

Drug donations
in
post-emergency situations

An Interagency study by:

AEDES
PQMD
WHO
World Bank

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Acronyms

| | |
|-------|--|
| AEDES | Agence Européenne pour le Développement et la Santé |
| CMR | Child mortality rate |
| COEN | Comité de Emergencia Nacional |
| EDL | Essential Drugs List |
| EHA | Emergency and Humanitarian Affairs |
| GOE | Government of El Salvador |
| GOM | Government of Mozambique |
| IEC | Information, education and communication |
| IFRC | International Federation of Red Cross and Red Crescent Societies |
| IMR | Infant mortality rate |
| IMC | International Medical Corps |
| INGC | Instituto Nacional de Gestão das Calamidades |
| JLOC | Joint Logistics Operating Center |
| KAP | Knowledge, attitudes and practices |
| MDM | Médecins du Monde |
| MMR | Maternal mortality rate |
| MOH | Ministry of Health |
| MSF | Médecins Sans Frontières |
| MSPAS | Ministerio de Salud Pública y Asistencia Social |
| NDF | National drug formulary |
| NEHK | New emergency health kit |
| NGO | Nongovernmental organization |
| OCHA | Office of Coordination for Humanitarian Affairs |
| ORT | Oral rehydration therapy |
| PAHO | Pan American Health Organization |
| PQMD | Partnership for Quality in Medical Donations |
| SCF | Save the Children Fund/USA |
| SUMA | Supply management system |
| UNDMT | United Nations Disaster Management Team |

| | |
|--------|--|
| UNICEF | United Nations Children's Fund |
| UNTAET | United Nations Transitional Administration in East Timor |
| USAID | United States Agency for International Development |
| WFP | World Food Programme |
| WHO | World Health Organization |

Executive Summary

The objectives of this project were:

- To conduct situation analyses on drug donations in East Timor (post-conflict country), El Salvador and Gujarat State in India (both affected by earthquakes), and Mozambique (floods), applying criteria derived from the Interagency Guidelines for Drug Donations¹, hereafter referred to as the Guidelines;
- To determine how and whether the implementation of the Guidelines has affected the processes and outcomes of drug donations; and
- To build evidence to facilitate wider acceptance of the Guidelines.

The study teams undertook to identify the organizations responsible for inappropriate donations, a step not often taken in earlier investigations. This information can now be used to facilitate educational initiatives aimed at preventing similar problems in the future.

Awareness of the Guidelines was high and appropriate drug donations were made in El Salvador, Gujarat State in India and East Timor. In Mozambique, it was found that even with strong recipient awareness of the Guidelines and country ownership of the drug donation process, dumping and inappropriate donations occurred. International donors did not follow requests made by the Mozambique Government, and disruption of administrative systems by the floods affected capacity to ensure proper management of drug supplies.

The majority of inappropriate donations in Mozambique came from:

- a) Smaller organizations with little or no field presence nor experience in the pharmaceutical sector.
- b) Governments, or 'bilaterals', often developing countries, donating surplus drugs originally donated to them or procured by them.
- c) Local in-country distributors unable to sell their drugs in the market. This is a relatively new finding.

In the four countries, drug needs in the first few days following the emergency were often met through buffer stocks. A common feature noted in Gujarat, East Timor and El Salvador was that, in most instances, adequate drug supplies were provided during the acute phase of the disaster through the use of local buffer stocks, as well as by major donor agencies with expertise in providing immediate disaster aid of good quality. In the case of Gujarat, the presence of a large domestic pharmaceutical production capacity in India significantly aided the swift response following the occurrence of the earthquake. In Mozambique, warehouses that contained buffer stocks were flooded.

The effectiveness of logistics software systems was closely dependent on local capacity and sustainability of the systems. The decision to use them for emergencies needs to be re-examined since the effectiveness of these tools is disputed. In India and Mozambique, elaborate

¹ Interagency Guidelines for Drug Donations. WHO/EDM/PAR/99.4

manual record-keeping systems that the local staff were familiar with and experienced in maintaining, served as a better source of information than computer based systems that were not updated, lacked functioning equipment and required staff knowledgeable in the use of the program.

In all four countries, no evidence was found to suggest that improvements are needed to the Guidelines. However, there is a continuing need for improved dissemination, mainly among specific donor groups such as bilateral organizations, diasporas and smaller organizations. Such targeting of information on drug donation practices would improve future outcomes.

In all four countries, relatively low awareness and capacity for implementation of the Interagency Guidelines for Safe Disposal of Unwanted Pharmaceuticals² indicates the need for further work to ensure proper disposal of unwanted drugs.

Principal recommendations include:

- Donor assistance in the pharmaceutical sector should be targeted at improving the state's capacity to manage the national pharmaceutical system, rather than setting up parallel and competing systems.
- Information, education and communication efforts should be directed to groups that showed least knowledge of good donation practices, in this case, bilateral governments and smaller nongovernmental organizations (NGOs).
- It is vital that donors listen, respond, respect formal requests by recipient governments for needed drugs, and heed such requests when the drugs are not needed.
- Donation volumes should be recorded by weight and unit in addition to packing units upon arrival of the drug in the recipient country. NGOs and bilateral donors should request full distribution reports for every shipment that they donate.
- Only agencies with institutional memory, pharmaceutical experience, established relationships with government and other actors, and a strong field presence in the recipient country should be permitted to assist by donating drugs. Governments and NGOs without these advantages should act through these aforementioned agencies.

² Interagency Guidelines for Safe Disposal of Unwanted Pharmaceuticals in and after Emergencies. WHO/EDM/PAR/99.2

I. Introduction

Well-planned and implemented drug donations in emergency situations have the potential to meet important human needs and to improve human welfare, especially among the poor. Alternatively, inappropriate, or poorly coordinated donated drugs, can create confusion and waste, impose substantial costs on the pharmaceutical and health systems in recipient countries, and contribute to adverse health outcomes. Past studies in post-emergency situations (Autier, Berckmans et al, 1998) have demonstrated the following negative impacts of inappropriate drug donations: a) loss of time, energy and labor on sorting and storing, b) loss of storage space that could be used for appropriate and necessary drugs, c) disruption of local public and private drug supply networks, d) creation of black markets, e) environmental degradation, and f) human morbidity and mortality resulting from the use of inappropriate drugs. It should be noted that measuring negative impacts is a complex process, as is weighing these against benefits.

Maximizing the positive impacts of drug donations requires effective communication and negotiation between donors and recipients, so that the supplies from donors have a better chance of meeting the needs of recipients. This, however, is not a simple process, as donations often flow across several layers of organizations, over language and cultural barriers, and through differentials of power and poverty³. Over the past ten years, there has been increasing concern among donors and the general public about the quality of drug donations. These concerns served as a catalyst to the publication of two editions of the Interagency Guidelines for Drug Donations in 1996 and 1999, respectively.

However, evidence from the Balkans, Central America and Turkey (Autier, Berckmans et al, 1998) suggests that unsatisfactory donations of drugs to developing countries have continued both during and after emergencies. According to these studies, donors have continued to send unrequested material, while recipients (including those that have formally adopted the Guidelines) have not always taken measures to ensure good donations. It has been suggested that the Guidelines in the 2nd edition (1999) have not been implemented by donor and recipient countries in a uniform and consistent fashion because they are fairly new and countries may be unfamiliar with them. Finally, there is also a perception that donor agencies have not allocated adequate funds for advocacy and information dissemination on drug donations.

The World Bank, in collaboration with the World Health Organization (WHO), the Agence Européenne de Développement et la Santé (AEDES) and the Partnership for Quality Medical Donations (PQMD), initiated this project in order to document drug donation practices and to assess the implementation of the latest Guidelines after more recent emergencies.

³ Reich M. An Assessment of U.S. Pharmaceutical Donations. Preface.

II. Project Objectives

- To conduct situation analyses on drug donations in East Timor (post-conflict country), El Salvador and Gujarat State in India (both affected by earthquakes), and Mozambique (floods), applying the criteria obtained from the Interagency Guidelines for Drug Donations, hereafter referred to as the Guidelines;
- To determine how and whether the implementation of the Guidelines has affected the processes and outcomes of drug donations; and
- To accumulate evidence to encourage wider acceptance of the Guidelines.

The World Bank's interest in the project is part of a broader concern with providing optimal assistance in post-emergency situations. Also, as the Bank is a signatory to the Guidelines it has a strong interest in assessing their effectiveness and implementation in the field. It is anticipated that the project's recommendations will guide World Bank operations in the pharmaceutical sector as well as its post-emergency health sector assistance strategy.

Furthermore, the Bank placed significant emphasis in the project on fostering collaboration among key internal and external stakeholders involved in drug donations. Within the World Bank, the project entailed a partnership across two groups (Post-Conflict, and Health, Nutrition and Population). Externally, the project built directly upon an existing partnership with WHO, which has been at the forefront of the interagency efforts to develop the Guidelines. The project also involved a close partnership with representatives of international NGOs involved in drug donations as well as with the pharmaceutical industry.

The project was conceived as a public/private collaboration among four stakeholders who, between them, have the potential to help recipients develop sound policies and management capacities for drug donations in post-emergency countries. The partners brought to the project a combination of resources, both technical and financial, and the project added to the resources that have already been committed by the Bank to the post-emergency situations in the four countries. With the World Bank's interest and expertise in disaster and post-conflict situations, AEDS' experience in monitoring drug donations during complex emergencies, WHO's global expertise with the Guidelines, and PQMD as an observer, the effectiveness of this collaboration was likely to be greater than the sum of the partners' individual contributions.

III. Sector Background

Donations of drugs and medical materials have evolved as a common response to countries affected by a human-made or a natural disaster. Donations have been encouraged by increasingly large media coverage of disaster and war situations, the advent of humanitarian relief operations, political considerations and the considerable surpluses of unused drugs existing in many donor countries (Berckmans et al, 1997; PIMED, 1994; ReMed et al, 1995; PSF, 1995).

