Disasters and Databases: Experiences of the CRED EM-DAT Project

*by D.G. Sapir, & C. Misson**
Centre for Research on Disaster Epidemiology (CRED), University of Louvain, Brussels, Belgium

Introduction

The need for systematic data for the field of disaster response and management has been of increasing concern to relief agencies at both the international and the national levels. Until recently, agencies tended to approach the problem in an *ad hoc* manner, by collecting information at the time of the emergency. Often the resulting data was incomplete, outdated or unusable. The need to obtain more accurate, verifiable data after the disaster was rarely considered important enough to rank high on the list of funding and policy priorities.

This situation reflected a lack of professionalism that has cost international and national authorities years of relief expenditure without a corresponding reduction in future vulnerability. However, with an increase in the number of disasters which require external assistance, national governments and international aid agencies have recognized the need for a more systematic approach to disaster relief, and a fundamental change aimed at more rational, long-term, management-oriented policies is now taking place. This approach is spearheaded by major U.N. agencies, such as UNDRO, UNDP and WHO, as well as scientific institutions. Within this context, CRED began to explore the feasibility of constructing a system of databases to help strengthen the system of disaster management on a global basis. The three databases which were eventually designed are:

- **Disaster Events and their characteristics (EM-DAT);**
- **Disaster Institutional and Human Resources (EM-RES);**
- **Key facts related to Disasters by country (EM-FACT).**

The first and third of these were implemented with the active support and collaboration of UNDRO and WHO. This article presents the first of these databases - Disaster Events Database or EM-DAT.

EM-DAT - Design and scope

The database EM-DAT was conceived as an integral part of a complete information system, the design of which is presented in *Figure 1*. It is a working database housed at CRED in Brussels and at UNDRO-Geneva. It operates by means of a compiled, menu-driven software programme and provides

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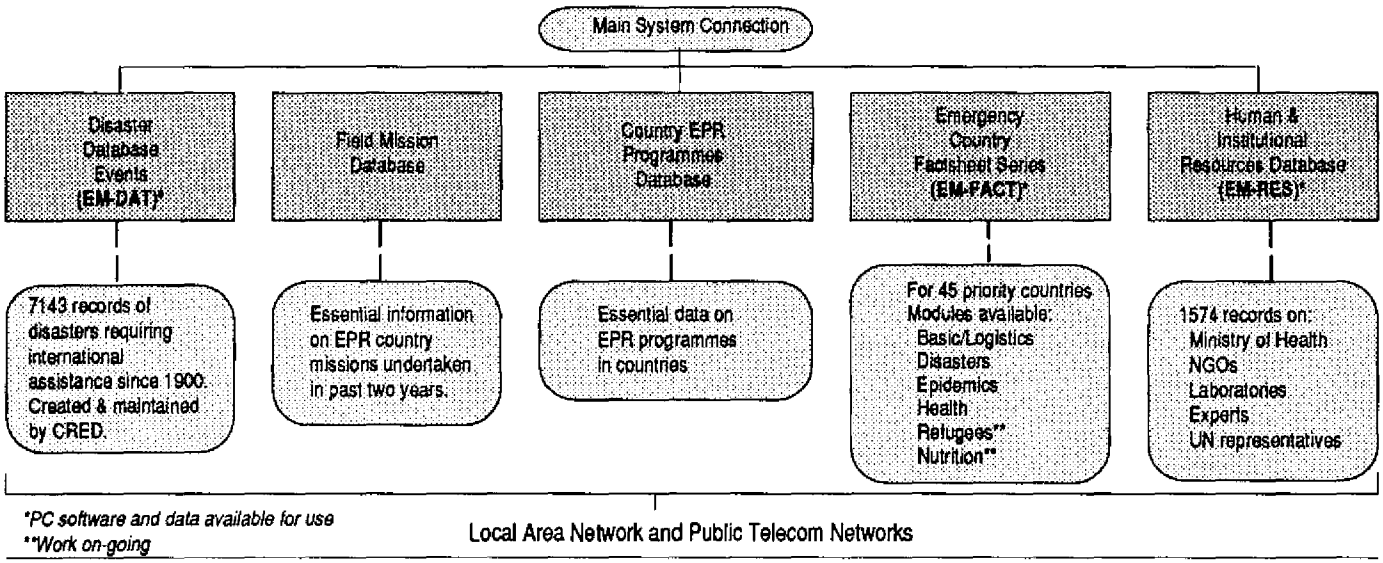
Figure 1
Emergency Management Information System
Layout for Data Bases



options for data retrievals and simple statistical reports, as well as updates and modifications. Todate, it has approximately 7,200 records. Events are entered into the database immediately after notification by an automatic telex-telefax reporting system. The staff of UNDRO and CRED then verify the reports with information from alternate sources. In addition, case by case validation of data from 1960 onwards is undertaken on a continuing basis. All redundancies, inconsistencies and blanks are checked and corrected accordingly.

