

Revised and Updated

Management of Dead Bodies after Disasters: A Field Manual for First Responders Second Edition



MANAGEMENT OF DEAD BODIES AFTER DISASTERS:

A FIELD MANUAL FOR FIRST RESPONDERS

SECOND EDITION

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Geneva, 2016

PAHO HQ Library Cataloguing-in-Publication Data

Pan American Health Organization

Management of Dead Bodies after Disasters: A Field Manual for First Responders. Second (revised) Edition.
Washington, D.C. : PAHO, 2016.

1. DEAD BODY.
2. NATURAL DISASTER.
3. DISASTER EMERGENCIES.
4. DISASTER MANAGEMENT.
5. DISASTER EPIDEMIOLOGY.

ISBN: 978-92-75-31924-6

(NLM Classification: WA 295)

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FOREWORD

Natural disasters can have catastrophic consequences, causing large numbers of deaths and overwhelming local and even regional emergency response services. Local organizations and communities are usually the first to respond to a disaster, which includes rescuing and caring for survivors and managing the dead.

The humanitarian community recognizes that proper management of the dead is a key component of disaster response, together with the recovery and care of survivors and the supply of basic services. Experience from events such as the 2004 Indian Ocean Tsunami and the 2013 Typhoon Haiyan in the Philippines have reaffirmed that first responders – including local residents and volunteers – play an important role in managing the remains of those killed.

These first responders throughout the world need simple, practical and easy-to-follow guidelines, ensuring that they can carry out this task in a proper and dignified way. This includes taking the necessary steps to aid future work by forensic specialists and investigators in identifying human remains and clarifying the fate of the missing. Such guidance is also necessary for planning adequate disaster preparedness.

The first edition of this manual was published in 2006 precisely to respond to those needs. It marked an important practical step towards improving management of the dead in disasters, promoting an understanding of why proper and dignified management of the dead in disasters is important, and helping people to recognize the role of first responders in this task.¹

The manual has since been in steady demand worldwide. It is now available in several languages and has shown its utility in major disasters and mass fatality events around the world. It has become a source of reference for many mass fatality response plans. Although it was drafted and designed for contexts where forensic services are scarce or non-existent, it has also been well received, including as a useful tool for disaster preparedness, in countries with well-resourced and highly developed forensic services and disaster response agencies. It may take days for the experts to reach areas affected. The work of first responders as set out in this manual makes the work of the experts more effective.

Lessons have been learnt from the use of the manual and the implementation of its recommendations. Its usefulness and appropriateness have been confirmed, but scientific and technical developments in the field of mass fatality management suggested that an update was necessary.

Work to update this manual, initiated by the World Health Organization and the International Committee of the Red Cross, began in 2015. The International Federation of Red Cross and Red Crescent Societies and the Pan American Health Organization again played a key role in revising the manual and Interpol was consulted extensively to ensure that all manuals on the management of dead bodies were in alignment. Professor Stephen Cordner, from the Victorian Institute of Forensic Medicine, oversaw the editing of this second edition.

This new edition of the manual retains the spirit and purpose of the original publication and recognizes the valuable contribution of first responders in managing the dead in disasters. The manual provides simple, practical and useful guidance for this difficult yet essential task.

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1. INTRODUCTION

This manual has two aims: first, to promote the proper and dignified management of dead bodies and, second, to facilitate their identification. Following many disasters, and certainly larger ones, the retrieval and immediate management of dead bodies is done by local authorities, organizations and communities, residents and volunteers. This is because forensic experts may not arrive for some days, or even longer; and in some contexts, there are no forensic experts at all. Consequently, this manual focuses on practical recommendations for those who are on the spot or are able to respond in the immediate aftermath of a disaster – i.e. first responders.

The early work of first responders in managing the dead protects the dignity of the dead. The proper recovery of bodies involves:

- ◆ allocation of a unique code to each body,
- ◆ taking photographs and recording data about each body as soon as possible,
- ◆ placing each body in a body bag, and
- ◆ the orderly temporary storage of the bodies.

These steps in the early management of the dead go a long way to protecting their dignity. They help to ensure the traceability of the bodies and thus avoid their loss. But more is needed if the bodies are to be identified:

- ◆ a list of the missing must be created, and
- ◆ information about those on the list must be gathered.

Provided all these steps are taken, the foundations have been laid for later efforts by forensic experts to enable the formal identification of the dead. Implementing all these measures early on also increases the number of dead bodies identified even if a forensic response is not possible. The proper management of the dead also includes acknowledgement and assistance to their bereaved families, friends and communities.

The manual does not provide a comprehensive framework for forensic investigation and does not replace the need for specialist forensic identification of victims. However, if the recommendations in the manual are not followed, identification of dead bodies in significant numbers will not occur. For example, many people nowadays believe that DNA technology alone suffices for identification. However, it is necessary to implement all the recommendations of this manual before **any** unique identifying method (whether fingerprints, DNA or dental examination) can be used effectively following disasters (see Annex 8).

Immediately after a disaster there is little time to read guidelines, so this manual dedicates one chapter to each key task and uses bullet-points for brevity and clarity. Local coordinators can easily copy and distribute the relevant chapters to individuals responsible for specific tasks, such as body recovery.

The manual also includes material to assist planners and managers to prepare for future disasters and to carry out training of first responders.

In summary, what is set out in this manual is an immediate response for managing the dead following a disaster. This response is:

- * considerate of the dignity of the dead;
- * respectful of the bereaved;
- * realistic about logistical and human resource constraints;
- * as effective and efficient as possible in ensuring the traceability and identification of the dead;
- * a preparation for the next and necessary step, namely a proper and graduated operation to identify as many of the remaining unidentified bodies as possible. If available, this will involve forensic experts who will rely on the results of the work initiated by first responders.

The length and scope of the immediate response will vary according to the size, context and type of disaster. Close communication and coordination between those responsible for the immediate disaster response – e.g. first responders, some international organizations such as the International Committee of the Red Cross (ICRC), the World Health Organization (WHO), the United Nations (UN) – and those responsible for disaster victim identification (DVI)² (usually police and forensic experts applying Interpol DVI principles) is mandatory, and should be pursued as soon as possible, and ideally, even before disaster strikes.

If this approach is taken, an orderly, graduated response to the identification of as many bodies as possible can be realized.

Throughout the manual the terms “dead bodies”, “the deceased” or “the dead” are used, instead of the more respectful and technically correct term “human remains”, because the former are less ambiguous for readers. The term “body part” is used to refer to tissue that is recognizably human but is less than a whole body; body parts are treated in the same manner as the whole body.

2. PLANNING AND COORDINATION

Aims

1. To promote effective leadership and coordination among agencies to plan and deliver the response.
2. To ensure that available resources are used effectively and efficiently to manage the dead bodies.

Overview

1. Disaster management plans should be developed in advance (see Annex 4).
2. The plans should include special arrangements for dead bodies (e.g. see Annex 5), which are then implemented by first responders:
 - * Planning should be initiated by the senior emergency management, health or police official responsible for disaster planning, or by the professional responsible for forensic medicine.
 - * Special arrangements should be developed jointly with police, faith representatives, government (including the Ministry of Health), local authorities, the voluntary sector (including Red Cross/Red Crescent) and experts.
 - * Special arrangements should be in line with existing coordination mechanisms on the ground.
 - * Coordination is needed at several levels: local, regional/provincial, national and international.
 - * In humanitarian crises, international assistance is organized in clusters³, and the health cluster is the one most likely to deal with management of the dead bodies, in coordination with other relevant clusters.
3. In delivering the response, prior coordination is vital to:
 - * assess the scale and scope of the response needed;
 - * identify required resources (e.g. forensic teams, mortuaries/body storage facilities, body bags, etc.);
 - * liaise with the regional/national agency responsible for the management of the dead;
 - * implement the plan of action for managing the dead and dealing with the families;
 - * collect and manage information about the dead bodies and about those missing or presumed dead, and record information on those missing in the Missing Persons Information Form (Annex 2);
 - * share accurate information with families and communities about the management of the dead and their identification;
 - * ensure culturally appropriate practices are followed in managing the dead, including their temporary storage or burial.

Planning and coordination should include the provision of the necessary equipment for first responders. In Box 1 the items marked with * are the essential items whereas the rest are desirable items to have.

Box 1. Items for the recovery of the dead

Protective equipment:

1. Impermeable aprons*
2. Disposable overalls: XXL, XL and L sizes preferable
3. Protective eye-wear (i.e. goggles)
4. Gloves (heavy duty and mortuary types, large sizes)*
5. Rubber (washable) boots*
6. Masks (surgical disposable)
7. Masks (chemical/fume protection) + supplies (i.e. canisters)
8. Insect repellent
9. Sunscreen
10. Hand and surface disinfectants (soap, liquid)*
11. Wet wipes
12. First-aid kit*

Recovery, transportation and storage equipment:

1. Body-bags (carrier bags with handles)*
2. Stretcher/s
3. White sheets
4. Zippered plastic bags, with writing surface (evidence collection bags ideal), 3 sizes*
5. Screw-top containers for sealed storage of samples
6. Paper bags, 3 sizes
7. Industrial garbage bags
8. Cardboard boxes (for skeletal remains)
9. Water-resistant adhesive tape
10. Cutter/s or scissors
11. Sample tubes (plastic, with writing surface)
12. DNA sample collection kits (FTA/Whatman paper-based) (only for first responders with managers to guide them)
13. Tarpaulins/plastic sheets
14. Rope (25 metres)
15. Spade/s
16. Pickaxe
17. Screen (medium mesh)
18. Trowels

19. Axe/machete
20. T-sound (metal ground probe), at least 2 metres long
21. Communications equipment

Record-keeping equipment:

1. Cable ties, ankle size*
2. Body-tags (see Annex 3), waterproof with printed numbers. Otherwise use tags with writing surface to write unique body code (sturdy, plastic or metal, with holes for cable ties and writing surface)*
3. Indelible markers*
4. Pens and pencils*
5. Flashlight (LED/head lamp/s)
6. Laptop/s
7. Photographic camera/s (preferably digital, 7-8 megapixels, and should include spare batteries, memory cards and memory card reader for laptop)*
8. Scale/s (evidence scales ideal)
9. Stakes (aluminium, tent stakes)
10. Measuring tape (metal, 10 metres)
11. Barrier or scene tape, to secure scene (at least 100 metres)
12. Paint-spray (can/s)
13. Pegs/flags (for marking evidence)
14. Forms: Dead Body Data Form (Annex 1) and Missing Persons Form Annex 2) *
15. Forms: INTERPOL DVI Scene, AM and PM forms.
16. Stapler (and staples)
17. Clipboard
18. Squared A4 paper, preferably waterproof (if no waterproof paper is available, ensure plastic cover for clipboard and folders to store paper)
19. Compass
20. North arrow
21. GPS

Effective local coordination

- ◆ As soon as possible, and in accordance with existing disaster management plans, identify the agency and name the person to serve as the local coordinator with full authority and responsibility for the management of the dead (e.g. local governor, police chief, military commander or mayor).
- ◆ The selection of medical or hospital directors as coordinators should be discouraged as their primary responsibility is the care of the living and the injured.
- ◆ Establish a team to coordinate management of the dead. Include available key operational partners such as the military, civil defence, fire service, local emergency departments, and search and rescue organizations, the national Red Cross/Red Crescent Society, local funeral homes, morticians and coroners. Include religious authorities and others with a good understanding of cultural practices, including burial.
- ◆ If present, include the health representation or UN Office for Coordination of Humanitarian Affairs (UNOCHA) in the team in order to liaise with international search-and-rescue teams or DVI teams from other countries. If international assistance is not present but is needed, appoint a person to liaise with the authorities to bring this about (see Annex 11 for a list of international organisations).
- ◆ Appoint persons to be in charge of one or more of the following activities and provide them with the relevant chapters of this manual:
 - * Health and Safety (Chapter 3, for all first responders);
 - * Allocating a Unique Code to the Dead Bodies (Chapter 4);
 - * Taking Photographs and Recording Data from Dead Bodies (Chapter 5);
 - * Recovery of Dead Bodies (Chapter 6);
 - * Temporary Storage of Dead Bodies (Chapter 7);
 - * Traceable Long-Term Storage and Disposal of Dead Bodies (Chapter 8);
 - * Support for Families and Relatives (Chapter 9);
 - * Collection and Management of Information on the Missing (Chapter 10);
 - * Communication with Families and the Media (Chapter 11);
 - * Logistics (Chapters 4, 5, 6, 7 and 8).

