Disasters Database

Getting the facts and figures right

As disasters become more complex, and the cost of response grows, the need for systematic data for disaster response and management has been of increasing concern to international and national relief agencies, governments and donors

Despite the obvious time pressures of relief actions and fund raising, the ad hoc collection of information by individual organisations at the time of an emergency is clearly inadequate for effective disaster response, good management and strategic planning.

The Centre for Research on the Epidemiology of Disasters is exploring the feasibility of a system of databases for global disaster management, based on CRED's existing disasters documentation and computer system. Development of its EM-DAT Disaster Events Database was supported by the University of Louvain, the International Federation of Red Cross and Red Crescent Societies, the World Health Organisation, the government of Belgium and the United Nations Department of Humanitarian Affairs.

EM-DAT is now fully operational, with more than 9,000 records of disaster events from 1900, and its own menu for updates, modification and retrieval. Designed to have the right level of detail for wide use, the entries are constantly being reviewed for redundancies, inconsistencies and the completion of missing data.

The criteria for event entry are. 10 deaths, and/or 100 affected, and/or an appeal for assistance. In cases of conflicting information, priority is given to data from governments of affected countries, followed by the UN Disaster Relief Organisation and then the US Office for Foreign Disaster Assistance. Agreement between any two of these sources takes precedence over the third. This does not reflect the value placed on the quality of data; most reporting sources have vested interests, and figures may be affected by socio-political considerations.

There are a series of caveats inevitable when presenting information on disasters, including the tables presented on the following pages which have been prepared by CRED from EM-DAT.

Despite efforts to verify, cross-check and review data, its quality can only be as good as it is reported. The complexity and cost of compiling essential data coherently from numerous sources requires considerable investment, which could be avoided if field agencies followed functional conventions for reporting. The data presented here are all recorded at CRED; while no responsibility can be taken for a figure, its source can always be provided.

Dates are a source of ambiguity: the declared date for an event such as famine is both necessary and meaningless, since famines, population movements, conflict and epidemics can rarely be pinpointed to occur on a single day. In such cases, the date of declaration of an emergency by the appropriate body has been used.

Figures for those "killed" in disasters should include all confirmed

dead and all missing and presumed dead. Frequently, in the immediate aftermath of a disaster, the number of "missing" is not included, but it may be added later. Without international standards, definitions vary from source to source, so CRED checks each entry for clarification.

People "injured" covers those with physical injury, trauma or illness requiring medical treatment as a direct result of disaster. First aid and other care provided by volunteers or medical personnel is often the main form of treatment provided at the site of a disaster, but it has not been defined whether people receiving these services should be included as "injured".

"Homeless" is defined as the number of people needing immediate assistance with shelter. Discrepancies may arise when source figures refer to either individuals or families. Average family sizes for the disaster region are used to reach consistent figures referring to individuals.

Defining "persons affected" is extremely difficult, and figures will always rely on estimates, as there are many different standards, especially in major famines, conflict and the complex disasters of the former Soviet Union and eastern Europe.

Disparities in reporting units can be a problem, such as monetary value of damages expressed in either US dollars or local currencies. While simpler to leave currencies as they are reported and only convert only when the event is of interest, that slows the comparisons and computations often required by data users.

Ambiguities also exist because of changes in national boundaries in the past few years, notably the break-up of the Soviet Union and Yugoslavia and the unification of Germany. In such cases, no attempt has been made to retrospectively disaggregate or combine data. Data is presented, for the country as it existed, at the time the data was recorded.