Claude de Ville de Goyet and co-workers (1976) described the essential characteristics of inappropriate donations sent to Guatemala in the aftermath of the 1976 earthquake. Since then, numerous articles, reports and other media coverage have commented on the inappropriateness

of many drug donations in other emergencies (Zebalios, 1985; Ali et al, 1988; Cohen, 1990; Autier et al, 1990; Offerhaus 1992; t'Hoën et al, 1993; Forte, 1994; Woldeyesus, 1994; Schouten and van der Heide, 1995; Berckmans et al, 1997; Saunders, 1999). In most cases, 'inappropriate' was defined as: not corresponding to local needs; not corresponding to the WHO Model List of Essential Drugs (WHO, 1998); not used because of language problems; or not used due to expiration or having a remaining shelf-life of less than 12 months. In all cases, inappropriate drug donations wasted considerable human and economic resources for their sorting, storing and destruction.

History

Some of the most significant examples of large-scale inappropriate donations are described below (Autier, Berckmans et al, 1998).

- Unsorted drugs represented over 90% of the volume of drugs donated to Guatemala after the 1976 earthquake. In a two-week period, 100 tons of mixed, unused medicines were delivered. Huge quantities continued to arrive, despite the fact that the acute emergency was over in a week (de Ville de Goyet et al, 1976).
- In Armenia, after the 1988 earthquake that killed 29 944 people and affected half a million more, 5000 tons of drugs and medical supplies worth US\$55 million were sent during the one-year period after the disaster (Autier et al, 1990). Theoretical basic drug needs for that period were estimated as representing no more than 100 tons. Fortunately, appropriate drugs were more numerous during the first weeks after the earthquake and the bulk of inappropriate donations arrived after the acute emergency period. Overall, inappropriate drug donations represented about 70% of all donated drugs, and international aid was needed to finance the construction of an incinerator for the safe disposal of the unused pharmaceuticals.
- In Rwanda, in 1994, at the peak of the refugee crisis, a large international pharmaceutical company donated six million pills of Cefaclor, a sophisticated antibiotic (Purvis, 1996). Refugee workers had had no experience of using Cefaclor, and so the drug was not used. Part of the donation was returned, and the remainder had expired and had to be destroyed.
- From 1991 onwards, political instability, wars and population displacements affected countries that were part of former Yugoslavia. In one decade, large amounts of drugs were sent by the international community to Croatia, Bosnia and Herzegovina, and Kosovo. The volumes of inappropriate donated drugs in former Yugoslavia were particularly high, most likely due to a combination of the proximity to European countries (Quaglio et al, 2000) and the lack of coordination of health relief efforts (Berckmans et al, 1997; Quaglio et al, 1999).
- Fifteen percent of all drug donations received by the WHO field office in Zagreb in 1994 were completely unusable and 30% were not needed (Forte, 1994). By the end of 1995, 340 tons of expired drugs were stored in Mostar.

- In Croatia, 2700 tons of “pharmaceutical wastes” of foreign origin were stored in 250 warehouses. A specific component of a health project was financed by the World Bank in order to ensure safe disposal of these inappropriate donations (The World Bank, 1999; Stritof and Vrhovac, 1997). This amount was budgeted at approximately US\$4 million.
- The war in Bosnia and Herzegovina, 1992-95, affected 4 million people and resulted in around 200 000 deaths. The country received about 30 500 tons of drugs (compared to estimated needs of 1800 tons), out of which 50–60% were inappropriate (Berckmans et al, 1997). This study documented dumping practice, which is defined as the delivery (intentional or non-intentional) of large quantities of inappropriate drug items.

Past experiences indicate that most drug donations are unsolicited, i.e. provided without ascertaining from the recipient country if the donations would be useful. Also, in most instances, donated quantities far exceeded the required quantities, while simultaneously failing to provide those drug items needed for critical health problems prevailing in the affected area (Markus, 1996). Even clear information from the recipient countries to the international community seemed to be unsuccessful in stopping inappropriate donations (Zeballos, 1986; Woldeyesus, 1994). Also, since many inappropriate donations are motivated by the desire to help the populations of disaster affected areas, donors have had difficulty in understanding the rationale behind the Guidelines, or that some drug donations can be problematic (t’Hoehn, 1998; Autier et al, 1998).

Cross-border regulations to date

Inappropriate drug donations are facilitated by the absence of international conventions regulating transfer of pharmaceutical products across frontiers. However, conventions do exist in regard to expired or spoiled pharmaceuticals. These are considered as hazardous waste, and as such, if transferred across frontiers, are subject to the Basel Convention on the Transfrontier Shipment of Hazardous Wastes (Basel Convention, 1997). This Convention states that permission to cross international borders must be obtained from all states on the travel route before shipping expired or spoiled drugs abroad. These procedures can take several months to complete.

The original Guidelines were based on several rounds of consultation and comments by over 100 humanitarian organizations and individual experts. In 1996, WHO was requested by the World Health Assembly, in resolution WHA49.14, to review experiences with the Guidelines after one year. In autumn 1997, WHO's Action Programme on Essential Drugs therefore initiated a global review of first-year experiences. The results of the review are presented in the document ‘First-year Experiences with the Interagency Guidelines for Drug Donations’⁴. This evaluation formed the basis for the changes in the text in the revised edition.

In general, experiences with the original Guidelines were very positive, but there were matters requiring reconsideration. There were complaints that the authorities in some recipient

⁴ <http://www.who.int/medicines/library/par/who-edm-par-2000-1/who-edm-par-2000-1.pdf>

countries strictly adhered to the Guidelines, without regard for the exceptions specifically included. As a result, useful donations were lost. For example, problems were reported with Guideline 6: "donated drugs should have a remaining shelf-life of 12 months upon arrival in the recipient country". However, the problems arose from misunderstanding of, or failure to refer to the stated exceptions to that Guideline, rather than from the text of Guideline 6 itself. In this revised edition, Guideline 6 has been modified. It now allows for direct donations of drugs with a remaining shelf-life of less than one year to specific health facilities, provided assurance can be given that the drugs can be used prior to expiration. At the same time, many nongovernmental agencies have built up professional management methods for supplying drugs and other medical materials to affected populations, tightly adhering to the philosophy and recommendations included in these Guidelines. These initiatives have included the development of software specifically designed for the management of medical supplies during emergency situations, as well as guidelines in local languages.

Some donor countries (Australia, the Netherlands, Norway and the United States)⁵ have also developed guidelines for drug donations based on the Interagency/WHO recommendations (Forte and Alderslade, 1998). At the country level, emergency preparedness programs have promoted the definition of essential emergency drugs lists (PAHO, 2000). Once an emergency occurred, authorities in charge of relief operations were required to provide timely information on actual needs to the international community using these lists. Current logistics support systems for disaster mitigation are being examined by PAHO, WHO/EHA, OCHA and WFP, among other agencies.

It is critical that an artificial divide should not be created between post-conflict situations following inter/intrastatal wars and post-disaster situations (whether human-made or natural), since both situations are within the scope of complex emergencies, particularly regarding sectoral priorities in health systems and medical relief.

IV. Methodology

The study methodology was based on the evaluation technique used by AEDES in their earlier work in Armenia and Bosnia and Herzegovina (Autier et al, 1992; Beckermans et al, 1998). Weights were estimated using the WHO standard for the New Emergency Health Kit (NEHK), which provides drugs and medical supplies for 10 000 people for approximately 3 months. Kits are shipped on 2 pallets (1st pallet contains 10 Basic Units measuring 1.20x1.00x1.90 m; 2nd pallet contains the Supplementary Unit in 14 boxes measuring 1.20x1.00x1.70 m). The total gross weight of the NEHK is 865 kg per kit with a volume of 4.3 m³ (see list below). The cost of one NEHK is approximately US\$5700 (with anti-malaria drugs)⁶. The key steps in this AEDES' technique are as follows:

- a. Identifying key persons in charge of drug management during the disaster period. This includes staff from governmental agencies, local health authorities, local political authorities, United Nations agencies and NGOs.

⁵ http://www.usaid.gov/hum_response/pvc/ofdadrug.doc

⁶ http://www.who.int/medicines/docs/par/who-cdm-pat-99_4_en.doc

- b. Confirming whether the country had a disaster preparedness plan, and whether it worked in practice.
- c. Identifying the routine drug procurement and distribution system in the country.
- d. Identifying the main routes of entry and storage points for drugs donated to the affected area.
- e. Gathering information on methods used for managing donated drugs, as well as whether concerned persons at the local level were satisfied with the quality and quantity of the donated drugs in meeting their specific needs.
- f. Reviewing administrative documents related to the management of donated drugs.
- g. Visiting storage facilities (e.g. warehouses, hospital pharmacies), where a quick two-step method was used to evaluate the volume of drugs present in a storage facility, in addition to drawing sample items from the donations to ascertain the appropriateness of drugs present in the storage facility. These samples were only gross samples (no chemical analysis was performed) and, typically, 30 items were to be sampled in each storage facility.

However, in this project, two of the country teams (Gujarat and East Timor) encountered difficulties in applying the sampling methodology due to the following constraints:

a) Differences in applying certain definitions: Certain definitions from the earlier studies were clearly not applicable in the context of some places included in this project. For example, the Central Medical Stores (CMS) in Ahmedabad, Gujarat, is officially made up of three units. However, they are all under the same roof, and by considering the Stores as one entity the mission realized that smaller facilities would not be appropriately represented. Similarly, the formulary used at the State level (a formal essential drugs list has not been compiled) sometimes made it difficult to reconcile the appropriateness of the donation due to differences between respecting the WHO Model List of Essential Drugs and the State formulary.

b) Incomplete documentation of drug donations: Documentation for the initial period following the disasters was incomplete, since record-keeping was made a lower priority due to the huge quantities donated and the urgency of distributing the items to the affected areas. Further complications arose when all cartons received at the final destination site had to be counted manually as packing lists had been retained at a higher level. Though the origin of the goods was easily traceable, as the manufacturer's name always appeared on the goods, tracing the donation back to the donor was almost impossible as no record accompanied the delivery. Furthermore, even when the delivery parcel had a label identifying the donor, it was often impossible to establish details such as whether the goods were manufactured especially for this delivery, were diverted by the manufacturer from another order, or came from a wholesaling stock.

c) Mixing of drugs: In some instances, cartons of drugs were stored together making it difficult to estimate their respective quantities. This was especially difficult if drugs were mixed together within the same carton, including those which were a part of ready-made kits. Since sorting through such cartons was often not possible (given time and resource constraints), it was difficult to categorize such drugs at the time of sampling.

d) Variable size and representativeness of storage sites: The size of the storage sites could be over 1000 m², or just few square meters, depending on whether it was the central medical stores or the storage area in a small center. This variation in size meant that taking the same number of samples at each location, irrespective of its size, would lead to over-weighting the samples from the smaller sites. A similar concern emerged in instances where the volume of donated drugs at the storage site being sampled was in question. In such cases, extrapolating from the results of the sampled sites was felt to be inappropriate.

e) Variable quantity of sample drugs: The methodology is based on the premise of systematic sampling, without taking into consideration the size of the “donation space” from which the sample is taken. In actuality, the quantity of a drug could be as small as one carton or as large as ten (or sometimes even hundreds of) cartons. Hence, one could get a discrepancy between the actual volume of mixed/bad and dumped items and the volume calculated in accordance with the methodology.