Effective regional and national coordination

- ◆ As soon as possible, name a person as national or regional coordinator with the appropriate authority for the management of the dead (e.g. minister, governor, police chief, military commander or mayor).
- ◆ Refer to the mass fatality section of your disaster management plan.
- ◆ Establish a coordination group including key individuals to advise on:
 - * liaison with the local agency and responsible person;
 - * logistical support (e.g. military or police);
 - * technical support for allocating unique codes to, and collecting and recording data from, the dead bodies;
 - * managing information about the dead bodies and about those missing or presumed dead;
 - * legal issues about identification and death certification;
 - * communications with the public and the media;
 - * liaison with diplomatic missions, intergovernmental and international organizations (e.g. United Nations, World Health Organization, International Committee of the Red Cross, International Federation of Red Cross and Red Crescent Societies, Interpol) regarding the management of deceased foreign nationals (see Annex 9).

DO'S AND DON'TS

- ◆ Do include the management of the dead in every disaster response plan.
- ◆ Do plan in advance for a disaster where first responders will need to deal with the dead.
- ◆ Do understand that a good early response enables and certainly increases the number of identifications.
- ◆ Do not ignore the dead in disaster planning.
- ◆ Do not ignore the needs of the families of the dead.

3. HEALTH AND SAFETY – INCLUDING INFECTIOUS DISEASE RISKS OF DEAD BODIES

Aims

1. To promote the safe handling of dead bodies.
2. To improve the understanding that the risk to first responders and to the public generally of infectious disease spreading from dead bodies is very low.

Note: This chapter does not cover disasters involving chemical or radiation hazards. These are beyond the scope and capacity of first responders who should not be involved in the response to such disasters. This chapter also does not cover all requisites for first responders dealing with deaths from highly infectious disease (e.g. Ebola). Special training and special protective equipment are mandatory before handling bodies suspected of harbouring highly infectious agents (see Annex 6). The following deals mainly with natural disasters.

Overview

1. After disasters there is often fear that dead bodies will cause epidemics.
2. This general belief is not supported by evidence, and is often wrongly reported by the media and by some medical and disaster professionals.⁴
3. The political pressure brought about by these rumours can result in unnecessary (and medically unjustified) measures such as rapid and disrespectful mass burials and the use of so-called “disinfectants”.
4. Dead bodies in general do not cause epidemics after disasters due to natural hazards.
5. The surviving population is much more likely to spread disease.
6. The only time dead bodies pose a health risk of epidemics is when the deaths resulted from a highly infectious disease (e.g. Ebola, cholera, Lassa fever) or when a natural disaster occurs in an area where such disease is endemic.
7. The consequences of mismanagement of the dead include long lasting mental distress for their families as well as social and legal problems.

Infectious disease transmission and dead bodies

- ◆ Victims of natural disasters usually die from injury, drowning or fire, and not from disease.
- ◆ At the time of death, victims of such disasters are not likely to be sick with infections that cause epidemics (e.g. plague, cholera, typhoid, anthrax, Ebola).
- ◆ Some victims may have chronic bloodborne infections such as hepatitis or HIV, or may have tuberculosis, or diarrhoeal or other infectious diseases.
- ◆ Infectious organisms survive for a variable time in dead bodies. Many do not survive beyond 48 hours but others do. The latter include HIV⁵ and Ebola⁶.

Risk to the public

- ◆ There is a risk (which has never been measured or documented) of drinking water from sources becoming contaminated by faecal material released from dead bodies and possibly causing diarrhoea.

Risk to body-handlers

- ◆ The bodies of people killed in disasters may be bloodstained and/or leaking faeces and other body fluids (e.g. stomach contents).
- ◆ Persons who have direct contact with blood, faeces or other body fluids have a small risk of infection while handling dead bodies with the following diseases:
 - * hepatitis B and C
 - * HIV/AIDS
 - * diarrhoeal diseases.
- ◆ High risks exist when handling dead bodies in epidemics due to highly infectious diseases. Examples include Ebola, other viral haemorrhagic fevers and cholera (see Annex 6)
- ◆ Body handlers are also at risk from other hazards:
 - * injuries from working in hazardous environments (e.g. collapsing buildings and falling debris, heat stroke, hypothermia, etc.) and tetanus (transmitted via soil);
 - * psychosocial problems, including from stigmatization by family, friends or others in the community because of their role in managing the dead;
 - * communities (possibly angry in their grief) which do not welcome first responders involved in dead body management.

Safety precautions for body-handlers

- ◆ Health and safety precautions should take into account existing environmental hazards.
- ◆ Basic hygiene helps to protect workers from diseases spread by blood and other body fluids.
- ◆ Workers should also be trained, preferably prior to the disaster, to:
 - * use basic personal protection equipment, including at least waterproof gloves, an apron and boots (see Fig. 3.1);
 - * not wipe face or mouth with hands;
 - * understand that face masks are not essential;
 - * wash hands with soap and water after handling bodies and before eating;
 - * thoroughly wash all clothes and equipment that will be re-used;
 - * clean the vehicles used in transportation of bodies.
- ◆ The recovery of bodies from confined, unventilated spaces should be approached with caution. After some days of decomposition, potentially hazardous toxic gases (e.g. ammonia) can build up. Time should be allowed for fresh air to ventilate confined spaces. In some circumstances, special masks may be required for health and safety purposes, including when toxic gases, smoke, particles, etc. are present.
- ◆ Psychosocial support, including debriefing with co-workers and managers, should be in place for body-handlers. Colleagues, family and other social groups could also provide support.
- ◆ See Chapter 6 for recommendations on the use of body bags.



Fig. 3.1: Basic personal protection equipment: gloves, apron, boots (the mask, here in his hand, is optional)

DO'S AND DON'T

- ◆ Do seek security clearance of the site before proceeding with the search and recovery of dead bodies.
- ◆ Do ensure that first responders are aware of the risks of entering potentially hazardous environments.
- ◆ Do treat bodies carefully and with respect.
- ◆ Do understand that in deaths from natural disasters (earthquakes, floods, typhoons) the risk of infectious disease transmission is extremely low, especially with the basic precautions outlined above.
- ◆ Do inform people that dead bodies resulting from natural disasters generally do not cause epidemics (unless the deaths were due to a highly infectious disease, or the disaster has occurred in an area where highly infectious disease is endemic).
- ◆ Do provide necessary support to workers helping to manage the dead.
- ◆ Do not allow untrained first responders to manage the dead where deaths are due to highly infectious diseases.
- ◆ Do not allow untrained first responders to manage the dead in an area where a highly infectious disease is endemic.
- ◆ Do not allow first responders to manage the dead in disasters with chemical or radiation risks.

4. ALLOCATING A UNIQUE CODE TO THE DEAD BODIES

Aim

1. To explain how to allocate a unique code to the dead bodies

Overview

1. To avoid loss of bodies, to ensure correct documentation and traceability, and to help identify dead bodies, a unique code must be allocated to each body.
2. All information collected and recorded about individual dead bodies is also allocated this unique code.
3. The unique code assigned to a body should be more than a simple number. It should be a combination of text and a number in order to avoid duplication and confusion.

Process

- ◆ Assign a unique code (it should include text and a sequential number) to each body or body part.
- ◆ Unique body codes must not be duplicated.
- ◆ Prior agreement on a standard approach to creating unique body codes is recommended.
- ◆ An example of a unique body code is a composite of three items: i) the name of the place where the body was found; ii) the name of the team which located the body; and iii) a number.
- ◆ Inclusion of the specific place where the body was found and the name of the team which discovered the body will strengthen the unique body code. The unique body code must also be recorded on the Dead Body Information Form (see Annex 1).
- ◆ For the unique body code, do not use a simple number alone as this may be duplicated and cause confusion.

The body's unique code should be included on all photographs and should accompany all data, including forms and associated evidence, collected from the body.

Label

- ◆ Annex 3 is an example of a label which could be used to record the unique body code as well as record the chain of custody of the dead body. Write the unique body code on two waterproof labels (or paper sealed in plastic) and securely attach the labels to:
 - * the body (e.g. the wrist or ankle) or body part, and to
 - * the container for the body or body parts (e.g. body bag, cover sheet or bag for the body part).

DO'S AND DON'TS

- ◆ Do allocate a unique code to each dead body as soon as possible.
- ◆ Do attach this to the body (or body part) AND to its container.
- ◆ Do make sure that the unique code is included and readable in all photographs and on all data recorded about the body.
- ◆ Do not use a simple number only as the unique code because this may cause duplication and confusion.

5. TAKING PHOTOGRAPHS AND RECORDING DATA FROM DEAD BODIES

Aims

1. To explain that dead bodies should be documented with photographs and by the collection and recording of simple data.
2. To describe how to collect and record the required photographs and data.

Overview

1. As it may take several days or longer for forensic experts to be mobilized, it will be first responders who will have the early opportunities to take valuable photographs and collect and record data from the dead bodies. These valuable opportunities will be lost as the bodies decompose.
2. Identification of dead bodies is based on: i) proper recovery of the dead (allocating a unique code to the body, labelling it and temporarily storing the body so that it can be retrieved); ii) collecting information, including photographs, from the dead bodies as soon as possible; and iii) matching this information with information about individuals who are missing or presumed dead (see Chapter 10).⁷
3. Sooner is better for photographing the dead and collecting and recording information from them. Even so, valuable information for identification purposes may be collected by first responders even at a later stage of decomposition.
4. The Dead Body Information Form in Annex 1 can be used to collect simple, valuable information that will aid later identification of the bodies.

General principles

- ◆ Visual recognition of dead bodies is relied upon in normal circumstances, in the period before the onset of decomposition and with the assistance of professionals, as a means of formal identification. In circumstances following disasters without expert oversight, visual recognition can be mistaken. These mistakes cause serious distress and legal difficulties for the bereaved, and embarrassment to the authorities.
- ◆ Injuries, decomposition, or the presence of blood, fluids or dirt, especially around the head, will increase the chance of mistaken visual recognition.
- ◆ For accurate identification of large numbers of bodies, forensic expertise is required.
- ◆ In disasters, it is preferable not to rely on visual recognition but to supplement this by applying additional criteria (matching information, fingerprinting, dental examinations, and/or DNA). The success of any of these applications relies heavily on the key early steps taken by first responders, including allocating a unique body code and labelling the body with it, taking photographs and completing the Dead Body Information Form. The dead body must be labelled with, and the form must include, the unique body code.
- ◆ Any separate body part must be managed as though it were a whole body and assumptions must not be made that a separate body part belongs to an adjacent or nearby body.

Photograph (mandatory if situation allows and photographic equipment is available)

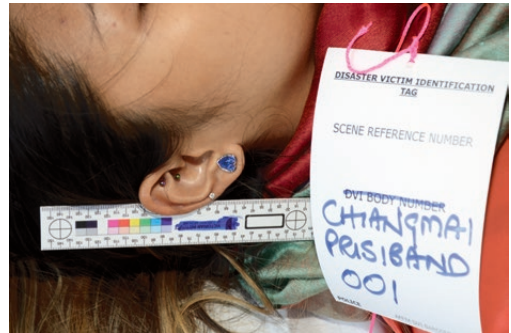
- ◆ The importance of early photography prior to the onset of decomposition cannot be overstated. If at all possible, the photographs of the body should be taken as soon as the unique body code is allocated, at the time of recovery of the body. This is likely to be the single most important contribution enabling the body to be identified.
- ◆ The unique body code must be included, and must be readable, in all photographs. This may require the creation of a new label solely for the photographs if the labels already attached to the body are too small or cannot be used in all photographs.
- ◆ If available, digital cameras allow for easier storage and distribution of photographs.
- ◆ Clean the body sufficiently to allow facial features and clothing to be properly represented in the photographs.
- ◆ The photographs must include separate pictures of:
 - * the full length of the body, front view (Fig. 5.1)
 - * the whole face, front view (Fig. 5.2)
 - * any obvious distinguishing features (Fig. 5.3 – Fig. 5.5)
 - * all clothing or other items being worn e.g. bracelets (Fig. 5.2 – Fig. 5.5)
 - * and preferably, a scale.
- ◆ If circumstances permit, or at a later time, additional photographs, with the unique code, can be included of the following:
 - * the upper part of the body
 - * the lower part of the body
 - * side views of the face
 - * any personal belongings.
- ◆ When taking photographs the following should be considered:
 - * Blurred photographs will not be useful.
 - * Photographs must be taken close to the dead body. When the face is photographed, for instance, it should fill the entire frame.
- ◆ The camera lens should be at a right angle to the plane of interest to reduce distortion. For example, do not take the picture of the whole body while standing at the head or feet, but take it while standing beside it, level with the middle of the body.



