection tools can be used as part of an ongoing surveillance system or as sample surveys that are repeated over time. WHO is coordinating the pilot testing of these tools in collaboration with the above mentioned organizations. We hope that these tools will identify areas where landmine injuries are a significant

problem and thus target regions where more intensive surveys should be undertaken.

Since the initial meetings, many groups, including the United Nations Mine Action Service (UNMAS) and the Information Management System for Mine Action (IMSMA) have assisted with further refining the hospital data tool so that it is standardized and universally accepted.

Physicians for Human Rights and other members of the International Campaign to Ban Landmines (ICBL) have developed an additional set of tools to measure:

- Pre-hospital care and hospital capabilities
- Prosthetic capabilities
- Rehabilitation and social reintegration of landmine victims

We encourage Landmine Monitor, UNMAS and other governmental or non-governmental organizations to use these tools or modify them as they see fit. These tools are different than “Level 1 Surveys”. Level 1 surveys are intensive, often year-long studies using focus groups in villages to determine priorities for mine clearing. The tools contained in this manual can be used to supplement the findings of a Level 1 Survey or, more importantly, can easily provide data on areas that require further humanitarian mine action assessment. These tools were designed to be easy to use, inexpensive to administer, and can be used either collectively or individually. Used as short surveys, they can be performed quickly to determine need and can be repeated to measure change.

Our hope is that all parties concerned with the effects of landmines on the public health of nations and communities may use these tools as a guide to target donor funding for future interventions.



# 2 INTRODUCTION

It is estimated that approximately sixty million landmines are scattered in over 60 countries<sup>1</sup>. On March 1, 1999, an international treaty banning the use, production, sale, transfer and stockpiling of antipersonnel landmines entered into force (the Mine Ban Treaty). Intensive efforts are still needed, however, to provide adequate care for the victims of these weapons.

The pain and suffering for countless victims of landmines around the world is staggering. In Cambodia, one out of every 236 people is an amputee and in Afghanistan, nearly one out of every 50 Afghans is a landmine victim.<sup>2</sup> Studies have shown that 48% of victims may die before receiving assistance and most will ultimately need extensive rehabilitation.<sup>3</sup> In many of these countries the loss of a limb severely disables a person and impedes their ability to function as a productive member of society.

## TYPES OF LANDMINES

Mines vary in size, cost and destruction capacity. Generally, it is the military, often under direct orders from the government, who determine what kinds of mines are to be used, where they will be placed and what kind of pattern will be used in laying them. Theoretically, the utilization of mines is determined by a specific, strategic policy designed to maximize defensive and offensive military capabilities. However, in the actual practice of warfare, such rules are usually ignored, resulting in the indiscriminate terrorization of civilian populations. The placement of landmines within or in close proximity to non-military occupied areas has led to both physical and psychological trauma.

A description of the various types of mines and their common uses listed below provides a clearer image of the insidious and pervasive threat caused by landmines.

**Antipersonnel (AP) Landmines:** These devices are designed to explode when a person walks on, or, in some cases, near them. They are often laid to protect

military installations from enemy approach. In some countries, antipersonnel mines are used to prevent enemy soldiers from removing antitank mines from strategically placed minefields. In addition to maiming enemy soldiers, AP mines may delay and inconvenience enemy forces as soldiers are required to remove a severely injured comrade from the field of battle. Typically the worst scenario occurs when armies utilize antipersonnel landmines indiscriminately to demoralize the civilian population by mining access routes to drinking water and firewood sources, grazing and agricultural lands, as well as travelling paths.

**Antitank (AT) mines:** These are larger devices that explode when vehicles drive over them. They are commonly used to limit and deter the movement of enemy troops

**Improvised Explosive Devices:** Also referred to as **Booby-Traps**, these are designed to explode when a person opens a door or picks up or handles a particular object, such as a toy.

**UXO (Unexploded Ordinance):** Missiles, rockets, grenades and other explosives that fail to explode upon impact, are referred to as Unexploded Ordinance, or UXOs. Most of these devices may still be “alive” or active years, or even decades, after being deployed.

## TYPES OF LANDMINE INJURIES

Landmine injuries are frequently fatal with case fatality rates estimated as high as 48%.<sup>4</sup> Morbidity, including high amputation rates in many mine-affected countries, increases the devastating effect of landmines. There are three patterns of landmine injuries, as described by surgeons from the International Committee of the Red Cross.<sup>5</sup>

**Pattern I Injuries:** Pattern I injuries are usually the most severe type and result when an individual steps on a buried landmine. Severe wounding of the legs, geni-



talia, and arms often occurs and necessitates amputation of legs and arms. Antipersonnel mines are the type of landmines most responsible for Pattern I casualties.

**Pattern II Injuries:** These wounds result from detonation of fragmentation mines. Although frequently lethal, these injuries follow patterns similar to those caused by other fragmentation and shrapnel mechanisms such as UXO devices. Wounds of this type can effect any part of the body and patients frequently require abdominal surgery to repair bowel injuries. Injuries include extremity, abdominal, or facial injuries.

**Pattern III Injuries:** Wounds listed as Pattern III injuries usually cause injury to the hands and face and frequently lead to blindness. They are very often a result of “mine tampering.” Mine tampering may result from the handling of mines by a demining worker or children playing with small mines that look like toys. “Butterfly” mines, plastic mines with wings shaped like a butterfly, are most often the perpetrators of these types of injuries.

## Interventions

The World Health Organization describes landmines as a major worldwide public health problem.<sup>6</sup> They have outlined the need to:

- Determine the magnitude, scope and characteristics of the landmine problem;
- Study the factors that increase the risk of disease, injury or disability and determine which factors are potentially modifiable;
- Assess what can be done to prevent the problem by using the information about causes and risk factors to design, pilot test and evaluate interventions;
- Implement the most promising interventions on a broad scale.

In following these principles, PHR, along with experts from WHO and other organizations developed survey tools to measure the magnitude of landmine injuries and the circumstances in which they occur.

To assess the validity of these tools, a pilot test was conducted in June 1999 in Azerbaijan. A team from PHR surveyed hospitals, rehabilitation centers, and communities and field-tested the ability of these tools to quantify the public health consequences of landmine injuries and the capacity of the medical infrastructure. Relief International, a non-governmental organization that has operated in Azerbaijan since 1992, assisted in the logistics and recruitment of local health professionals to administer the surveys.

# 3 SURVEY TOOLS

Below is a summary of the tools contained in this manual:

## I. OVERVIEW TOOLS

*To Assist the Researcher in Preparing to Implement the Tools*

### 1. Country Capacity Overview

A tool to collect data on populations, health facilities, and landmine-affected regions.

### 2. Key Informant Survey

A tool to collect data from interviews with community or village leaders that is used to identify high-risk areas most affected by landmines and to help determine sample sites for the community survey.

## II. EPIDEMIOLOGICAL TOOLS

*To Measure the Extent of the Landmine Problem*

### 1. Hospital Surveillance or Survey of Landmine Injuries

A tool to record data on landmine victims at the time they present to a hospital or, if proper records are available, from operating room records and patient charts. The goal of this tool is to establish a global reporting system where injury data is collected and then transmitted either to centers in ministries of health or to international organizations responsible for the analysis and dissemination of the data. It integrates easily into the WHO injury surveillance system with continuous data collection. In addition, this tool can be used as a short survey to establish baseline information that allows for measuring trends over time.

### 2. Community Survey

A tool to record data of mine-affected areas and provides information regarding the effect landmine injuries have on communities. This tool is designed to assess the magnitude of the landmine problem in the

community and to create a profile of mine-affected communities and individual landmine victims. It is specifically designed to collect data on all individuals, including those who either did or did not seek hospital care or died before attaining care. By calculating the percent of victims that were missed in the hospital data, the region's true incidence of mine injuries can be determined. Data can be used to prioritize expenditure of resources, time, and money.

## III. CAPABILITY AND SOCIAL REINTEGRATION TOOLS

*To Assess the Effectiveness of the Resources of the Hospitals and Orthopaedic/Rehabilitation Centers to Treat Mine Victims.*

### 1. Hospital Capability Survey

A tool to assess the capacity of hospitals providing surgical care in regions affected by landmines. Measurements provide information regarding hospital services necessary for performance of surgery. These include characteristics of the physical plant, personnel, surgical capabilities, and capacity of a hospital. The data collected will help in the allocation of donor funding for specific projects or to individual facilities in need of necessary equipment and supplies.

### 2. Orthopaedic/Rehabilitation Center Capability Survey

A tool to assess the capability of orthopaedic and rehabilitation centers to treat landmine survivors in order to determine where improvements and resources are needed. Functional capacity, health, educational and social issues can be determined based upon the results of this survey.

### 3. Social Reintegration and Rehabilitation Survey

A tool to collect data that will allow agencies and governments to determine the effectiveness of resources that are available to landmine survivors and what steps can be done to insure that survivors receive

adequate attention for successful reintegration into society. This survey will measure the extent to which a victim's injuries are interfering with their ability to lead relatively stable and self-sufficient lives and the degree to which they are receiving aid from the government.

This tool should only be used where rehabilitation services are available and administered carefully so as not to raise expectations, which may not be possible to fulfill, of more assistance to a community.

# 4 PRE-IMPLEMENTATION

## COMMITMENT AND ACCESS

Before the administration of any of the tools, cooperation in the data collection should be obtained (if possible) from all levels of the government in question, as issues of access are critical. At the very least, commitments of support and/or access to records should be obtained from those ministries that supervise health care/hospital records (such as the Ministry of Health). Data on landmine injuries may be considered by the country to be militarily sensitive and may also require Ministry of Defense permission.

Ministries that provide access to mine-affected communities, such as the Ministry of Defense and/or Ministry of Interior, may also be approached for permission. Assurances should be obtained that community surveys will not result in any form of retaliation or otherwise negative impact upon those surveyed. When possible, permits should be obtained before implementation in order to facilitate actual administration of the survey tools. All permits/assurances should be provided in writing in order to assist with local administration.

