

REPORTS AND DOCUMENTS

Revised practical guidance for first responders managing the dead after disasters

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Abstract

The proper and dignified management of the dead is one of the three pillars of the humanitarian response to disasters, along with the rescue and care of survivors and the provision of essential services. First launched in 2006, the widely used publication Management of Dead Bodies after Disasters: A Field Manual for First Responders offers practical and easy-to-follow guidelines. It has become the go-to guide not only for non-experts confronted with dead bodies in the aftermath of a catastrophe, but also for those responsible for disaster planning and preparedness in countries with well-developed forensic services. Ten years after the publication of the 2006 Manual, a revised edition has been released. The inclusion of a decade of experience in its field implementation, as well as the incorporation of recent scientific developments in mass fatality management, makes the revised Manual an invaluable resource for first responders confronted with the realities of dead body management following a disaster.

Keywords: humanitarian forensic action, management of the dead, disaster victim identification, first responders, disasters.

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In May 2005, the Pan American Health Organization (PAHO), the World Health Organization (WHO) and the International Committee of the Red Cross (ICRC) organized an expert meeting on lessons learned from the management of the dead¹ in the aftermath of the 2004 Indian Ocean tsunami. Held in Lima, Peru, the meeting identified the need for practical, easy-to-follow guidelines on the management of the dead for non-expert first responders, who are almost always at the forefront of disaster response in large emergencies. The result was the first edition of *Management of Dead Bodies after Disasters: A Field Manual for First Responders*² (2006 Manual), developed in close collaboration with the ICRC's Forensic Advisory Board, which is comprised of internationally leading experts in the in the field of forensic science. This document offered practical guidelines for non-specialists on how to handle human remains in the aftermath of mass fatalities. It was translated into multiple languages and has since become the most consulted and downloaded document on the PAHO website.

The humanitarian community recognizes the proper and dignified management of the dead as one of the three pillars of disaster response, along with the recovery and care of survivors and the supply of basic services. Neglect of this core principle has the potential to cause trauma and emotional suffering to bereaved families, long outliving the physical effects of the disaster in question.³ Unfortunately, in mass disasters, it is not unusual for only a few of the deceased to be identified.

The first response, often carried out by members of the affected communities in the initial hours and days, lays the crucial foundation for the dignified handling of those who have died. This early response will condition the later identification of the dead, and as such, should be properly handled. In simple steps, the Manual sets out the elements of this proper procedure for non-experts acting as first responders. By filling this gap in the emergency response, the Manual complements other guidance aimed at forensic specialists, such as the Interpol disaster victim identification (DVI) guide.⁴ The DVI guide, launched in 1984 and updated several times since, is aimed at a different audience: police and forensic specialists. It has systematized the technical aspects of human identification, making an important contribution to the response to small and medium-sized disasters. However, in large disasters where the authorities simply cannot respond, or when experts are not available at the scene, guidance for those providing the first response is needed. It is this gap that the Manual was designed to fill.

1 In this article, as in the Manual, the terms “the dead”, “dead body/bodies”, “the deceased”, “deceased persons” and “human remains” are all synonymous and are used interchangeably.

2 Olivier Morgan, Morris Tidball-Binz and Dana van Alphen, *Management of Dead Bodies after Disasters: A Field Manual for First Responders*, 1st ed., PAHO, Washington, DC, 2006. For more on the 2006 Manual, see Morris Tidball-Binz, “Managing the Dead in Catastrophes: Guiding Principles and Practical Recommendations for First Responders”, *International Review of the Red Cross*, Vol. 89, No. 866, 2007.

3 WHO, *Disaster Risk Management for Health: Mass Fatalities/Dead Bodies*, 2011. See also Pål Kristensen, Lars Weisæth and Trond Heir, “Bereavement and Mental Health after Sudden and Violent Losses: A Review”, *Psychiatry*, Vol. 75, No. 1, 2012.

