

## Chapter 9

### **Disposal of dead bodies**

In many emergency situations, especially in the immediate aftermath of a natural disaster such as an earthquake or cyclone, there may be many dead bodies that require appropriate disposal. Despite many myths and rumours to the contrary, exposure to dead human bodies is **not** in itself a serious health hazard except in specific cases. For this reason, bodies should as far as possible be handled and buried or cremated by the families of the dead people, in ways which are as close as possible to their normal cultural and religious practices. Mass cremation or mass burial should be avoided if possible.

#### **9.1 Associated risks: Myths and realities**

In many scenarios, the management of corpses is based on the false belief that they represent an epidemic hazard if not immediately buried or burned. In fact, in the vast majority of situations, the health hazard associated with dead bodies is negligible. Indeed, WEDC field assessments by the authors have repeatedly shown that disposal of the dead presents the lowest health hazard of all the sanitation sectors covered in this book.

*'The myth that dead bodies cause a major risk of disease, as reiterated in all large natural disasters... is just that, a myth.'* (Goyet. 1999)

The presence of a large number of corpses following a disaster is likely to cause fear and uncertainty among the affected population. It is essential that this is not exacerbated by inaccurate information linking dead bodies and infectious disease. The primary problems and risks associated with dead bodies are social and political, not health-related.

##### **9.1.1 Infectious diseases**

One of the most common myths associated with disasters is that dead bodies are responsible for epidemics. In fact, a relationship between corpses and epidemics has never been scientifically demonstrated or reported (WHO, 1999). If people have died from the direct effects of war, famine or natural disaster then the risk of infectious disease is negligible.

Where the person has actually died from typhus or plague, the body may be infested with infected lice or fleas which can transmit these diseases to other individuals (WHO, 2001).

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Likewise, a person who has died from cholera or ebola may pose considerable health hazards to those in direct contact with the corpse. However, such situations are not common.

### 9.1.2 Water-related diseases

Contamination of water sources and the resulting transmission of infection may occur in a very limited number of cases when bodies are in contact with the water system and transmit gastro-enteritis

Diseases transmitted by mosquitoes such as malaria and dengue fever are not associated with the presence of dead bodies.

### 9.1.3 Pollution

The pollution of groundwater by buried corpses is rare although burial sites do produce dioxin and furan emissions which are potentially highly hazardous to humans. Possible health effects caused by exposure to dioxins include skin diseases and cancer. There are also some concerns about embalming fluids, such as formaldehyde, entering the groundwater. The risks of this are slight, however, since 4 per cent formaldehyde solution is usually used and most of this degrades in the body and soil before reaching the water table.

Air pollution can be considerable where large funeral pyres are built; this produces smoke hazards and air-borne dioxins.

### 9.1.4 Mental health

Perhaps the biggest risk associated with dead bodies is that to the mental health of the affected population. This includes the trauma of searching for survivors and retrieving corpses, as well as the unintended social impact of the precipitous and unceremonious disposal of bodies.

Observation of the dead can be deeply disturbing and the odours produced by decomposing corpses may be even more so. It is therefore important that corpses are collected quickly and morgue facilities are provided if bodies cannot be buried or cremated fairly rapidly.

In most situations, the cultural obligation to take care of dead bodies and the mental health consequences of open mass graves and uncollected corpses should be given priority over potential disease transmission.

## 9.2 Medical epidemics

Medical epidemics where corpses play a key role in disease transmission are relatively rare, even in emergency situations where the population is suffering from widespread malnutrition, or where water supply and sanitation facilities are poor. Epidemics are not **caused** by undisposed corpses; however, where an epidemic already exists, the disposal of the dead may become a more hazardous issue.

### 9.2.1 Cholera

Cholera is an acute intestinal infection which causes watery diarrhoea and can lead quickly to severe dehydration and death. Despite conflicting rumours, transmission through person-to-person contact is rare (WHO, 2000). The most common pathways for infection are the ingestion of contaminated drinking water or food contaminated during or after preparation

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In general, dead bodies do not usually interfere with the transmission of the disease. However, funerals for people (who die of cholera or any other cause) in a community affected by cholera can contribute to the spread of an epidemic. Funerals may bring people into infected areas from which they can carry the cholera organism elsewhere. For this reason, it may be necessary to limit funeral gatherings, ritual washing of the dead and funeral feasts. Burial or cremation should take place soon after death and near the place of death, to reduce the spread of infection.