The country teams concerned either made appropriate methodological modifications to the sampling method (as in Gujarat), or did not use the sampling method at all (as in East Timor). This fact did affect the calculations of the total volume of donations in Gujarat (where the calculation is based on an alternative method) and in East Timor (where a calculation of the total volume of donations was not undertaken). However, we believe that the use of alternative methods for calculating donation volumes does not in any way compromise the overall conclusions of the project, which relied on a variety of observations in addition to the volume of donations.

V. Results: Country cases

The four case studies constituting the evidence base for this report are East Timor, El Salvador, the Indian State of Gujarat, and Mozambique. In all cases, the countries were selected based on the recent occurrence of natural disasters or conflicts that created an emergency situation requiring donor assistance and contributions of medicines. The four cases do differ in that some of the emergencies are older than others, the countries have very different levels of human and system capacity, and most importantly, in that the nature and complexity of the emergencies vary widely across the spectrum. Armenia and Bosnia and Herzegovina data are included in the table for comparative purposes.

Table 1 – Summary of drug donation practices in six emergency situations

| Country | Armenia ⁷ | Bosnia & Herzegovina | Mozambique | El Salvador | East Timor | Gujarat (India) |
|---|----------------------|----------------------|--------------------------------|----------------------------|-------------------------|-----------------|
| Month/year of disaster | 1989 | 1992-95 | 3 floods in 2000 and 1 in 2001 | 13th Jan and 13th Feb 2001 | Sept 1999 to April 2001 | Jan 2001 |
| Population in the affected area | 500,000 | 2,656,240 | 500,000 | 1,600,000 | 850,000 | 1,500,000 |
| Duration of emergency (months) | 12 | 48 | 12 | 3 | 18 | 3 |
| Estimated drug donations (tons) | 5,000 | 30,500 | 514 | 882 | 545 | 1,308 |
| Estimated drug donations per person (kg) | 10 | 11.48 | 1.03 | 0.55 | 0.64 | 0.87 |
| % appropriate | 30% | 30% | 25% | 63% | 95% | 95% |
| Estimated appropriate drug donations (tons) | 1,500 | 9,150 | 130 | 556 | 518 | 1,243 |
| Expected (1) or expressed (2) needs in essential drugs for the affected population (tons) | 86 | 1,827 | 1,393 | 69 | 219 | 65 |
| Estimated appropriate drug donations in excess quantity (tons) | 1,414 | 7,323 | -1,263 | 487 | 298 | 1,178 |
| Estimated inappropriate drug donations in excess quantity (tons) | 3,500 | 21,350 | 128 | 326 | 27 | 65 |

- (1) For all countries but Mozambique, calculated according to the New Emergency Health Kit, which covers 10,000 persons for 3 months, with an average weight of 865 kg (Médecins Sans Frontières).
- (2) For Mozambique, weights were derived from the three requests to the international community issued in 2000 by the Ministry of Health just after each flood.

⁷ Armenia and Bosnia-Herzegovina are included in Table 1 to add historical perspective to the comparisons. They were not included as part of this specific study.

Table 2 – Summary of situations and of drug donations and administration in selected emergencies

| 1. Country | Armenia | Bosnia & Herzegovina | Mozambique | El Salvador | East Timor | Gujarat (India) |
|---|---|---|---|---|---|--------------------------------|
| 2. Type of situation | Earthquake | War | Floods | 2 earthquakes | War | Earthquake |
| 3. Month/year of disaster | 1989 | 1992-95 | 3 floods in 2000 and 1 in 2001 | 13 th Jan and 13 th Feb 2001 | 1999 | Jan 2001 |
| 4. Political context | Opening of former USSR to west | Attrition war Serbia and Bosnia | Successful recovery after civil war | Nothing special | Massive destruction after independence | Nothing special |
| 5. Drug donations long after end of emergency phase | Yes, for extended period long after the earthquake | Long lasting emergency | Yes | Yes | Long lasting emergency | Yes |
| 6. Population in the affected area | 500,000 | 4 million | 500,000 | 1.6 million | 850,000 | 1.5 million |
| 7. Number of deaths | 24,944 | 200,000 | 700 | 1,159 | 7,000 | 19,727 |
| 8. State of administration/ organization of services during/ after the disaster | Total disruption during the 3 months following impact | Total disruption during entire war period | MOH operational, but with limited resources | MOH fully operational | No government; transitory UN agencies | MOH fully operational |
| 9. Disaster preparedness plan and system, including drug donations | No | No | Yes, local volunteers | Yes | No | Yes |
| 10. Existence of local essential drugs list | No | No | Yes | No | Yes | Yes |
| 11. Entry points for medical supplies | Multiple, no control | Multiple, no control | Centralized in 2 cities (Maputo and Beira), with some control | Centralized in 1 city (San Salvador), controlled | Centralized in 1 harbour (Dili), controlled | Multiple, most were controlled |
| 12. Main type of entry points | 2 airports, roads later | Roads, airports | Airports, harbours, | 1 airport, roads | 1 harbour | Roads, airports |
| 13. Central coordination of medical supplies during disaster period | Absent | Absent | Present | Present | Present | Present |
| 14. Peripheral coordination with center drug supplies | Absent | Absent | Present | Weak | Present | Present |
| 15. Local capacity for drug sorting and administration | None | None | Too few pharmacists and warehouse managers | Yes | Yes | Yes |
| 16. HR ⁸ capacity to cope with massive drug donations | Limited, overwhelmed during first months | None | Overwhelmed ^b | Yes, but overwhelmed during the month post-impact | Yes, but overwhelmed | Yes, but overwhelmed |
| 17. Local logistic for drug distribution | Deficient and damaged roads | None, in charge of foreign aid | Deficient, damaged roads | Operational but damaged roads | Operational | Operational but damaged roads |
| 18. Screening of drug donations at central level | No | No | The majority | Yes, but many reached peripheral levels | Yes | The majority |
| 19. Timely information on needs to international community | None or erratic | None or uncoordinated | Yes | Some | Yes | Yes |
| 20. Role of media: degree and appropriateness | Poor | Fair | Very good | Poor | Good | Generally good quality |
| 21. Estimated drug donations (tons) | 5,000 | 30,500 | 143 | 882 | 545 | 1,043 to 1,572 |
| 22. Percentage inappropriate donations | 70% | 50-60% | 69% | 37% | Less than 5% | Less than 5% |
| 23. Incineration or other disposal facilities | None, incinerators installed by experienced NGOs | None | Good incineration procedures in Maputo and Beira | Centrally one incinerator, Peripherally private firms | Good incineration procedures | |

⁸ Human resources.

1) East Timor

Background: On August 30 1999, for the first time in their history, the people of East Timor were given the opportunity to vote on self-determination in a UN-monitored national referendum. The outcome was overwhelming; 98.6% of eligible voters took part in the ballot and 78.5% of them voted for independence, thereby ending 24 years of Indonesian rule. Militias went on a three-week campaign of destruction and terror that could not be stopped.

With a life expectancy rate of 49 for males and an infant mortality rate of 121/1000 live births, East Timor ranks among one of the poorest areas in East Asia. The per capita income is estimated at around US\$210 per year, half the 1996 level. Unemployment is 80-90%, and even those East Timorese with jobs struggle to meet the cost of living, especially in Dili and the larger towns.

Description of the emergency: In the violence that followed the referendum, it is estimated that over 75% of the population of 850 000 were displaced, and of those who fled to West Timor, approximately 100 000 are still refugees. Almost 70% of the physical infrastructure was destroyed or rendered inoperable. With the destruction of schools, clinics and other public buildings, the social sectors were hit especially hard by the violence. The exodus of higher-level Indonesian personnel, who occupied most of the technical and managerial positions in the country, exacerbated the situation.

A major constraint recognized by the team was the amount of time that had lapsed since the acute phase of the emergency ended. Nevertheless, a decision was made to include East Timor among the study sites, since it was felt that it would be useful to study the transitions that East Timor had made from the emergency phase to the reconstruction and development phase. It would also enable more to be learnt about how this transition had impacted on the pharmaceutical sector in general, and on the country's dependence on drug donations, in particular.

Emergency preparedness: Emergency preparedness was non-existent prior to the crisis. East Timor had been under-resourced for decades and a chronic humanitarian emergency had been slowly building up. Although international and local NGOs had begun to respond to the humanitarian needs of the population under the Indonesian occupation, no coordinating capacity had emerged to prepare for such an emergency. In October 1999, the United Nations Transitional Administration in East Timor (UNTAET) was created to fill the void created by the sudden cessation of Indonesian authority, and to facilitate the development of a national government and an administrative system.

Response to the emergency: The major international relief agencies, as well as some of the larger, experienced NGOs, were very quickly able to set up and provide specialized assistance for the health sector. In addition to their own drug supply systems, they ordered pharmaceuticals and medical materials through their own procurement agencies, managed transportation and logistics in the field, and had their own staff of health workers to distribute and use these supplies. The UN (notably WHO and UNICEF) largely coordinated their actions.

The first supplies arriving in the country were in the form of New Emergency Health Kits (NEHK)⁹ specially designed for the early phase of emergency situations.

During the emergency period, the top priorities of the health sector were (i) to supply the refugee camps (in West Timor) and (ii) to restore basic health services at district and sub-district levels, as nothing was left from the previous system. An important element of these initial activities was the establishment of a public sector drug procurement and logistics system. This later eased the transition from the emergency phase into longer-term health sector development. The goal of the pharmaceuticals logistics system was to re-establish a viable procurement, storage, inventory and delivery system that would ensure a constant supply of high quality, affordable, safe and effective essential drugs, as well as medical supplies for the entire population. The available evidence suggests that the Division of Health Services (DHS) has been fairly successful in realizing this goal, at least for the subset of drugs from the East Timorese Essential Drugs List (EDL) that are being supplied by the Central Pharmacy. As a direct result of and proportionate to these efforts, the need for drug donations has decreased progressively since the establishment of the Central Medical Store in Dili in March 2000.