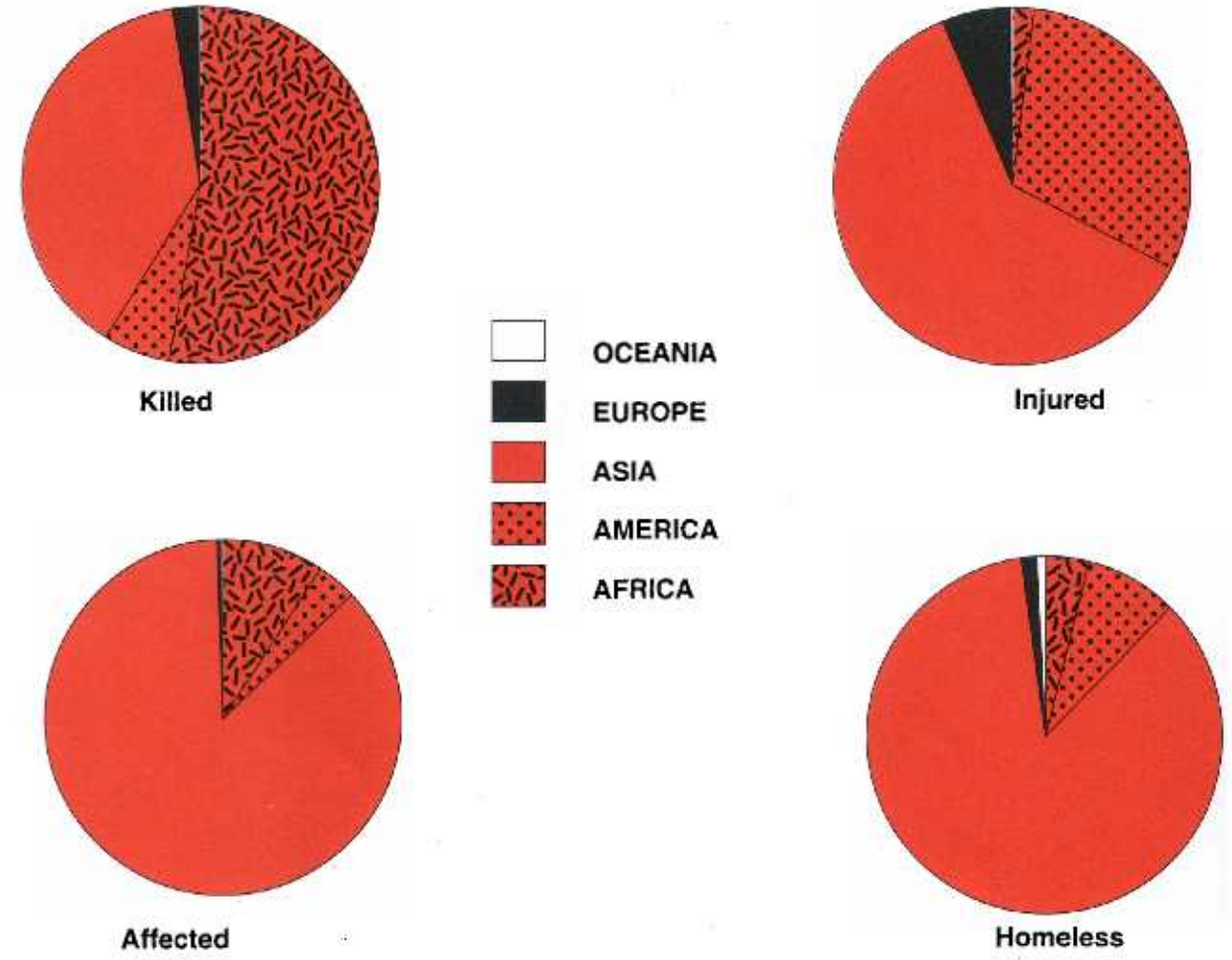
(Please note: percentages may not always add to 100 because of rounding.)

Disasters Database

Tables and charts

TABLE 1
25 year average by region
Disasters with a natural trigger 01/01/68 - 31/12/92

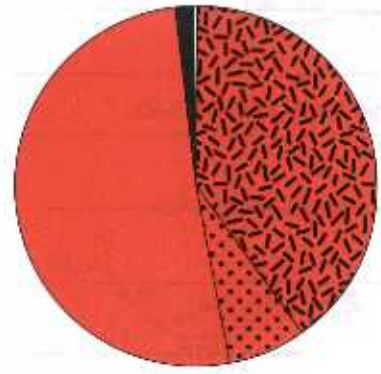
	AFRICA	AMERICA	ASIA	EUROPE	OCEANIA	TOTAL
Killed	77,277	8,946	56,245	3,359	96	145,923
Injured	1,008	14,907	29,832	2,900	90	48,737
Affected	10,572,025	4,354,757	99,771,480	541,990	84,774	115,325,026
Homeless	175,105	347,014	3,613,177	64,368	27,986	4,227,650



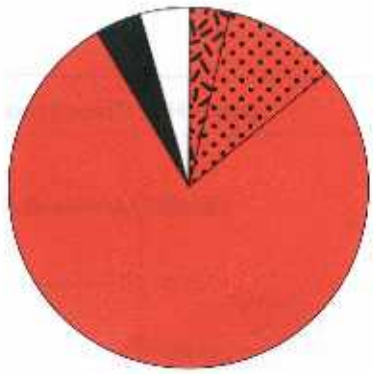
Average annual human impact by global region from disasters with a natural trigger 1968-1992: the total ratio of affected to killed is around 800:1. The significantly higher average in Asia is largely due to its higher absolute population and its higher density, both of which increase the levels of exposure to natural hazards.

TABLE 2
25 year average by region
Disasters with a non-natural trigger 01/01/68 - 31/12/92

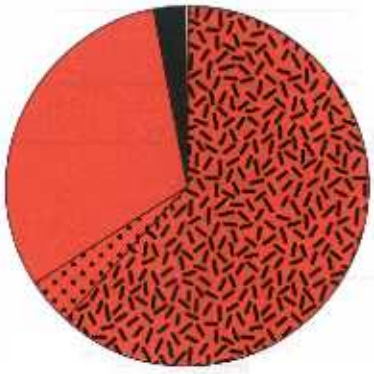
	AFRICA	AMERICA	ASIA	EUROPE	OCEANIA	TOTAL
Killed	44,847	7,761	56,930	1,884	78	111,500
Injured	434	1,158	8,722	483	476	11,273
Affected	4,256,265	286,408	2,154,289	202,158	650	6,899,770
Homeless	18,876	3,375	120,895	8,944	56	152,146