If expatriate consultation is required, written permission from the Ministry of Health or other governmental agency may be required for entry permits before arrival in-country.

### **Military Landmine Victims/Access to Government Facilities**

Names and addresses of landmine victims injured during service with the military may be considered to be confidential information, as would patient records in government and/or military facilities. Prior to implementation, the concerns of the Ministry of Defense regarding this information should be obtained and permission received. However, in recognition of the sensitive nature of this information, staff should be prepared to maintain flexibility and may wish to train military personnel to self-administer the survey of military

facilities/personnel for confidential distribution. Surveyors may then receive results (without identifiers) for analysis.

Similarly, military hospital capability may be of a sensitive nature. However, all possible effort should be made to obtain this information as many landmine victims may be sent primarily to military hospitals and only secondarily transferred to civilian hospitals only after military hospitals reach full capacity.

Individual survey teams must then decide whether they consider the results accurate and complete enough for inclusion in the overall country report or whether analysis should be carried out separate from the independent evaluation.

### **Local Officials**

Local officials may or may not maintain communications with the Ministries of Health and Defense. Therefore, contact should be made before arrival in districts to be surveyed. Approval from local officials to collect data is valuable for political reasons as well as prevention of queries by local police agencies.

## BACKGROUND INFORMATION

Population data (denominators) as well as detailed maps should be gathered before implementation. Population data is essential to calculate rates, which are essential for comparison work and resource allocation. At times, this demographic information may be hard to obtain due to local or national political issues based on that data. One may have to perform some quick censuses on a few villages to obtain more accurate estimates. (Note: The source of information must be cited in all reports.)

Previous surveys of landmine affected regions, public health consequences of landmines, and overall country capacity may already have been attempted. Careful research may reveal background incidence rates and/or health care facility capability. Such studies

may prove useful as external validation of the tools as well as introductory information regarding mine-affected regions. Again, care must be taken and all sources must be cited.

## **OTHER ORGANIZATIONS**

Frequently, countries with a high prevalence of landmine injuries will already have organizations (government sponsored, non-governmental organizations, private foundations, etc.) in place to assist and document the effects of landmines. These agencies should be contacted as far in advance as possible both as a courtesy and as a valuable resource for information, access and potential assistance. Methods to identify such agencies include contact with the government, World Health Organization, United Nations Mine Action Service, members of the International Campaign to Ban Landmines, Save the Children country directories, United Nations Office of Coordination of Humanitarian Affairs country offices, local news organizations, and Internet searches.

## **LOGISTICS**

Whenever possible, logistics of the survey should be set-up before implementation; however, flexibility must be maintained as these considerations will undoubtedly change in the field as unexpected findings and challenges are encountered.

## **STAFFING**

Staffing needs will vary by country. In determining the specific staffing needs of an individual country the following staffing considerations may be of use:

- Expatriate consultants for training in administration of the survey tools: Ideally this training will include a “Training of the Trainers” module whereby in-country staff will perform all aspects of future surveys.
- In-country survey administrators including supervisors of surveys and locally recruited personnel to administer the survey. Assistance in recruiting local personnel to conduct surveys may be facilitated through contact with local, landmine-specific NGOs, village leaders, local rehabilitation centers, etc. Consideration should be taken concerning confi-

dentiality as local survey administrators may either elicit more information (due to greater trust by local community members), or less (due to fears regarding confidentiality). Examples of local personnel who may be recruited include teachers, administrators, and other respected members of the community. These people may be approached to recommend surveyors or requested to perform the surveys themselves.

- Translators
- Drivers

## **TRANSPORTATION**

The number of vehicles necessary for staff members to travel to mine-affected regions should be determined. The physical terrain and accessibility of such areas is also of high importance. Questions to address include: How good are the roads? Is there a particular season during which roads are impassible? Are the roads mined? For example, surveys may need to be postponed until a dry season if annual rains prevent access.

## **LODGING**

Provision should be made for lodging while in mine-affected regions and, if necessary, while performing hospital and rehabilitation surveys.

## **TRANSLATION OF SURVEY TOOLS**

The tools should be translated into the local language. An independent translator should translate them back into English to validate the text.

## **DEFINITIONS**

The time frame for sampling of records, i.e. one-month interval, six-month, one year, etc., should be specified prior to application, although flexibility may be maintained as availability of records will dictate the outcome.

## **SECURITY/SAFETY MEASURES**

Issues of security and safety must be of the utmost concern. Under no circumstances are survey administrators to be placed in danger while obtaining data. Information regarding local conditions should be ascer-

tained from all available sources including local leaders and organizations, embassy staff and media sources. It should be remembered that *objective* sources of information may be most significant in these cases.

## MEMBERS OF THE SURVEY TEAM

Several factors should be considered when choosing the members of the survey team. As a whole the team should possess the following abilities, however, these qualifications may overlap among team members and do not constitute a strict requirement for each individual member:

- Supervisory Experience (preferably of survey administrators)
- Medical and/or public health background
- Knowledge of local language and culture

Before the implementation phase, all members of the team should gather and discuss the questions, methods for obtaining information, and division of duties. Team members may wish to assign groups to assess each individual phase, i.e. hospital capability, rehabilitation, community, or rotate through all surveys. As these assignments may change in the field, all members of the team ought to familiarize themselves with all surveys that are to be implemented.

It may be useful to discuss with all team members (expatriate or local) natural reactions they may have when first seeing or working with amputees or trauma victims. To some members of the team, this may be insignificant, for others, the exposure may cause some initial trauma and therefore a group discussion may help mollify the experience.



# 5 IMPLEMENTATION AND ANALYSIS

This section focuses on the specific needs for implementing each of the surveys. A description of all survey questions and analysis of what conclusions can be drawn from each question is provided.

Depending on staffing and adequate supervision, multiple levels of the implementation phase may proceed simultaneously; however, some surveys are necessary to complete in order to guide the implementation of others.

When deciding upon which surveys to implement, the tools can be divided into three groupings. The hospital capability and hospital surveillance or survey forms may be implemented at the same time during a single visit with a hospital director. Similarly the orthopaedic center survey may provide a list of names for random sampling for the social reintegration survey. The key informant survey may provide overview information for either the community or the social reintegration survey.

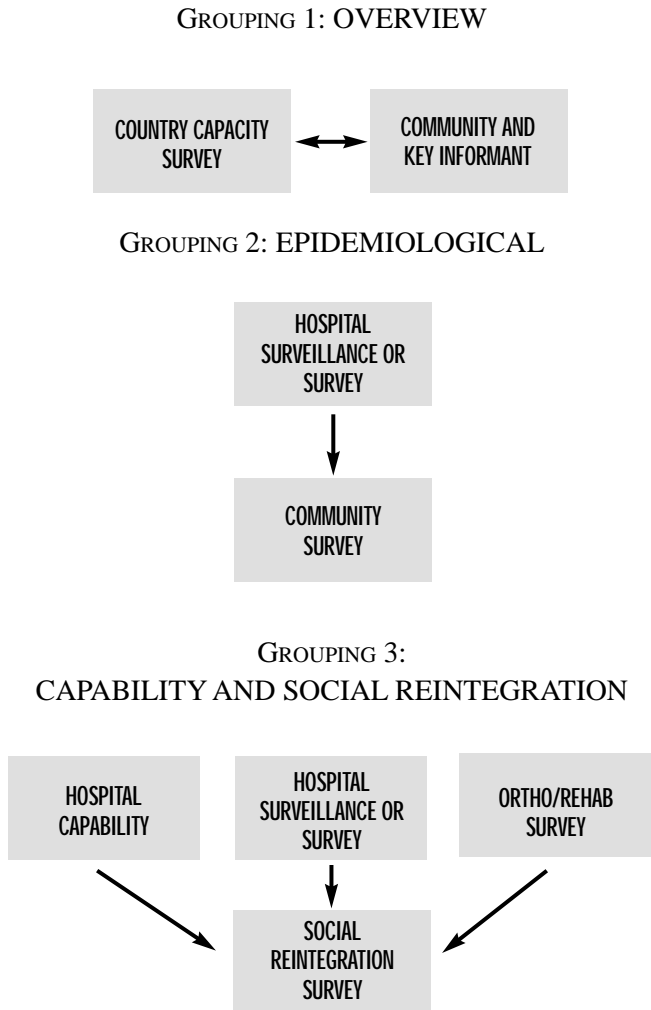
A basic timeline is on the following page and is meant only as a rough guide. As some surveys more logically precede others, surveyors may wish to administer those tools sooner.

When implementing the surveys and during meetings, the following must be maintained:

- Agencies should understand that the information is public and will be available for wide distribution.
- All participants should be aware of the scope of the survey, including Ministry of Health and other agencies involved.
- The preliminary reports are to be available immediately upon completion of the survey.

All data may be immediately entered into Epi-Info for ease of calculation, or preferably the UNMAS or IMSMA data base with preliminary frequencies and percentages available at the end of the study for distribution to the Ministry of Health and interested local organizations. All participating agencies *must* receive a copy of

**The Country Capacity Overview Tool should always be completed first.**



the preliminary report, both as a courtesy and for data verification. A letter requesting feedback from all participants should accompany the report. Such feedback includes suggestions for future studies/surveillance as well as agencies' perceptions of which areas need to be targeted for donor funding based on preliminary results. All suggestions should be examined and, if possible incorporated into the secondary analysis.



## TIMELINE

### **Hospital Capability Survey:** 1-2 days

### **Hospital Surveillance or Survey:** 1-2 weeks

Is adequate staffing available to complete the forms?

Will the hospital second staff to examine medical records?

Will the data come from discharge records, operating theatre logs, or emergency department forms?

Will training be required of those who will fill out the forms?

Will a staff be motivated and able to implement the long-term WHO Surveillance system or should one just perform a simple one-time survey?

### **Key Informant Survey:** 1-2 days

### **Community Survey:** 1-3 weeks

Are adequate staff available to administer surveys?

How far apart are the villages to be surveyed?

Will there be training of trainers? How will they be recruited? (local, urban) How long will it take (1-2 days)?