Field visit results and observations: Given the difficulties encountered in data gathering, it is difficult to get a precise estimation of the total value and volume of drug donations during and after the emergency period. The source of the majority of donations was, and continues to be, NGOs and UN agencies, and these donations can generally be considered to be appropriate. Overall, the assessment team found only two clear large-scale examples of poor and/or mismanaged donations - Timor Aid and International Medical Corps (IMC) cases - aside from some small-scale donations made by individuals and/or small organizations to private clinics in East Timor (e.g. to the Bairo Pite clinic in Dili). However, if these donations are compared to the total volume of drugs received, inappropriate donations are very small (i.e. only about 10%, by volume, of donations received during the emergency phase, and less than 5% of donations since March 2000, are inappropriate).

There could be several reasons why the quality of drug donations to East Timor was much better than that observed elsewhere:

- East Timor is part of an island, and direct connections by air or boat were rare during the emergency phase. For logistical and security reasons, all supplies had to transit through Darwin, Australia. That transit allowed some surveillance of donations by UN agencies and international NGOs. Therefore, deliberate sending of inappropriate drugs to East Timor would have required substantial expense and effort.
- UNICEF made significant amounts of useful drugs available to NGOs and religious charities operating in East Timor within days of the start of the emergency. Therefore, there were no shortages of drugs and no *perception* of drug shortages in the field, and (possibly as a result) ad hoc drug donations were limited.
- The NGOs that were active in East Timor during the emergency phase mainly imported the NEHK, which work well in the initial phases of emergencies. Kits are, in general, easier to

⁹ <http://www.who.int/disasters/tg.cfm?doctypeID=12>

track, distribute and monitor than are individual drugs. In other words, these donations were appropriate.

- The fact that there were no bilateral drug donations (since there was no “receiving government”) may have been a factor in reducing inappropriate donations (global experience shows that bilateral donations frequently tend to be less appropriate).
- Several pharmaceutical companies were only willing to make donations that complied with the Guidelines. In response to a request for a donation of drugs from a (small) NGO to 42 companies in Australia, only two companies sent (a small but inappropriate amount of) drugs. Several (five or six) others replied that they could only donate if they were sure that export/import requirements were being met, and only according to the Guidelines. It is unclear which part of the Interagency Guidelines the companies were referring to.
- The events in East Timor received less media coverage in most potential donor countries when compared to many other events, and tended to focus more on the physical insecurity in East Timor than on the humanitarian situation/refugees¹¹.
- Overall, the East Timor experience would suggest that the Guidelines did have a positive impact on drug donations in emergency and post-emergency situations.

2) El Salvador

Background: A relatively small country, El Salvador has approximately 6 million people, with 450 000 living in the capital, San Salvador. Annual population growth is 1.5% with a per capita GDP of US\$1960 (2001). Life expectancy at birth is 70.4, while infant mortality is 27/1000 live births. The Salvadoran Government health system is managed by the Ministerio de Salud Pública y Asistencia Social (MSPAS). There are nine health departments, four tertiary hospitals and 12 secondary hospitals in the country.

Description of the emergency: Two earthquakes hit El Salvador in 2001, the first on January 13th, quickly followed by a second on February 13th. The two catastrophes combined affected at least 25% of the total population, and up to 75% of the population in specific areas. The Salvadoran health system (particularly in San Vicente, Usulután and La Paz) bore the brunt of the disaster. It has been estimated that 46 health facilities were damaged, four severely. Moreover, the earthquakes damaged seven of the 16 hospitals, and in three full evacuations of patients and staff were necessary. The estimated cost of damage caused to the Salvadoran health system by the two earthquakes is US\$10 million.

Emergency preparedness: The emergency coordination body in El Salvador, Comité de Emergencia Nacional (COEN), manages all donations, including drugs, at specific points of entry. El Salvador was aware of the issues surrounding drug donations and had established procedures to prevent inappropriate drug donations. There is a national management policy for inappropriate drug donations, dated January 1993, which states that the country cannot accept any type of drug sent as a donation that is not appropriate to the need of the population. It also assigns responsibilities for the reception and rejection of drugs donated at different levels (from national to local).

¹¹ A notable exception to this is Australia, where events in East Timor received considerable media coverage.

When dealing with drug donations and medical supplies, COEN immediately involves MSPAS for appropriate sorting and classification. MSPAS does initial sorting at Comalapa Airport in the presence of customs officials. When it is not possible to do the sorting and classification of drugs at the point of entry (large packages, uncertainty regarding the content, etc.) they are sent to the main MSPAS warehouse for drugs.

The principal donation management tool for emergency preparedness in El Salvador was the supply management system, SUMA. SUMA is a computerized system developed by PAHO to manage humanitarian donations in emergency situations. The system is not only limited to drugs. COEN is supposed to activate and work closely with the SUMA team following a disaster, with SUMA responsible for recording the donations. The system was first installed in El Salvador following the Hurricane Mitch emergency. Following a request from the Government of El Salvador (GOE), SUMA sent a supporting team from Costa Rica to assist the Salvadoran team. All information and data were to be shared between SUMA and the main national entities involved in the management of donations (in the case of drugs MSPAS is also involved).

Response to the emergency: Immediately following the earthquakes, drug donations began to arrive in the country. The main point of entry for donations was Comalapa Airport, where all the donations from international organizations, NGOs and private groups, were managed by the existing Government-led coordination body, COEN. SUMA was operating in strict collaboration with COEN, as the entity in charge of managing supplies donated in response to an emergency. It appears that COEN managed to control and coordinate the majority of donations in the country. Private donations were fairly minor considering the large number of Salvadorans living abroad. Though donations, including drugs, were sent, it has been estimated that the amount that bypassed COEN was negligible. SUMA should facilitate donations in-kind from other countries (bilaterals) since the materials coming from those countries (e.g. in this case, Colombia and Honduras) should already have been recorded in those countries as 'shipments out'. In practice, however, this was not the case. From a discussion with the SUMA Coordinator, a technician working in both SUMA and COEN, it emerged that this information was not collected in advance, and therefore the effectiveness of the whole system was diminished.

Field visit results and observations: Total drug donations in El Salvador approximated 882 tons, out of which, five NGOs donated about 48 tons of drugs. Approximately 10% (US\$1.4 million) of this donation was defined by the same NGO staff as 'inappropriate'. Out of the total volume of drugs donated, 37% was defined as "inappropriate". A further 12.9% was defined as "mixed unusable drugs giving rise to suspicion of dumping" (roughly calculated to be valued at US\$2.8 million).

An estimate of US\$10 million for total drug donations to El Salvador was made based on data collected from the main medical NGOs working in the country. The quantity of drugs donated to the country was estimated by visiting all the MSPAS drug warehouses and by performing an estimate on the volume of the donated drugs received by each warehouse; a rough estimate of the weight of the observed volume was also calculated. According to the qualitative

information provided at each warehouse, an estimate was made of good, bad and dumped donations.

The team found that SUMA appeared to be working mainly at central level and was not well integrated at either the regional or local levels. This appeared to be due to insufficient training at departmental levels, as well as a lack of technical supplies (computers and/or specific software) at lower levels of the system. Other problems also emerged regarding SUMA's operational issues, including the question of a "unit". When supplies arrived in El Salvador, the quantity was not specified on the package using the appropriate unit of measure. Sorting and classification of donations is particularly important in the case of donated drugs and medical supplies, but the SUMA team has not been trained to do these. Theoretically, the SUMA team should have opened each box and classified its content at the point of entry. However, according to the SUMA Coordinator, this takes a considerable amount of time and especially in the case of an emergency is often not possible. Donated drugs are therefore shifted to the MSPAS for sorting and classification, and only after the MSPAS has classified drugs and medical supplies received are donated drugs classified according to their "unit". Moreover, it appears that there is no integration from the central to the regional/local level; information is not sent to peripheral levels; the reason for this is linked to the lack of training of those working at peripheral level, as well as a lack of computers.

Overall observations include:

- The effectiveness of SUMA was diminished by lack of coordination with the agencies sending drugs out and drug sorting and classification skills by SUMA staff. One of the major problems encountered by the team was the lack of quantitative information -- both COEN and SUMA reports on documentation use the word "box", which can be of any size.
- Information dissemination from the center to the periphery was problematic due to lack of capacity at peripheral level.
- Software alone is limited in its utility. The software for managing data was not installed in the departmental warehouses, nor was information on drug management computerized.

Recommendations:

- Emphasis should be placed on reinforcing recommendations already made from previous studies on drug donation practice, particularly regarding actions at peripheral levels.
- A clear definition of a shipping "unit" for drug donations should be established.
- Quality control at the central level should be enhanced in order to avoid sending inappropriate drugs to peripheral levels.

3) Gujarat State (India)

Background: On 26 January 2001, a major earthquake (measuring 6.9 on the Richter scale) occurred in the State of Gujarat in the Republic of India. The earthquake was totally unexpected and occurred as the entire country of India was celebrating Republic Day. The disaster was acute in nature and the State began its recovery from the emergency phase within a few weeks of the occurrence of the earthquake.

Description of the emergency: The damage was primarily centered in the Kutchh District. The population of Gujarat State is estimated at 48.6 million with about 1.5 million in the Kutchh District. The Kutchh area was already experiencing a severe drought and thus the earthquake was a disaster within a disaster. There are 947 villages in this District and all were affected, including 181 totally destroyed and 152 extensively damaged. An estimated 110 000 families in rural areas and 100 000 families in urban areas were affected. Estimates as of March 2001 for all of Gujarat State were that over 16 000 were dead and about 150 000 injured following the earthquake.

The impact of the earthquake on the physical infrastructure was huge. Destruction of property, particularly housing, was massive. The health system also suffered severe damage, with almost all of the district health facilities either destroyed or sustaining major damage, including the district hospital at Bhuj, 9 out of 10 community health centers (which serve a population of about 100,000), and all 37 primary health centers (which serve a population of about 30,000). The roads were also extensively damaged, although ground transport to the affected areas was re-established within 24 hours.

