

## **Summary**

This document reports findings of research into the management of dead bodies following the South Asian tsunami disaster. Activities included reviewing relevant documents and media reports, interviews with key informants and field visits to Thailand, Indonesia and Sri Lanka between 18<sup>th</sup> February and 4<sup>th</sup> March 2005. The main findings from this work are:

### **Public Health**

- The public health risk from dead bodies is negligible: in Banda Aceh, where several thousand bodies remained unburied for several weeks, no disease outbreaks were reported.
- There were no reports of infections among workers recovering, identifying and disposing human remains.

### **Resources**

- None of the affected countries had mass fatality management plans.
- No agency or organisation was able to provide national and local governments with technical support or guidance.
- Coordination of recovery, identification and disposal was disjointed.
- Although management of dead bodies is of national importance, responsibility for implementation is at the local level.

### **Guidance and procedures**

- Basic equipment for body recovery was available locally; in most cases, specialist equipment arrived too late.
- No country had sufficient resources for advanced identification techniques (e.g DNA or dental analysis). The absence of reliable antemortem data in many countries means these methods may not be practical.
- Photographic equipment was widely available. Photographs may provide the best information for identification following mass fatalities after natural disasters

### Recommendations

- Simple plans for mass fatality management should be considered as part of national and local disaster preparedness activities. This should include the healthcare sector, military, police, and non-governmental organisations such as the Red Cross.
- A named person/organisation should have an agreed mandate to coordinate the management of dead bodies at the national and local level.
- Simple, practical field guidelines for the management of dead bodies are needed at the national and local level.
- The Pan American Health Organization/ World Health Organization should continue to develop technical capacity in the area of managing dead bodies.
- For large fatality incidents, basic methods of identification should be a minimum requirement. The simplest approach is likely to be visual identification, supplemented by photographs. More advanced techniques can then be used to support identification efforts, when and if resources become available.
- Where refrigerated storage is unavailable, bodies should be photographed, documented and temporarily buried in a manner that allows for future exhumation.
- Further field research should continue to systematically document and learn about the management of the dead after natural disaster.

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## 1.0 Introduction

Management of the dead is one of the most challenging aspects of disaster response. Existing knowledge of methods and approaches has largely been developed from aviation and transport accidents. To date, there is a limited evidence base to inform response following mass fatality events resulting from natural disasters.

The Pan American Health Organisation recently published the first comprehensive book on this topic, *Management of dead bodies following disasters*. However, there remains an important gap in the published literature of field studies on how the dead are actually managed in large natural disasters.

The tsunami disaster, while having terrible consequences for the affected population, offers an important opportunity to learn lessons about management of the dead. There have been examples of good practice and the use of sophisticated methods for identification, most noticeably in Thailand. Unfortunately however, there have also been many examples of mass burials, cremations, and surviving relatives unable to identify their loved ones.

This report is the first attempt to systematically document the management of the dead after a large natural disaster. It develops case studies from Indonesia, Sri Lanka and Thailand. We hope that our conclusions and recommendations will serve to improve the way we manage mass fatality disasters, and reduce the suffering of affected communities.

## **2.0 Study purpose, research questions and propositions**

### **2.1 Study purpose**

To describe disaster management issues concerning dead bodies following the South Asia tsunami disaster

### **2.2 Research questions**

1. What were the public health implications of the large number of dead bodies?
2. What procedures, systems and guidelines were used to manage the dead?
3. What resources were used for the management of the dead?

### **2.3 Study Propositions**

A previous review of the literature about the infectious disease risks from dead bodies [1] identified the following propositions regarding the public health implications

- For the public, the risk of infectious diseases is negligible.
- Those who handle the dead may be exposed to bloodborne viruses (Hepatitis B, C & HIV), tuberculosis and gastrointestinal infections. Therefore basic hygiene precautions (gloves & hand washing) are recommended.
- To avoid possible contamination of groundwater, cadavers should be buried at least 250m away from drinking water sources and with at least 0.7m above the saturated zone (where water can be found within the soil).

In the recently published book *Management of Dead Bodies in Disaster Situations* [2], countries are recommended to develop a preparedness plan for managing fatalities following disasters. This plan should consider four main steps in the management of the dead:

- Recovery of the bodies
- Transfer and storage of cadavers
- Identification
- Final disposal of remains

There is currently little information about the resources needed to respond to mass fatality disasters. However, for any operational intervention, manpower, equipment and finances are likely to be important. These can be considered for each step in the management of the dead. Finally, inappropriate burial practices and disposal of dead bodies should be avoided for public mental health, legal and other reasons.

## 3.0 Methods

### 3.1 Case study design

We used a descriptive multiple case study design. This method compares and contrasts the same study questions (see above) between several cases [3].

#### **3.1.1 Case selection**

Each case was a separate country. Our resources enabled us to select the following three countries

- Indonesia
- Thailand
- Sri Lanka

We used the following criteria to select the countries:

- Countries with a large number of fatalities caused by the tsunami
- Different levels of sophistication used to managed the dead (based on media reports & information from colleagues in the field)



### **3.1.2 Data collection**

Three sources of data were used:

- Media reports – mostly accessed on the Internet
- Documents – any relevant documents produced such as situation reports from Governments, WHO or NGOs
- Interviews with key informants – individuals from organisations such as Ministry of Health or other Government agencies, WHO or other UN agencies and NGOs. Interviews with the affected populations were not conducted.

### **3.1.3 Data analysis**

The study propositions were used as the framework for data analysis. For each case, key concepts within each of the propositions were analysed. In addition, a cross-case analysis was used to compare and contrast each of the propositions between the case studies. When possible, data from several sources were sought to verify (or triangulate) findings. For example, issues regarding body recovery in Band Aceh drew on data from media reports, interviews with key informants and observations in the field.

## **3.2 Ethical approval**

There does not currently exist a clear ethical framework for research in emergency situations. However, this project addresses two of the key concerns, namely asking for consent and ensuring anonymity (see [www.who.int/disasters/repo/5532.doc](http://www.who.int/disasters/repo/5532.doc)). In the absence of ethical approval in each country, this project employed similar ethical standards as required in the UK.

Ethical approval for the case studies was not sought in each of the countries where case studies were conducted. Instead, this study was approved by the ethics committee at the London School of Hygiene and Tropical Medicine