4 Interpol, *Disaster Victim Identification Guide*, 2nd ed., 2013.

In the ten years since the 2006 Manual was released, its usefulness and importance have become apparent. It has found frequent application in disaster response planning and preparedness, including in countries with highly developed forensic services and disaster response agencies. Over the past decade, there have been important scientific and technical developments in mass fatality management. In addition, lessons have been learned in the aftermath of the 2013 Typhoon Haiyan⁵ in the Philippines, during the 2014/15 Ebola epidemic in West Africa⁶ and following the 2015 earthquake in Nepal.⁷ Together, these have generated improvements to the recommendations that underpin the Manual's continued usefulness and led to its revision.

The 2016 revised Manual⁸ (2016 Manual or, hereafter, the Manual) is divided into twelve short chapters covering the essential aspects of managing the dead following a mass fatality. In the immediate aftermath of a disaster, these chapters can be photocopied and distributed to first responders tasked with various responsibilities. The Manual furthermore contains eleven annexes which include data collection forms, checklists, practical recommendations, useful additional information and links for anyone involved with the management of the dead in emergency responses.

The Manual continues to serve its original purpose: providing guidance on the appropriate and dignified management of the dead, and on carrying out the early, crucial steps which will assist the later identification of the deceased, as well as promoting respect for the bereaved. The 2016 Manual is not a comprehensive framework for forensic investigations, nor does it replace the need for later specialist forensic identification of victims. Implementation of the Manual's recommendations is required to enable later effective investigations by specialist forensic teams using the Interpol DVI guidelines,⁹ if and when such teams arrive in the field.

To make the information more easily accessible, the aims of each chapter are listed at its beginning, and the material is summarized in a "Do's and Don'ts" section concluding each chapter.

The following sections will outline the content of the 2016 Manual, highlighting its updates and additions.

5 Chris McCall, "Scars of Typhoon Haiyan Still Run Deep 1 Year On", *The Lancet*, Vol. 384, No. 9955, 2014.

6 WHO, *Nepal Earthquake 2015 – Grade 3 Emergency*, 2016, available at: www.who.int/emergencies/nepal/en/ (all internet references were accessed in January 2017).

7 WHO, *Field Situation: How to Conduct Safe and Dignified Burial of a Patient Who Has Died from Suspected or Confirmed Ebola Virus Disease*, Geneva, October 2014, available at: www.who.int/csr/resources/publications/ebola/safe-burial-protocol/en/.

8 Stephen Cordner, Rudi Coninx, Hyo-Jeong Kim, Dana van Alphen and Morris Tidball-Binz (eds), *Management of Dead Bodies after Disasters: A Field Manual for First Responders*, 2nd ed., PAHO, Washington, DC, 2016 (2016 Manual), available at: <https://shop.icrc.org/gestion-des-depouilles-mortelles-lors-de-catastrophes-manuel-pratique-a-l-usage-des-premiers-intervenants-595.html>.

9 Interpol, *Disaster Victim Identification Guide*, 2009, available at: www.interpol.int/INTERPOL-expertise/Forensics/DVI-Pages/DVI-guide.

Planning and coordination

In the event of a disaster, time is of the essence. Planning and effective coordination are the backbone to any successful disaster response operation. Command structures, logistics and the necessary resources to successfully implement a plan of action for the management of the dead need to be developed in advance. At the local, regional and national levels, it is paramount to quickly appoint the agencies and individuals in charge of overseeing operations, as well as coordination groups. Responsibilities must also be allocated promptly. At a local level, this includes:

- health and safety;
- search and recovery;
- allocating unique codes to the bodies;
- taking photographs and recording data;
- the temporary storage of bodies;
- the traceable long-term storage of bodies;
- providing support to the bereaved;
- the collection and management of information on the missing;
- communications with next of kin and the media;
- logistics; and
- liaison with operational partners and authorities.

On a regional and national level, coordination groups to advise on liaison with local agencies, logistical support of police or military, technical support for data collection, information management, and legal issues related to identification need to be established. Liaison with the public and the media, as well as with diplomatic missions and external organizations, should also be addressed.