Emergency preparedness: India has an established natural disaster management system with a defined chain of command from the central to the peripheral level. It consists of the Disaster Management Group in the Ministry of Agriculture at the center, with nodal officers (Chief Relief Commissioners) at the state level. Nodal officers are also located at the district level for co-ordination purposes, and additional officers are deputed to work at the airport and other checkpoints to facilitate the arrival and movement of relief supplies. A Coordination Committee has also been established to synchronize the activities of various donors, both from within and outside the country.

India has an essential drugs list as well as a formulary both at both national level and state level. The Government of India was fully aware of the Guidelines, as were the major donors. However, awareness of the Guidelines on unwanted pharmaceuticals was low and only a few facilities had devices for the safe disposal of these products.

Response to the emergency: For management of health sector related activities, round-the-clock control rooms were set up immediately at the Commissioner's Office in Gandhinagar, in addition to the Civil Hospital at Ahmedabad, six Regional Deputy Directors' offices, 19 district hospitals and 19 district health offices. Teams of specialists, medical officers and paramedical personnel were dispatched to the affected districts and reached all 947 villages within 72 hours. In addition, the UN Disaster Management Team (UNDMT), the UN Disaster Assistance Committee and the Office for the Co-ordination of Humanitarian Affairs (OCHA) were all actively involved in earthquake relief efforts.

Priority donations identified for the immediate post-disaster period included items needed for search and rescue operations, communications equipment, mobile surgical operating theatres, and other medical goods and supplies, including drugs. An emergency meeting of technical experts and decision-makers in the administrative system was convened at state level within hours of the earthquake to discuss the health needs, including drugs, for the disaster period. These drugs were then provided on an urgent basis to the quake affected areas. The Directorate

General of Health Services also issued a list of medical equipment, supplies and drugs required in the affected areas.

A general appeal was issued via the media, and there was an outpouring of support both from national and international agencies and individuals. Initial media reports concentrated on describing the extent of damage and human suffering, but the media were later used as a channel to inform agencies and the public on the specific needs of the affected populations. In addition to the supplies from the central level, a large number of national and international agencies and individuals sent their drug donations directly to the lower levels of the health system. A large number of qualified medical and paramedical personnel were deployed from the public sector, and they were joined by qualified personnel from the private sector.

Field visit results and observations: During the site visits, the team observed that the vast majority of the drug donations appeared to be appropriate, were clearly labeled and had expiry dates that were at least one year from the time of arrival in India. There were a few examples of drugs labeled in a foreign language which could not be deciphered at the local level, some drugs that had a short expiry period, and a few cartons of unsorted, mixed drugs, but these inappropriate donations did not appear to be significant in terms of total drug donations. In fact, from the analysis of the field observations as well as the review of documentation, it appears that less than 5% of the total quantity of donations was inappropriate. Moreover, there was no evidence of drug dumping by any agency or country.

Most of the donated drugs were manufactured in India, even when funding came from overseas (e.g. UNICEF, which provided close to US\$16 million in terms of medical relief including drugs and supplies, procured over 97% of the goods from within India). Based on discussions and review of documentation, the mission was informed that about 60–70% of all drugs and medical supplies were funded by government and domestic agencies, while about 30–40% were funded by international agencies and foreign governments.

Other observations included:

- Medical personnel were familiar with the vast majority of the drugs made available during the relief period.
- Both the field visits as well as the documentation and interviews with key personnel revealed that the quantities of drugs received significantly exceeded projected needs for a disaster of the scale faced in Gujarat. Approximately 1308 tons of drugs were received for a population of 1.5 million people.

Recommendations:

- It is essential to tailor an established national disaster plan to reflect the differences in strategy and interventions depending on the type of emergency (e.g. earthquake, flood, etc.) in order to target the population most effectively. Since many disasters disrupt all local infrastructure, external medical teams and other relief teams should be self-sufficient – teams should come self-contained for at least a few days with equipment, instruments, supplies, food, etc. Also, complete packages of relief items should be sent in. For example, the refrigeration required for certain drugs and vaccines should also be made available in conjunction with the relevant supplies.

- Labeling of shipments should be clear and understandable to the citizens of the country, based again on good practice in this case. For donated items to be useful at the local level, personnel in the field should be able to fully understand the composition and use of the donated drug.
- Use the media to get your messages across effectively. Some international agencies, as well as the Government of India, used the TV in their home country and in India respectively to inform people and agencies on actual needs, in addition to dissuading them from sending unnecessary items or personnel.

4) Mozambique

Background: As much as 60% of Mozambique's population lives below the poverty line. Life expectancy in 1999 was only 41.8 years for males and 44.0 for females. The population is growing at 3.5% annually and total fertility rate is 6.1 children. Mozambique's infant mortality rate (IMR) is 134/1000, child mortality rate (CMR) is 201/1000, and maternal mortality rate (MMR) is 1 100/100 000. As in most sub-Saharan countries, the main health problems in Mozambique are infectious and parasitic diseases. Foremost among these are diarrhoea, acute respiratory infection, measles, tuberculosis, malaria and pneumonia, in addition to child malnutrition. Among adults the principal cause of morbidity is malaria, while tuberculosis is the main reason for hospitalization and patient mortality¹².

Description of the emergency: In the first three months of 2000, Mozambique was hit by the worst floods ever recorded. Heavy rains had started in November 1999 and above normal precipitation was predicted for January to March of 2000. The floods caused 700 deaths and more than 500 000 people had to flee their homes. According to Government of Mozambique (GOM) and World Bank estimates, reconstruction costs will be over US\$400 million. During the course of the disaster, four major floods hit the rivers of southern and central Mozambique from January to March 2000. The first, caused by heavy rains, was in mid-January and primarily affected the Maputo region. The second, in early February, was caused by Cyclone Connie, and again brought much damage to Maputo. At the end of February, Cyclone Eline hit central Mozambique and caused severe floods on the Limpopo River. A third cyclone, Gloria, hit central Mozambique in March, causing the fourth flood. The second and third flooding, being the most severe, caused the majority of damage and fatalities.

Disaster preparedness: In spite of its relatively recent creation, the disaster coordination body, Instituto Nacional de Gestão das Calamidades (INGC), and its partners had drawn up contingency plans for three possible scenarios of flooding for Mozambique. Hindsight shows that they grossly underestimated the potential of both the volume of water and the area that was flooded. Estimated resources planned for search and rescue were 20 boats and 240 lifejackets for the whole country. However, donor support was not forthcoming for these modest efforts until **after** the disaster hit, and INGC dealt with the floods with only one boat in Maputo and six in the rest of the country. Provincial planning was also poor, with no visits or upgrading of the provincial disaster plans. Nonetheless, the provinces and districts did their best to hatch their own plans, even if they were just lists of safe places to go for refuge. Disaster

¹² World Bank. Health Sector Recovery Program, Staff Appraisal Report, p.8.

preparedness plans did exist, but were weak at the central level. INGC needs improved management capacity.

The MOH began planning with provincial directors for possible floods in November, 1999, via its Technical Unit for Emergency Coordination and Information. Chief among health concerns was the potential for cholera and malaria epidemics, which were targeted by MOH officials distributing medicine stocks planned for early 2000 at the end of 1999, to ensure that health posts had adequate stocks even if transport was obstructed by floods. Although they did not plan adequate health facilities for the 'accommodation centers' which would be created, they did distribute extra stocks of rehydration fluids and malaria prophylactics. Some of the provinces more prone to flooding also anticipated the disaster by setting up cholera facilities prior to the flooding.

The MOH was the only government agency that was able to rationalize all the NGOs working in the country. They did this by publishing a list of the NGOs authorized to work in health, along with their locations and activities. However, awareness of the guidelines on safe disposal of pharmaceutical products was low, and only a few facilities had devices for the safe disposal of these products.

Response to the emergency: The rescue services were unique in this disaster in that the United Nations relief system was integrated with a local disaster management system. Additionally, after initial management difficulties, a Joint Logistics Operation Center (JLOC) was set up to coordinate aircraft operations from all participating air forces. Most participants in these systems agree that they proved to be more effective than previous efforts.

At this time, the news in the international press created a great illustration of international solidarity, which resulted in an extraordinary increase in the volume of cargo delivered for the emergency. During this phase of the emergency, import procedures were simplified so that the donors had only to alert the MOH in advance that a donation was arriving. Delivery was often chaotic. At least 71 shipments arrived during 45 days, most without warning, and many with no documentation or packing list¹³.

Since the water stayed high for so long, people were forced to stay for long periods in hastily constructed accommodation centers. The large volume of aid and its effective coordination ensured that deaths due to disease and starvation were minimal. A few NGOs such as Project Hope and Médecins Sans Frontières (MSF) requested full distribution reports from the MOH, which were shown to be accurate upon validation. However, the MOH only recorded this information if the donor made a specific request.

Field visit results and observations: The three lists of drugs requested by the Government, as well as lists of received drugs, were made available to the mission (the '*Cheias*' report). For estimating weights of drugs, the weights for each drug item were provided by the logistics unit of MSF. The numbers of boxes (or bottles or vials) of drug items were then multiplied by the weight of each box (or bottle or vial) of the drug item. The total weight of drugs included in the

¹³ Christie F, Hanton J. Mozambique and the Great Flood of 2000, p.95.

three international requests represented 1393 tons. The international community donated 514 tons of drugs, i.e. 37% of the total amount requested. The estimate of 514 tons of donations corresponds reasonably well to descriptions of the aforementioned arrival of 71 shipments. Of these 514 tons, only 130 tons (25%) corresponded to requests issued by the MOH, and thus, could be considered as appropriate.

During the floods of 2000, the MOH made three appeals – the requests followed each of the three hurricanes that caused the floods – to the international community in order to cope with the increasing needs in the affected areas. The requests were estimated to have a total value of US\$4 357 800.

The requests included a list of 33 drugs that were part of Mozambique's national drug formulary (NDF). In response to the 33 drugs asked for, the international community sent 403 different items, out of which 68% were not even included in the NDF¹⁴, much less the government's request. Health workers often did not know how to use these drugs, and so they were useless in the emergency. Of the 33 types of drugs requested, only 19 were actually donated – of which:

- Five drugs were donated in double the quantity needed.
- Nine drugs were donated at less than 20 % of the requested amount¹⁵.
- Only five of the 33 requested drugs were donated in quantities needed.