Those who prepare the body of a cholera patient for burial can be exposed to high concentrations of cholera vibrios (WHO, 1993). It is important that these people are not responsible for the preparation of funeral food since this may increase the risk of transmission of infection. If this cannot be avoided then meticulous handwashing with soap and water is essential prior to handling food.

Despite these measures, appropriate disposal of the dead is not the main factor in controlling a cholera outbreak. Better excreta disposal systems, improved hygiene practice (especially concerning food) and increased access to safe drinking water are essential for minimising the transmission of cholera.

### 9.2.2 Ebola

Ebola Hemorrhagic Fever (Ebola HF) is a rare but severe and often fatal disease caused by the Ebola virus. It typically appears in sporadic outbreaks, usually within a health-care setting. The disease can be transmitted through body fluids or secretions, and using the same water. It is a brutal virus and, while inside the body, it can live easily in all fluids such as blood, spit, sputum, vomit, faeces and semen. Once outside the body, Ebola is quite fragile. It can easily be killed with the use of water and soap, but if nothing is done, for instance if a drop of blood is not cleaned, then the virus can remain much longer than the HIV virus (Médecins Sans Frontières, 2001).

Where an Ebola epidemic occurs, it is essential that high levels of awareness are promoted within the community, and that those who work with the sufferers, whether the patients be alive or dead, have the highest level of protection.

Where dead bodies are traditionally bathed by the family prior to burial this may actually assist the spread of the disease. In such cases it may be necessary to avoid traditional ceremonies and explain the risks to the bereaved family.

### 9.2.3 Typhus and plague

Bodies of people who have died from typhus or plague are likely to be infested with fleas or lice that can spread these diseases. It is recommended that handling of such bodies is conducted by trained medical staff only, that they are provided with appropriate protective clothing such as gloves, overalls and face masks, and that all equipment is thoroughly disinfected after use. Traditional bathing by family members should again be prevented if possible. It is advised that bodies are placed in body bags (if available) prior to burial but contact with corpses should be minimised and embalming should not be carried out (Healing et al., 1995).

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### 9.3 Cultural practices and needs

In general, the cultural practices and needs of the families of the deceased should be given priority over public health concerns. The process of mourning and burial or cremation will be highly significant and emotional to the family and friends of the dead person. It is important that relief workers take time to absorb the wishes and traditions of different groups within the affected population. Misunderstandings between aid personnel and families may result in unnecessary friction.

Cemeteries or cremation facilities should be planned for and provided early on in an emergency, in consultation with members of the affected population. Lack of acceptable funeral facilities and procedures may leave social issues unresolved, which may contribute to the overall grief of those involved, causing rather than reducing trauma. The collection, disposal, burial and/or cremation of corpses requires important human and material resources which should be allocated to the family and friends of the deceased.

People often expend scarce resources on funeral rites and graves, and where this is their wish it should be respected. In emergencies following conflict or genocide, memorials may help to heal wounds, and energies poured into this may speed up the emotional and physical recovery of the community.

In some communities 'burial societies' responsible for burial of the dead may be formed among the affected population; these should be promoted and used where possible.

### 9.4 Mortuary service and handling of the dead

#### 9.4.1 Morgues

In some situations it may be appropriate for the family of the deceased to keep the body after death to conduct a traditional wake prior to burial or cremation. In the immediate stage of an emergency where there are many casualties, or where there is an epidemic, it may be necessary to set up a mortuary. Ideally, a morgue should consist of:

- a reception room;
- a viewing room;
- a storage chamber for bodies not suitable for viewing; and
- a room for records and storage of personal effects.

Ideally, bodies should be stored at 4°C but this is rarely possible.

#### 9.4.2 Records

Provision should be made for monitoring deaths and funerals to record mortality data and to issue death certificates where appropriate. Depending on circumstances, the recovery and identification of the bodies of family members may be the primary concern of survivors.