The Manual includes a helpful and comprehensive checklist of items needed for the recovery of the dead, including personal protective equipment (PPE), recovery, transportation and storage equipment, and recording equipment.¹⁰

Health and safety, including infectious disease risk of dead bodies

In all disaster response scenarios, the health and safety of the first responder are of the utmost importance. Contrary to circulating misconceptions, human remains do not generally pose a risk of causing epidemics. However, as with the deceased in any circumstances, there is always a chance that an individual who died in a mass fatality was already infected with a blood-borne disease such as hepatitis or HIV.¹¹ In such

¹⁰ 2016 Manual, above note 8, pp. 3–6.

¹¹ See, e.g., H. Douceron, L. Deforges, R. Gherardi, A. Sobel and P. Chariot, “Long-lasting Postmortem Viability of Human Immunodeficiency Virus: A Potential Risk in Forensic Medicine Practice”, *Forensic Science International*, Vol. 60, No. 1–2, 1993.

cases, the risk of transmission to body handlers can be kept in check by ordinary precautions such as adequate PPE (gloves, boots and apron), while the risk to the public not in direct contact with such remains is negligible.¹² The exceptions to usual disasters are situations where the deaths occurred as a result of a highly infectious disease (i.e., an epidemic) or the disaster occurred in an area where such disease is endemic. For example, in the Ebola crisis, handling the dead was one of the main modes of transmission of the disease. In such circumstances special precautions are required, and these are explained in the Manual.¹³ Importantly, the Manual stresses that untrained first responders are not to be involved in responses to chemical, biological (epidemic) or radiation disasters.

Other hazards are much more common, and it is these issues that the Manual focuses on: the risk of injury from collapsing buildings and falling debris, heatstroke, hypothermia, tetanus from simple cuts, and the psychosocial effects of dead body management. Psychological support, including debriefing and the option of counselling for body handlers, is an important component of risk management.¹⁴

Allocating a unique code to dead bodies

Allocating a unique code to each recovered body or body part at the earliest possible time is crucial. Although the need for this procedure was included in the 2006 Manual, the concept is so important that it has been clarified and given a separate chapter of its own in the revised edition.¹⁵ It ensures that the body or the body part can be traced and that related information can be associated with it. This helps to prevent bodies from getting “lost”, remaining unidentified or being misidentified. The code, which is a sequential number, is unique and must be included in all photographs and records related to the remains, in addition to the place where the body was found and the name of the person or team that dealt with the body. The unique code should be allocated, the body labeled and photographs taken as soon as possible, preferably all at the time when the body is first located.

Taking photographs and recording data from dead bodies

The 2016 Manual has also dedicated a separate chapter to the taking of photographs and recording of data from human remains.¹⁶ Good photographic documentation of the remains, taken as early as possible, together with the recording of any associated details and artefacts, is indispensable. Decomposition begins and progresses rapidly, particularly in warmer climates, rendering visual recognition

12 Claude de Ville de Goyet, “Epidemics Caused by Dead Bodies: A Disaster Myth that Does Not Want to Die”, *Pan American Journal of Public Health*, Vol. 15, No. 5, 2004, available at: http://publications.paho.org/english/editorial_dead_bodies.pdf.

13 2016 Manual, above note 8, pp. 7–9.

14 *Ibid.*, p. 8.

15 *Ibid.*, pp. 11–12.

16 *Ibid.*, pp. 13–17.

impossible after a few days or sometimes even hours. As it may take days for forensic specialists to be dispatched and arrive at the scene, prompt photographic documentation by first responders is invaluable.

Prior to photographing, bodies should be cleaned as much as possible to show facial features, and the unique body code must be included in each picture. If possible, a standard photographic scale or an object of known size – a dollar bill, for example – should appear in the picture. At a minimum, the following photographs should be taken: a full-length front-view picture of the body, a front view of the entire face, any obvious distinguishing features (such as tattoos or jewellery) and all clothing.

At the time of taking photos, information about the remains should be recorded in the Dead Body Information Form (Annex 1 of the Manual) as soon as possible. The form has room for basic information on physical appearance and the recovery location. Mandatory data include the person's sex (if recognizable), the approximate age range, personal effects, obvious identifying features, height, colour and length of hair, and visible dental features. Any personal effects need to stay with the body, in order to facilitate their return to the families or next of kin.