5.1: Full length of the body, front view



5.2: Whole face, front view



5.3: Distinguishing features and personal effects



5.4: Distinguishing features and personal effects



5.5: Distinguishing features and personal effects

Fig. 5: Examples of photographs suitable for documentation purposes at time of body recovery

Data from dead bodies

- ◆ Basic data about the dead body, such as his/her general condition, state of preservation, physical characteristics and external appearance, must be collected as soon as possible. While realising that often it will be difficult, every effort should be made to do this before the onset of decomposition.
- ◆ Data should be recorded as soon as the recovery operation starts. Recovery teams are advised to assign a person to be responsible for recording information on dead bodies and recovery locations using the Dead Body Information Form (Annex 1). This is a simple form containing the basic information that needs to be recorded about the dead body and its recovery location.
- ◆ Any personal belongings or other materials clearly associated with a single body should remain with the body, placed in the body bag or container, and recorded under the unique body code.⁸ By doing this, the risk of personal effects being lost or misplaced is minimized.
- ◆ Bodies and corresponding personal belongings, as well as related information (Dead Body Information Form, photographs, etc.) must be traceable throughout the process. For this purpose the use of the Dead Body Information Form as a record is highly recommended as part of the chain-of-custody process (Annex 1, section D) when dead bodies or relevant documentation are handed over to another appropriate authority.

Record (mandatory)

- ◆ Always record the following data, together with the unique body code, using the Dead Body Information Form in Annex 1:
 - * sex (if recognizable without full body search)
 - * approximate age range (infant, child, adolescent, adult or elderly)
 - * personal belongings (jewellery, clothes, identity card, driver's licence, etc.)
 - * obvious specific marks on the skin (e.g. tattoos, scars, birthmarks) without removing clothes
 - * any obvious deformity.
- ◆ Also record:
 - * height
 - * colour and length of hair
 - * obvious dental features.

Secure (mandatory)

- ◆ After examination, recording and photographing of personal belongings from the body, these should be left on the body or in the clothing where they were found.
- ◆ Clothing should be left on the body.

Identification and release of body to relatives

- ◆ Identification and release of dead bodies is under the responsibility of the authorities.
- ◆ The scientific identification of the bodies is the domain of forensic experts, applying Interpol DVI Guidelines. Such experts should be involved in the identification process if they are available.
- ◆ However, it is recognized that in some contexts forensic experts may not be available.
- ◆ In such circumstances, to increase the reliability of any visual recognition, viewing conditions should minimize emotional stress of bereaved relatives.
- ◆ The viewing of high-quality photographs, especially if taken prior to decomposition, may be more reliable, acknowledging that this too is very stressful for bereaved relatives.
- ◆ This can be supplemented by the viewing of photographs of clothing and belongings.
- ◆ The presence of the unique body code in the photograph enables the correct body to be retrieved.
- ◆ Bodies that cannot be identified should be properly stored (see Chapter 8) until it is possible for forensic experts to investigate.

DO'S AND DON'TS

- ◆ Do use the Dead Body Information Form and complete it legibly.
- ◆ Do follow the guidelines on photography – clear photographs taken as early as possible before putrefaction, and with the unique body code visible, are vital for later identification.
- ◆ Do not remove any clothing, personal belongings or other artefacts from dead bodies (except to examine, record and photograph them) as they can serve as valuable clues that may assist in later identification.

6. RECOVERY OF DEAD BODIES

Aim

1. To describe the approach to the recovery of dead bodies.

Overview

1. The rescue and care of survivors should take precedence over dead bodies.
2. Effective recovery of dead bodies can make their future identification much easier.
3. The type of disaster and the area affected will have a major effect on recovery (e.g. earthquake, typhoon, landslide; remote community, city) and the time it takes.
4. This part of the process is essential for future identification and should be read in conjunction with Chapter 3 “Health and Safety – Including Infectious Disease Risks of Dead Bodies”, Chapter 4 “Allocating a Unique Code to the Dead Bodies” and Chapter 5 “Taking Photographs and Recording of Data from Dead Bodies”.
5. In planning this phase, consider allocating a unique code to the bodies, photographing and recording data from them at the time of their recovery.

Locating dead bodies

- ◆ This is often done by surviving family, friends and other first responders.
- ◆ Later, organized and experienced search and recovery teams may arrive.
- ◆ The risks of removing dead bodies from collapsed building or other dangerous places which usually accompany disasters need to be emphasized. Injury and death that occur in many phases of the disaster response, particularly recovery, are well recognized. Health and safety precautions should prevail as the operation proceeds.

Body recovery

- ◆ Rapid body recovery is a priority because it aids later identification and reduces the psychological burden on survivors. However, it should not interrupt other interventions aimed at helping survivors.
- ◆ Ideally, allocating the unique body code, taking photographs, documenting dead body data, and securing the documentation should occur around the same time as moving the body (see chapters 4 and 5).
- ◆ Dead bodies of adults are difficult to handle and normally at least two people are required to move them.
- ◆ The safety of the recovery team is paramount.
- ◆ Those recovering dead bodies should be familiar with Chapter 3 on Health and Safety.

Body bags or similar storage items available

- ◆ The dead body should be placed in a body bag at the place of recovery. Generally at least two people are needed to move an adult in a body bag (Fig. 6.1 – 6.6).



Fig. 6.1



Fig. 6.2



Fig. 6.3



Fig. 6.4



Fig. 6.5



Fig. 6.6

Fig. 6.1 – 6.6: Side-roll movement for placing a body in a body bag: The body, tagged around the wrist with its unique body code, having been placed on the ground (Fig. 6.1), is rolled to its side (Fig. 6.2). The body bag is partially rolled up, and the rolled portion is placed immediately adjacent to the back of the body on the ground (Fig. 6.2). The body is returned to lie on its back (Fig. 6.3). The rolled portion of the body bag is unrolled (Fig. 6.4) and the body bag is closed (Fig. 6.5). The bag is labelled (Fig. 6.6).

No body bags or similar storage items available

- ◆ If no body bags are available, the best way to move a dead body is with one person on each side of the body.
- ◆ One person supports the head and pelvic area while the other supports the upper back and lower thighs for both lifting the body and moving it.
- ◆ Alternatively, for heavier bodies or with a third person helping, one stands at the head end of the body supporting the head and shoulders, while the other two are on each side of the body supporting the back, pelvic area and legs. In this formation, the body is moved feet first.

After recovery of the body

- ◆ After dead bodies are recovered, they should be kept in the coolest possible area, protected from direct sunlight, scavengers and public viewing and should be secured.
- ◆ Ideally, if not already in one, each body should be in a body bag or similar storage item.
- ◆ If a collection centre is established (see Chapter 7), the bodies should be taken there for further processing.

DO'S AND DON'TS

- ◆ Do understand that proper recovery of dead bodies will help protect their dignity and contribute to their identification.
- ◆ Do understand that proper recovery of dead bodies includes allocating unique codes, taking photographs and completing the Dead Body Information Form.
- ◆ Do secure the information collected against loss.
- ◆ Do not interrupt or impede operations focused on saving or helping survivors.

7. TEMPORARY STORAGE OF DEAD BODIES

Aim

1. To describe the purpose and possible options for temporary storage of dead bodies.

Overview

1. Following a disaster which overwhelms normal response capacity, the ability to process bodies quickly is lost. This means that storing bodies temporarily may be necessary.
2. The aim of temporary storage of dead bodies is to be respectful, to preserve and protect the bodies as best as possible, and to improve the chance of identification.
3. Within 12–48 hours in hot climates, decomposition may be too advanced to allow facial recognition.
4. A collection centre should be established for temporary storage and, if not already gathered, the collection and recording of data from dead bodies (including photography).
5. Following collection of the data, the unidentified bodies can be temporarily buried unless better temporary storage is available.

Storage options

- ◆ Whichever storage option is used, each body or body part should be kept in a body bag or similar storage item before storage.
- ◆ Waterproof labels or paper in sealed plastic with the unique body code should be used. Do not write the unique body code directly on bodies or body bags/sheets only as it may be easily erased, or the sheet separated from the body, during storage.
- ◆ The preferred storage option is refrigerated containers which should be placed in a suitable location (e.g. as part of a collection centre).
- ◆ If refrigerated containers are not available, the preferred options are: i) orderly storage in a protected location that is as cold as possible (not in direct sunlight and preferably under cover); or ii) temporary burial (see below).

Refrigeration

- ◆ Refrigeration between 2°C and 4°C (35.6°F and 39.2°F) is the best option.
- ◆ Refrigerated transport containers used by commercial shipping companies can be used, with suitable racking, to store up to 50 bodies.
- ◆ Enough containers are seldom available at the disaster site and alternative storage options, such as a cool and protected room or environment, should be used until refrigeration becomes available.

Temporary burial

- ◆ Temporary burial, following allocation of the unique body code, taking photographs and completion of the Dead Body Information Form, provides a good option for early storage where no other method is available, where longer-term temporary storage is needed and where it does not conflict with cultural norms.
- ◆ The underground temperature is usually lower than that at the surface, thereby providing a form of natural cooling and protection, including from scavengers.
- ◆ Temporary burial sites should be constructed in the following way to help ensure future location and recovery of bodies:
 - * Use individual graves for a small number of bodies and trench burial for larger numbers.
 - * Burial should be 1.5 m deep and at least 200 m from drinking water sources.
 - * In trench burials, leave 0.4 m between bodies (see Fig. 7.1).
 - * Lie bodies side-by-side in one layer only (not on top of each other).
 - * Clearly mark each body and mark their positions at ground level including the unique body code.
 - * Consider the option of burying bodies head-to-toe if required.
 - * Create a sketch map of the burial site recording the location of bodies using the unique code (see Chapter 4).

Ice

- ◆ The use of dry ice (frozen carbon dioxide) is not recommended as it produces toxic carbon dioxide, can cause cold “burns”, and is a major logistical problem.
- ◆ The use of ice (frozen water) should be avoided where possible because:
 - * In hot climates ice melts quickly and large quantities are needed.
 - * Melting ice produces large quantities of dirty waste-water that may cause diarrhoeal disease.
 - * Disposal of this waste-water creates additional management problems.
 - * The water may damage bodies and personal belongings (e.g. identity cards).

DO'S AND DON'TS

- ◆ Do store bodies in a dignified manner.
- ◆ Do use temporary storage options, as required, to protect the dead bodies and make later identification easier.
- ◆ Do not use dry ice.



AFP/Getty Images

Fig. 7.1: Temporary burial of dead bodies in Thailand following the tsunami disaster on 26 December 2004

8. TRACEABLE LONG-TERM STORAGE AND DISPOSAL OF DEAD BODIES

Aims

1. To uphold the dignity of the dead by ensuring that dead bodies can be traced so that they are easily available from recovery to disposal.
2. To describe the long-term storage of unidentified and unclaimed dead bodies and associated evidence for continuing investigation and possible identification.
3. To ensure that the exact location of each dead body, as well as the associated information and personal belongings, is known.
4. To give families and communities a place for paying tribute to their loved ones remaining unidentified.

Overview

1. All identified dead bodies should be released to relatives or their communities for disposal according to local custom and practice.
2. Long-term storage (or, depending upon local custom, other disposal) will be required for remaining unidentified/unclaimed bodies.
3. Unidentified and unclaimed bodies should be properly preserved and documented for future identification and return to relatives.

Method of disposal/long-term storage

- ◆ Burial is the preferred option in the case of mass casualties and the most effective method as it preserves evidence for possible future identification.

Burial conditions

- ◆ A specific location should be identified as a burial area, with boundaries clearly established and protected (see Annex 7).
- ◆ Careful thought must be given to the location, the customs and wishes of the local community, and land ownership.
- ◆ Use of the site should be acceptable to those living in nearby communities.
- ◆ The site should be close enough for members of the affected community to visit.
- ◆ The burial site should be clearly marked and surrounded by a buffer zone that is at least 10 m wide to allow planting of deep-rooted vegetation and to separate the site from inhabited areas.
- ◆ Soil conditions and the highest water-table level should be considered. When possible, dry (sand-clay) and alkaline soil conditions are advisable to prevent water contamination and DNA degradation.