Are any difficulties anticipated in locating those to be surveyed?

### **Orthopaedic/Rehabilitation Capability:** 1-2 days

Can also provide a list of names for the Social Reintegration Survey.

### **Social Reintegration Survey:** 1-3 weeks

Is adequate staffing available to administer the survey?

How much time is allotted to train survey administrators? 1-2 days?

How much time is required to travel between those surveyed? i.e. How far apart are villages in which informants live?

# 6 OVERVIEW TOOLS

## 1. COUNTRY CAPACITY TOOL

This is a tool designed to collect background data on populations, health facilities, and landmine-affected regions to guide the researcher. This includes basic information such as number of districts, number of hospitals with surgical capability, number of medical facilities without surgery, number of rehabilitation facilities, number of physicians and number of surgeons.

This tool should be completed first.

See Appendix D for sample tool.

## 2. KEY INFORMANT SURVEY TOOL

This tool is designed to collect background information useful in the completion of the community survey. Begin to collect this information as soon as possible before starting the community survey. Initial data collection will preferably begin in the capital city and continue throughout the mine-affected regions. From this data, a list of ‘sentinel’ villages can be gathered.

The key informant survey should be administered to anyone who may be of assistance in identifying villages in which mines are an actual or a perceived problem. Key informants should include (but not be limited to): doctors/hospital administrators, government administrators (e.g. Ministry of Health personnel, District level administrators), heads of villages, staff of local mine-related NGOs, rehabilitation center workers, advocacy groups or mine victims.

If possible, information should be collected on the population size and approximate area of any affected districts. This information will be useful in the analysis

phase for approximating incidence and prevalence rates. Collect information on the number and location of any hospitals (facilities with surgical capability) and medical facilities (without surgical capability), as well as prosthetic and rehabilitation centers, throughout the region.

The following questions should be asked of local community leaders:

- Are houses or buildings in the community currently mined or booby trapped?
- Are fields or farmland currently mined?
- Have livestock been lost to mines in the previous 12 months?
- Are water sources in the community currently mined?
- Has the population been displaced because of landmines in the previous 12 months?

From these questions, a general picture can be sketched of which villages are affected by mines and in what capacity. Information may also be used to develop a sense of the local *perception* of the problem; however, bear in mind that analysis of other surveys may indicate that the largest source of concern lies elsewhere (transport, hospital capability, etc.) This will later be helpful in targeting financial and human resources towards demining activities and mine awareness programs.

See Appendix D for sample of the Key Informant Survey Tool.



# 7 EPIDEMIOLOGICAL TOOLS

## 1. HOSPITAL SURVEILLANCE OR SURVEY OF LANDMINE INJURIES TOOL

The Hospital Surveillance or Survey Tool may be preferably used to set up an ongoing surveillance system. Alternatively, if permanent, reliable, affordable staff are not available, it may be used as a one-time survey and repeated periodically to measure change. As with other surveys, permission from the Ministry of Health for data collection, along with letters of introduction, should be obtained in advance. The data collection can lead the researcher to locations for the community surveys.

### Logistics

#### *Request for Assistance*

At least one meeting with the director of the hospital will be necessary to obtain data. Survey administrators should contact the director and request at least one hour to describe the survey in detail and seek assistance. If possible, the survey and letters of introduction should be forwarded before the meeting. The two purposes of this particular survey should be described.

First, the survey requires that hospital records regarding landmine victims be retrospectively reviewed for a specified period of time (one month, six months, one year, etc). If hospital staff is unavailable to search through the records, locally recruited survey staff should be hired, with the understanding that full access to patient records will be given. The director of the hospital will be asked to contact surveyors once medical records have been examined, and an estimate of the amount of time necessary should be requested. The researcher must determine the ease of obtaining accurate medical records and decide if discharge data should be the primary source, the operating theatre log book, or emergency room admission data.

If the tool is to be used for ongoing surveillance, the instrument has been designed so that data collection on

the incidence of landmine injuries and the circumstances in which these injuries occur can be collected on a regular basis as patients present themselves for care. This instrument can be used to collect data on the incidence of landmine injuries only, or can be used with other instruments to collect data on landmine injuries and injuries due to other causes (traffic accidents, violence, etc.) The latter being more cost effective. This ongoing data collection process will allow for monitoring of trends over time, documenting incidence rates and evaluating prevention programs.

#### *Quality control*

Regarding cross-sectional information, quality control may be achieved through random selection of patient records for examination. After surveys are completed, one or two may be selected through random number generation and compared against the patient record in question. Similarly, sentinel site surveillance (studying locations in depth that have been shown to have a high prevalence of the condition by either hospital or community data) may be randomly checked by day of the month, number of surveys completed, etc.

Surveyors should be aware that much of the information being requested might not be available. If the hospital director/Ministry of Health agrees to allow surveillance, hospital staff will need to be trained in the administration of the surveys.

### Survey Questions

The numbered questions on this tool are not in consecutive order because they coincide with the IMSMA Mine UXO/ Incident/Accident Form. This tool is designed not to only assist in measuring injuries but to guide deminers to locations.

#### *Questions 1.11-6.8*

- Basic demographic data on the victim

### Questions 2.4-6.11

- Describe characteristics of the accident, including place of incident and general extent of the injuries (including death). This information is used to plan mine clearance.

### Questions 7.1-7.2

- Provide details of the injuries which will help assess the physical burden on the country to deal with them.

### Questions 9.1-9.5

- Describe availability of first aid in the country or emergency medical services (ambulatory systems) to assess length of time before treatment. It also discusses the location of the mine incident. This information is important for evaluation of the quality of pre-hospital care which includes time taken to get to a hospital as well as availability of first aid.

### Question 9.6

- This information helps establish how mines are affecting daily economic activity of a region.

### Questions 9.9-end

- These assess levels of mine awareness in a region.

See Appendix D for a sample of the tool.

## 2. COMMUNITY SURVEY OF LANDMINE INJURIES TOOL

The Community Survey is designed to assess mine-affected communities and determine which areas need to be targeted for demining activities and which sub-populations require greater mine awareness training. By interviewing community members who have been victims of landmines within the last 12 months, the overall scope of the problem can be assessed in each affected community. *This survey is not to be administered for injuries occurring greater than 12 months prior to the interview.*

For example, if landmines are affecting herders in the fields of one community, then that sub-population should specifically be identified for mine awareness training. If in another community, mine accidents occur while driving, then the roads can be targeted for demining operations.

The survey is to be administered to all recent (within

12 months) landmine victims in a group of sentinel villages previously identified as being mine-affected (through the key informant survey). If upon completion of the survey in the sentinel villages, the number of recent mine victims is found to be too small to analyze properly, then, time and resources permitting, the survey can be administered to recent landmine victims in each village in the region.

Because the mine incidents have occurred within the last 12 months, it may often be impossible to interview the victim directly. The victim may now be dead, at the hospital, or too traumatized to complete the survey. In these cases, the interview should be conducted with the head of the victim's household. If at any time it becomes too difficult for the victim or family member to continue, the interview should be halted immediately and either continued with someone else from the family, delayed, or terminated.

### Choosing the Sentinel Villages

Before undertaking the Community Survey, interviews are conducted with key informants, (e.g. hospital directors, rehabilitation center directors, other landmine survivors, Ministry of Health or Ministry of Defense personnel) to identify villages at high risk and where landmine injuries are known to have occurred. (See: Key Informant Survey Tool and/or Hospital Surveillance or Survey Tool). In selecting the number of sentinel villages to visit, the total population of these sentinel villages should approximate 10% of the regional population. If population figures are not available, then 5-7 sentinel villages should be chosen. In these sentinel villages, the Community Surveys should be administered along with the Social Reintegration and Rehabilitation Survey to all landmine victims within the population parameters. If the number of sentinel villages identified through key informant interviews is too numerous, then the villages can be placed in a randomized order and visited in the order chosen.

### Identifying the Victims

The Community Survey is designed to be administered to those victims (or their families) whose landmine encounter was within twelve months of survey administration.

Once the sentinel villages have been chosen, it is important to identify all landmine victims within each village. This should not be a problem in smaller villages. However, in larger villages or small cities many key informants should be interviewed. Landmine victims can be identified through speaking with village chiefs, the village council, local doctors or social workers, disability activists, or through word of mouth. In mid-size to large cities, identification of all landmine victims may prove to be impossible. In these cases, the sample population can be identified through key informant interviews, or through hospital or rehabilitation center records.

The names and ages of all landmine victims from the village should be recorded, as well as the approximate date of the incident, location and the outcome (did the victim die?). The families of those who were involved in incidents over the last twelve months should be interviewed using the community survey instrument, regardless of whether or not the victim died. To ensure an accurate yearly rate of incidence, this survey is not to be administered for injuries occurring greater than 12 months prior to the interview.

### Administration of the Survey

A complete list of villages in the area should be obtained. It may be easier to break this list down by district, region, county, etc. These villages should be randomized and visited in the order presented. In each village, it should be determined whether or not there are mine victims present. If so, administer the survey to them; if not continue on to the next village on the list. If the key informant surveys were done properly, then the mine victims should be concentrated in the sentinel villages.

Every effort should be made to train local community health workers to administer the surveys. Survey data should be immediately analyzed and forwarded to the local Ministry of Health and interested international organizations. If a partnership with a local NGO can be established, then their staff members can be trained in the administration of the survey. Once local NGOs are properly trained, ongoing surveillance or repeat surveys can be easily implemented.

## Survey Questions

### Key Informant Information

#### *Questions 1-2: Household information*

- These questions are to determine a denominator for the household and to determine the number of victims.

#### *Questions 3-4: Number of people killed/injured by landmines in previous 12 months.*

- A high number of recent deaths and injuries in the community indicates the need for increased mine awareness and can also indicate recent mine laying activities.

#### *Questions 5-10: Village information*

- Responses will assess the level of mine awareness in the community as well as the community's perception of the mine problem. These data points can be used to target mine awareness activities.

### General Patient Information

#### *Question 11: Name*

- This information is used to ensure that individuals are not interviewed more than once, and for spot checking results.