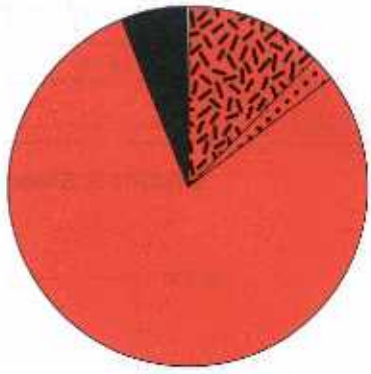
Killed



Injured



Affected

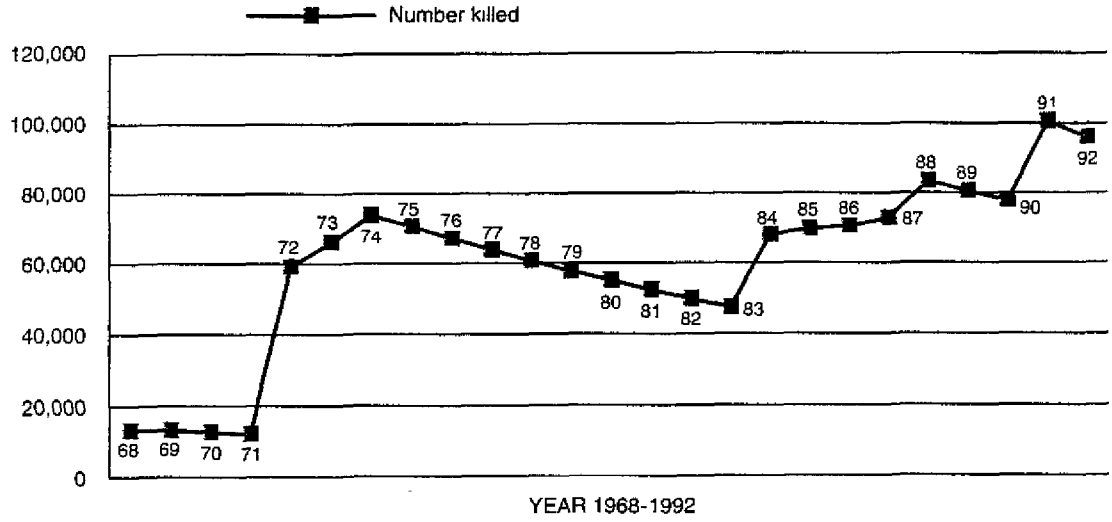


Homeless

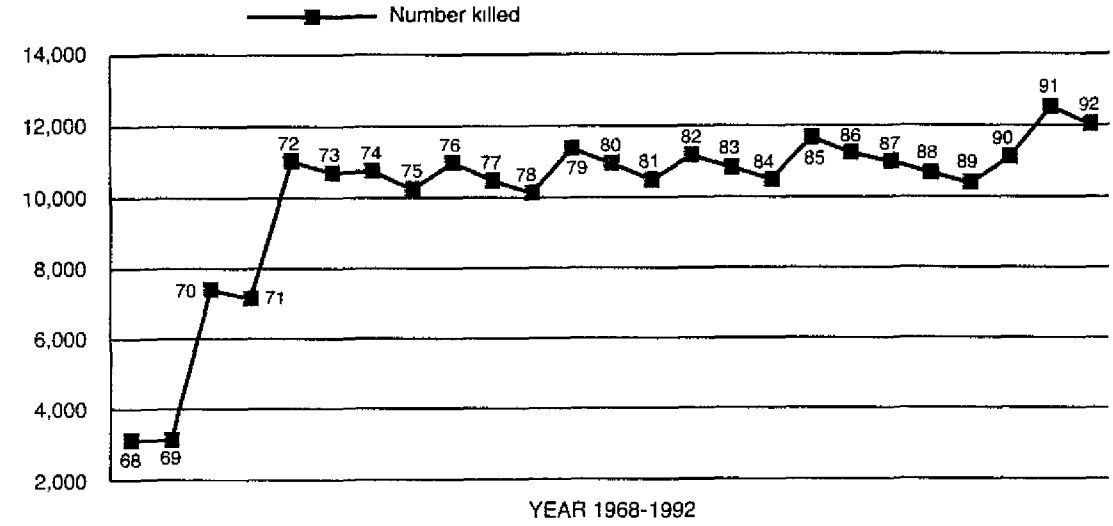
Average annual human impact by global region from disasters with a non-natural trigger 1968-1992: disasters with a non-natural trigger, which includes civil strife, displaced people, fires and a variety of accidents, tend to have higher mortality compared to affected than naturally triggered disasters, at around 60:1. Since most of the data for this table are drawn from insurance companies - except those for civil conflict - the accuracy of the information is fairly reliable. However, insurance companies tend to report only events that affect insured assets, and this introduces a selection bias in the data.