Each separate body part should be managed like a whole body would, as it may not belong to the nearest incomplete body. This means allocating and labelling it with a unique code, taking photographs and filling out the Dead Body Information Form. Following the above procedure will help to ensure that all human remains, associated items and information remain traceable throughout the process, and will provide strong support to later attempts at identification.

Recovery of dead bodies

Throughout the recovery operations, the health and safety of recovery personnel are crucial. In terms of management of the dead, body recovery is the first step and needs to take place as early as possible.¹⁷ Recovery goes hand in hand with the allocation of a unique code, labelling and documentation. Ideally the body should be placed into a body bag at the location of recovery. The Manual includes a series of photographs illustrating how to respectfully and efficiently roll a body into a body bag.¹⁸ After the recovery, human remains need to be kept in a cool place, secure from scavengers, public viewing and direct sunlight.

Temporary storage of dead bodies

There are two separate chapters dedicated, respectively, to the temporary storage of dead bodies (Chapter 7)¹⁹ and the traceable long-term storage and disposal of dead

17 *Ibid.*, pp. 19–22.

18 *Ibid.*, p. 21.

19 *Ibid.*, pp. 23–25.

bodies (Chapter 8).²⁰ In mass fatality events that overextend local capacities, the authorities might not be able to quickly process remains in terms of data collection. In these cases, organized and respectful short-term storage to protect the remains as efficiently as possible needs to be established. For this, a centralized collection centre where all data recording can take place needs to be determined.

Each dead body (or individual body part) needs to be bagged separately and have its own unique code on waterproof labels attached to the body (or body part) as well as attached to the bag. Ideally the remains should be kept refrigerated between 2 °C and 4 °C. When this is not possible, storage should be in a protected, cool location. Alternatively, temporary burials can be considered. In such cases, if there are small numbers of bodies, they should be placed in individual graves. Larger numbers can be placed in trench graves, side by side, with at least 0.4 metres between bodies. Each body, and each bag, needs to be individually labeled. The location of the body, with its unique code, must be recorded at the surface of the grave site, and on a plan of the whole burial site.

Traceable long-term storage and disposal of dead bodies

The identification of the dead is the responsibility of the authorities. However, once identified, the remains need to be released to the next of kin as soon as possible. Unidentified remains and unclaimed bodies need to be placed in properly documented long-term storage. In these situations, the preferred option is burial, as it is dignified and preserves the body for potential future identification and return to the family. Each body should be traceable after storage and burial to enable easy future location and recovery when necessary.

Selection of the burial site needs to be carefully considered, taking into account local customs, proximity to the local community, soil conditions and distance from drinking water sources. All human remains should be buried in clearly marked individual graves, which need to be carefully documented and mapped to ensure continuity and traceability. Unidentified bodies should not be cremated.

Support for families and relatives

Proper consideration of the next of kin is of the utmost importance. For this, a family liaison focal point – in the case of a large mass fatality, a Family Assistance Centre – should be established wherever possible. All next of kin need to be given realistic expectations of the recovery and identification process and should be informed about the findings prior to the media or anyone else. Children should not be expected to aid in the visual identification of remains. However, if the family wish to view the body as part of their grieving process, this should be

²⁰ *Ibid.*, pp. 27–28.

respected and facilitated. Psychological support to families should be provided, taking into account the families' needs, cultures and context. In some instances, material support to help with funerary rites may need to be provided, and special legal provisions put in place to expedite the issuing of death certificates and other urgent documents.

Collection and management of information on the missing, including those presumed dead

It is vital that information on missing persons is effectively collected, recorded and made accessible in a manner allowing for the recovered human remains to be identified. By definition, human identification is the attribution of the correct name to human remains. Only the bodies of those known to be missing (i.e., whose names have been collected onto a list) will have the possibility of being identified. Personnel in charge of data management need to be appointed. The recording of as much information as possible about the missing, as well as its consolidation and centralization, ideally in an electronic database, is particularly important. It is not uncommon for individuals to be reported missing multiple times to different agencies and by different individuals, and to be listed under different names and aliases. There is a potential for duplication and confusion if the data are not managed appropriately.