#### *Question 12: Victim number.*

- In the case that there is more than one landmine victim in a household, administer a separate questionnaire for each victim and number each survey consecutively. If there is only one victim in the household, this should be coded 1.

#### *Questions 13- 14: Age of victim at time of injury; Sex of victim.*

- Age of victim in years. If less than one year old, code as 01.
- These questions provide demographics of the patients surveyed. Are they primarily male and young? If so, they may be military personnel caught in conflict or post-conflict situations. Are they female and middle-aged? They may then be women traveling away from home to gather food, fuel, or water. Are they children? Landmines may be detonated while children play in affected areas.

*Question 15: Military status*

- Military status assists in demographic knowledge and patient profiling. Has the country recently been at war? If so, are civilians the ones primarily injured by landmines or is it the military?

*Question 16: Patient Status*

- Check all that apply. For example, an individual can be a refugee as well as engaged in demining activities.
- Useful in compiling a demographic profile of mine victims.

*Question 17: Type of area.*

- The type of area indicates those locations most likely to result in injury. In addition, this question can be combined with others to create a more complete picture of the situation. If injuries primarily occur on roads or footpaths, travel may be the major reason for injury. The results will indicate whether mines hinder resettlement (accidents occur in villages), travel (roads and footpaths), cultivation (field), military/government activity (buildings), and other daily activity (riverbank). All answers provide targets for education efforts and mine awareness.

*Question 18: Activity at time of injury*

- Handling a mine including taking the mine apart for scrap metal or simply holding or moving a mine.
- This question measures the effect of landmines on the area's economy. Do mines interfere with income generating activity (farming, fishing, herding, hunting), travel, or daily activity (collecting wood/water/food)? Are mine injuries occupational (demining)? Do they occur randomly (passing by)? If mines play a large role in daily or economic activities, priority should be given to demining arable land or routes to water supply. Similarly, mine awareness and education should focus on these areas. A large proportion of 'handling mine' victims indicates a need for a more general mine safety and awareness training.

*Question 19: Type of device*

- Types of mines: AP (antipersonnel) mines are smaller mines designed to explode when a person walks on them. AT (antitank) mines are larger devices designed to explode only when vehicles

drive over them. UXOs (unexploded ordinances) are items such as unexploded grenades, bullets, artillery or 'duds.' Booby traps - also called "improvised explosive devices" - are designed to explode when a person picks up or tampers with a particular object.

- This question is useful in predicting types of injury as well as site of incidents. If a large number of injuries are due to antitank mines, a greater number of casualties and injuries while traveling might be expected. High numbers of injuries due to UXOs often indicate prior indiscriminate shelling, and injuries are more likely to occur in a random fashion.

**Clinical Outcome** – Check all that apply.

*Question 20: Amputation Upper Limb*

- Amputation of arms; includes loss of fingers.

*Question 23: Deafness*

- Partial hearing loss is to be included

*Question 24: Blindness*

- Partial vision impairment is to be included.

*Questions 25-27: Head/neck injury; abdomen/thigh injury; limb injury*

- Limb injury involves any damage to the arms or legs not requiring amputation.

*Question 28: Paraplegia*

- For this survey, paraplegia is defined as total or partial loss of movement.
- Questions 20-28 are used to classify the major type of injury that has occurred. *Type 1*, the traumatic amputation of a lower extremity (questions 21-22), affects approximately 35% of the victims who survive. *Type 2* injuries include extremity, abdominal or facial injuries (questions 25-27) resulting from fragments, blast or shrapnel. *Type 3* injuries involve the hands or upper extremities (question 20). As victims of *Type 1* injuries almost always require a prosthesis along with substantial rehabilitation in order to fully reintegrate into society, a large number of *Type 1* injuries indicates a need to administer the social reintegration and rehabilitation survey in order to ensure adequate reintegration into society.
- Information on other injuries (deafness, blindness, paraplegia, etc.) will also be useful in targeting inter-

ventions for landmine survivors. For example, a large proportion of incidents resulting in deafness requires greater funding for assistance to the hearing-impaired.

*Question 30: Other?*

- For example, injury to genitalia.

## **Incident Report**

*Question 31: Was the area known to be mined?*

- Responses will assess the level of mine awareness in the community as well as the level of education needed to ensure adequate awareness.

*Questions 32-34: Number of other victims; number killed; number injured.*

- In order to be recorded, all other victims must have been physically injured. For example, people who were in the same vehicle in a landmine incident but were not physically injured should not be included.

*Questions 32-34 assess the level of injury and death associated with the mine involved. If mines are causing a large number of injuries per mine, mine awareness and demining efforts should be intensified.*

*Question 35: Did the victim go to the hospital?*

- ‘Hospital’ is defined as any medical facility with surgical capabilities.

*Question 36: Time to hospital*

- If the time to hospital is greater than three hours, then interventions should be made in transporting victims.

*Question 37: If the victim died, where did it occur?*

- Use only if the victim died as a result of landmine-related injuries.
- This is a measure of the severity injuries as well as a potential target for intervention. For example, if a high proportion of victims die in transport, then speed of transportation to the hospital may need to be improved.

*Question 38: Did the victim receive rehabilitative care?*

- Rehabilitative care is defined as training or social support.

*Question 39: Did the victim receive a prosthesis?*

- It is important to realize that if the accident happened recently, there may not have been enough time to receive a prosthesis. In the case of more recent victims (i.e. within 3 months), the number of victims receiving prostheses is expected to be low.

*Question 40: How often does/did the victim use a prosthesis?*

*Questions 41-42: Did the victim work before the injury? Does the victim currently work?*

- Work can be either part time or full time, for pay or not for pay. ‘Student’ is not included as work.
- Military enrollment is considered employment.
- Measures impact of landmine incident on economic activities and daily life events.

See Appendix D for a sample of this tool.





# 8 CAPABILITY AND SOCIAL REINTEGRATION TOOLS

## 1. HOSPITAL CAPABILITY SURVEY TOOL

This survey is designed to assess the ability of a hospital to care for landmine victims needing surgical attention. It is meant to provide a baseline analysis of the facility and to be administered along with the Hospital Surveillance or Survey Tool. This information is essential for donors who want to care for landmine victims. Helping build the infrastructure of a hospital may be one of the most important things that they can do.

### Logistics

#### *Meetings*

While meeting with the director of the hospital to collect data for the Hospital Surveillance or Survey Tool, the Hospital Capability Survey Tool can also be completed. The director or a staff member should be able to provide the answers to the survey. The surveyor should, however, take a thorough tour of the facility and closely observe all the departments as they are functioning to get a true picture of the hospital. Staff, other than the administrator, should also be informally interviewed to obtain a sense of the capacity of the facility. It may be necessary to schedule a second meeting to collect the survey form. At this time, it is useful to review the responses and then obtain any further information the director may wish to convey to the survey team or to potential donors. This information can be included along with the final report.

This tool can only measure physical capability. It is extremely difficult to measure individual staff motivation, which is often the most important determinant of quality of care.

### Survey Questions

Initial information and questions 1-3 provide location and contact information for the hospital in question. Many of the remaining questions require someone

on the team who has some knowledge of medical or hospital care.

#### *Physical plant*

Questions 4 through 17 provide information regarding the physical capability of the hospital to support surgical procedures. Each question is designed to provide insight concerning the essential equipment. A rough estimate of the quality and level of care the hospital can provide may be assessed through these questions. In general, the following standards should apply:

- Possession of dedicated operating room, running water, electricity
- Sterilized equipment always available
- Laboratory with hematocrit capability
- Stored blood available within 30 minutes
- Stored blood on premises
- Laboratory available and working to test blood for HIV, malaria and syphilis
- Operating Room records kept
- Vital signs recorded daily
- X-ray facilities available
- Patient charts kept
- Anesthesia records kept
- Intact screens

#### *Question 4: Is there a dedicated room for surgical procedures?*

- Is there a room specifically for surgical operations? Only one is necessary for a response of “yes.”
- A dedicated room/operating room for surgical procedures provides a measure of the size and capability of the facility to perform complex surgical procedures.

*Question 5: Is running water available for surgery greater than (>)12 hours per day?*

- Is water available for washing and sterilization of equipment? The term “>12 hours” is to prevent occasional (e.g. 15 minutes/day) water availability for constituting an answer of “yes” to this question. Running water measures the ability of the hospital to clean equipment, irrigate and clean wounds.

*Question 6: Is electricity always available for surgical procedures?*

- Can lighting be maintained for surgical procedures? Is a generator present on the premises?
- Electricity indicates the capacity for continuous lighting and ability to use more sophisticated equipment and to perform surgery at all hours.

*Question 7: Are there intact screens on the windows and doors of the operating room?*

- Are screens kept to prevent flies and other pests from entering the OR?
- Intact screens measure the cleanliness of the room as well as the ability to keep flies and pests out of the hospital.

*Question 8: Can X-rays be taken? (Is there film, developer, and technical support?)*

- Are X-rays available for use with operating room procedures? Are they available off-site?
- X-rays measure the support facilities of the hospital and the equipment available to assess wounds and fractures.

*Question 9: Is sterilization equipment always available/working? (For drapes and instruments)*

- Can equipment be sterilized prior to use or reuse?
- Sterilization equipment allows for surgical procedures to be done under sterile conditions, limiting possible infectious complications and also indicates some level of support facilities available.

*Question 10: Is blood available within 30 minutes?*

- Availability of blood may be associated with a phlebotomist available within 30 minutes to draw blood for use, or an off-site storage/blood transfer facility.
- If blood is not stored on premises, blood may be available through other means. Landmine victims frequently require blood transfusions and the ability to store blood may reduce complications.

*Question 11: Is stored blood available?*

- Stored blood in hospital should measure whether or not blood is available immediately upon demand (check with Question 10)
- The response is “yes” if stored blood is available on the premises and indicates whether or not refrigeration is available on-site.
- A walking blood bank near local staff or community that has been typed so they can donate blood rapidly may also be a solution.