Mortality from all disasters 1968-1992

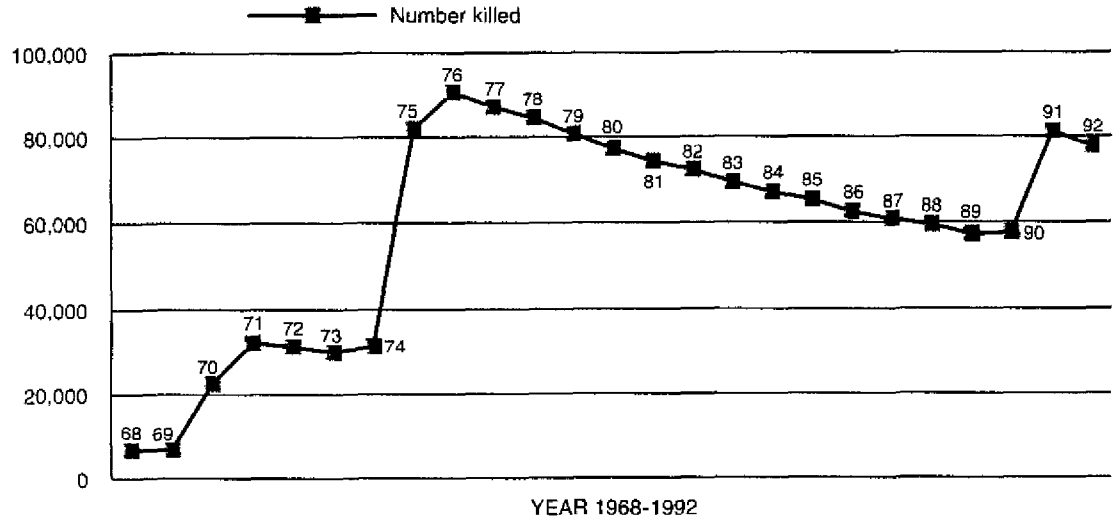
GRAPH 1: Smoothed time-trends in disaster-related mortality in Africa 1968-92.



GRAPH 2: Smoothed time-trends in disaster-related mortality in the Americas 1968-92.



GRAPH 3: Smoothed time-trends in disaster-related mortality in Asia 1968-92.



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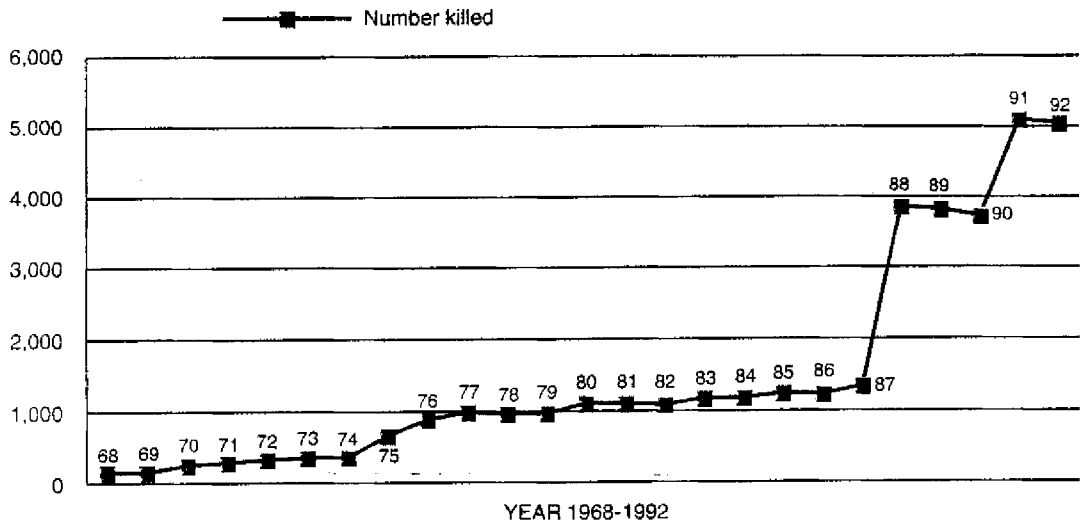
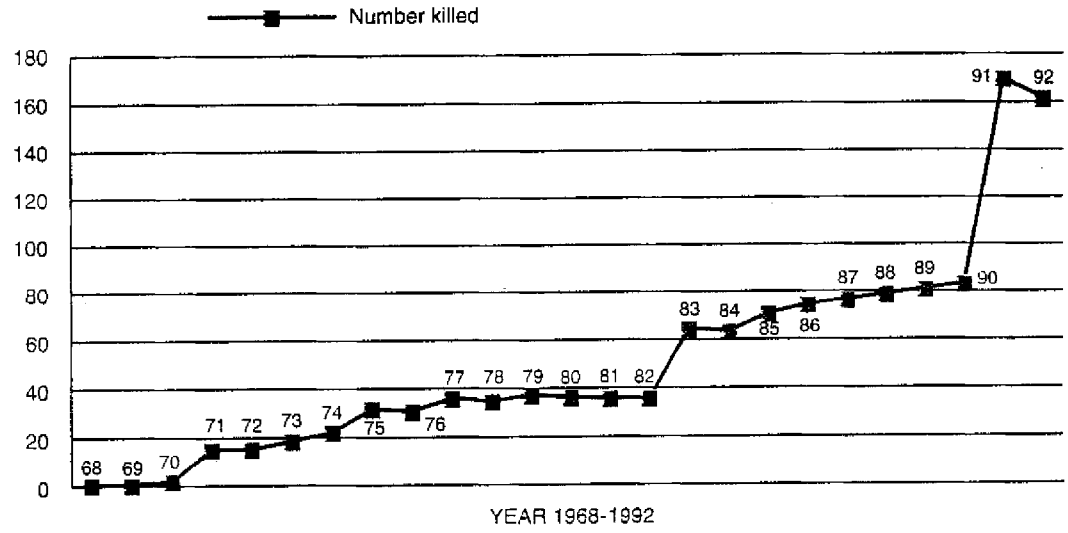
Mortality from all disasters 1968-1992

GRAPH 4: Smoothed time-trends in disaster-related mortality in Europe 1968-92.