- ◆ Avoid the use of biodegradable body bags, lime or other chemical products.
- ◆ In exceptional circumstances, the use of trench burial may be necessary and is acceptable if properly managed.

Grave construction

- ◆ Human remains should be buried in clearly marked individual graves.
- ◆ For extreme disasters (i.e. very large numbers of fatalities with limited resources and/or capacity to dig individual graves), trench burial may be unavoidable.
- ◆ Burial sites should be at least 30 m from springs or watercourses and 200 m from any well or source of drinking water.
- ◆ Prevailing religious practices may indicate preference for the orientation of the bodies (e.g. heads facing east, or towards Mecca).
- ◆ Trench burial should consist of a trench holding a single row of bodies, each placed parallel to the other, 0.4 m apart.
- ◆ Although there are no standard recommendations for grave depth, it is suggested that:
 - ★ Graves should be between 1.5 m and 3 m deep.
 - ★ Graves with fewer than five people should allow for at least 1.2 m (1.5 m if the burials are in sand) between the bottom of the grave and the water table, or any level to which groundwater rises.
 - ★ For communal graves, the water table should be at least 2.5 m deep and the bottom of the grave at least 0.7 m above the saturated zone.
 - ★ These distances may have to be increased according to soil conditions.

Traceability

- ◆ Careful documentation and mapping of the burial site are important to ensure that the dead bodies can be traced throughout the process. In this way, the place of final disposal of those remaining unidentified is accurately recorded.
- ◆ Make sure that each dead body, **and** its body bag or coffin, is securely tagged with its unique body code on a waterproof label or paper in plastic before burial.
- ◆ On the surface place a permanent sign, marked with the unique code of the dead body buried there, to indicate the exact position of the body. It is best if the sign is made of concrete, or similar. Avoid the use of perishable reference points or easily removable materials to mark burial sites.
- ◆ List and map the overall burial site, the graves and the dead bodies with their unique body codes. The use of GPS coordinates of the overall burial site is highly recommended.
- ◆ All information on the overall burial site, the graves and the dead bodies must be recorded and stored centrally. It must include the precise location of every dead body to allow future forensic investigations and the transfer of the body to the family or community once an identification is made. It is highly recommended to copy and store the information in at least two different places or institutions to ensure its security.

DO'S AND DON'TS

- ◆ Do use adequate forms (e.g. chain-of-custody forms or receipts) upon receipt or handover of human remains, personal effects or documentation to ensure the traceability of the dead bodies.
- ◆ Do bury remaining unidentified dead bodies.
- ◆ Do guarantee the traceability of unidentified dead bodies by marking, mapping, recording and centrally storing the precise location of their final disposal.
- ◆ Do not cremate or mix unidentified dead bodies.

9. SUPPORT FOR FAMILIES AND RELATIVES

Aims

1. To inform first responders of the importance of supporting the bereaved.
2. To ensure that the bereaved are considered and respected throughout the process.

Overview

1. The dead and the bereaved should be respected at all times.
2. The priority for affected families is to know the fate of their missing loved ones.
3. Honest and accurate information should be provided at all times.
4. A sympathetic and caring approach is owed to the families throughout the process.
5. Psychosocial support for families and relatives should be considered.
6. Cultural and religious needs should be borne in mind throughout the process.

Identification of victims

- ◆ A family liaison focal point should be established to support relatives.
- ◆ Families should be allowed to report a missing relative and should be provided additional information.
- ◆ Families of the dead and missing must be given realistic expectations of the process, including the methods used and time frames for recovery and identification of remains.
- ◆ Identification efforts should be started as speedily as possible.
- ◆ Children should not be expected to aid in the visual recognition of dead bodies.
- ◆ Families should be informed about findings and the identification of their loved ones before anyone else.
- ◆ Once identified, bodies should be released as swiftly as possible to their next of kin.
- ◆ After identification, the need for relatives to view the bodies of their loved ones as part of the grieving process should be respected. Families should be informed about what to expect if they have a viewing.

Cultural and religious aspects

- ◆ The overwhelming desire of relatives in all religions and cultures is to identify their loved ones.
- ◆ Advice and assistance should be sought from religious and community leaders to improve understanding and acceptance of the recovery, management and identification of dead bodies.
- ◆ Undignified handling and disposal of dead bodies may further traumatize relatives and should be avoided at all times. Careful and ethical management of dead bodies, including disposal, should be ensured, including respect for religious and cultural sensitivities.

Providing support

- ◆ Psychosocial support should be adapted to needs, culture and context, and should consider local coping mechanisms.
- ◆ Local organizations such as the national Red Cross/Red Crescent societies, nongovernmental organizations (NGOs) and faith groups can often provide emergency psychosocial care for those affected.
- ◆ Priority care should be given to unaccompanied minors and other vulnerable groups. Where possible, they should be reunited with, and cared for by, members of their extended family or community.
- ◆ Material support may be necessary for funeral rituals (e.g. burial shrouds, coffins, firewood, etc.).
- ◆ Special legal provisions for those affected (i.e. rapid processing of death certificates) should be put in place and publicized within the affected communities.

DO'S AND DON'TS

- ◆ Do involve families as early as possible in decisions which affect them.
- ◆ Do not raise false hopes or expectations in the minds of families and relatives.

10. COLLECTION AND MANAGEMENT OF INFORMATION ON THE MISSING (INCLUDING THOSE PRESUMED DEAD)

Aims

1. To inform first responders that the later identification of dead bodies requires
 - * the development of a list of missing persons, and
 - * information about missing persons.
2. To ensure that information on missing persons is effectively collected, recorded and made accessible so that dead bodies can be identified.

Note: The reference to missing persons includes those presumed to be dead.

Overview

1. Without a list of those missing, including those presumed to be dead, and information about them which can be compared with the information available about the dead bodies, it will not be possible to identify the dead bodies.

Organizational arrangements

- ◆ Information centres should be established at regional and/or local levels as part of the immediate implementation of disaster management plans.
- ◆ Within the locality, people dealing with information management should be quickly appointed to compile a missing persons list.
- ◆ Their responsibilities include consolidation and centralization of information as well as outreach with the public. They are particularly necessary for receiving tracing requests and information about the missing and for the release of information on people or bodies found or identified.
- ◆ A reliable and consolidated list of missing persons is a necessary and mandatory step towards identification efforts. Tracing services of the International Committee of the Red Cross and national Red Cross/Red Crescent societies may assist in this task.
- ◆ In the chaotic circumstances that prevail during disaster situations, it is often the case that a single person who is unaccounted for is reported multiple times to different agencies and by different family members. It is therefore important to record first names, family names, and aliases in a coordinated and standardized manner, as well as to assign unique identifying codes to every case in order to avoid confusion and duplication.

Information on missing persons

- ◆ At the same time as a consolidated missing persons list is being created, it is important to begin collecting individual information on each missing person. Such information is obtained from family members, friends or other sources and is recorded on the Missing Person Information Form. A simple Missing Persons Form, sections of which can be edited to better suit the particular context, can be found in Annex 2. Ideally the process of information collection should be carried out by trained personnel but first responders may be needed if trained people are not available. It is important to treat the relatives of persons who are missing with sympathy and respect, acknowledging the stress they are under.
- ◆ Interviewed family members should be asked if they consent to the information being used for identification purposes only, and this consent documented. Any information on missing persons should be regarded as highly confidential and should not be shared with unauthorized parties.

Centralization of information

- ◆ Information on missing persons and unidentified human remains may be stored centrally in an electronic database, under the guidance of a data management specialist, to assist in the tracing and identification efforts.
- ◆ The consolidation of data in one central database makes it easier for forensic experts to compare the information on unidentified human remains with information on missing persons to seek a possible match.
- ◆ Subsequently, by managing both the dead and corresponding information in a coordinated and standardized manner, the chances of successful identification are maximized while the chances of misidentification are minimized

DO'S AND DON'TS

- ◆ Do use the Missing Person Information Form following communication with the information centre, filling in the form as legibly and accurately as possible.
- ◆ Do not share any information on missing persons with any unauthorized person or with the media.

11. COMMUNICATION WITH FAMILIES AND THE MEDIA

Aims

1. To protect the dignity of victims and to respect their families by proper handling of personal, sensitive and confidential information.
2. To contribute to a successful victim recovery and identification process by good public communication which includes regular release of accurate and updated information.

Overview

- ◆ Good public communication contributes to a successful victim recovery and identification process.
- ◆ Accurate, clear, timely and updated information can reduce the stress experience of affected communities, defuse rumours and clarify incorrect information.
- ◆ The news media (television, radio, newspapers and the Internet) are vital channels of communication with families and the public during mass disasters. Journalists, both local and international, often arrive soon after the disaster happens.

Informing the relatives

- ◆ An information centre for relatives of the missing and the dead should be set up as soon as possible so that relatives can be informed regularly about the search and recovery operations.
- ◆ Only final results of identifications should be provided, along with more general information at all stages of the recovery and identification process.
- ◆ Families of identified victims should be informed individually prior to the release of information to the media.
- ◆ When dealing with large-scale disasters, during which it is impossible to invite all the relatives of possible victims, a wide range of media can be used, such as:
 - * Internet, social media
 - * noticeboards
 - * newspapers, television, radio, etc.

Working with the media

- ◆ Generally, journalists want to report responsibly and accurately. Keeping them informed will minimize the likelihood of inaccurate reporting.
- ◆ Engage proactively and creatively with the media:
 - * Media liaison officers should be appointed to deal with both local and international media.
 - * Establish a media liaison officer as near as possible to the affected area
- ◆ Cooperate proactively (prepare regular briefings, facilitate interviews, etc.).

Working with the public

- ◆ The information centre should make available a consolidated, updated list of confirmed dead and confirmed survivors, with details of missing individuals recorded by official staff.
- ◆ Information should be provided about the processes of recovery, identification, storage and disposal of dead bodies.
- ◆ Arrangements for death certification may also need to be explained.

Working with relief agencies

- ◆ Humanitarian workers and relief agencies – including United Nations agencies, the International Committee of the Red Cross and national Red Cross/Red Crescent societies – have direct contact with affected communities and may act as a source of local information.
- ◆ Aid workers are not always well informed and may give conflicting information, especially about the infectious risk of dead bodies.
- ◆ Providing correct information to aid agencies on management of the dead will help to reduce rumours and dissemination of incorrect information.

Information management

- ◆ Care is needed to respect the privacy of victims and relatives.
- ◆ Journalists should not be allowed direct access to photographs, individual records, or the names of victims. However, authorities may decide to release this information in a managed way to help with the identification process.

DO'S AND DON'TS

- ◆ Do prepare for communicating with families and the media.
- ◆ Do communicate with families and the media in a proactive way.
- ◆ Do consider using the media wisely through official channels and to the advantage of the operation.
- ◆ Do not share private information with the media.

12. FREQUENTLY ASKED QUESTIONS

1. Do dead bodies cause epidemics?

No, dead bodies from natural disasters generally do not cause epidemics. This is because victims of such disasters usually die from trauma, drowning or fire and do not normally harbour organisms which cause epidemics.

The exception to this is when deaths have occurred from highly infectious diseases (such as Ebola, Lassa fever, cholera), or when the disaster occurred in an area that is endemic for such highly infectious diseases. In these circumstances, the possibility of disease spreading from dead bodies exists.

2. What are the health risks for the public?

Unless the deceased has died from a highly infectious disease, the risk to the public is negligible. However, there is a risk of diarrhoea from drinking water contaminated by faecal material from dead bodies. Routine disinfection of drinking water is sufficient to prevent waterborne illness. (See question 6 for the health risks to those handling dead bodies.)

3. Can dead bodies contaminate water?

Yes they can, as do live bodies. Dead bodies often leak faeces which may contaminate rivers or other water sources, causing a risk of diarrhoeal illness which adequate treatment of water can prevent.

4. Is spraying bodies with disinfectant or lime powder useful?

Lime powder does not hasten decomposition and, since dead bodies are generally not an infectious risk to the public, disinfectant is not needed.