*Question 12: Is a laboratory available and working to measure hematocrit or hemoglobin?*

- The “laboratory” may consist of the ability to centrifuge/spin blood to obtain hematocrit levels. These levels would be used to diagnose anemia and to determine whether or not blood transfusion is necessary.
- The ability to measure Hct/Hgb should be used as a surrogate for a very basic laboratory facility. The ability to test blood indicates a slightly higher standard.

*Question 13: Is a laboratory available and working to test blood for viruses?*

- Can blood be tested for infections such as HIV, Hepatitis B and C, malaria and syphilis?

*Question 14: Are patient charts kept?*

- Is the patient monitored for the entire period of hospitalization?
- Patient charts indicate the level of follow-up care. If patient charts are kept, the patient was followed for the duration of hospitalization and the facility would probably be able to institute a surveillance system.

*Question 15: Is an operating room log kept?*

- Are types of procedures performed in the OR monitored? Is usage of the OR monitored?
- Presence of operating room logs indicate that the types of procedures in the operating room are followed, that the usage of the OR is measured, and that more complicated procedures are probably performed. These records can also be accessed for hospital surveillance or survey patients or social reintegration patients.

*Question 16: Are Anesthesia records kept?*

- Are intra-operative vital signs continuously monitored?

- Anesthesia records indicate that intra-operative vital signs are measured and recorded. Anesthesia records provide another measure of the level of patient management.

*Question 17: Are vital signs recorded on a daily basis?*

- Are temperature, heart rate, respiratory rate, and blood pressure measured on a daily basis?
- A daily record of vital signs indicates post-operative care and the presence of some staff qualified (by current hospital standards) to follow the patient and measure progress or identify complications.

### **Operating Room**

A hospital that can easily care for landmine victims can be expected to answer “yes” to all questions. Such a facility can provide for complex surgery and has adequate supplies for the performance of these procedures. Such a hospital most likely acts as a referral center and is the final facility usually encountered by landmine victims.

Basic abilities/capacities include cement floor/tile and operating lights. Mid-level technical expertise includes suction, circuit anesthesia. Supplies for 2 abdominal cases per day, circuit anesthesia, and endotracheal intubation would be functions of more advanced, referral hospitals.

*Question 18: Is the operating room floor cement or tile?*

- Can the floor be cleaned? Is this a permanent facility?
- Cement or tile flooring measures the cleanliness of the operating room and the permanence of the structure.

*Question 19: Are operating lights available and working?*

- Operating room lights, with the presence of electricity (Question 6) measures the ability to provide continuous care.

*Question 20: Are enough surgical supplies available for 2 abdominal cases per day?*

- Supplies for 2 abdominal cases per day indicates that major operations may be performed and that sterilized equipment and personnel are available.
- An answer of “yes,” to this question assumes adequate personnel and sterilized equipment. Recheck Question 9 (Is sterilization equipment available?) As this question should then also be affirmative as should questions 4, 5, and 10.

*Question 21: Is suction available and working?*

- Suction should be considered as mid-level technical expertise.

*Question 22: Is circuit anesthesia available and working for 2 abdominal cases per day?*

- Circuit anesthesia indicates continuous anesthesia with the ability to intubate the patient. (Question 23)

*Question 23. Are supplies for endotracheal intubation available and working?*

- Endotracheal intubation allows artificial respiration.
- Circuit anesthesia allows for more complex procedures.
- Endotracheal intubation requires anesthesia for larger procedures and is used in more complex procedures.

### **Personnel**

*Question 24: Is a medical officer available 24 hours a day?*

- Is a general physician (family practice, internal medicine, etc) available at all times of the day?
- The presence of a medical officer twenty-four hours per day equates with a higher level of care.

*Question 25: Is the hospital open for surgery 24 hours a day?*

- Surgery may be inclusive of less technical operations (lacerations, c-sections, etc.) and does not require that a surgeon be on the premises or on staff; however, some physician presence is necessary for an answer of “yes.”

*Question 26: Is a trained surgeon available 24 hours a day? (Trained for closed chest trauma, abdominal exploration and amputations)*

- Can a trained surgeon be called for immediate surgery in case of an emergency?
- Twenty-four hour surgery and the presence of a trained surgeon provides for the highest level of care.

*Question 27: Is anesthesia available 24 hours a day? (Including ET intubation)*

- An answer of “yes” would only be possible if Question 23 (ET ability) is answered in the affirmative.
- Presence of anesthesia 24-hours per day indicates that more technical procedures may be performed

*Question 28: Are nursing staff available 24 hours a day for intravenous infusions?*

- Are nursing staff trained to administer intravenous fluid and antibiotics for seriously ill patients?
- Presence of nursing staff indicates that post-operative vital signs and potential complications are monitored.

*Question 29: Is there staff to help feed and take care of patients post-op?*

- Do hospital staff follow patients for the duration of their hospital stay? Are patients fed or do family members stay in the hospital to care for the patient?
- Hospital staff to feed and care for patients helps to provide an estimate of the size of the facility and the staffing capabilities.

*Question 30: Number of hospital beds*

- This number indicates the size of the hospital.
- The number of hospital beds along with the number of in-patient admissions per year help to provide an estimate of facility utilization.

*Question 31: Number of patients hospitalized in previous 12 months*

- Check annual report. Approximations can be used if actual records are unavailable. This number should be in-patient admissions only.
- These questions allow for calculation of an overall mortality rate per hospital (deaths/# hospitalized).

*Question 32: Number of surgical procedures in previous 12 months*

- Check annual report. Approximations can be used if actual records are unavailable.
- Calculation of a surgical mortality rate (surgical deaths/procedures)

*Question 33: Number of abdominal operations per year*

- Check annual report. Approximations can be used if actual records are unavailable.
- Abdominal operations are considered more complex surgery (more so than amputations) and measure the ability of the hospital to perform larger cases.

*Question 34: Number of cesarean sections per year*

- Check annual report. Approximations can be used if actual records are unavailable.
- Cesarean sections per year measures the ability of the hospital to perform more technical but not complex surgery.

*Question 35: Number of landmine victims treated in previous 12 months*

- Check annual report. Approximations can be used if actual records are unavailable.
- Number of landmine victims treated in previous 12 months allows a measurement to be compared from community data. Also names of victims can be collected for social reintegration surveys. **It is imperative to note that this number does not necessarily indicate the number of landmine victims per year, as it will not include those with minor injuries or those who died and were never taken to a hospital.**

*Question 36: Number of amputations performed on landmine victims in previous 12 months*

- Check annual report. Approximations can be used if actual records are unavailable.
- Amputation rate: Number of amputations/number treated (level of severity of patients treated in hospital)

*Question 37: Number of landmine victims who died in the hospital in previous 12 months*

- Check annual report. Approximations can be used if actual records are unavailable.
- Mortality of those treated: number of victims who died/number treated

*Question 38: Number of operations for landmine victims in previous 12 months*

- Check annual report. Approximations can be used if actual records are unavailable.
- Operation rate: number operated on/number treated (level of severity of patients arriving in hospital)

## 2. ORTHOPAEDIC CENTER CAPABILITY SURVEY TOOL

### Initial Meeting: Request for Assistance

At least one meeting at the orthopaedic center will be necessary to obtain the required data. Survey administrators should contact the orthopaedic center director and request at least one hour to describe the survey in detail. If possible, the survey and letters of introduction should be forwarded before the meeting. Two purposes for the meeting should be identified.

1. The survey will highlight the capability of the facility in providing assistance for landmine victims. If possible, the director should complete the survey at the

initial meeting. However, it may be necessary to return for a second meeting.

2. A random list of names can be useful for instituting the social reintegration survey tool. If such a list is to be used, a *complete* list of names and addresses of all landmine victims seen at the facility within the time frame specified should be requested. Surveyors will then randomly select names for patients to interview according to the methods detailed below.

## Second Meeting: Data Collection

A second meeting with the director of the center may be necessary to retrieve the completed survey form or collect the list of landmine victims. At this time, the director should be informed and reassured that results will be made available as they are generated.

## Survey Questions

### *Question 1: Type of Center*

- An orthopaedic center refers to a facility that manufactures and/or provides prosthesis, wheelchairs or crutches to amputees and persons with disabilities. A rehabilitation center employs physical therapists and provides long term rehabilitation and physical therapy. A center may be one or both.
- The type of center and the number of each type (orthopaedic and/or rehabilitation) indicates the capability of the country to fit prosthesis and provide rehabilitation. One can then ask the question, are more orthopaedic centers necessary? More rehabilitation centers?

### *Question 2: Affiliation*

- Record major affiliation of the facility. “Public” refers to governmental, non-military facility.
- Affiliation indicates sources of funding. If most of the facilities are military, do civilians receive adequate care? If most are public, is there an opportunity for private funding?

### *Question 3 and Question 4: Are there established referral patterns and where do referrals come from?*

- “Hospitals” refer to a standardized method of referral from hospitals to orthopaedic centers.
- Location of referral indicates the pattern of the system. Is there a formal hospital referral system? The implementation of one might be necessary in order

to ensure adequate follow-up care. Is the community aware of the center? Community education efforts (brochures, media, etc.) may be required to increase knowledge of health facilities available.

### *Question 5: Number of patients fitted with prosthesis per year*

- Information from annual report, preferably most recent year.
- This number indicates the demand for services and may be used as a numerator for Questions 6-8, i.e. # of patients/prosthetists, # of patients/physical therapists

### *Question 6: Number of prosthetists employed.*

- This should refer to paid and fully trained staff only.
- These figures provide a quantitative assessment of the adequacy of staff. Is there a small number of prosthetists or physical therapists per patient? If so, more personnel may need to be hired. Is a small percentage certified? More training may be required to assist the facility.

### *Question 7: Number of prosthetists ISPO certified*

- How many of the prosthetists are trained and meet the standards of the International Society of Prosthetists and Orthothists?

### *Question 8: Number of physical therapists employed*

- If the center is not a rehab center (Question 1), this answer should be zero. If this is not the case, verify with the source.