The process of obtaining *ante mortem* information of missing persons from relatives requires trained personnel who will treat next of kin with sensitivity, sympathy and respect. Annex 2 of the Manual provides a convenient template for this.

Communications with families and the media

Good communication is a key factor in effective disaster management, because it helps maintain the victim's dignity, minimizes additional grief to the next of kin and also contributes to successful victim recovery and identification.

A Family Assistance Centre should be established as soon as possible so that the next of kin can be briefed regularly, swiftly and collectively. The briefings should include information about the recovery and identification process, the storage and disposal of remains, and anything else of relevance. The families of identified individuals should be briefed privately before information is released to the media. The privacy of victims and families is a high priority. In large-scale disasters, the Internet, noticeboards or other media outlets such as newspapers, TV and radio will need to be used to communicate with the next of kin. Having a media liaison officer to regularly hold briefings with the press minimizes the risk of inaccurate or premature reporting. Close working relationships with operating relief agencies are crucial, as these agencies frequently work in close direct contact with the affected communities and are a valuable conduit for

information. Good communications with external agencies are also important, as these agencies are not always well informed and may provide mistaken information to the community and the media – as is often the case, for example, with regard to the infectious disease risk of dead bodies.

Frequently asked questions

The “Frequently Asked Questions” section of the Manual addresses the myths of health risks to the public from the dead, the recovery and disposal of human remains, and existing opportunities for assisting in the response efforts. Because of the experience with the Ebola epidemic, the 2016 edition emphasizes that in such circumstances (and epidemics of, for example, Lassa fever or cholera), untrained first responders should not be involved in handling the dead. An additional question has been included: what are the minimum steps needed to identify as many bodies as possible? Sometimes, even the authorities do not know the answer to this question. In order to reach an identification, information gathered about a missing person is compared and matched to information collected from the recovered body. In relation to the former, a list of the missing, as well as specific information about each missing person, is required. This is then compared with information about the dead bodies: for example, photographs preferably taken prior to the onset of decomposition, identifying features, clothing and personal effects. When a comparison is positive, or further examination of the body is required, the body can be tracked and retrieved because its location is recorded and the body itself is labeled with the same unique code that is on the information recorded.²¹

Conclusion

The dignified management of the dead after a mass fatality, including their identification, is a fundamental component of disaster response. When the local emergency response capacity collapses as a result of a disaster, the management of the dead frequently falls to first responders from the affected community until the arrival of outside agencies, including forensic services. The popularity of the 2006 Manual demonstrates the demand for practical and easy-to-follow guidelines, a gap which the Manual filled. The revised 2016 Manual takes into consideration experiences and lessons learned from ten years of application in the field, namely from the management of the 2014 Ebola epidemic, as well as technical and scientific developments of the past decade. With increasing globalization, the majority of mass fatalities nowadays incorporate an international dimension, making a standardized approach in the crucial first

21 See below for a discussion of the implications of reliance upon DNA to assist with identification.

hours and days after the event indispensable. For the success of subsequent identification efforts, the revised Manual is a timely and important resource.

Annex 1: Dead Body Information Form

Annex 1, previously called the “Dead Bodies Identification Form”, is now called the “Dead Body Information Form”. It can be printed online or photocopied from the Manual and handed out to first responders to help them in the crucial task of recording information about human remains as accurately and as early as possible in the response phase, which might aid in future identifications. The form includes the unique body code and prompts the recording of data under sections titled “Physical Description” and “Associated Evidence”.

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)	

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:	Use additional sheets if needed. If possible, include a sketch of the main findings. Note if photographs taken (include unique code in all photographs)
	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	

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

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

Annex 2, the Missing Persons Information Form, is to be filled out by those with requisite training in interviewing the next of kin of missing individuals. It includes the categories “Physical Description” and “Personal Effects”.