5. Local officials and journalists say there is a risk to the public of disease from dead bodies. Are they correct?

The risk from dead bodies after disasters due to natural hazards is misunderstood by many professionals and the media. Even local or international health workers are often misinformed and contribute to the spread of unfounded rumours about outbreaks and epidemics. Dead bodies from natural disasters generally do not cause epidemics. The risk of disease from dead bodies is real only in cases where the deceased has died of a highly infectious disease, or has died in an area where such infectious disease is endemic. Even then, the risk of disease transmission to a trained body-handler is low (see question 6)

6. Is there a risk for those handling dead bodies?

For people handling dead bodies (rescue workers, mortuary workers, etc.), there is a risk if the deceased are infected with highly infectious disease (such as Ebola, Lassa fever, cholera). The infectious agents responsible for these diseases last for varying periods after death. The internal organs that harbour organisms such as tuberculosis, which can survive for very long periods after a person's death, are usually handled only by trained personnel during actual autopsy. This is not part of any procedure described in this manual. Processes to support persons handling the dead should be in place to deal with any psychological impacts arising from their work.

7. Should workers wear a mask?

The smell from decaying bodies is unpleasant, but the smell itself is not a health risk in well-ventilated areas, and in such areas wearing a mask is not generally required for health reasons. However, special masks may be required for health and safety purposes in some circumstances, including in the presence of toxic gases, smoke, particles, etc.

8. How urgent is the collection of dead bodies?

Body collection is *not* the most urgent task after a disaster from natural hazards. The priority is to rescue and care for survivors. Nevertheless, bodies should be collected and photographed as soon as possible (and preferably before decomposition has commenced), basic information about the bodies should be collected and recorded, unique body codes allocated, and the bodies should be temporarily stored to protect them and to assist possible identification. The earlier this is done, the greater the number of bodies which will be identified. In the presence of an epidemic of highly infectious disease, collection and proper management of dead bodies by trained personnel is an urgent priority.

9. Should mass graves be used to speed up disposal of dead bodies?

Rapid mass burial of victims on public health grounds is not justified. Rushing to dispose of bodies without having taken photographs and relevant information from them, and without keeping track of the location of each body, traumatizes families and communities. If these simple steps to identify the greatest possible number of bodies are taken, serious social and legal consequences for families can be avoided. In exceptional circumstances, the use of communal graves as a form of temporary traceable storage and protection of dead bodies is acceptable if properly managed.

10. What should the authorities do with dead bodies in the short term?

Dead bodies should be collected and stored, using refrigerated containers where possible, or temporary burial. The simple steps required to help identify all the dead bodies should be taken. Photographs should be taken and descriptive information recorded for each body. Remains should be stored or buried temporarily to allow for the possibility of an expert forensic investigation in the future.

11. What are the minimum steps needed to identify as many dead bodies as possible?

Identifying dead bodies following disasters can be complex. The minimum steps needed to identify as many dead bodies as possible are set out in the *Management of Dead Bodies after Disasters* manual. In general terms, identifying a dead body is done by comparing information about the person while alive with information about the dead body. Thus, information about those who are missing or presumed to be dead is needed (a list of the missing, and specific individual information about each missing person). Also information about the dead body is needed (photographs, preferably taken before decomposition has started, and information about identifying features, clothing and personal effects). In order to keep track of this information, the body needs to be given a unique code which must be in all the photographs, and on all the information collected; and attached to the body and the body bag, and any burial site, so that its location can be recorded, and the body retrieved at any time. Ideally, forensic experts should be involved, but this is not always possible.

12. What are the potential mental health issues for the bereaved?

The overwhelming desire of relatives (from all religions and cultures) is to identify their loved ones. All efforts to identify the bodies will help. Grieving and traditional individual burial (or other means of disposal of the body) are important factors for the personal and communal recovery or healing process. In the case of epidemics, traditional burial rites may not be appropriate because of the health risks involved. The psychological issues arising from this must be taken into consideration.

13. How should bodies of foreigners be managed?

Overseas families of visitors killed in a disaster, just like local families, will be hoping their loved one is identified and the body is returned to them. Proper identification has family, social, economic and diplomatic implications. The simple steps required (allocation of a unique body code, photographs, data from the dead bodies collected and stored) will maximize the number of foreigners identified. Foreign consulates and embassies should be informed, and other relevant agencies (ICRC, Interpol, etc.) should be contacted for assistance.

14. I am a volunteer: how can I help?

To be helpful you could promote the proper recovery and management of dead bodies and assist in recording necessary information. You could also assist with the recovery and disposal of the dead, under the direction of a recognized coordinating authority. However, you would first need to be briefed, advised, trained, equipped and supported for this difficult task. The field manual on *Management of Dead Bodies after Disasters* should be the framework for your participation.

15. I represent an NGO: how can I help?

Providing support for families and collecting information in collaboration with the coordinating authority will best help the surviving relatives. You may also promote proper identification and treatment of the dead, including through dissemination of the field manual on *Management of Dead Bodies after Disasters*. NGOs should not be asked to manage the dead unless they are trained for this task and work for and under the direct supervision of a legal authority.

16. I am a health professional: how can I help?

The survivors need you more than the dead. Any professional help in fighting the myth of epidemics caused by dead bodies will be appreciated. Talk about this with your colleagues and representatives of the media with reference to the field manual on *Management of Dead Bodies after Disasters*.

17. I am a journalist: how can I help?

If you hear comments or statements regarding the need for mass burial or incineration of bodies to avoid epidemics, challenge them. Promote an understanding of the field manual on *Management of Dead Bodies after Disasters*, including by referring to it in your reports. If necessary, do not hesitate to consult the appropriate persons at WHO, PAHO, ICRC, IFRC or the local Red Cross/Red Crescent office.

ANNEXES

- ANNEX 1. DEAD BODY INFORMATION FORM**
- ANNEX 2. MISSING PERSON INFORMATION FORM**
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ANNEX 1

DEAD BODY INFORMATION FORM

Unique code:

(Use this same code on associated files, photographs or stored objects.)

Possible identity of body (Explain reasons for attributing a possible identity):

Person completing this form

Name: _____

Official status: _____ Place & date: _____

Signature: _____

Recovery details (Include place, date, time, by whom found, and circumstances of finding. Give GPS coordinates if available. Indicate if other bodies were recovered in the same area, including name and possible relationship, if identified)

Unique Code: _____

A. PHYSICAL DESCRIPTION

A.1	General condition (mark one):	a)	Complete body	Incomplete body (describe):		Body part (describe):	
		b)	Well preserved	Decomposed	Partially skeletonized	Fully skeletonized	Burnt
A.2	Apparent sex (mark one and describe evidence):	Male			Female		Undetermined
		Describe evidence (genitals, beard, etc):					
A.3	Age group (mark one):	Infant	Child	Adolescent	Adult	Elderly	
A.4	Physical description (measure or mark one):	Height (crown to heel with units):		Short	Average	Tall	
		Weight (specify units):		Slim	Average	Fat	
A.5	a) Head hair:	Colour:		Length:	Shape:	Baldness:	Other:
	b) Facial hair:	None		Moustache	Beard	Colour:	Length:
	c) Body hair	Describe:					
A.6	Distinguishing features: Physical (e.g. old amputations – limbs, fingers) Surgical prosthesis (e.g. artificial limb) Skin marks – (scars, tattoos, piercings, birthmarks, moles, etc.), specify location Apparent injuries: include location, side Dental condition: (crowns, gold teeth, adornments, false teeth). Describe any obvious features	Use additional sheets if needed. If possible, include a sketch of the main findings. Note if photographs taken (include unique code in all photographs)					

Unique Code: _____

B. ASSOCIATED EVIDENCE

B.1	Clothing:	Type of clothes, colours, fabrics, brand names, repairs. Describe in as much detail as possible
B.2	Footwear:	Type (boot, shoes, sandals), colour, brand, size. Describe in as much detail as possible
B.3	Eyewear:	Glasses (colour, shape), contact lenses. Describe in as much detail as possible
B.4	Personal items:	Watch, jewellery, wallet, keys, photographs, mobile phone (include number), medication, cigarettes, etc. Describe in as much detail as possible
B.5	Identity Documents	Identity card, passport, driving licence, credit card, etc. Take photograph if possible (including the unique code in the photograph). Describe the information contained in them

Unique Code: _____

C. RECORDED INFORMATION

C.1	Fingerprints:	Yes	No	Taken by whom? Stored where?
C.2	Photographs of body:	Yes	No	Taken by whom? Stored where?

D. STATUS OF BODY

Stored:	(mortuary, refrigerated container, temporary burial). Describe location
	Under whose responsibility:
Released:	To whom and date:
	Authorized by:
	Final destination:

ANNEX 2

MISSING PERSONS INFORMATION FORM

Missing person's name and unique number for this file: (If name, give family name first followed by comma then other names) (Use unique number on associated files, photographs or stored objects.)
Interviewer name:
Interviewer contact details:
Interviewee(s) name(s):
Relationship(s) to missing person:
Contact details of interviewee: Address..... Telephone..... Email.....
Other contact person for missing person, if different from above: (who to contact in case of news). Give name and contact details

MP N°/Code: _____

A. PERSONAL DETAILS

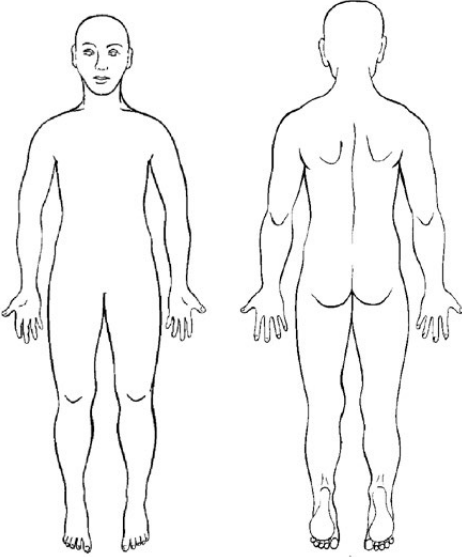
A.1	Missing person's name:	Include surname, father's and/or mother's name, nicknames, aliases				
A.2	Address/place of residence:	Last address, plus usual address if different from the former				
A.3	Marital status:	Single	Married	Divorced	Widowed	Partnership
A.4	Sex:	Male	Female	Other		
A.5	If female:	Unmarried name:				
		Pregnant	Children	How many?		
A.6	Age of missing person:	Date of birth:		Age:		
A.7	Place of birth, nationality, principal language					
A.8	Identity document: Main details (number, etc.)	If available, enclose photocopy or photograph of ID				
A.9	Fingerprints available?	Yes	No	Where:		
A.10	Occupation:					
A.11	Religion:					

B. EVENT

B.1	Circumstances leading to disappearance: (use additional sheet if necessary)	Place, date, time, events leading to disappearance, other victims and witnesses who last saw missing person alive (include name and address)				
	Has this case been registered elsewhere?	Yes	No	With whom/where:		
B.2	Are other family members missing; if so, have they been registered/identified?	List name, relationship, status:				

MP N°/Code: _____

C. PHYSICAL DESCRIPTION

C.1	General description (indicate exact measure, or approximate AND circle the corresponding group):	Height (exact/estimated?):		Short	Average	Tall
		Weight:		Slim	Average	Obese
C.2	Ethnic group/skin colour:					
C.3	Eye colour:					
C.4	a) Head hair:	Colour:	Length:	Shape:	Baldness:	Other:
	b) Facial hair:	None	Moustache	Beard	Colour:	Length:
	c) Body hair	Describe				
C.5	Distinguishing features: Physical – e.g. shape of ears, eyebrows, nose, chin, hands, feet, nails, deformities	Continue on additional sheets if needed. Use drawings and/or mark the main findings on the body chart				
	Skin marks – Scars, tattoos, piercings, birthmarks, moles, circumcision, etc.					
	Past injuries/ amputations – include location, side, fractured bone, joint (e.g. knee), and if person limped					
	Other major medical conditions – operations, diseases, etc.					
	Implants – pacemaker, artificial hip, IUD, metal plates or screws from operation, prosthesis, etc.					
	Types of medications –(used at time of disappearance)					
						

MP N°/Code: _____

C.6

Dental condition:

- Please describe general characteristic, especially taking into account the following:
- Missing teeth
 - Broken teeth
 - Decayed teeth
 - Discolorations, such as stains from disease, smoking or other
 - Gaps between teeth
 - Crowded or crooked (overlapping) teeth
 - Jaw inflammation (abscess)
 - adornments (inlays, filed teeth etc)
 - any other special feature