Overall quantitatively, only 15% of the drugs actually requested were delivered. It is worth noting that average price per ton of requested drugs was US\$3128, a low-cost figure when compared to the usual costs of the drug component of the NEHK (around US\$11 000 per ton). The reason for the significant discrepancy is the large amounts of intravenous fluids and solutions included in the three requests. Intravenous fluids and solutions are heavier and cheaper than the drugs in the NEHK.

According to the first recommendation of the Guidelines, “All drug donations should be based on an expressed need and be relevant to the disease pattern in the recipient country. Drugs should not be sent without prior consent by the recipient.” In Mozambique, the Government clearly expressed its drugs needs. They received only 37% of that need, of which only 25% corresponded to the request issued by the MOH, and complied with the Guidelines. The drugs that were requested by GOM in the three appeals are all appropriate for emergencies, and on both the NDF and the WHO EDL. The quantities that were requested by the GOM may not have been exactly accurate, but that is to be expected in a rapidly escalating disaster situation such as the floods of 2000. The GOM had no way of knowing what volume of existing stocks had been destroyed by the flood, nor what outbreaks might occur. The *Cheias* report documents a logical process in the determination of quantities for the three appeals: to replace stock lost due to flooding of warehouses, to replace used stock, and to prepare for potential outbreaks of malaria and diarrhoeal diseases.

¹⁴ Cheias 2000 - Emergencia, Balanco dos donativos recebidos, Ministerio da Saudo, Departamento Farmaceutico, p.3

¹⁵ Christie F, Hanlon J. Mozambique and the Great Flood of 2000, p.94.

Qualitative evidence from Dr. Arturo Silva, WHO/Rome, who visited accommodation centers during the floods of 2001, clearly shows that health centers and accommodation centers were not adequately stocked with basic drugs needed for vaccinations, tetanus inoculations, malaria, oral rehydration therapy (ORT) and certain infectious diseases. Measles, dysentery and cholera have all been documented during both sets of floods. There were no children's dosages of drugs, so tablets had to be broken down into smaller pieces. At least 80% of the accommodation center residents had schistosomiasis, but no anti-parasitic drugs were available. They urgently needed dextrose solution and sulfadoxine + pyrimethamine. The cause of the stock-outs may have been transport or materials management constraints, but the need at the field level is clearly proven. Such information does not exist for the floods of 2000, but given that they were more severe it is logical to assume that similar shortages occurred.

Additionally, the team was provided with a packing list of a donation that was received from the Government of Zambia (GOZ) during the early phase of the disaster. It was a large shipment of 2 million gentamicin ampoules that arrived with four months remaining before expiration. Knowing that this drug is not used as a first-line antibiotic and given the shipment's short expiry date, most of the product had undergone disposal before the team arrived. This donation was said to have been from a surplus stock of procured drugs from a World Bank project, but in fact, it resulted from an over-procurement that the World Bank insisted be repaid to the health credit by the GOZ.

A striking feature of the three donation appeals conducted by GOM was the inconsistency of the donor response. While the first appeal was met responsibly, the subsequent two appeals deviated in both the amount that was requested and the amount that was sent. This behavior raises some provocative questions regarding drug donations. However, it can be generally stated that the GOM behaved appropriately and the donors reacted insufficiently and inappropriately. Also, no evidence was found of dumping by industry.

Other general observations included:

- Drugs that were requested by GOM were relatively low in unit costs.
- Essential drugs that were needed at the peripheral health centers were not available for various reasons, ranging from stock-outs to lack of transport.
- There is no one agency or entity that shoulders the entire responsibility for inappropriate drug donations in Mozambique.
- There is a high level of awareness of the Guidelines in the recipient country, and in most of the donor agencies with a strong field presence.
- It is critical to note that the majority of inappropriate donations came from:
 - a) Smaller organizations with little or no field presence on the ground or in the pharmaceutical sector.
 - b) Governments, or 'bilaterals', usually also developing countries, donating surplus drugs that were originally donated to them or procured by them.
 - c) Local distributors inside the country who could not sell their drugs in the market. The latter is a relatively new finding that deserves further study.

Recommendations:

- Donor assistance in the pharmaceutical sector should be targeted at improving the country's capacity to manage the national pharmaceutical system, rather than setting up parallel and competing systems. The performance of MEDIMOC, the country's drug supply agency, is one example of a strong parastatal organization that has survived through a war and numerous disasters¹⁶.
- There should be increased targeting of IEC towards groups that showed most evidence of inappropriate drug donations, in this case bilateral governments and smaller NGOs.
- It is vital that donors listen and respond positively to the MOH's formal list of drugs needed, which is incorporated in their formal appeals.
- Donation volumes should be recorded by weight and unit in addition to packing units upon arrival of the drugs in the recipient country. NGOs and bilateral donors should request full distribution reports for every shipment that they donate.
- Only agencies with institutional memory, pharmaceutical experience, established relationships with government and other actors, and a strong field presence in the recipient country should be permitted to assist in drug donations. Governments and NGOs without these advantages should act through these aforementioned agencies.

VI. Common themes

The following common themes were found in the case studies summarized above:

1. Local capacity

Without exception, the capacity within all countries affected by disasters is overwhelmed in meeting the needs during the emergency period. Despite this, it remains critical to recognize and rely upon local expertise and knowledge in management of the emergency. Some countries, such as India, were able to recover more quickly from the emergency phase. This was possible because the infrastructure in the rest of the country (and state) remained intact and there was a functioning administrative system to coordinate the relief operations. In countries such as El Salvador and Mozambique, where the system's capacity is limited to begin with, the emergency phase lasts longer. The presence of inappropriate donations at such times just adds further stress and unnecessarily exacerbates the crisis.

2. Drug needs in the first few days of an emergency

A common feature noted in Gujarat, East Timor and El Salvador was that, in most instances, adequate drug supplies were provided during the acute phase of the disaster through the use of locally available buffer stock. This was augmented by supplies from major donor agencies with expertise in providing disaster aid. In the case of Gujarat, the presence of a large domestic pharmaceutical production capacity in India significantly aided the swift response following the earthquake. Conversely, in Mozambique, flooding of the warehouses that contained buffer stocks demonstrated that a crisis can occur within a crisis, and that nothing is guaranteed or

¹⁶ World Bank. Population, Health, and Nutrition Sector Report, Report No. 7244, Mozambique, January 9, 1990, p 48.

protected in such emergencies. Each situation should be assessed individually according to the situation on the ground at the time.

3. Post-acute phase donations

In all the countries included in the study, it was observed that donations continue to arrive for a long period of time even after the acute phase is over. Given that it appears that most drug needs are met in the first few days following the disaster, this continuing arrival of drugs often poses logistical problems for the country. Over time, the quantity of drug donations received is often significantly more than the projected needs. Furthermore, the quality of donations appears to become worse.

In all the countries, the proportion of inappropriate drugs increased as the time lag between the occurrence of the emergency and the arrival of the drugs in the country increased. This was corroborated by examination of documents and through field visits. In El Salvador and India, it was apparent that the quantities of drugs received significantly exceeded the quantities needed. In Mozambique, however, there was a significant shortfall of drugs provided through donations when compared to the requests made by the Government to the donor community. The Government then expressed its desire to continue receiving more drugs so that they could use the additional drugs to replenish their buffer stock which had been destroyed by the flooding.

4. Effective management and coordination are critical to the drug donation process

The case studies point to the critical importance of effective leadership by governments, or their representatives. Coordination between donors and recipients is essential in ensuring the drug donation process is handled efficiently. For example, in East Timor and Gujarat, the drug donations process could easily have become chaotic. Effective cooperation and coordination among the various stakeholders active in the health sector under the leadership of the Government in India and the UN in East Timor, ensured that the process was handled smoothly. East Timor's later dependence on drug donations was minimized due to similar good management and coordination, ensuring a quick transition from the emergency to the rehabilitation phase. In Mozambique, where the country itself managed the drug donation process, the MOH's effort to rationalize and register all NGOs is an example of local good practice.

The Mozambique case studies also show that, however appropriate drug donations might be, the proper management, storage and distribution of these donated drugs to the people who need them is critical. If a good drug logistics system is not in place, if the storage facilities are inappropriate or inadequate, or if financing is not available for distributing donated drugs, even good donations can lie unused, spoil and/or expire. This situation is particularly problematic because, despite the obvious need for them and their usefulness, these drugs are not available to the people who need them, take up storage space that might have been used for other drugs, and ultimately must often be destroyed by the recipient at their expense. Donors can add value to this process by conducting spot checks of local pharmacies and markets, as well as by requesting full distribution reports of donations.

5. Utilizing the media to influence the quality of donations

It was observed that the media play an important role in making information available on both the extent of the emergency and the quality of relief equipment and supplies received. Communicating effectively with and through the media is critical in getting the relevant information to both the international community and the broader public. In Mozambique, the Prime Minister made a public appeal to the international community, not only for appropriate drug donations but also for compliance to regulations. This demonstrated good practice. The media offers opportunities to change donation behavior. In India, the television channels were used to update the public on the kinds of relief items that would be most useful in assisting the affected populations. At the local level, media should also be utilized to warn people of the potential adverse effects of purchasing drugs from the black market or other informal sectors, since this is where much of the uncontrolled inappropriate stock may be dumped.

6. Inappropriate donations and the potential for dumping

Donations given in good faith by the companies may be rendered inappropriate by delivering organizations such as NGO and private voluntary organizations. Yet no evidence was found of inappropriate donations attributable to major pharmaceutical companies or experienced NGO agencies. The field visits confirmed that it is very difficult to attribute the inappropriate drug donations as evidence of dumping by the companies that produce the drugs. It is also necessary to clearly distinguish between intentional and non-intentional dumping practices, and to find hard evidence, before airing such accusations. Even in Mozambique, where large quantities of inappropriate donations were made, no evidence was discovered. However, recipients must remain vigilant to breaches of the Guidelines so that they ensure the quality of drug donations. Examples of circumstances in which large quantities of inappropriate drugs are received, such as in Mozambique's case, could serve as the basis for further investigation of the possibility of inappropriate dumping via third-party donors.

7. Awareness of the Guidelines

In all the countries visited, the experienced relief agencies were very familiar with the Guidelines and complied with the Guidelines' requirements. However, in many cases, it appears that more work needs to be done in raising awareness of the Guidelines among bilaterals (including developing country donors), government agencies and smaller NGOs. Examples from the case studies relate to the Government of Zambia, Government of Belgium, and faith-based organizations.