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

A. PERSONAL INFORMATION

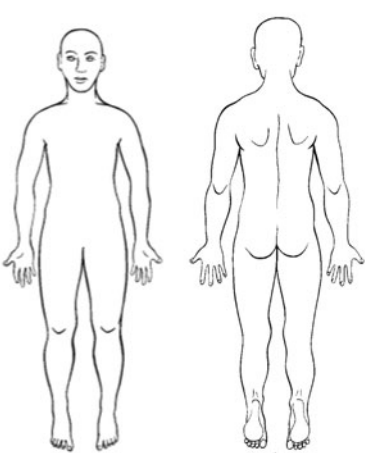
A.1	Missing person’s name:	Include surname, father’s and/or mother’s name, nicknames, aliases				
A.2	Address/place of residence:	Last address, plus usual address if different from the former				
A.3	Marital status:	Single	Married	Divorced	Widowed	Partnership
A.4	Sex:	Male	Female	Other		
A.5	If female:	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:		

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 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.	Continue on additional sheets if needed. Use drawings and/or mark the main findings on the body chart.				
						

	Types of medications – (used at time of disappearance)	
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C.6	<p>Dental condition: Please describe general characteristic, especially taking into account the following:</p> <ul style="list-style-type: none"> • 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 <p>Dental Treatment: Has the Missing Person received any dental treatment such as</p> <ul style="list-style-type: none"> ▪ 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 	<p>If possible, use a drawing, and/or indicate the described features in the chart below.</p> <p>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.</p> <div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="text-align: center;"> <p>BABY/PRIMARY TEETH</p> </div> <div style="text-align: center;"> <p>ADULT/PERMANENT TEETH</p> </div> </div>
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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

Annex 3 comprises a photocopiable template for the dead body label, which is to be filled out by the first responders. It has room for the unique body code as previously described. In addition, the label allows for the chain of custody of the body to be recorded. This label should be either waterproof or paper sealed in plastic, and duplicated. One copy should be securely attached to the body or a body part inside the body bag, while the other should be attached to the outside of the bag, allowing for the chain of custody form to be easily accessed so it can be updated at each handover of the body.

●

UNIQUE BODY CODE

PLACE OF RECOVERY
PERSON/TEAM
NUMBER

Date	Time
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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

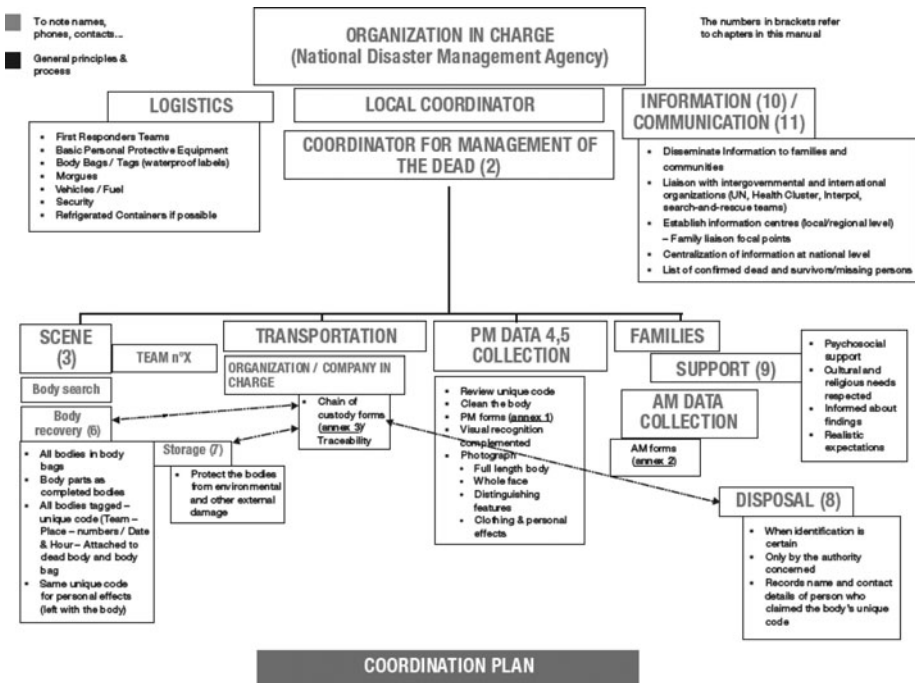
Annex 4: Mass Fatality Plan Checklist

The Mass Fatality Plan Checklist in Annex 4 outlines the key elements of an effective mass fatality plan. The Checklist is split into categories: Purpose; Activation; Command and Control; Logistics; Welfare; Identification and Notification;

