

# **Guidelines for safe disposal of unwanted pharmaceuticals in and after emergencies**

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International Pharmaceutical Federation  
International Solid Waste Association  
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# 1. Introduction

## 1.1 Background

During conflicts and natural disasters large quantities of pharmaceuticals are often donated as part of humanitarian assistance. Undoubtedly many of the pharmaceuticals save lives and alleviate suffering, but some donations given by well-meaning but uninformed people may cause problems. Pharmaceuticals may arrive past or near their expiry date, may be inappropriate for the needs, be unrecognizable because they are labelled in a foreign language or may have been sent in unwanted quantities. Donated pharmaceuticals with a long shelf-life may be mismanaged, particularly in the confusion during and after armed conflict or a natural disaster. Staff and storage space may be lacking and the pharmaceutical management system in disarray. Such problems also occur when drug donations form part of development assistance. Smaller quantities of pharmaceutical waste may accumulate in the absence of emergency situations, due to inadequacies in stock management and distribution, and to lack of a routine system of disposal. Safe disposal of these unwanted or expired drugs often creates a major problem.

These disposal guidelines are based on a report on the safe disposal of unwanted and unusable drugs in Mostar, which had accumulated during the war in Bosnia and Herzegovina. Quantifying pharmaceutical waste may be difficult. One report states that 50–60% of the 27,800–34,800 metric tons of medical supplies donated to Bosnia and Herzegovina between 1992 and mid-1996 were considered to be inappropriate, and by mid-1996 there were an estimated 17,000 metric tons of unusable drugs stockpiled in warehouses and clinics throughout the country<sup>1</sup>. These dramatic figures are contested: something in the region of 1,000 metric tons is considered by some to be more reasonable. A recent figure of 2,000 metric tons of pharmaceutical waste in Croatia is regarded as accurate. Unusable donated drugs hindered the efficient operation of pharmacies in many of the states of the former Yugoslavia and represented a significant disposal problem.

## 1.2 Prevention of waste from pharmaceutical donations

### Appropriate donations

Inappropriate donations may be minimized by donors adhering to the interagency *Guidelines for Drug Donations*<sup>2</sup>. The key principles are that drugs donated shall address the expressed needs of the recipients and that the date of expiration on arrival shall be no less than one year, unless there is clear evidence from the recipients that they have the logistic and managerial capacity to store and distribute shorter-dated drugs efficiently. The blind donation of pharmaceuticals based on unsubstantiated assumptions of recipient needs and logistic capacities is a major factor in the production of pharmaceutical waste.

## **Good donations may be wasted**

Mismanagement of received donations may turn a good donation into pharmaceutical waste.

## **1.3 The cost of disposal of waste pharmaceuticals**

### **The cost of waste pharmaceutical high temperature incineration**

Pharmaceuticals are ideally disposed of by high temperature (i.e. above 1,200°C) incineration. Such incineration facilities, equipped with adequate emission control, are mainly to be found in the industrialized world. Quotations for disposing of the pharmaceutical waste in Croatia and Bosnia and Herzegovina in this way range from US\$2.2/kg to US\$4.1/kg. To incinerate the current stockpile of waste pharmaceuticals in Croatia would therefore cost between US\$4.4 million and US\$8.2 million.

### **Quoted weights of pharmaceutical waste**

The gross weights mentioned previously include packaging. Actual pharmaceutical contents may be half, or less than half, of the gross weight.

## **1.4 Purpose of the guidelines**

These guidelines provide advice on the implementation of safe disposal of unusable pharmaceuticals in emergencies and in countries in transition where official assistance and advice may not be available. They are not meant to supersede local, regional or national laws regarding disposal of drugs, but to provide assistance where there is insufficient guidance or none at all.

A number of methods for safe disposal of pharmaceuticals are described. These are methods which involve minimal risks to public health and the environment, and include those suitable for countries with limited resources and equipment. The adoption of the guidelines by ministries of health, environment and other relevant ministries, and their practical application, will contribute to the safe and economical elimination of stockpiles of unusable pharmaceuticals.

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