GRAPH 5: Smoothed time-trends in disaster-related mortality in Oceania 1968-92.



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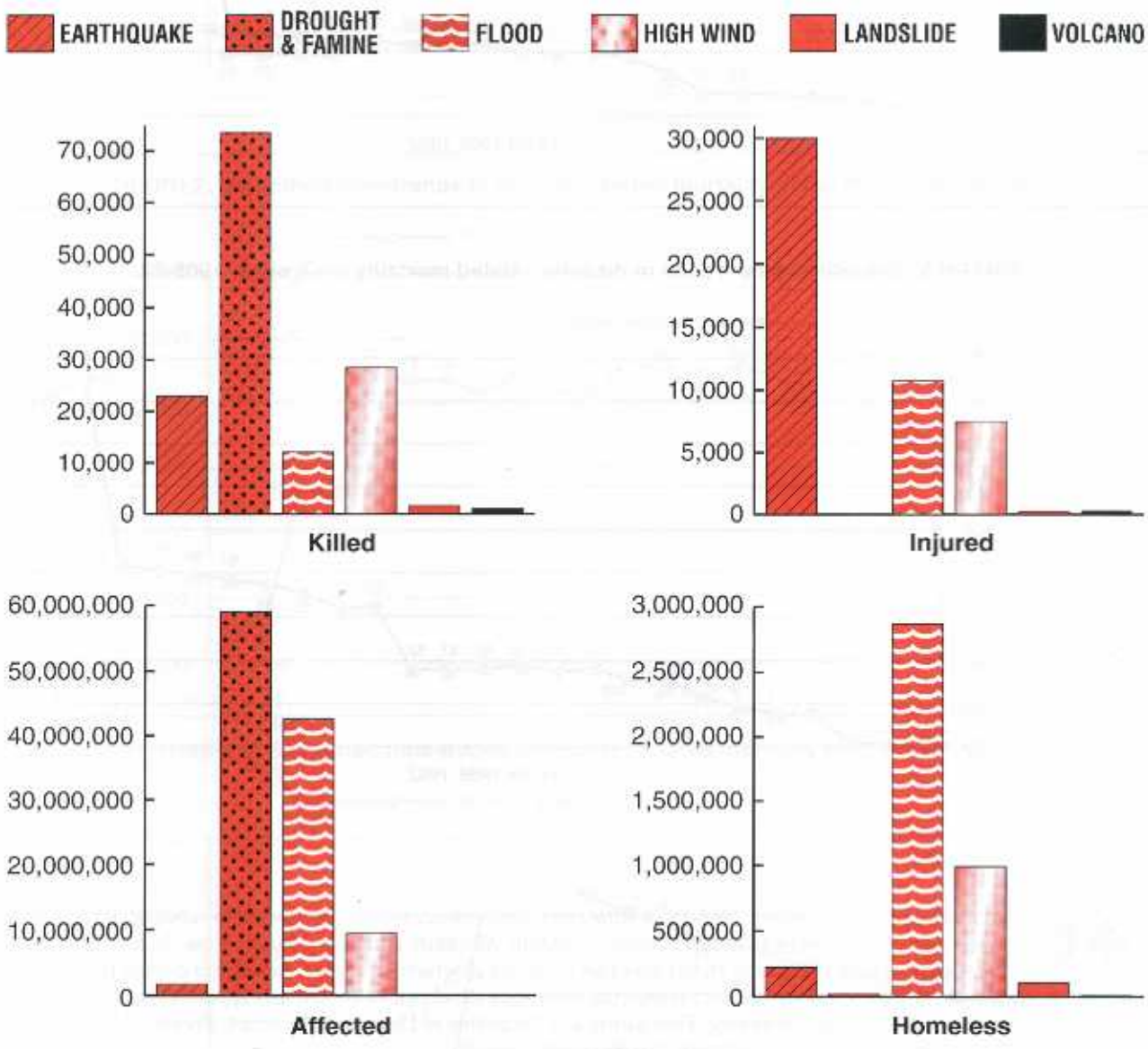
Mortality from all disasters 1968-1992: little empirical evidence has been presented to substantiate recent discussion about increasing disaster-related mortality. Mortality data over 25 years from the EM-DAT database was used to estimate trends over this period by geographical region. In order to display the trend clearly, the statistical method for exponential smoothing developed by Brown was applied to the data. This method (described in Smoothing, Forecasting and Prediction of Discrete Time Series, Prentice-Hall, 1962) estimates a coefficient for an extrapolation between two observation points.