### *Question 9: Do you have enough personnel?*

- Ask the source to define what is meant by enough personnel, e.g. “no waiting list” might be used as a guide for adequacy of personnel.

### *Question 9 provides a qualitative follow-up to Questions 5-8.*

- An administrator may feel that inadequate staffing is present, yet the patient load per personnel may indicate that resources need to be targeted elsewhere. Conversely, the patient load may be larger than expected, yet the administrator answers that staffing is adequate. Such situations would require follow-up and re-interview for further assessment.

### *Questions 10-14: Number of artificial limbs, primary limbs, replacement limbs, wheelchairs, and crutches made per year.*

- Primary limbs are those fitted for a patient for the first time.
- Replacement limbs are fitted for patients when a primary limb is broken or inadequate.
- These numbers present the capability of the facility to provide mobility equipment to amputee and persons with disabilities.
- The number of primary limbs compared to the number of replacement limbs can give a rough indication of the number of amputations occurring during a given year and the longevity of prostheses.

### **Type of Prosthesis Used**

*Questions 15-18: Polypropylene, leather/wood, aluminum, polyester/fiberglass*

- If an answer of “yes” is given to any of these questions, Questions 10-12 should have a value (i.e. If a type of prosthesis is made, then a certain number should be made per year). If this is not the case, query the source for verification.
- On-site capability to make a prosthesis is measured.

*Question 19: Do you have a polypropylene press and mould?*

- If the answer to Question 19 is “yes,” and Question 15 (polypropylene prosthesis made) is “no,” query the source as to why.

*Question 20: Do you charge for a prosthesis?*

- Does someone outside the facility (patient, government, etc.) pay for a prosthesis, or is it give free of charge? Whether or not the facility charges for prosthesis indicates the access to care by the patient and also the resources available to the facility.
- Do they have inadequate staff because they provide care to the indigent whereas another facility requires payment yet have adequate staffing? Do they charge yet have inadequate supplies?

*Question 21: Do you have adequate supplies for manufacturing prostheses?*

- Is material available for manufacturing prostheses?
- Adequate supplies for manufacture points to the ability of the facility to provide enough prostheses to keep up with patient demand, especially if patient load/year is high and no charge is assessed.

*Question 22: Is there standardized manufacturing of prostheses?*

- Is a singular and simple format used every time in the manufacture of prostheses? This question is most applicable to those with a polypropylene press (Question 19) and other who manufacture their own prostheses (Questions 10-12)
- Is a simple format used for the manufacture of a prosthesis? Standard manufacture indicates a formalized method for training. If no standard is maintained, quality control and training efforts might be directed towards manufacture.

*Question 23: Is there centralized manufacturing of prostheses?*

- Does the country possess a central site for the manufacture of prostheses?
- Central distribution points to a country’s ability to provide prostheses. If no standard is maintained (Question 22) and there is no centralized distribution point, the quality of the prosthesis might be inadequate to meet patient needs. If central distribution is absent, local capacity building through training programs in the manufacture of prosthesis might offer more value.

*Question 24: Are there other ortho/rehab centers near by?*

- Are centers located close enough for easy referral of patients in case one center receives too many patients at once?
- If the patient load of the facility is high, can another center meet the increased demand?

*Question 25: Are there local training programs for technicians?*

- Does the center itself provide training programs for technicians?
- Is the program sustainable? For example, if a non-governmental organization is funding the facility (Question 2: Affiliation), do they provide a mechanism for continuation after the NGO leaves the country or turns over the facility?

*Question 26: Are there outreach programs?*

- Does the center itself provide outreach? Outreach should be described as entering into the community to provide information regarding rehabilitation and assistance to patients who may not be able to reach the clinic/center on their own accord.

- Outreach programs and employment of disabled persons provide a measure of the facilities' efforts to reintegrate the victim into society.

*Question 27: Are there appropriate facilities and surgeons available to do stump revisions?*

- “Appropriate facilities” include hospital services and personnel for stump revision. These do not need to be in the center itself.
- This question provides a qualitative assessment by the facility director of the *hospital's* ability to do stump revisions, i.e. If stump revision percentages are high, does the problem lie with the surgeon's ability to perform a primary amputation, the patient's ability to care for the amputation or access to secondary surgery?

*Question 28: Can you estimate the number of patients who need stump revisions?*

- A stump revision indicates the need for additional surgery on the stump in order to properly fit a prosthesis.
- The source should be asked to provide as close an approximation as possible, but it should be stressed that only an approximation (not an exact figure) is necessary.
- Stump revisions point to either the quality of the amputation itself (use with hospital capability survey) or the care and management of the stump. If the number is large, training might be required in one of these two areas or there may be inadequate access to surgical interventions.

### 3. SOCIAL REINTEGRATION AND REHABILITATION SURVEY TOOL

#### Rationale

This is one of the most important tools in this manual. It measures the effectiveness of the rehabilitative efforts—whether they be from hospitals, rehabilitation centers, governmental or non-governmental efforts. This data will assist in helping these resources finetune their efforts.

The purpose for the Social Reintegration and Rehabilitation Survey Tool is to determine the extent to which the needs of landmine victims are satisfied. It is designed to provide a multidimensional measure of a victim's return to society after experiencing physical trauma associated with a landmine injury. These

dimensions of social reintegration measured by the survey fall under the following categories:

#### I. Informational Access

Does the victim have access to information and knowledge concerning the injury

#### II. Disability Discrimination

Discrimination based upon disability (Has the injury affected the victim's ability to gain employment, schooling, training, etc.)

#### III. Social Support

Personal social support structures indicate the level to which the victim is cared for and receives help, be it informational, emotional, financial or physical support.

Access to medical facilities, which includes both the provision of information concerning the victim's injuries as well as the surgical processes required for a prosthesis, i.e. does the victim understand the need for stump revisions?

#### IV. Institutional Resources

What kind of systems are in place to provide efficient and reliable assistance to mine victims, i.e. is there a hospital or clinic close to mine-infected villages?

#### Meetings

This survey is to be used for all surviving victims of landmine injuries who sustained their injuries *more than 12 months ago*, thereby insuring that they have undergone some kind of reintegration and/or rehabilitation process which is now being evaluated. To most effectively accomplish the goals of this survey, meetings must be set up with officials from the local hospitals, rehab/orthopaedic centers and village key informants. Due to the sensitive nature of speaking with mine victims, meetings should also be arranged with representatives of the local Ministries of Health and Social Welfare.

#### Implementation

Lists of victims to survey can be obtained either from registries at hospitals and orthopaedic centers or directly from local villages and districts. The decision on group of patients to survey depends upon who will use the data and the availability of initial information. Either random



sampling or cluster sampling of landmine survivors (see next chapter) can accomplish to desired goal of obtaining a representative sample of rehabilitation and social reintegration in a defined community.

While administering the survey, if there are questions which prove to be emotionally difficult for the victim, it is advisable to either move on to the next question or end the survey depending on the situation, i.e. “Refused to Answer” is a completely acceptable answer and should not be pressed further. The benefits of this survey include its straightforward but comprehensive construction and the potential for interventions based upon the collected data. **Note:** One significant difference between this and the Community Survey Tool is that this survey must be done *with the victim* as opposed to the head of their household.

## Survey Questions

### *Questions 1–3: Source of Sample*

- By knowing where the victim population is being sampled from, you can compare and contrast information gained from the sample with the other surveys that may have utilized the same source, thereby creating a general picture of each sample source’s resource profile.
- This profile can then guide future interventions aimed at increasing resources within respective sample sources such as a specific rehabilitation center or village.

### *Questions 4–8: Personal Data*

- During the analysis stage, it will be important to determine the relative age, gender and year of injury of landmine survivors for purposes of intervention.

### *Questions 9–17: Types of Injuries*

- Gaining an understanding of the types of injuries experienced by landmine survivors will help determine which medical resources need to be targeted towards specific disabilities. For example, the needs of someone who has been blinded are different than the needs of someone who has lost both their legs.

### *Question 18: Where did you receive medical care?*

- Information on the type of medical care received will allow for targeting of specific facilities for improvement or possible interventions.

### *Question 19: Physical Therapy Upon Leaving the Hospital*

- Identifying the number of survivors receiving rehab or physical therapy will allow for evaluation of access and current standards of care.

### *Question 20: Did you have an amputation?*

- This section is to evaluate survivors with amputations and the care they receive.

### *Question 21: How many orthopaedic/rehab center have you visited?*

- This question provides insight into whether survivors obtain proper care or must seek equipment and care from varying sources.

### *Questions 22–25: Mobility Equipment*

- It is just as important to know that survivors are using *some kind* of mobility equipment as well *what kind* of equipment they are using. If a large proportion of survivors are not using mobility equipment then this must be further investigated.
- Survivors who are waiting for a long time for their mobility equipment are experiencing a high degree of frustration and discomfort in their daily lives.

### *Question 26: How many surgeries did you need before you could wear a prosthesis?*

- The number of surgeries needed in order to wear a prosthesis will help illustrate the effectiveness of medical therapy.

### *Question 27: Do you think you need additional surgery or a stump revision?*

- This question represents the survey’s first attempt to measure survivor’s *perceptions* of their injuries and the services they receive. If you find a difference between what is perceived and what the needs are, interventions can then be sought. For example, if you find that a large number of survivors think they need a stump revision when in fact their prosthesis is at fault and therefore not being used, then education of survivors may be a priority.

### *Questions 28–35: Prostheses*

- These questions will provide basic information concerning a survivor’s use of prostheses. It will be vital to know if survivors do not have a prosthesis or if they have not had one in some time. You will be able to determine how durable and comfortable their

prostheses are, why they may not be wearing their prostheses and their perceptions on whether or not their prostheses are fully functional or in need of repair. This will allow you to know if the survivors have been given proper instructions on the care of their prostheses, how often the prostheses should be replaced, and if they possess a basic understanding of the mechanics of their prosthetic.

*Questions 36-42: Employment Information*

- These series of questions provide a measure of the impact of a survivor's injuries upon their ability to be employed, whether it be as a soldier in the army, a government administrator, or a farmer. The before and after nature of the questions will allow you to know to what extent their injury has affected their potential as a productive member of society. You will be able to figure out what injuries have provided the most amount of harm in limiting the potential of *where and for how long* a survivor works.