8. Awareness of the safe disposal of drugs and of the Guidelines on this subject is particularly low among all cases in this study.

The case studies demonstrate that there is a need for countries to have effective and safe drug disposal systems, regardless of how good their system for the management of drug donations is. In most cases, it appears that the countries dispose of their drugs using less than optimal methods (burial, inappropriate incineration etc.). There is also negligence in sorting the drugs into the different categories and disposing them according to their composition. The awareness of the passages relating to these matters in the Guidelines was particularly low amongst all cases in this study. The international community could play a much more pro-active role in increasing awareness of the Guidelines. Furthermore, their role could extend to providing technical assistance and other resources to enable developing countries to establish safe disposal facilities for pharmaceutical products and other medical waste. In cases where there is

clear evidence of dumping, it may also be worthwhile to pursue options to obtain monetary compensation from countries/agencies that are responsible for propagating such inappropriate drug donations.

9. Using logistics software systems in emergencies

In both East Timor and El Salvador where SUMA¹⁷, the supply management system, had been used, the effectiveness of these tools was not undisputed and needs to be studied more thoroughly. The effectiveness of logistics software systems is very closely dependent on the local capacity of the systems. It appears that in most developing countries where computerization is still in development, many of these systems have problems, due to physical and human capital constraints. Computer based systems were often not updated due to either the lack of functioning equipment or the availability of staff knowledgeable in the particular program. In fact, in India and Mozambique, an elaborate manual record-keeping system that the local staff was familiar with and experienced in maintaining served as a much better source of information.

10. Emergency forecasting and preparedness increases effectiveness

The greater the emergency preparedness of a country, the higher the likelihood that the majority of the donations were appropriate. This requires countries to have a detailed plan for dealing with an emergency, local capacity to implement the plan, and a coordinating body (e.g. the State Government in Gujarat, the UN in East Timor). Countries that expressed their drug needs categorically at an early stage to the international community were able to more effectively influence the kinds of drugs received. An efficient and effective means of controlling the points of entry of drug donations also had a favorable impact on the quality of drug donations. Emergency forecasting and preparedness, while never perfect, still enables greater effectiveness in all responses, including the quality and quantities of drug donations.

¹⁷WHO-initiated supply management project meant to provide national authorities with a management tool and the skills to sort and inventory large amounts of relief supplies in a short period of time, de ville de Goyet, Acost E, Sabbat P, Pluut E., World Health Statistics Quarterly 1996; 49 (3-4): 189-94.

VII. Recommendations

1. Drug donations can be improved by effective health systems initiatives at the national and international level

A key feature observed in all the country studies is that drug donations are an integral part of medical relief efforts. The effectiveness of drug donations are dependent on the quality of overall health systems in the country. Furthermore, strengthening the emergency preparedness at both the national and international levels makes a significant contribution towards ensuring effective drug donations. Without effective linkages between drug donations and medical relief efforts, the mere availability of donated drugs is unlikely to have a significant impact.

Such emergency preparedness needs to be implemented multisectorally, with particular attention to the health system, in order to guarantee adequate health interventions to the affected population. The combination of harmonizing global emergency response efforts along with developing in-country institutional capacity should be a priority for the international community. In particular, countries should be encouraged to clearly enunciate their relief needs (international assistance is available to help countries calculate such needs), and donors should listen and respond to the country's request. In regard to inappropriate donor responses, compliance with regulations may be improved if swift international censure were delivered to those donors, by an entity invested with suitable monitoring powers by the international community.

2. Establishing an information exchange system between donors and recipients

It is important to establish an information exchange system between donors and recipients to facilitate management of drug donations by recipients. From all the country studies, at least some of the donations arrived in country with little information regarding package contents, while others arrived with labels in languages other than that of the receiving country. Donors should carefully prepare such packages and ensure that the details on the contents are provided in standardized units, and that weight and volume information is included. For their part, recipients need to make a concerted effort to maintain a detailed record of the items that arrive in the country, in order to improve the management of the drug donations. It is further recommended that receiving agencies begin recording volume by weight and unit in addition to packing units, upon drug arrival to the recipient country. Spot checks and requests for distribution reports by NGOs and donors are recommended good practice. It may also be useful to explore the possibility of a cut-off date for drug donations in post-emergency situations.

Donors should actively listen to government's requested list of drugs. Also, donors should seek to support necessary relief actions other than drug donations (e.g. donations in cash, logistics, and reconstruction) according to the needs of the government in emergency. Governments should clearly formulate needs, updating them daily, and express them clearly to donors. This is especially important during the crisis period.

3. Advocacy in emergency situations

Informed advocacy is an extremely effective tool during emergency situations. The media response during an emergency is often enormous, and can be of great use to authorities in delivering messages to the international and the local communities. However, unless the

messages are well thought through, clear and concise, an uncoordinated or even counter-productive response may ensue. It is essential to cultivate ties with international media and to provide them with accurate information. In addition, smaller agencies and the local community should be specifically targeted for information and educational purposes. This should include locally targeted messages to those who may not be fully aware of the impact of inappropriate donations. These messages should seek to discourage the purchase of black market or informal pharmaceuticals by describing the potential adverse effects of using illicit or inappropriate drugs.

4. The Guidelines must be more forcefully advocated and implemented

The results of the case studies suggest that the Guidelines have had a positive impact on drug donations in emergency and post-emergency situations. No information was found from the studies to indicate the need to refocus the Guidelines. That having been said, more work remains to be done in the effective dissemination of the Guidelines. Since inappropriate drugs are often supplied by individuals and smaller institutional donors, these should be targeted particularly. Furthermore, both larger donors and recipients should also be reminded of how the proper implementation of the Guidelines assists effective responses to emergencies, particularly in regard to drug donations generally and safe disposal of inappropriate drugs. Close attention to the Guidelines will not only greatly improve the quality of drug donations, but also conserve the stressed resources employed by the recipients during the emergency. Improved use of the Guidelines will also reduce the time wasted in getting drugs to those who need them, time otherwise spent on sorting through huge quantities of useful drugs, as well as useless and harmful donated drugs.

5. Training of personnel in recipient countries

The greater the emergency preparedness status of a country and the stronger the implementation capacity, the more likely that the recovery period from the emergency phase is shortened. A critical element of overall emergency preparedness is a strong foundation in good drug donation management practices. The training of emergency personnel in drug donation management standards (screening, handling, storage and safe disposal) should be an integral part of emergency preparedness training programs. Even in a country with fairly large local capacity, such as India, there was a clear need for better handling of storage and safe disposal issues. In Mozambique, as a result of this study, such a proposal for capacity building is currently being conducted by Project Hope.

6. Donors, drug storage and drug disposal

The international donor community can play a critical role in advising countries on storage issues pertaining to large drug donation consignments, as well as on the disposal of inappropriate drug donations. It is clear that most developing countries are not well equipped to deal with these issues even in normal times, and their limited capacity is overwhelmed during emergency periods. The provision of technical assistance for drug storage and the knowledge and methodology to dispose of unwanted drugs and other medical waste are critical needs in ensuring emergency preparedness.

Annex A: References

General

Ali HM, Homeida M, Abdeen M. "Drug dumping" in donations to Sudan. *Lancet*, 1988; 333: 538-9. (Letter).

Autier P, Férir MC, Hairapetian A, et al. Drug supply in the aftermath of the 1988 Armenian earthquake. *Lancet*, 1990; 335: 1388-90.

Autier P, Berckmans P, Schmets G. Re: Inappropriate drug donation practices in Bosnia and Herzegovina, 1992 to 1996. *New England Journal of Medicine*, 1998; 338: 1473-4. (Letter).

Basel Convention. Secretariat of the Basel Convention No. 97/012. Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal, 1998 and Decisions Adopted by the First (1992), Second (1994) and Third (1995) Meetings of the Conferences of the Parties (September 1997).

Basel Convention. Full text of the Basel Convention No 97/012. Available from URL: <http://www.basel.int/>

Basel Convention. Manual on implementation. Basel Convention No 97/012. Available from URL: <http://www.unep.ch/sbc/manual.html>

Berckmans P, Dawans V, Schmets G, Vandenberg D, Autier P. Inappropriate drug donation practices in Bosnia and Herzegovina, 1992 to 1996. *New England Journal of Medicine*, 1997; 337: 1842-5.

Berckmans P, Dawans V, Schmets G, Vandenberg D, Autier P, Matthys F. Report on drug donation practices in Bosnia and Herzegovina, 1992-96. Brussels, AEDDES, 1997.

Cheias. Emergencia, Balanço dos Donativos recebidos, Maputo, Ministerio da Saude, Dereccao Nacional de Saude, Departamento Farmaceutico, 2000.

Christie F, Hanlon J. *Mozambique and the Great Flood of 2000*. Oxford, International African Institute, James Currey Oxford and Indiana University Press, 2001.

Cohen S. Drug donations to Sudan. *Lancet*, 1990; 336: 745. (Letter).

de Ville de Goyet C, del Cid E, Romero A, Jeannée E, Lechat M. Earthquake in Guatemala: epidemiologic evaluation of the relief effort. *PAHO Bulletin*, 1976; 10: 95-109.

de Ville de Goyet C, Lechat M, Boucquey C. Drugs and supplies for disaster relief. *Tropical Doctor*, 1976; 6: 168-170.

de Ville de Goyet C, Acosta E, Sabbat P, Pluut E. SUMA (Supply Management Project), a management tool for post-disaster relief supplies. *World Health Statistics Quarterly*, 1996; 49: 189-94.

Forte GB. Private donations for Former Yugoslavia. *WHO Drug Information*, 1994; 8: 195-6.

Forte GB, Alderslade R. Re: Inappropriate drug donation practices in Bosnia and Herzegovina, 1992 to 1996. *New England Journal of Medicine*, 1998; 338: 1473. (Letter).

Gray R. Standardization of health relief items needed in the early phase of emergencies. *World Health Statistics Quarterly*, 1996; 49: 218-220.

Hoehn JB. Re: Inappropriate drug donation practices in Bosnia and Herzegovina, 1992 to 1996. *New England Journal of Medicine*, 1998; 338: 1472-3. (Letter).

Hogerzeil HV, Couper MR, Gray R. Guidelines for drug donations. *British Medical Journal*, 1997; 314: 737-40.