The mortality curves for the five global regions are presented here. The overall trend in all regions is on the increase. Africa shows the most consistently-steady increase. Some of the sudden increases are due to major disasters, such as the 1991 Bangladesh cyclone. Europe shows a significant increase in recent years, possible due to the civil conflicts and earthquakes in the years 1981 to 1991. In the Americas, a substantial increase is noted in the early 1970s, after which it increases slowly but steadily. Asia displays a decrease in mortality until 1990. Since then there have been several major disasters in the region that have contributed to a sudden jump in the curve.

TABLE 3
25 year average by type
Disasters with a natural trigger 01/01/68 - 31/12/92

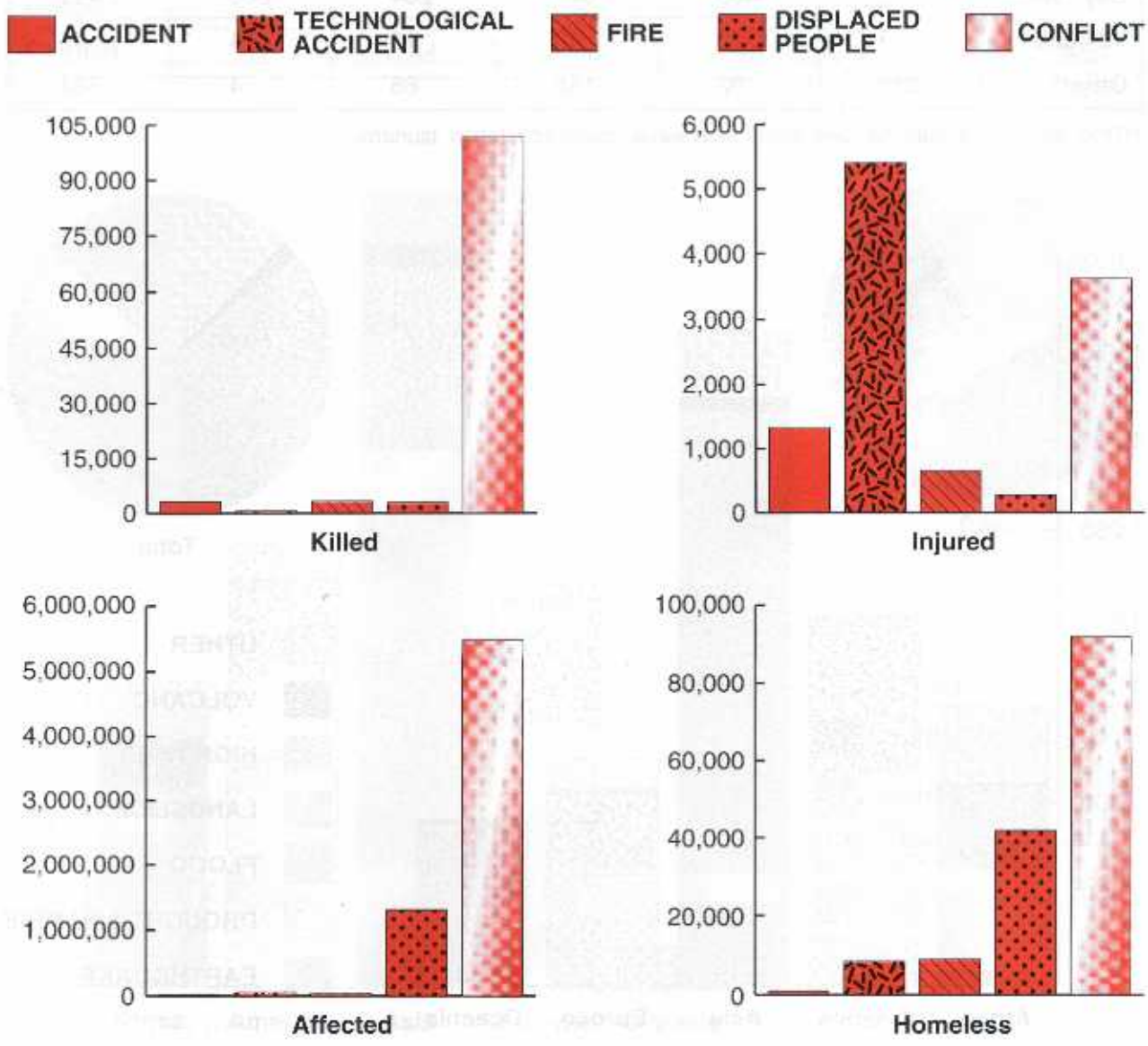
	EARTHQUAKE	DROUGHT & FAMINE	FLOOD	HIGH WIND	LANDSLIDE	VOLCANO	TOTAL
Killed	22,956	73,606	12,067	28,534	1,563	1,009	139,735
Injured	30,003	0	10,725	7,468	235	278	48,709
Affected	1,764,831	58,973,495	42,584,343	9,431,063	130,986	92,306	112,977,024
Homeless	224,006	22,720	2,870,831	989,544	106,824	10,604	4,224,529



Average annual human impact by main categories of disasters with a natural trigger 1968-1992: droughts, famines and floods account for more than half of all affected, whereas floods and high wind disasters destroy the largest proportion of homes. Overall, floods appear to be the most destructive, in terms of magnitude of human impact. The massive numbers killed and affected by famines are due to the Sahelian famines of the early 1970s and mid-1980s.