International Dimensions; Site Clearance and Recovery of Deceased; Mortuary; Disposal: Final Arrangement; Chemical Biological, Radiological, Nuclear (CBRN) Disasters; Public Information and Media Policy; Health and Safety; and Disaster Mortuary Plan.

Annex 5: Coordination plan flowchart for management of the dead: An example

Annex 5 is an adaptable example of a coordination plan flowchart, which lists the most fundamental aspects to be considered in a mass fatality response, and which can be adapted to individual scenarios and contexts.



Annex 6: Dealing with the bodies of persons who died from an epidemic of infectious disease

Another new feature of the Manual is Annex 6, which is dedicated to the management of the dead from an epidemic of infectious disease. As previously stated, it is important to stress that untrained first responders should not handle the dead in these circumstances. When infected with Ebola virus disease (EVD),

the bodies remain very infectious for some time after death. If first responders and non-experts are to be trained to handle human remains in these circumstances, this training should be provided by individuals who are experienced in handling the disease. Those providing training should also understand the mode of transmission, be experienced in handling the bodies and know the correct and crucial procedures for donning and doffing PPE. The annex includes a summary of the WHO guidelines on safe handling and burial of deceased victims of EVD, while emphasizing that this is not a replacement for proper training.

The following is an excerpt from Annex 6.

<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>

10. Burial at the cemetery and engaging of community for prayers as this dissipates tensions and provides a peaceful atmosphere	<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
11. Return to the hospital	<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

Annex 7 addresses concerns and considerations for choosing a burial ground for temporary or long-term storage of bodies in the aftermath of disasters. Points covered include the potential for the contamination of drinking water from decaying human remains, preventing predator access and topographical considerations, as well as cultural, religious and legal aspects of burial.

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. 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. 6. Coffins should be made from materials that decompose rapidly and do not release persistent chemical by-products into the environment. <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	<p>Cemeteries are usually located on elevated ground, above the surrounding area, in order to protect the groundwater.</p> <ul style="list-style-type: none"> • 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. • 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

It is a mistake to think that the use of DNA simplifies the management of the dead in a mass disaster. When the correct procedures are being adhered to, DNA analysis is an extremely powerful tool which helps increase the number of victims identified following a mass fatality disaster. DNA sampling takes place subsequent to the assigning of a unique body code and the examination of the remains according to the procedures outlined in the Manual. The extracted samples (which could be muscle, bone or perhaps fingernails or toenails – this needs to be agreed in advance with the laboratories involved) need to be secured, labelled and properly stored to decelerate DNA degradation. A comprehensive list of missing individuals and their *ante mortem* information are still required, as well as biological reference samples from surviving family members, for identifications based on DNA profiling to be successful. Other considerations include the identification of laboratories for the analyses; samples taken from human remains and biological reference samples should normally be processed in separate laboratories, each with the capacity and technical standards to deal with the large number of samples and to analyze and interpret the results, including the statistics required for ascertaining the identity of human remains. Financing for these analyses needs to be sourced.

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.

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.	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.
Establish a framework for evaluating DNA data that considers the number of individuals missing and adopts statistical thresholds for DNA-based matches. Ensure that suitable software, along with robust protocols, is available for the comparison of the two groups of samples (victims and relatives).	A failure here will result in false identifications (possibly multiple), thereby undermining the whole identification process.
The finances required to fund the above need to be understood, and a source found.	For large-scale disasters, the finances will probably be beyond the capacity of many governments.