*Question 43-44: Legal issues concerning disabilities*

- Policies and laws concerning persons with disabilities will vary greatly from country to country, but the extent to which a survivor knows of the laws of their nation may impact their well-being. For instance, if a survivor is unaware that there are national laws concerning mine-disabled survivors, then they are also likely to be unaware that they are eligible for a pension due to their injury stemming

from a landmine. In addition, if aid agencies can insure that survivors are made aware of *national* as well as *international* laws governing the rights of mine survivors, then they may become empowered to both pursue their entitlement as disabled and as global citizens.

*Questions 45-47: The accessibility of health care resources*

- The information collected in this section enables you to pinpoint the inadequacies in medical care for mine survivors. As well, if a rehab center is located far away it will limit a victim's desire and ability to travel for physical therapy and medical follow-ups.

*Questions 48-49: Social Support Capability*

- These question outline the support network of a particular community. In countries where there is little community support, government institutions or other groups may be necessary to provide the care which is needed for landmine injury survivors.

*Questions 50-51: Injury Discrimination and Limitations*

- This information, when viewed in relation to employment status and injury, can help to give an indication of the effectiveness of rehabilitation and social reintegration. survivors who are able to function in society are less likely to feel that they are treated differently from others or suffer limits to their education or work.



# 9 COLLECTING DATA

Whatever method of data collection or sampling is used, it is imperative to get national and local population figures. The number of victims is only of value if related to a reliable denominator (population data). Accurate population data may be difficult to obtain as it may have political value. Check as many sources as possible in order to assure the validity of the results. These data are crucial in developing ratios and tracking differences between various regions and countries.

Sampling enables us to conduct a scientifically sound study without visiting all members of the population at risk. Sampling should only become an issue when conducting either the Community Survey or the Social Rehabilitation Survey. The Hospital and Key Informant Surveys can guide the researcher to regions reported to have landmine victims. The Community Survey allows the calculation of rates, since the hospital data alone misses those who may have never received documented medical care. In completing the two capability surveys, it should be feasible to visit each and every facility to administer the survey, ensuring 100% coverage (in theory). However, in countries with large numbers of landmine victims, it will prove to be impossible to administer a survey to every survivor; even if one had the time and financial resources to visit thousands of survivors, it would prove to be impossible to locate every one.

There are essentially four sampling methods that can be used for the landmine project: simple random sampling, systematic sampling, two-stage cluster sampling and sentinel site sampling. In general, one should start at the hospitals to identify where survivors are coming from and then visit these districts. The Key Informant tool will then be useful in determining the villages that are most affected. Households within these villages should then be visited and family members or survivors interviewed.

In situations where there is social collapse and key informants such as chiefs, mayors, or priests do not exist then one of three methods is necessary to obtain a

sample. First, if all houses in the village or affected areas are known then a random survey can be undertaken. If the number of households is not too large and there are adequate resources, a systematic sample, every  $n^{\text{th}}$  house, can be sampled, providing the entire village is covered. Lastly, if only rough estimates of the village populations in a region exist, a two-stage, 30-cluster survey should be undertaken. This last method should be undertaken as a last resort, because it is really only valid if the prevalence is high and it uses considerable resources.

## CALCULATING A SAMPLE SIZE

This discussion of sample size may seem complicated at first glance, but it is simpler than you think if you try it. If you are having trouble, contact people who have done previous statistical work for assistance.

Simply put, the sample size is the number of interviews necessary to administer before the data can be considered to be statistically sound. The sample size depends on both the prevalence rate of landmine injuries in the population and the investigator's desired precision of the data. In most cases, the precision can be assigned to be either  $\pm 5\%$  or  $\pm 10\%$  (using 5% will result in a larger sample size). The sample size can then be calculated as:

$$\text{Sample size} = \frac{(1.96^2 \times \text{prevalence \%}) \times (100 - \text{prevalence \%})}{(\text{Precision \%})^2}$$

Therefore, with an estimated landmine victim prevalence rate of 10%, and a precision of  $\pm 5\%$ , the sample size can be calculated to be  $(1.96^2 \times 10 \times 90)/5^2 = 138$ . One would need to conduct 138 interviews to ensure quality of data.

However, it is important to note that:

- This formula is not valid if the prevalence rate is either very low ( $<5\%$ ) or very high ( $>95\%$ ).

- If the prevalence rate is in doubt, then it is best to use 50% as this will lead to a larger sample size.
- This formula is only valid for a large population size. As a general rule, this formula holds when the calculated sample size represents less than about 10% of the total population.

## Simple Random Sampling

Simple random sampling is a method that ensures that every member of the population has an equal chance of being included in the sample. For example, once a complete list of landmine victims is obtained from a rehabilitation center in preparation for the Social Rehabilitation Survey, this method is used to choose which victims should be surveyed, and how many surveys will be necessary. If the number of recent landmine victims is very large, this method can also be used to choose to whom to administer the Community Survey.

- Obtain a complete, numbered list of landmine victims that meet the criteria for the social rehabilitation survey (e.g. victim more than 12 months ago, still alive). This is your sampling frame. (for example, 1,200 victims) Each victim is assigned a number starting with 0001, 0002 and so forth.
- Using the random number table in Appendix A, choose any single digit number on the page as an arbitrary starting place (see sample 1 circled on random number table).
- Read down the column of numbers from this point, looking at groupings of four numbers across (since the sampling frame is four digits). Ignore the space between columns, if necessary. All numbers which are less than or equal to the sampling frame (1,200 in this case) are selected as members of the sample. For example, 0233 would be the first sample from this list. Going down from the circled number 1, 5029 would be too large, same with 1,332. The number 0233 would be victim number 233. This person is included as the first in your random sample. The next number for this sample would be 0733 or victim number 733.
- If any numbers are repeated, ignore them after their first appearance. When you reach the bottom of the page, move to top of next column starting at

same relative position as original first number. (Example 4887). Proceed down this row. Continue finding appropriate victim numbers until sample size has been reached (138 in this case). If you reach the end of the page before this is obtained, begin again in first column of top of page to the left.

## Systematic Sampling

This is an alternative to simple random sampling used when it is difficult to obtain a sampling frame. Sample households are chosen systematically as they appear in time or space. For example, one household out of every 15 households as field health workers walk systematically around a village.

- Estimate the total number of households in the village.
- Calculate the sampling interval ( $s$ ) by dividing the number of households by the required sample size (see above).
- Choose a random number less than or equal to the sampling interval. This is the number of the first member of your sample.
- Proceed in sequence to select one in every  $s$  members of the population for the sample until the required sample size has been achieved

## Two-Stage Cluster Sampling

Cluster sampling has been popularized by WHO's Expanded Program on Immunization. It has become popular for making rapid assessments of large populations because it is quicker and more convenient to organize than simple random sampling. The basic idea is that, first, villages are chosen at random and, secondly, clusters of individuals or households are chosen within each village. This method should only be used in a very large population in which the number of landmine victims is large and fairly uniformly distributed. These conditions may be rarely met for mine victim data.

To calculate cluster size, use the formula for sample size given above and double the result. For example, in the example given above, the sample size would be  $138 \times 2$  or 276. Then divide the sample size by the number of clusters you require (usually 30) and round up to the

nearest whole number. This provides the number of individuals per cluster. In this example, the sample size 276 is divided by the number of clusters 30 to get 9.2, which is rounded up to get 10 individuals per cluster.

- Make a list of all villages in the region together with their population size.
- Calculate the cumulative population size as you go down the list.
- Calculate the sampling interval by dividing the total population by the number of clusters to be selected (usually 30).
- Select a random number which is less than or equal to your sampling interval, and using the cumulative population total, find the village it represents.
- The next village is obtained by adding the sampling interval to this starting number and locating the village which it represents. It may be that the same village, especially if it has a proportionally high population, will be chosen more than once using this method. If that is the case, then conduct more than one cluster survey in those villages.
- Continue to add the sampling interval to the previous number obtained until the correct number of clusters has been obtained.

Once the list of villages to be surveyed is determined, then for each village:

- Go to a central place in the village.
- Spin a bottle and mark the direction in which it points.
- Walk to the edge of the village in this direction and count the number of households on the route.
- Choose a random number to identify one of the households on the route.
- Start with this house and select the individuals living in the house who belong to the population being sampled. If no one fits the criteria, continue to the next house.

- Continue visiting neighboring households until the number of individuals per cluster is obtained.
- If a village is to have more than one cluster, then repeat all the steps for each cluster.

## Sentinel Site Surveillance

Because landmine victims are often grouped around affected villages and not evenly distributed throughout a region, two-stage cluster sampling is usually not an effective means of measuring the impact of landmines in the region. If by chance, the clusters that the investigators chose do not correspond with where the landmine victims are, then the data will subsequently be under-reported. If by chance, one does choose the correct villages, then the data will be over-reported. *Because of this fact, sentinel site surveillance is usually the most accurate means of reporting data on landmine victims.*

Sentinel sites are chosen because they are known to be affected by landmines, and therefore have a greater chance of having a large number of victims. While this data cannot be extrapolated to the greater area as a whole, it does give an accurate picture of the affected regions.

In order to perform sentinel site surveillance, a number of key informant interviews should be administered to identify as many mine-affected villages in the region as possible. When enough interviews have been completed a list of all the villages mentioned should be compiled. These villages can then be put into a random order, using a random number table. If time and resources permit, then the rest of the villages in the region can also be put into a random order, and these villages can be visited after completion of all the sentinel sites.

Upon arrival in each of the sentinel villages, if a complete list of landmine victims is unavailable, then individual households can be chosen for sampling purposes using either one of the three previously described methods.

# APPENDIX A: RANDOM NUMBER TABLE

See page 32 for instructions on how to use this table. The markings on this table are an example described on page 32.