TABLE 4
25 year average by type
Disasters with a non-natural trigger 01/01/68 - 31/12/92

	ACCIDENT	TECHNOLOGICAL ACCIDENT	FIRE	DISPLACED PEOPLE	CONFLICT	TOTAL
Killed	3,091	580	3,271	2,863	101,696	111,501
Injured	1,328	5,402	652	272	3,620	11,274
Affected	15,841	52,704	32,837	1,302,124	5,496,264	6,899,770
Homeless	868	8,372	8,866	41,760	92,280	152,146

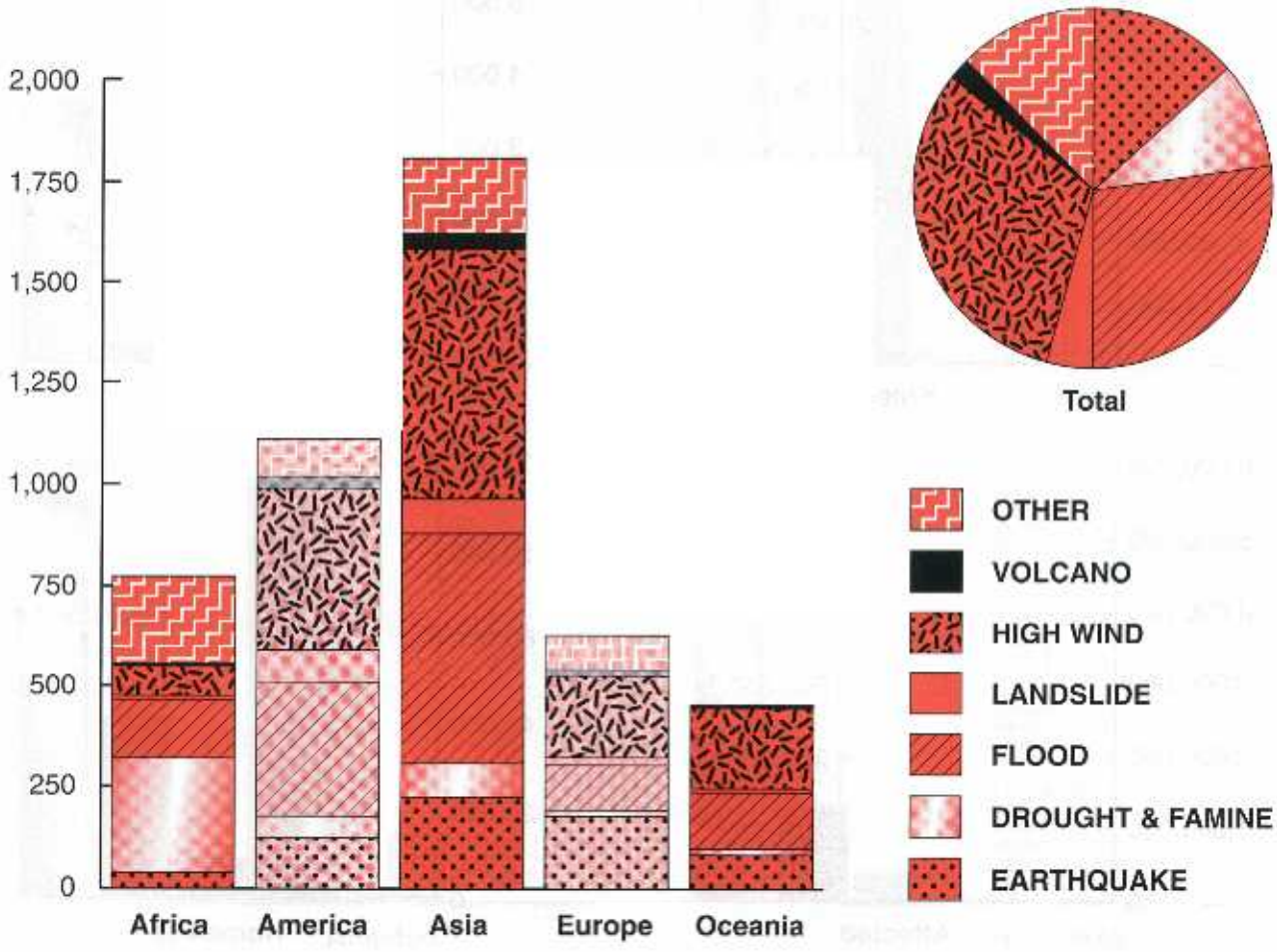


Average annual human impact by main categories of disasters with a non-natural trigger 1968-1992: predictably, civil conflict, which has increased in frequency and scope in the past five years, accounts for the highest mortality and affected. Displaced populations is second in the numbers of people affected and, while the majority of the displacement is caused by civil conflict, some displacement is caused by general insecurity and instability, which - despite its similar effect - is not classified as a strictly conflict situation.