Criteria defining the entry of an event

The working criteria used for entering an event in the database are:

A disaster is entered when it is known to have killed at least 10 persons, or affected at least 100, or when an international appeal for assistance has been launched. Furthermore, any event that has entailed the displacement of 2,000 or more persons (not necessarily with fatalities) would be eligible for entry into the database. All chemical accidents are entered, even if no deaths or number of persons affected have been reported.

When considering conflicting information, priority ranking is given first to data from the government of the affected country, (which is usually identical to that of UNDRO), followed by USAID, the Office of Foreign Disaster Assistance, insurance firms, specialized institutions and, finally, the press.

Limitations and ambiguities in disaster data

■ *Definition of a valid case*

The construction of a disaster database begins with the definition of a disaster - agreement on a universal definition of a disaster has generated an interminable, ongoing debate.

The various versions of disaster definitions used by agencies have been based, invariably, on their own needs. The definitions used by the WHO and UNDRO are as follows:

A disaster is any occurrence that causes damage, ecological disruption, loss of human life, deterioration of health and health services on a scale sufficient to warrant an extraordinary response from outside the affected community or area. (Extracted from : WHO Manual Section XV.4 article 20, 1/3/89).

For the purposes of the database, a stricter definition had to be formulated to enable the data manager to identify a valid case for entry. A newer definition, devised in collaboration with UNDRO, is in current use:

A serious disruption of the functioning of a society, causing widespread human, material, or environmental losses which exceed the ability of the affected society to cope using only its own resources.

Disasters are often classified according to their speed of onset (sudden or slow), or according to their cause (natural or man-made).

The definition of a disaster, thus, encompasses the following categories of events:

- Sudden Natural Disasters including all those of geological origin (earthquakes, landslides, avalanches, volcanic activity, tsunami); hydrometeorological origin (floods); high winds (tropical cyclones, hurricanes and typhoons); extremes of weather (heat or cold); insect infestation.

- Natural disasters of gradual onset including drought and famine; epidemic diseases.

- Man-made disasters including mass conflicts (civil war, major riots): events of a political origin, not necessarily violent (displaced persons, mass evacuation, refugees, expellees); accidents (transportation, food or insecticide poisoning); chemical accidents (factory explosion, nuclear accident but excluding slow pollution).

■ *Ambiguity in typology*

It may seem desirable to have categories of disasters refined to include as many specific groups as possible. But this specialization would pose logistical problems by inflating the number of categories for the key variables in the records; furthermore, the use of numerous disaster type names would complicate the procedure for lay users.

An example of a problem caused by ambiguity in disaster typologies is the frequent confusion between the terms *drought* and *famine*. A famine can be caused by a drought. It can also be caused by a civil war (Mozambique 1987, Sudan 1990), insect infestation (potato blight in Ireland), and economic disequilibrium (Great Bengal famine 1941) or a siege (Netherlands 1944). These disasters could be entered into the database as famines - or as one of the described underlying causes.

Displacement of populations gives rise to a similar ambiguity. Displaced persons in the CRED database now include: all expellees (persons expelled from their country of residence, e.g. Indians from Uganda); returnees (persons obliged to return to their home countries, e.g. Mozambicans from South Africa); and refugees (persons obliged to leave their home country due to religious, racial, or political persecution). Other groups belonging to this category are those persons displaced due to food scarcity or to civil war. Often such people have moved within their own country and therefore are not regarded as refugees or expelled persons.

The problem of ambiguity in typology is handled at present by entering the disaster as an exact event, together with all other relevant information, thus allowing the user to extract and re-create new categories as appropriate.

■ *Ambiguity in dates*

The declared date for a disaster, such as a famine, can be necessary for database purposes and at the same time be nearly meaningless in terms of the actual phenomenon. Famines do not originate on a single date; nor do displacements of populations. Civil strife, can, on occasion, erupt on a specific date, but it can also build up over time. Similarly, there is rarely a precise date for the outbreak of an epidemic. Dates publicized for these events can be as much a political decision as a matter of fact.

When considering severe disasters (cyclones, earthquakes, flash floods) one frequently finds cases with two different recording dates. The declared date of the emergency may vary according to the source: external agencies may announce an emergency situation before the national authorities do, or the contrary may occur. For natural disasters, the solution to such confusion is relatively easy, since the physical occurrence of earthquakes, cyclones and other sudden natural events are well monitored and can be verified by accurate, scientifically-measured information. The EM-DAT procedure is to correct all dates of severe, natural disasters according to the exact recorded time of occurrence provided by technical, meteorological and seismic institutions.

■ *Ambiguities in numeric information*

There are five numeric variables which require exact values. These are *persons killed, affected, homeless, injured* and the *monetary value of losses sustained.* Each of these has ambiguities of definition which require clarification for a reliable data base.

Due to the lack of a standard method for recording the precise number of lives lost as an immediate conseuqence of a disaster, the number of **persons killed** often includes all those confirmed dead, as well as all those missing and presumed dead.

Persons injured may include those with physical injuries requiring immediate medical attention or

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