9 4 6 8 7	7 8 1 3 9	0 4 3 7 1	4 7 2 4 8	8 7 0 8 9	4 8 2 6 6
9 9 3 1 7	8 8 0 6 0	1 8 0 5 7	5 8 9 1 5	8 8 9 9 6	4 1 8 0 5
4 9 6 1 2	3 9 1 5 3	9 5 2 5 2	5 3 3 1 6	0 3 6 4 0	6 2 3 3 4
0 4 1 1 1	3 7 4 1 9	6 8 1 3 0	0 3 5 9 2	8 2 2 0 1	6 5 6 3 2
2 0 4 2 0	8 2 3 0 7	3 0 7 9 8	6 9 0 5 9	1 0 8 8 1	1 3 1 8 8
1 0 9 7 5	1 9 2 5 4	5 5 3 8 3	6 1 7 4 6	3 8 9 2 7	4 4 2 4 8
5 0 0 2 8	0 1 2 4 7	4 3 3 0 7	4 6 9 1 9	9 1 9 2 9	4 5 1 0 5
2 4 5 3 0	4 1 1 2 6	7 7 2 5 9	8 3 7 8 2	9 9 8 0 2	5 6 3 3 1
8 7 2 0 2	7 3 5 6 6	8 9 7 0 9	6 1 8 4 8	1 1 2 4 4	5 7 7 9 7
9 3 3 3 7	9 9 9 0 1	6 9 2 1 0	8 7 2 0 7	2 0 6 6 9	2 5 0 5 7
		Start ↘			
7 0 0 9 1	3 7 7 4 4	2 2 9 5 0	2 9 3 9 3	3 0 1 4 6	8 3 3 1 7
7 7 4 2 5	3 5 1 2 4	9 0 5 1 3	3 2 7 0 9	1 7 0 9 7	1 5 0 5 1
4 5 9 4 3	7 7 5 6 9	3 9 5 6 6	1 8 1 2 5	3 0 7 0 3	5 5 9 4 5
4 2 9 8 0	8 8 4 2 2	2 1 2 0 2	3 3 6 6 8	6 2 8 2 7	8 2 5 5 1
5 8 9 4 6	7 6 7 3 5	7 4 4 7 0	2 1 6 4 9	7 7 3 7 1	0 2 1 3 3
3 9 7 7 4	4 3 3 6 2	0 5 3 9 2	3 6 2 1 1	1 5 3 6 6	3 6 5 5 6
1 2 7 2 2	0 6 3 0 2	9 9 0 4 3	8 5 4 2 7	7 9 1 4 0	3 6 7 0 1
4 6 0 1 1	5 8 1 8 1	1 9 1 0 7	3 3 1 7 8	7 2 4 6 4	9 5 0 2 2
8 9 0 4 8	5 3 1 9 3	2 2 9 5 7	2 7 4 8 9	6 3 6 9 4	4 2 1 8 6
1 0 1 5 7	2 8 4 7 9	5 9 3 0 8	3 8 4 2 0	1 9 2 3 9	6 8 2 7 5
7 7 2 5 4	6 5 9 6 9	6 7 1 5 6	6 3 5 0 0	3 7 6 8 6	5 4 6 4 6
9 1 4 1 1	0 9 3 6 7	8 0 5 1 6	2 0 7 7 6	2 7 1 7 1	2 0 0 0 6
0 9 0 6 8	0 3 3 4 3	0 3 9 2 3	3 5 3 2 2	3 8 6 2 9	6 2 5 4 2
0 8 8 5 6	5 6 5 6 4	6 1 8 5 8	4 1 4 9 5	3 8 0 2 8	1 9 4 5 7
8 6 0 6 3	7 7 7 3 9	9 9 2 1 5	2 1 9 5 8	4 0 6 7 9	4 9 8 7 1
6 0 6 8 1	0 1 2 9 2	8 3 5 3 0	7 3 8 3 6	4 6 2 8 1	3 3 9 1 0
8 0 9 1 2	6 1 8 1 1	6 3 9 6 0	3 1 7 2 9	0 2 4 6 0	4 8 6 8 3
4 3 1 5 9	6 8 9 9 8	9 0 3 5 5	7 2 8 3 0	4 5 8 4 5	4 7 5 1 7
8 0 5 2 4	1 7 4 7 6	8 5 6 3 3	5 6 4 7 7	9 5 5 6 7	2 5 7 4 1
4 5 6 1 9	6 8 7 2 4	2 8 6 6 0	9 8 1 5 1	4 3 8 6 7	0 0 5 6 8
0 4 7 1 2	9 0 1 2 0	5 0 3 1 3	1 5 7 1 4	8 6 9 8 5	2 5 7 4 7
4 7 1 7 9	9 1 5 8 1	3 1 7 5 2	9 1 6 4 2	4 3 9 3 4	0 5 0 5 4
9 4 2 3 2	5 2 5 0 6	3 1 4 4 7	1 7 4 8 9	9 0 3 5 5	7 7 6 9 0
3 5 7 0 1	0 2 4 3 7	5 6 5 2 0	2 3 8 6 5	0 9 4 9 7	3 6 7 0 6
1 2 4 6 6	2 6 4 5 8	7 0 0 5 9	1 8 0 7 9	9 4 3 7 6	2 9 6 5 7
4 5 7 2 5	3 2 6 7 5	6 4 5 2 6	2 3 0 5 1	2 8 1 4 9	2 2 3 2 2
6 2 9 1 9	9 4 9 4 3	9 8 6 0 1	0 9 4 3 6	7 1 2 1 5	6 9 6 3 1
3 7 8 3 7	5 3 6 7 6	2 1 9 8 8	0 9 9 6 9	3 1 4 7 1	3 7 0 3 4
9 9 8 4 9	3 4 3 5 8	8 3 8 2 4	9 4 4 8 9	5 3 9 4 6	9 4 3 0 2
2 1 5 8 1	3 8 0 5 0	3 9 7 7 5	7 1 9 3 7	2 8 9 8 0	0 0 6 1 0
1 4 3 7 1	2 1 8 9 6	9 3 2 6 1	7 3 9 8 6	5 8 2 8 7	8 3 3 6 5
7 7 9 7 4	9 8 8 3 4	8 5 6 5 3	7 4 6 4 1	7 5 5 9 2	2 7 1 9 9
8 3 8 4 3	9 9 6 9 0	7 8 8 1 1	3 6 3 8 4	2 8 6 4 1	3 4 6 6 5
5 1 7 3 0	9 6 7 2 7	7 8 9 8 9	8 0 3 9 7	6 7 6 8 5	5 3 0 3 5
3 9 6 8 5	4 1 5 2 7	0 9 0 0 5	6 1 7 5 9	3 8 7 9 5	1 4 2 1 7
8 4 1 2 0	5 6 7 8 9	2 6 6 8 5	4 6 4 3 1	9 9 3 7 3	6 5 6 9 4
6 3 8 6 6	3 0 4 1 5	5 7 0 2 2	7 9 8 3 9	5 0 9 6 1	5 6 1 3 7
8 3 5 0 5	0 3 0 1 5	8 3 3 5 0	2 2 5 1 8	2 2 6 9 1	5 7 2 5 9
9 4 5 3 7	7 9 8 2 0	2 8 2 8 1	6 1 3 6 7	6 3 9 9 8	6 8 8 5 3
4 4 2 6 7	3 7 0 8 3	1 5 1 2 6	2 0 2 7 9	6 7 3 1 6	8 3 3 2 8

# APPENDIX B: BIBLIOGRAPHY

We recommend the following journal articles for background reading.

Bennett S, Woods T, Liyanage WM, Smith DL. A simplified general method for cluster-sample surveys of health in developing countries. *World Health Statistics Quarterly*, 44: 98-106 (1991). A good explanation of conducting a cluster-sample survey. A bit more technical than the other articles cited, but still useful for the field health worker.

Ledogar RJ, Andersson N. Impact estimation through sentinel community surveillance. *Third World Planning Review*. 15(3): 263-272, (1993). This excellent overview of sentinel site surveillance is designed for use in urban planning, but can be adapted to the public health sector. The article includes sections on selection of sites, constraints of the method and measuring impact.

Macfarlane SBJ. Conducting a descriptive survey: 1. planning the survey. *Tropical Doctor*. 26: 161-164, (1996).

Macfarlane SBJ. Conducting a descriptive survey: 2. choosing a sampling strategy. *Tropical Doctor*. 27: 14-21, (1997).

Macfarlane SBJ. Conducting a descriptive survey: 3. summarizing and presenting data. *Tropical Doctor*. 28: 18-28, (1998).

This three-part series offers an excellent presentation of how to conduct descriptive surveys, such as the landmine community survey. Explanations on how to plan the survey, calculating sample size, choosing a sampling method, calculating cluster size and different methods of presenting the data. The series should be must reading for anyone conducting this type of public health surveillance.



# APPENDIX C: ENDNOTES

<sup>1</sup> International Campaign to Ban Landmines, *Landmine Monitor Report 1999: Toward a Mine-Free World*, 1999. [www.icbl.org](http://www.icbl.org)

<sup>2</sup> Humanitarian Demining, “Direct and Indirect Consequences of Landmines on Public Health,” [www.brtrc.com](http://www.brtrc.com), October 7, 1998.

<sup>3-4</sup> Ascherio A, Biellik R, Epstein A, Deaths and Injuries Caused by Landmines in Mozambique, *Lancet*, 1995; 346: 721-724.

<sup>5</sup> Krug E, Ikeda R, Qualls M, Anderson M, Rosenberg M, Jackson R, “Preventing Land Mine-Related Injury and Disability: A Public Health Perspective,” *Journal of the American Medical Association (JAMA)*, 1998; 280 (5) 465-6.

# APPENDIX D: BLANK SURVEY TOOLS

## Overview Tools

Country Capacity Tool

Key Informant Tool

## Epidemiological Tools

Hospital Surveillance or Survey of

Landmines Injuries Tool

Community Survey Tool

## Capability and Social Reintegration Tools

Hospital Capability Survey Tool

Orthopaedic/Rehab Center Capability Survey Tool

Social Reintegration and Rehabilitation Survey Tool