In some situations, deaths may not be reported and bodies may be secretly buried to prevent reduction in food rations and other relief items.

When those being buried are the victims of violence, forensic issues should be considered (Sphere Project, 1999).

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### 9.4.3 Body dressing

Depending on local custom, it may be necessary to provide coffins, cloth or other materials for families to wrap their dead before burial or cremation. Blankets and sleeping mats can also be used if cloth is not available. In epidemics sealed body bags should be provided where possible.

### 9.4.4 Disinfection

In epidemic situations, 'disinfection' with lime (or chloride of lime) is often promoted. This is largely superficial, does little to remove infectious pathogens, and is hazardous to those using it (Healing et al., 1995). The provision of appropriate protective clothing to those handling the dead is likely to be more effective in most cases. Where appropriate, chlorine solution or medical disinfectants can be used by trained people to disinfect areas which have been in contact with infected corpses.

### 9.4.5 Protective clothing

Gloves and overalls should be provided to those handling dead bodies from epidemics and bodies with open wounds. In most other situations the family will take care of the corpse and will not require special clothing. Health workers in contact with dead bodies should be encouraged to wash themselves thoroughly with disinfectant soap, especially in epidemics or where there is a high prevalence of HIV and open wounds.

### 9.4.6 Transportation

The most common mode of transport to the burial or cremation site is for the body to be carried in procession by the family group. Only in exceptional cases, such as epidemics, should it be necessary for corpses to be transported by motor vehicle. Where this is the case vehicles should be thoroughly cleaned and disinfected after use by spraying with disinfectant. Taxis or wheelbarrows may sometimes be used and these should be disinfected immediately, prior to leaving the site.

### 9.4.7 Mass management

In the rare cases where the mass management of dead bodies is required appropriate teams will need to be set up to collect, store and bury or cremate bodies. Record keeping and identification of family members is likely to be complex and time-consuming in such situations, especially in the immediate aftermath of a large scale humanitarian disaster.

## 9.5 Burial

Burial is the preferred disposal method in general and should be used unless the customs and wishes of the family dictate otherwise.

### 9.5.1 Burial sites/cemeteries

Burial sites should be determined through consultation with the affected community and local authorities. Soil conditions, water table level and available space must be considered in their selection.

Graveyards should be located at least 50m from groundwater sources used for drinking water and at least 500m from the nearest habitable building. Ideally, an area of at least 1500m<sup>2</sup> per ten thousand population is required.

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The use of the cemetery should be carefully managed. Where there are different religious groups within the affected population it may be necessary to provide separate burial areas. Depending on local custom cement for grave markers may also be required.

### **9.5.2 Burial depth**

It is important that bodies are buried at sufficient depth to eliminate odours and prevent disturbance by carrion and dogs. A covering of soil of at least 1.0m is recommended.

The base of any grave should be at least 1.5m above the groundwater table where possible, to minimise contamination. In general, it is not necessary to line graves unless there is an especially high risk of contamination.

## **9.6 Cremation**

Health considerations alone provide no justification for cremation and this should only be conducted where it is the traditional or preferred method among the relevant family members.

### **9.6.1 Fuel**

The primary constraint concerning cremation is the availability of fuel. It is estimated that a single traditional cremation in India requires approximately 300kg of firewood (TERI, 2001). It is essential that adequate fuel can be obtained without significant detrimental effect on the local environment. It is also important that those responsible for cremation are experienced, to ensure that corpses are cremated at sufficient temperature.

### **9.6.2 Smoke pollution**

Cremation can cause extreme smoke pollution which may contain harmful dioxins, especially where large numbers of bodies are cremated at the same time. Mass funeral pyres should be avoided and cremation sites should be carefully located at least 500m downwind of habitable dwellings.

## **9.7 Key recommendations for the disposal of the dead**

The following are key recommendations for the disposal of the dead in emergency situations:

- Give priority to the living over the dead (provide sanitation facilities for the survivors first).
- Promote the identification and tagging of corpses.
- Provide accurate information concerning the risks associated with corpses
- Do not promote mass cremation of bodies.
- Do not support mass burial of unidentified bodies in large graves.
- Conserve fuel and resources.
- **Respect the wishes and social customs of the families.**

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