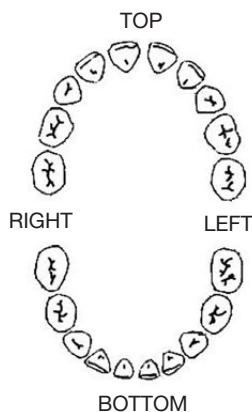
Dental Treatment:

- Has the Missing Person received any dental treatment such as
- Crowns, such as gold-capped teeth
 - Color: gold, silver, white
 - Fillings (incl. color if known)
 - False teeth (dentures)- upper, lower
 - Bridge or other special dental treatment
 - Extractions

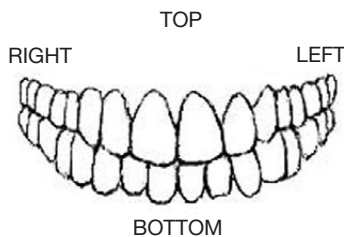
If possible, use a drawing, and/or indicate the described features in the chart below

If the missing person is a child, please indicate which baby teeth have erupted, which have fallen out and which permanent teeth have erupted and use the chart below

BABY/PRIMARY TEETH



ADULT/PERMANENT TEETH



MP N°/Code: _____

D. PERSONAL EFFECTS

D.1	Clothing: (worn when last seen/ at time of disaster)	Type of clothes, colours, fabrics, brand names, repairs. Describe in as much detail as possible
D.2	Footwear: (worn when last seen/ at time of disaster)	Type (boot, shoes, sandals), colour, brand, size. Describe in as much detail as possible
D.3	Eyewear:	Glasses (colour, shape), contact lenses. Describe in as much detail as possible
D.4	Personal items:	Watch, jewellery, wallet, keys, photographs, mobile phone (include number), medication, cigarettes, etc. Describe in as much detail as possible
D.5	Identity documents: (which the person was/might have been carrying when last seen/at time of disaster)	Identity card, passport driving licence, credit card, etc. Take photocopy if possible. Describe the information contained in them
D.6	Habits:	Smoker (cigarettes, cigars, pipes), chewing tobacco, betel nut, alcohol, etc. Please describe, including quantity
D.7	Doctors, medical records, X-rays:	Give details of doctor, dentist, optometrist, or other
D.8	Photographs of missing person:	If available, enclose photographs or copies of photographs: as recent and as clear as possible, ideally smiling (with teeth visible), and also photographs of clothing worn when disappeared

Note: By signing this form, the interviewee understands that the information collected in this form will be used only for the search and identification of the missing person. Its content is confidential and any use other than for the search and identification of the missing person requires the explicit consent of the interviewee.

Place and date of interview:

Interviewer signature:

Interviewee signature:

If requested, a copy of this form with contact details of the interviewer should be made available to the interviewee.

ANNEX 3

LABEL FOR THE DEAD BODY WITH UNIQUE BODY CODE AND CHAIN OF CUSTODY RECORD

●

UNIQUE BODY CODE

PLACE OF RECOVERY
PERSON/TEAM
NUMBER

Date	Time
------	------

CHAIN OF CUSTODY	
-------------------------	--

<u>Received from</u>	<u>To</u>
Date	Time
<u>Received from</u>	<u>To</u>
Date	Time
<u>Received from</u>	<u>To</u>
Date	Time

ANNEX 4

MASS FATALITY PLAN CHECKLIST

Mass fatality plan checklist – an annex to a National Disaster Management Plan

The Pan American Health Organization has developed a checklist on mass fatalities that can serve as the elements to be included in an annex to any National Disaster Management Plan. The checklist is based on the London Resilience Mass Fatality Plan 2006 and on this manual.

The checklist contains the essential elements that should be addressed by ministries of health or disaster management offices as they develop a mass fatality plan. The mass fatality plan does not need to be stand-alone; it can be an annex to the National Disaster Management Plan. As such, the mass fatality annex needs only to focus on elements unique to a mass fatality.

It is important that countries conduct regular exercises based on their plans to evaluate organizational capability to implement the plan (or part of it) and to promote preparedness.

Essential elements of the mass fatality plan

I. Introduction and purpose

- ◆ Outline the purpose of the mass fatality plan.
- ◆ List the assumptions of the plan.
- ◆ Define the scope of the plan and local hazards that can create mass fatalities – i.e. type, frequency, level of impact, etc.
- ◆ List members of mass fatality coordination committee/key partners, stakeholders in the planning and implementation process.

II. Activation

- ◆ Describe the activation process and identify who, or which agency, will be responsible for activating the mass fatality plan. (Make sure this is the same authority that is listed in the National Disaster Management Plan.)
- ◆ Include a call-out chart and attach roles and responsibilities to each individual for this phase of the plan.

III. Command and control

- ◆ Discuss with local health, law enforcement and disaster management officials where/how the mass fatality plan fits in with national plans.
- ◆ Discuss the role of health authorities, NGOs and national disaster offices during mass fatalities.
- ◆ Discuss the legal authority for handling of dead bodies from the point of examination by a physician/pathologist to the actual burial process. Consider the investigative needs of law enforcement agencies.
- ◆ Outline the local incident command structure
- ◆ Provide an organizational chart for chain of command, including operations, logistics, planning and finance/administration.
- ◆ Reference all hazards/emergency operations plans as appropriate.

IV. Logistics

- ◆ Outline arrangements for transporting the dead bodies and related personal effects.
- ◆ Outline arrangements for temporary body storage; this may involve the commandeering of 20/40 ft refrigerated containers. Remember that each container has limited capacity and requires considerable quantities of electricity/fuel.
- ◆ Describe the means for emergency communications between all relevant parties; this must involve secure channels that are not easily accessible by the media and general public.

- ◆ Identify where and how required resources can be obtained – e.g. national/regional stocks of body bags, waterproof labels, etc.
- ◆ Identify how portable electrical supply and water can be obtained and provided to field sites.
- ◆ Designate a trained individual and supporting team members to manage and oversee logistical arrangements.
- ◆ Identify local and regional technical specialists/resources and arrangements for obtaining their services through previously made agreements.

V. Welfare

- ◆ Identify the provisions that will be made for handling the welfare needs of family and friends, including a designated area for viewing bodies (consider cases where bodies have to be isolated as in the case of some epidemics).
- ◆ Outline the process involved in releasing or allowing for burial of the dead and the recognized forms of burial in the country. This needs to be agreed in advance with the relevant forensic pathology/medical examiner/coroner/police/judicial agency responsible for death investigation in the country. Ensure that provisions are made in the plan for addressing local cultural and religious needs of the community.
- ◆ Include linkages with local crisis intervention teams or psychosocial support teams and define procedures for their activation based on the level of assistance that they can provide.

VI. Identification and notification

Identify a team of persons from law enforcement, health authority, social services, etc. who can serve to identify the deceased (with use of forensic procedures), securing the remains and reuniting them with family/friends. Consider the local rescue and recovery procedures in place and how these will be linked to the work of this team. A physician or pathologist should determine how body parts should be handled and these decisions should be included in the plan.

- ◆ Include information regarding the legal rights of the deceased – e.g. Law Enforcement Acts, Interpol Resolution AGN/65/res/13 (1996), humanitarian laws and other ethical and social norms.
- ◆ Arrangements for viewing of bodies should be included. Facilities for this should be identified and arrangements made for setting up these facilities. Consider how the bodies will be stored and presented and who will be responsible for these activities.
- ◆ The matter of investigation should be carefully considered and the relevant information included. Review legislation relevant to inquests, registration of death, insurance procedures and criminal actions, etc.
- ◆ The plan should consider disaster situations in which specialist identification teams are not available or the scale of the disaster exceeds local capacity. Arrangements for external assistance and/or local arrangements to facilitate identification at the local level should be considered.

VII. International dimensions

- ◆ Mass fatality incidents may involve foreign nationals: foreign workers, tourists, immigrants or visiting relatives of affected families.
- ◆ The mass fatality plan should be shared with foreign embassies.
- ◆ Dealing with immigrants should include provision for repatriation of bodies of victims to their home country. Consult with the Immigration and Attorney General's Departments.
- ◆ The Department of Foreign Affairs or Governor's Offices should be consulted on arrangements for returning victims who are nationals from your country who died in the country where the disaster has occurred. Arrangements for receiving these victims should be included in the plan and provisions for handling the deceased once they have been received.
- ◆ Consider special arrangements that may be required: embalming, how the death certificates will be issued.

- ◆ In the event that tourists or high-level officials are involved and their bodies are being shipped, consideration must be given to the sensitivity of the situation and the controlled release of information to the local and international media. Consult the Pan American Health Organization/World Health Organization resolution on the International Transportation of Human Remains (1966).⁹
- ◆ Identify the national and regional Interpol counterparts and define arrangements for requesting their assistance when required.

VIII. Site clearance and recovery of deceased victims

- a. Clearly define procedures for photographing dead bodies/body parts and placement of proper identification tags, as well as what tagging system will be used (in accordance with police procedures) and who will be responsible for keeping accurate records of the tags. Also consider where these procedures will take place (e.g. collection centre) and provision of adequate security measures.
- b. Procedures for photographing, labelling and securing personal effects must also be included in the plan. Who will be responsible for these processes? Most likely they will be assigned to the police. Are resources available, such as digital cameras with sufficient memory?
- c. Provisions should be made for a quality audit (it may be advisable to have a group external to the police) to verify that the correct procedures were followed. The plan must define who, where and how this will be performed.
- d. In certain situations such as criminal and/or terrorist attacks, the disaster site must be preserved for investigative purposes. Who will be responsible for this and how will it be done? This should be outlined in the plan in a step-by-step format; consult with a law enforcement agency on this matter.

IX. Mortuary

- e. For storage and body preparation, local mortuary facilities and funeral homes – location, capacity, resources, etc. – should be listed in the plan with relevant contact details. Transportation to these facilities must be considered. The plan should consider the development of national/regional stocks of coffins, body bags, etc. A memorandum of understanding (MOU) can be developed with private mortuary/funeral homes and included as part of the plan. Consult with the Attorney General's offices on these arrangements.
- f. Ensure that the plan addresses issues such as individuals who die while being transported and those who die in hospitals as a result of injuries sustained from the disaster. In some countries they are passed through the same procedures as those who have died at the disaster site.
- g. Consider arrangements for handling the media and for security at these facilities.
- h. A general principle should be applied – hospital mortuaries should NOT be used unless numbers are manageable, especially in the case where there is only one hospital available. Temporary mortuary facilities should also be considered.
- i. Ensure that law enforcement agencies identify and provide procedures for securing routes for transporting dead bodies to identified mortuary facilities.

X. Disposal: final arrangements

- ◆ Procedures for returning the deceased to families must be clearly defined – these can be provided by the physician/pathologist. The wishes of the family for returning partial remains must also be considered.
- ◆ Discussions should take place with the physician/pathologist and social welfare or other relevant local agencies regarding the disposal/burial of unclaimed victims/remains. The legal issues must be considered and discussed with the Attorney General's chambers. Ensure that these are clearly documented in the plan.

XI. Chemical, biological, radiological, nuclear (CBRN) disasters

- ◆ Include procedures for handling such events, including how dead bodies should be handled, the training and personal protective equipment requirements, decontamination procedures, and ongoing monitoring of the site and any remains or items removed and where cold storage facilities can be located.
- ◆ Consider decontamination arrangements for vehicles and other storage equipment and facilities, and environmental impacts along with requirements for evacuation or isolation of surrounding communities.
- ◆ Arrangements with external agencies may have to provide for risk assessments and advice on viewing, return of bodies, burial, cremation and repatriation. Identify such agencies in the plan and establish MOUs accordingly.

XII. Public information and media policy

- ◆ Many countries have national public information plans and policies. These can be applied to this element of the plan. Official statements should be channelled through the relevant media centres at either the National Emergency Operations Centre (NEOC) or the incident command post in the field. Information from all sites – i.e. mortuary, hospital, family viewing areas – should be channelled to the NEOC for compilation.
- ◆ Media should be restricted from entering mortuary facilities or crisis intervention centres/family viewing areas. Include procedures for securing these areas and for channelling information to the media centre.
- ◆ Procedures for releasing the names of the deceased should be clearly defined in the plan, especially considering large numbers of unidentified deceased victims. Provisions should be made for setting up facilities for the public to enquire about missing/deceased persons, and these sites should be away from the hospital and mortuary.