Markus M. Medical supplies donated to hospitals in Bosnia and Croatia, 1994-1995 - report of a survey evaluating humanitarian aid in war. *Journal of the American Medical Association*, 1996; 276: 364-8

Offerhaus L. Russia: emergency drugs aid goes awry. *Lancet*, 1992; 339: 607. (Letter).

PAHO. Natural Disasters: Protecting the Public's Health, Scientific Publication No. 575, 2000.

PAHO/SUMA. Supply management project in the aftermath of disasters. Washington DC, Pan American Health Organization. Emergency Preparedness and Disaster Relief Program. November 1996.

PSF. PSF mission in Bosnia and Herzegovina and Croatia, Annual Report. Paris, Pharmaciens Sans Frontières, 1995.

PIMED. Les médicaments non utilisés en Europe: recueil, destruction et réutilisation à des fins humanitaires. Paris, Pour une Information Médicale Ethique et le Développement, 1994.

Quaglio G, Mezzelani P, Cuchillo C. Drugs arriving in Kosovo need checking. *British Medical Journal*, 1999; 319: 1007. (Letter).

Quaglio G, Mezzelani P, Procacci P, Cuchillo C. Guidelines on drug donations are not sufficient for effective coordination: the case of Mostar in former Yugoslavia (in Italian). *Epidemiologia e prevenzione*, 2000; 24: 120-2.

Purvis A. The goodwill pill mess. *Time Magazine*, 29 April 1996.

Reich MR, ed. *An assessment of U.S. pharmaceutical donations: players, processes, and products*. Boston, MA: Harvard School of Public Health, 1999. Available from URL: <http://www.hsph.harvard.edu/faculty/reich/donations>).

Reich MR, Wagner AK, McLaughlin TJ, Dumbaug KA, Derai-Cochin M. Pharmaceutical donations in the USA: an assessment of relevance and time-to-expiry date. *Bulletin of the World Health Organization*, 1999; 77; 675-80.

ReMed, PIMED, Wemos. *Les échanges de médicaments entre pays européens et pays en développement: efficacité des systèmes de régulation, problèmes et perspectives*. Paris, Réseau Médicaments et Développement, 1995.

Saunders P. Donations of useless medicines to Kosovo contributes to chaos. *British Medical Journal*, 1999; 319: 11.

Schouten E. Drug donations must be strictly regulated. Georgia has tight guidelines. (Letter). van der Heide B. Assortments of drugs causes more problems than it solves. (Letter). *British Medical Journal*, 1995; 311: 684.

Stritof M, Vrhovac B. *Report on the receipt and storage of donations and evaluation of drug distribution during and after Croatian Patriotic War from August 12th 1991 to August 12th 1996*. Zagreb, Center for the Receipt and Distribution of Drugs and Medical Supplies. Croatian Ministry of Health and State Institute of Health Insurance. Zagreb University Hospital, 1997.

't Hoen E, Hodgkin C, Milkevicius D. Harmful human use of donated veterinary drug. *Lancet*, 1993; 342: 308-309. (Letter).

The World Bank. *Project appraisal document on a proposed loan in the amount of US\$29.0 million to the Republic of Croatia for a health system project*. Report No. 19155, Washington DC, 2 July 1999.

WHO. *Guidelines for drug donations*. WHO/DAP/96.2. Geneva, World Health Organization, 1996. Available from URL: <http://www.who.int/medicines>

WHO. *The new emergency health kit*. WHO/DAP/90.1. Geneva, World Health Organization, 1990.

WHO. *The new emergency health kit*. 2nd ed. WHO/DAP/98.10. Geneva, World Health Organization, 1998. Available from URL: <http://www.who.int/medicines>

WHO. *The use of essential drugs*. WHO Technical Report Series No 882. Geneva, World Health Organization, 1998.

WHO. *Guidelines for safe disposal of unwanted pharmaceuticals in and after emergencies*. WHO/EDM/PAR/99.2. Geneva, World Health Organization, 1999. Available from URL: <http://www.who.int/medicines>

WHO. *Guidelines for drug donations, revised 1999*. WHO/EDM/PAR/99.4. Geneva, World Health Organization, 1999. Available from URL: <http://www.who.int/medicines>

Woldeyesus K. Eritrea's policy on donations. *Lancet*, 1994; 344: 879. (Letter).

Zeballos JL. Health aspects of the Mexico earthquake-19 September 1985. *Disasters*, 1986; 10: 95-109.

References specific to Gujarat, India

1. WHO Report. Health Sector Assessment and Intervention after the Gujarat Earthquake. February 16, 2001
2. United Nations Disaster Assessment and Coordination Team Bhuj, Final Report
3. Earthquake in Gujarat – An Update (March 17, 2001)
4. Central Medical Stores Organization – Statement showing Stock Position Received Under Earthquake Relief Donation (March 17, 2001)
5. Disaster Needs Calculations Sheet Received from Military Hospital, Bhuj
6. Six Monthly Indent Sheet, Central Medical Stores Organization
7. UNICEF Status Report for Gujarat Earthquake Emergency (March 20, 2001)
8. Bhuj and Ahmedabad Airport Supplies
9. List of Foreign Medical Teams
10. Field Studies on Drug Donations Practices in the Aftermath of Disasters – Briefing Notes for India (March 14, 2001)
11. Post-earthquake Weekly Disease Surveillance Report Sheet
12. Voluntary Health Association of India (VHAI) Annual Report (1999 – 2000)
13. Office for the Coordination of Humanitarian Affairs (OCHA) Situation Report No. 4, India Earthquake (January 28, 2001)
14. Gujarat Earthquake Rehabilitation Village Partnership Procedure Manual – Gujarat State Disaster Management Authority (GSDMA)
15. MSF – Holland, Medical Report (March 10, 2001)

References specific to East Timor

(None reported)

References specific to Mozambique

1. Beneficiary Assessment on Perceptions of Health: a Study in Four Provinces in Mozambique, Executive Summary, Community Agency for Social Enquiry and Center for Health Policy: <http://www.case.org.za/htm/mozexec.htm>
2. Hanlon J. Who Calls the Shots. James Currey Ltd and Indiana University Press, 1991
3. Mabiére R, Perron V. Rapport sur le tri des médicament au Mozambique en 2000, MSF-CH. 11-24 mars 2000
4. Mozambique Country Economic Memorandum: Growth Prospects and Reform Agenda, February 7, 2001. World Bank Report No. 20601-MZ

5. Pavignani E. The Reconstruction Process of the Health Sector in Mozambique:
http://www.who.int/eha/disasters/hbp/case_studies/reconstruction.htm
6. Reich MR. An Assessment of U.S. Pharmaceutical Donations: Players, Processes and Products. Harvard School of Public Health 1999:
<http://www.hsph.harvard.edu/faculty/reich/donations/>
7. Rienstra D. U.S. Corporate Giants Funnel Aid Through Direct Relief
8. Humanitarian Affairs Review Summer 1999, pp. 42-45
9. Republica de Mocambique Ministerio da Saude Formulario Nacional de Medicamentos, IV Edicao 1999
10. World Bank Population, Health, and Nutrition Sector Report, Report No. 7244, Mozambique, January 9, 1990

References specific to El Salvador

1. <http://www.paho.org/English/PED/EISalvador-suma.htm>
2. CEPAL. EL Salvador, danos en el sector de salud. March 2001.
3. WHO, HFA Database, January 1999 version. Copenhagen, WHO Regional Office for Europe.
4. Relief Web: <http://wwwreliefweb.int>
5. OCHA, Situation Report No 8; El Salvador Earthquake, 27 February 2001

Annex B: Terms of reference for field studies

- Each situation analysis will be undertaken by a team of three people consisting of a representative of the World Bank, a representative of AEDES and a representative of PQMD, along with locally based experts and field officers, as appropriate. The site visits shall be carried out over a period of two weeks in late-February and early-March of 2001.
- As much information as possible should be gathered on all aspects of drug donations, using the standardized questionnaire developed for the project.
- Data should be collected for the disaster period itself, as well as the immediate and subsequent post-disaster periods. Should hard data not be available for either of these periods, educated guesses should be made based on interviews and other sources of qualitative information.
- Collection of data will require visits to all concerned institutions, including the MOH, the customs office, ports and other entry points for donations, the main storage warehouses, UN agencies and major NGOs.
- The analysis of the data obtained should, as a minimum, include the following:
 - Identified donations should be analyzed using indicators derived from the Interagency Guidelines for Drug Donations. These indicators include: availability of packing list using generic names of drugs, expiry date, remaining shelf-life, unit of presentation, presence of free sample drugs and returned/partially used packages, etc.
 - Examination of official documentation submitted for import authorization of drug donations should be analyzed using indicators derived from the Interagency Guidelines for Drug Donations. These indicators include: was the donation requested by recipient, presence of packing list, use of generic names for drugs, amount of drugs donated, presence of free sample drugs and returned/partially used packages, presence of drug not approved for use in that country, expiry date, remaining shelf-life, etc.
 - Direct examination of donations as well as the examination of official documentation should take particular note of the respect paid by donors to national legislation and/or government requests regarding donations.
 - Donations should then be categorized as appropriate or inappropriate using the definition of the AEDES Bosnia study. In addition, generic categorizations (such as by type of institution involved) should be made of the drug donors making appropriate/inappropriate donations.
 - The proportion of appropriate to inappropriate donations should be calculated.
 - The value of inappropriate and appropriate drugs received per inhabitant of the affected area should be made.
 - Estimates of the value of drugs should be made per cubic meter and per ton, as well as based on average wholesale price data.
 - Estimates of the cost of destruction of inappropriate drugs should be made.
 - The practicality of developing impact indicators derived from the above for use in assessing the effect of interventions should be explored.

- Based on the above analysis a comprehensive report should be prepared by each team for submission to either the World Bank or WHO, as appropriate, within 2 weeks of the end of the field visit.

- The report should, as a minimum, include the following:
 - A description of the affected area and reconstitution of the crisis history.
 - A description of the main pharmaceutical supply chains, including the storage and distribution channels for donated drugs.
 - An identification of main donors and their donations.
 - An estimation of volumes of drugs donated and related financial value (could, if possible, be compared with the total pharmaceuticals market in the country).
 - A description of procedures and instruments used to monitor drug donations at reception in the host country (assessment of local organization and management procedures and capabilities).
 - A description of measures taken/planned by the country/institutions (if any) to assist donors and discourage bad donations.

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Annex D: Membership of Partnership for Quality in Medical Donations (PQMD)**NGOs**

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