Annex 9: The management of dead foreign nationals following a large mass fatality disaster

As mass fatality events frequently include individuals of foreign nationality, arrangements applying to overseas nationals following their identification need to be made. These procedures should be established in advance and may need to include Interpol and foreign embassies. It is crucial that a systematic approach to management of all the dead and their identification is taken, and that this process is not distorted by pressure to prioritize the identification of foreign nationals.

Annex 10: Supporting publications

Annex 10 is a list of supporting publications which the reader of the Manual may wish to consult to gain more in-depth knowledge on the individual topics discussed. The list includes the following references:²²

Claude de Ville de Goyet, “Epidemics Caused by Dead Bodies: A Disaster Myth that Does Not Want to Die”, *Pan American Journal of Public Health*, Vol. 15, No. 5, 2004, pp. 297–299, available at: http://publications.paho.org/english/editorial_dead_bodies.pdf.

H. Douceron, L. Deforges, R. Gherardi, A. Sobel and P. Chariot, “Long-lasting Postmortem Viability of Human Immunodeficiency Virus: A Potential Risk in Forensic Medicine Practice”, *Forensic Science International*, Vol. 60, No. 1–2, 1993, pp. 61–66.

William D. Haglund, Melissa Connor and Douglas D. Scott, “The Archaeology of Contemporary Mass Graves”, *Historical Archaeology*, Vol. 35, No. 1, 2001, pp. 57–69.

²² References have been edited here to match the format of the *Review*.

ICRC, *Forensic Human Identification*, Geneva, 2013, available at: www.icrc.org/en/publication/4154-forensic-identification-human-remains.

ICRC, *Missing People, DNA Analysis and Identification of Human Remains: A Guide to Best Practice in Armed Conflicts and Other Situations of Armed Violence*, 2nd ed., Geneva, 2009, available at: www.icrc.org/en/publication/4010-missing-people-dna-analysis-and-identification-humanremains-guide-best-practice.

Interpol, “Disaster Victim Identification”, Interpol Resolution No. AGN/65/RES/13 of the 65th Interpol General Assembly, Antalya, 23–29 October 1996, available at: www.interpol.int/content/download/22405/210383/version/4/file/65-RES-13-Ang.pdf.

Interpol, *Principles of Good DVI Governance*, Lyon, available at: www.interpol.int/INTERPOL-expertise/Forensics/DVI.

PAHO/WHO, Resolution on the International Transportation of Human Remains, 1966, available at: http://iris.paho.org/xmlui/bitstream/handle/12345_6789/2177/CD16.R36en.pdf?sequence=1.

United Nations Office for the Coordination of Humanitarian Affairs, “The Cluster Approach”, *Humanitarian Response*, available at: www.humanitarianresponse.info/en/coordination/clusters.

WHO, “Ebola Virus Disease”, Fact Sheet No. 103, Geneva, August 2015, available at: www.who.int/mediacentre/factsheets/fs103/en/.

WHO, *Field Situation: How to Conduct Safe and Dignified Burial of a Patient Who Has Died from Suspected or Confirmed Ebola Virus Disease*, Geneva, October 2014, available at: <http://who.int/csr/resources/publications/ebola/safe-burial-protocol/en/>.

WHO, *Laboratory Biosafety Manual*, 3rd ed., Geneva, 2004, available at: www.who.int/csr/resources/publications/biosafety/Biosafety7.pdf?ua=1.

WHO, *Personal Protective Equipment in the Context of Filovirus Disease Outbreak Response: Rapid Advice Guideline*, Geneva, October 2014, available at: <http://who.int/csr/resources/publications/ebola/ppe-guideline/en/>.

C. P. Young, K. M. Blackmore, A. Leavens and P. J. Reynolds, *Pollution Potential of Cemeteries*, Environment Agency, Bristol, 2002.

Annex 11: International organizations

Annex 11 is a list of international organizations, namely WHO, the PAHO, the ICRC, the International Federation of the Red Cross and Red Crescent Societies, and Interpol, all of which may be involved with the response to a mass fatality incident and could be consulted for support and research.