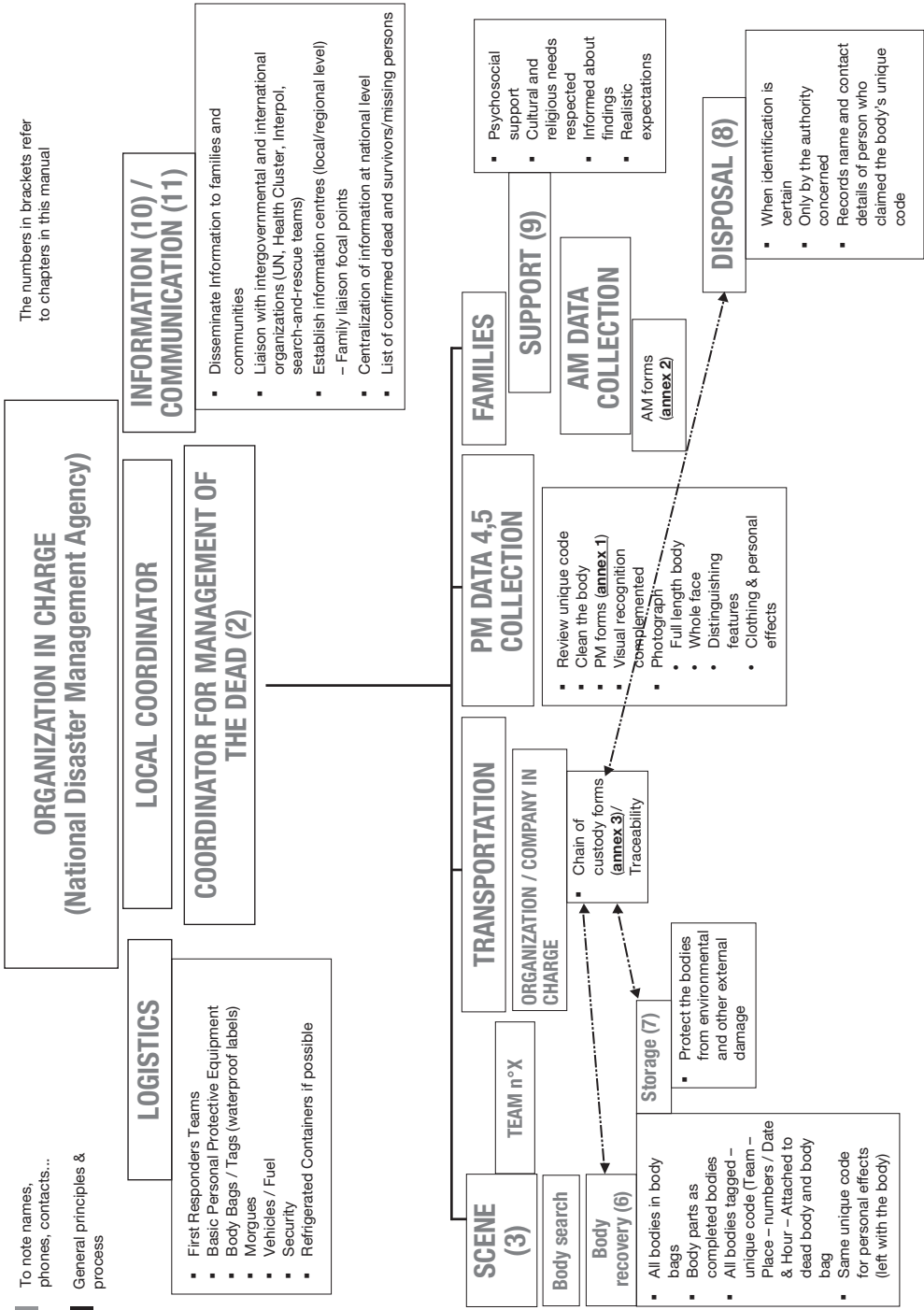
XIII. Health and safety

- ◆ Consider provisions for the welfare and psychological needs of responders; the local crisis intervention teams or mental health services can give support in this area. Consider how volunteers from the Red Cross and other similar services can be accommodated to provide such support – once they are trained.
- ◆ There may be a need to identify and equip rest areas. Responsibility for this and how the resources will be acquired should be established locally.
- ◆ Provision should also be made to determine how responders who have lost family members and friends will be handled and by whom.

XIV. Disaster mortuary plan

- ◆ In many countries it is the responsibility of the police to set up and manage the documentation of the deceased at the mortuary and for evidential continuity. Relevant forms, procedures and a layout of the mortuary should be included in the plan.
- ◆ In the event of a large-scale event involving numerous victims it may be necessary to establish a mortuary management team. The composition of the team should be included in the plan, along with call-out procedures and responsibilities for each individual.
- ◆ Include, as part of this element, the mortuary procedures to be followed: registration and arrival, storage, examination and photographing, cleaning of body, radiography, fingerprints, odontology, re-bagging, embalming, viewing, release of body, bodies not claimed, repatriated bodies, DNA and toxicology, documentation, securing of property, equipment list, waste disposal, staffing, visitors, health, safety and welfare.

ANNEX 5 COORDINATION PLAN FLOWCHART FOR MANAGEMENT OF THE DEAD: AN EXAMPLE



ANNEX 6

DEALING WITH THE BODIES OF PERSONS WHO DIED FROM AN EPIDEMIC OF INFECTIOUS DISEASE

Introduction

This is a manual for first responders. Untrained first responders should not be involved in the management of dead bodies in an infectious disease epidemic such as is caused by Ebola virus disease. First responders or non-experts can be trained to handle such dead bodies but the training must be provided by those experienced in handling the disease which caused the epidemic. This annex sets out the main principles, the steps to take and the materials available to guide such training. However, this annex is not a substitute for training by experts.

Principles

Handling the bodies of those who have died in an epidemic of a highly infectious disease such as Ebola is an exercise in infection control. This means that the body-handler requires:

- * an understanding of the disease, the organism which causes it and its modes of transmission;
- * knowledge of the correct procedures in handling potentially infectious dead bodies, including the donning and removal of personal protective equipment (PPE);
- * self-discipline to follow the procedures correctly and without exception.

Achieving this requires education and training.

Understanding infectious diseases – Ebola virus disease

In infectious disease outbreaks, it is important to understand the mode of transmission of the disease. Some diseases may be transmitted by aerosol, while others are transmitted through direct contact with bodily fluids. Understanding the mode of transmission will help first responders to protect themselves against the disease.

Some pathogens that causing disease die shortly after leaving the body of the dead, reducing the risk of transmission of the disease to living persons. However, there are a few diseases that cause problems even after the infected person dies. One of these is Ebola virus disease.

Ebola Virus Disease (EVD), formerly called Ebola Haemorrhagic Fever, falls into the Group 4 classification of biological agents that cause infectious diseases. Pathogens in Group 4 “usually cause serious human or animal disease that can be readily transmitted from one individual to another, directly or indirectly. Effective treatment and preventive measures are not usually available”.¹⁰ This disease is transmitted through direct contact with the body fluids of a person or body with the disease. The virus can survive on the body’s surface and on sheets that have been contaminated with body fluids for up to a number of days. Persons handling dead bodies have become infected with Ebola as body fluids from the deceased person have contaminated them through broken skin or mucous membranes of the handler. As such, it is important to be aware of the serious risks and to wear full protective gear when handling dead bodies. Such awareness and preparation requires education and training about diseases falling within this pathogen group and how those that have died should be managed.

Personal protective equipment (PPE)

This is a short introduction to some basic recommendations on using PPE when handling bodies possibly harbouring Group 4 pathogens.¹⁰ However, handlers must undertake properly supervised training before using this equipment.

When handling bodies possibly harbouring Group 4 pathogens, all body-handlers should:

1. Have the mucous membranes of their eyes, mouth and nose completely covered by PPE.
2. Use either a face shield or goggles.
3. Wear a fluid-resistant medical/surgical mask with a structured design that does not collapse against the mouth (e.g. duck bill, cup-shaped).
4. Wear double nitrile gloves (not latex).
5. Wear protective body wear in addition to regular on-duty clothing (e.g. surgical scrubs).
 - * This protective body wear should be either a disposable gown and apron or a disposable coverall and apron. The disposable gown/coverall should be made of fabric that is tested for resistance to penetration by blood or body fluids or to bloodborne pathogens.
 - * The choice of apron should be, in order of preference: disposable waterproof apron; if this is not available, then use a heavy duty, reusable waterproof apron, provided appropriate cleaning and disinfection occurs between uses.
6. Wear waterproof boots (e.g. rubber/gum boots).
7. Wear a head cover that covers the head and neck. The head cover should be separate from the gown or coverall so that these may be removed separately.

(Technical specifications are contained in WHO's Rapid advice guideline on PPE in the context of a filovirus disease outbreak response, issued October 2014.¹¹

Safe handling and burial

WHO has developed a protocol on the safe handling, including burial, of those who have died from suspected Ebola virus disease.¹² These measures should be applied by all who handle the dead body, however briefly, or are involved in its transportation or burial. **Only trained personnel should handle such bodies.**

This procedure is very sensitive for the family and the community. It can be the source of trouble or even open conflict. Before starting any procedure, the family must be prepared, with the burial process and all steps explained, especially with regard to dignity and respect for the deceased person. Once agreed and understood, the burial can be performed. No burial process should take place until agreement is obtained.

In summary, the process includes the following:¹³

<p>1. Prior to departure:</p> <ul style="list-style-type: none"> • Team composition and • preparation of disinfectants 	<p>Each team:</p> <ul style="list-style-type: none"> • 4 carriers, each to wear full PPE • one sprayer in full PPE • one technical supervisor – no PPE • one community facilitator/communicator – no PPE
<p>2. Gathering of all necessary equipment before going to the house of the deceased</p>	<ul style="list-style-type: none"> • Body bags • Hand hygiene • PPE • Waste management
<p>3. Arrival: Prepare for burial with the family at the house of the deceased; evaluate risks</p>	<ul style="list-style-type: none"> • Greet family without PPE • Offer condolences; seek family representative; discuss organization of the burial • Explain safety procedures • If family has a coffin, identify family members who will carry it • Verify that a grave has been dug; if not, organize digging
<p>4. Donning of the PPE</p>	<ul style="list-style-type: none"> • Put on all PPE in presence of the family
<p>5. Placement of the body in the body bag</p>	<ul style="list-style-type: none"> • At least two members of team enter the house • Place body bag alongside the body and open it • Take the body by the arms and legs and place body in body bag • Close the bag • Disinfect outside of body bag
<p>6. Placement of the body in a coffin where culturally appropriate; if not available, transport body to the crematorium</p>	<ul style="list-style-type: none"> • Take body bag and place it in the coffin • Place clothes and other items, as wished by family, in coffin • Allow family member, wearing gloves, to close coffin • Disinfect coffin • Respect grieving time requested by family
<p>7. Collection of soiled objects, disinfection if needed, or burning and cleaning and disinfection of the environment (rooms, house) wearing PPE</p>	<ul style="list-style-type: none"> • Clean with detergent then disinfect all rooms and annexes of the house possibly infected by deceased patient; especially areas soiled by body fluids (e.g. blood, nasal secretions, sputum, urine, faeces and vomit) • Collect and dispose of any sharps possibly used on the patient in a leakproof and puncture-resistant container • With family agreement, any objects, clothes or bed linen soiled with the deceased patient's body fluids should be burnt at some distance from the house. Replace sheets, mattresses, straw mats and the like with new items • Disinfect other objects possibly infected by deceased patient <p>At the end of this step, all belongings of the deceased patient are either burnt, in the coffin, or in a disinfected bag; and all potentially contaminated places in the home are disinfected.</p>

<p>8. PPE removal by burial management team</p>	<ul style="list-style-type: none"> • Guide disinfection of any family members wearing PPE • Disinfect reusable PPE (e.g. rubber boots) of the team • Remove single use PPE into appropriate waste bag following the recommended steps • Perform hand hygiene • Recover reusable disinfected equipment in a waste bag <p>At the end of this step, the team members have removed their PPE and performed hand hygiene</p>
<p>9. Transportation of the coffin or the body bag from the house to the cemetery</p>	<ul style="list-style-type: none"> • If coffin is not soiled, transport using household gloves is sufficient • Rear of a suitable car can serve as a hearse • Respect and grieving time required • Some family members can sit with the coffin, but not in the cab which is required for the burial team • Conventional expressions of grief – shouting/crying/songs – should be respected <p>At the end of this step, the coffin is on its way to the cemetery</p>
<p>10. Burial at the cemetery and engaging of community for prayers as this dissipates tensions and provides a peaceful atmosphere</p>	<ul style="list-style-type: none"> • Carriers wearing household gloves take coffin to, and lower it into, the grave • Place bags with clothes and objects in the grave • Respect cultural customs (e.g. opening a node of the coffin to allow the spirit to escape; allow time for prayers and speeches; family members to close the grave) • Place permanent identification marker on the grave • Recover and place household gloves in infectious waste bag for disinfection • After removal of gloves, perform hand hygiene
<p>11. Return to the hospital</p>	<ul style="list-style-type: none"> • Incinerate the single-use equipment • Reusable equipment is again disinfected and dried • The hearse is cleaned and disinfected, especially the part which carried the coffin (or body bag)

ANNEX 7 CEMETERIES

This annex provides considerations and recommendations to address the main issues in choosing a burial ground for short- or long-term storage of dead bodies following disasters. In extreme circumstances it may not be possible to follow them all. Following epidemics from infectious diseases, further specialist advice must be sought.

Criteria / risks to be taken into account	Measures
Contamination of drinking water from decaying human remains	<ol style="list-style-type: none"> 1. Contamination of the water may occur from buried human remains through microorganisms washing out into drinking water in high concentrations. The microorganisms are those that were present in the bodies at death. However, no epidemics or widespread disease outbreaks which were unequivocally the result of seepage from cemeteries are documented in the literature.^{14,15} 2. Keep a safe distance between the burial site and drinking wells, boreholes and wells (250m*). 3. Keep a safe distance between the burial site and any other spring or watercourse (30m*) and from field drains (10m*). 4. Human remains should be buried above the groundwater table. 5. A buffer zone with deep-rooting vegetation around the burial ground helps to eliminate microorganisms and decay products.¹⁶ 6. Coffins should be made from materials that decompose rapidly and do not release persistent chemical by-products into the environment.¹⁴ <p>*Distances may vary according to the local geological and hydrological properties of the soil</p>
Scavengers	<ul style="list-style-type: none"> • The body should be covered with a thick layer of soil (90cm–1.2m) to prevent scavenger access. • Enclosure of the site may prevent access by big scavengers.
Topography	<ul style="list-style-type: none"> • Cemeteries are usually located on elevated ground, above the surrounding area, in order to protect the groundwater. • If the chosen site is flat, the risk of flooding should be excluded. Slopes and hills can be subjected to landslides and may be more difficult to develop. • A geological and hydrological opinion should be sought in any case prior to the opening of a new cemetery.
Cultural and religious aspects	<ul style="list-style-type: none"> • Funeral rites differ widely within and between communities. The burial site should allow the bereaved to honour their dead according to their wishes.¹⁵ • The final burial site of each body must be indicated above ground. • For unidentifiable body parts (e.g. from highly fragmented bodies), a memorial garden/monument may be installed as agreed with the bereaved families.
Legal aspects	<ul style="list-style-type: none"> • Many countries have a legal framework around the installation of cemeteries (public health law, environmental laws, laws around the management and protection of the water, construction laws, cemetery laws, privacy laws).

ANNEX 8

PROCESSES ENABLING THE USE OF FORENSIC DNA ANALYSIS IN A LARGE MASS FATALITY DISASTER

Forensic human identification should be approached in a holistic fashion, using all available lines of evidence to identify the dead following a disaster. If DNA technology is to be used to help identify large numbers of bodies following a disaster then the following considerations should be borne in mind. DNA profiling is the biggest single advance in forensic science since the discovery of fingerprints. As powerful as it is in individual cases, using DNA to identify large numbers of people in a disaster is complex and requires the following processes to be implemented successfully.¹⁷

PROCESS	REASONS WHY THE PROCESS IS NEEDED
The bodies are each given a unique body code, have been examined in accordance with this manual, the findings recorded, and the bodies stored in such a way that they can be tracked and accessed.	This process allows specific bodies with distinctive, potentially identifiable characteristics or findings, or whose DNA profile is later matched with the biological relative(s) of a missing person, to be retrieved for <ul style="list-style-type: none"> • further examination; or • return of the body to relatives for burial; or • enables placement of a memorial marker with the correct name if the body is already buried and will not be moved.
A sample from the body is obtained from which DNA can be extracted (e.g. muscle, bone, toenail).	DNA profiling of the deceased is enabled.
The sample is secured, labeled (including with the unique body code) and stored so that its further deterioration is arrested, its continuity is ensured and it is available for profiling.	This optimizes the chance that DNA profiling of the sample from the dead body will be possible by minimizing sample deterioration. When profiling is successful and leads to a match, it enables the profile to be reliably traced back to a particular body.
There is a list of names of the missing together with antemortem information about those people in accordance with this manual.	Without a list of the missing, it is not possible to make a significant number of identifications on any basis (even with full DVI examinations), including with DNA profiling of the dead bodies. Without a list it will be harder to obtain reference DNA samples from family members. Without antemortem information about the missing person, it will not be possible to corroborate any DNA matches with other information.
There is a system designed to enable relatives of those missing and believed to be dead to provide a reference biological sample.	Without appropriate reference samples (which will vary according to circumstances and profiling systems) significant numbers of DNA-led identifications will not be made because there will be insufficient statistical power in the matches.

<p>Identify and communicate with laboratories which are capable of dealing with large numbers of degraded samples (from the dead bodies), and large numbers of biological samples from relatives. Samples from victims and from families should be processed in physically separate locations if one laboratory is to be used for all samples.</p>	<p>Laboratories may not be available in-country. Sending samples overseas may invoke additional psychosocial, political and logistical considerations for next of kin and the authorities.</p>
<p>Establish a framework for evaluating DNA data that considers the number of individuals missing and adopts statistical thresholds for DNA-based matches.</p> <p>Ensure that suitable software, along with robust protocols, is available for the comparison of the two groups of samples (victims and relatives).</p>	<p>A failure here will result in false identifications (possibly multiple), thereby undermining the whole identification process.</p>
<p>The finances required to fund the above need to be understood, and a source found.</p>	<p>For large-scale disasters, the finances will probably be beyond the capacity of many governments.</p>

ANNEX 9

THE MANAGEMENT OF DEAD FOREIGN NATIONALS FOLLOWING A LARGE MASS FATALITY DISASTER

Visitors, or residents who are citizens of other countries, will have families who are desperate for news of their fate. As stated in the Interpol General Assembly resolution AGN/65/RES/13, “human beings have the right not to lose their identities after death”.¹⁸ Obtaining news of a relative’s death and receiving the body are equally important for local families and international ones. It is therefore reasonable in a multi-fatality disaster for the overall process of managing the dead to include arrangements that will apply to the bodies of overseas nationals after identification.

This is a principle which is easy to articulate, but difficult to implement. Ultimately, the issue of discovering which bodies are those of overseas nationals is best resolved by identifying all persons who died in the disaster. It is sometimes thought that a process prior to identification to separate those who are thought to be foreign nationals from those who are local can be undertaken. This usually cannot be done reliably. If this is understood, early response to the disaster will be simplified and will avoid discrimination.

Pressure to prioritize the finding of foreign nationals must not be allowed to distort the priorities of a systematic local approach to identifying all the dead. It would not normally be appropriate, for example, for a team from another country to be present in the field simply to deal with bodies thought to be from their country. Such assistance should be available for the overall management of the dead. On this basis, and in the event that nationals from a foreign country are discovered, it may be reasonable, subject to the direction of those responsible locally, for a team from that country to become involved in their management.

In relation to the Mass Fatality Plan dealing with overall management of the dead, a step should be included which outlines the procedures to be followed if a dead body is discovered to be that of an overseas national. These procedures should be established in advance and may involve Interpol and the diplomatic corps/foreign embassies.

ANNEX 10

SUPPORTING PUBLICATIONS

¹ Tidball-Binz, M. Managing the dead in catastrophes: guiding principals and practical recommendations for first responders. *International Review of the Red Cross*. 2007, 89 (866): 421-442.

² Principles of good DVI governance. *Interpol Disaster Victim Identification*. Lyon: Interpol. (<http://www.interpol.int/INTERPOL-expertise/Forensics/DVI>).

³ The cluster approach. *Humanitarian response*. Geneva: United Nations Office for the Coordination of Humanitarian Affairs. (<https://www.humanitarianresponse.info/en/coordination/clusters>).

⁴ de Goyet C. Epidemics caused by dead bodies: a disaster myth that does not want to die. *Rev Panamericana de Salud Pública* 15(5):297-9. (http://publications.paho.org/english/editorial_dead_bodies.pdf).

⁵ Douceron H, Deforges L, Gherardi R, Sobel A, Chariot P. Long-lasting postmortem viability of human immunodeficiency virus: a potential risk in forensic medicine practice. *Forensic Sci Int*. 1993;60:61-66.

⁶ Ebola virus disease. Fact sheet No. 103. Geneva: World Health Organization; August 2015. (<http://www.who.int/mediacentre/factsheets/fs103/en/>).

⁷ Forensic Human Identification. *International Committee of the Red Cross*, 2013. (<https://www.icrc.org/en/publication/4154-forensic-identification-human-remains>).

⁸ Haglund WD, Connor M, Scott DD. The archaeology of contemporary mass graves. *Historical Archaeology*. 2001;35(1 Archaeologists as forensic investigators: defining the role):57-69.

⁹ PAHO/WHO Resolution on the International Transportation of Human Remains. 1966. (<http://iris.paho.org/xmlui/bitstream/handle/123456789/2177/CD16.R36en.pdf?sequence=1>).

¹⁰ Laboratory biosafety manual, third edition. Geneva: World Health Organization; 2004. (<http://www.who.int/csr/resources/publications/biosafety/Biosafety7.pdf?ua=1>).

¹¹ Personal protective equipment in the context of filovirus disease outbreak response. Rapid advice guideline. Geneva: World Health Organization; October 2014. (<http://who.int/csr/resources/publications/ebola/ppe-guideline/en/>).

¹² Field situation: how to conduct safe and dignified burial of a patient who has died from suspected or confirmed Ebola virus disease. Geneva: World Health Organization; October 2014. (<http://who.int/csr/resources/publications/ebola/safe-burial-protocol/en/>).

¹³ How to conduct safe and dignified burial of a patient who has died from suspected or confirmed Ebola virus disease. World Health Organization. 2014. (http://apps.who.int/iris/bitstream/10665/137379/1/WHO_EVD_GUIDANCE_Burials_14.2_eng.pdf?ua=1).

¹⁴ The impact of cemeteries on the environment and public health. Copenhagen: WHO Regional Office for Europe; 1998.

¹⁵ Young CP, Blackmore KM, Leavens A, Reynolds PJ. Pollution potential of cemeteries. Bristol: Environment Agency; 2002.

¹⁶ Dent BB. The hydrogeological context of cemetery operations and planning in Australia. (Thesis). Vol 1. Sydney: 2002 .

¹⁷ Missing people, DNA analysis and identification of human remains: A guide to best practice in armed conflicts and other situations of armed violence. Second Edition. International Committee of the Red Cross, 2009. (<https://www.icrc.org/en/publication/4010-missing-people-dna-analysis-and-identification-human-remains-guide-best-practice>).

¹⁸ Disaster victim identification. Interpol Resolution No. AGN/65/RES/13 of the Sixty-fifth Interpol General Assembly, Antalya, 23–29 October 1996. (<http://www.interpol.int/About-INTERPOL/Structure-and-governance/General-Assembly-Resolutions/Resolutions-1990-to-1999/1996-AGN65>).

All Web references were active at the time of publication.

ANNEX 11

INTERNATIONAL ORGANIZATIONS

World Health Organization

<http://www.who.int/en/>

Pan American Health Organization

<http://www.paho.org/hq/>

International Committee of the Red Cross

<http://www.icrc.org>

International Federation of Red Cross and Red Crescent Societies

<http://www.ifrc.org/>

Interpol

<http://www.interpol.int/>



World Health
Organization



ICRC



International Federation
of Red Cross and Red Crescent Societies

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