TABLE 5
Number of events over 25 years
Disasters with a natural trigger 01/01/68 - 31/12/92

	AFRICA	AMERICA	ASIA	EUROPE	OCEANIA	TOTAL
Earthquake	39	123	223	176	82	643
Drought & Famine	280	53	83	15	15	446
Flood	146	333	574	111	138	1,302
Landslide	10	80	85	19	10	204
High Wind	73	400	617	204	200	1,494
Volcano	8	28	40	15	4	95
Other*	217	92	185	86	4	584

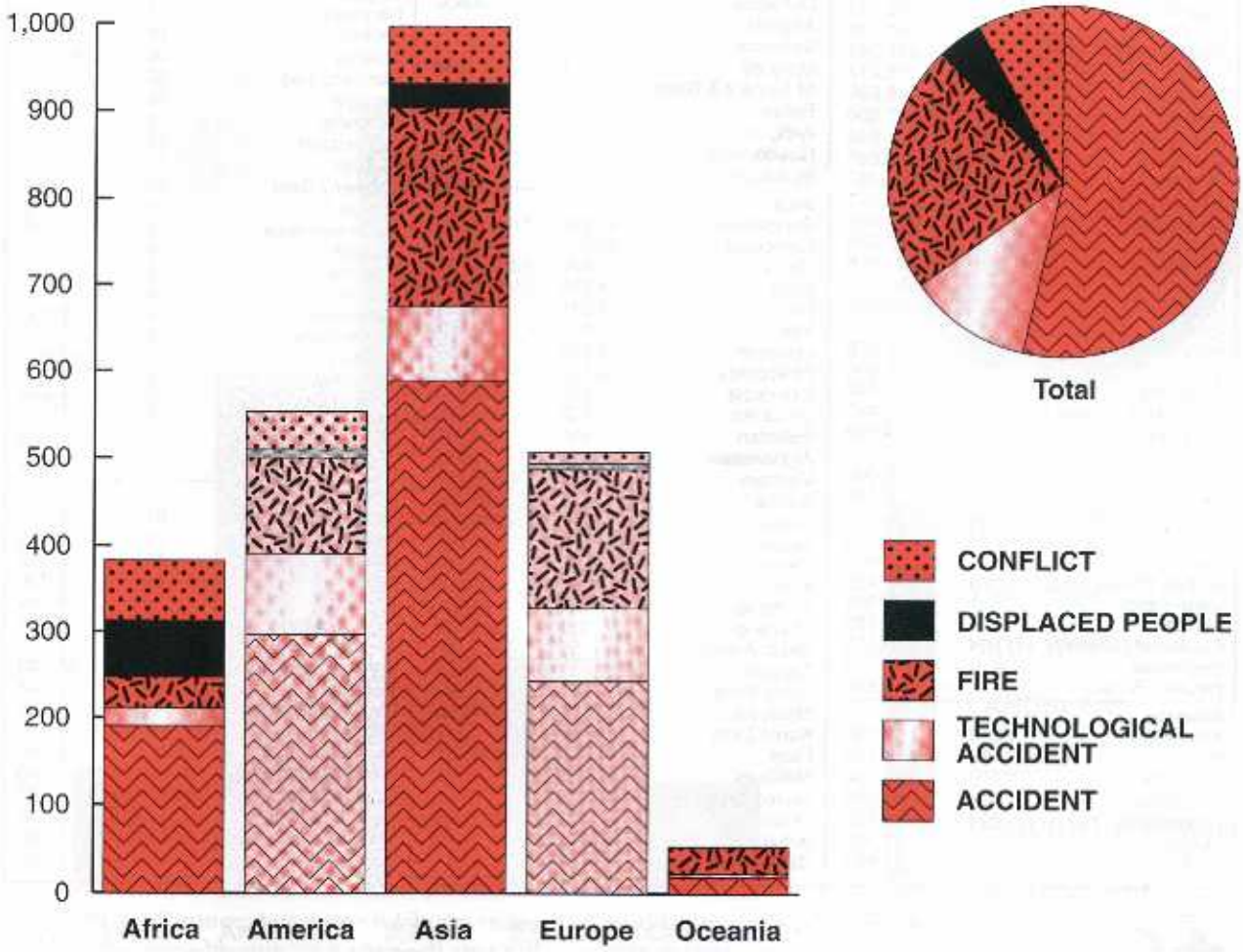
*Other includes: avalanche, cold wave, heat wave, insect infestation, tsunami.



Number of disasters with a natural trigger by global region and type 1968-1992: in terms of absolute numbers, Asia as a region leads the list, recording nearly twice the number of disasters than in the Americas, which ranks second. Wind and flood disasters are the most frequent, accounting for more than half of all the natural-trigger disasters in the period in every region except Africa, where it is drought and famine are the most prevalent disaster types.

TABLE 6
Number of events over 25 years
Disasters with a non-natural trigger 01/01/68 - 31/12/92

	AFRICA	AMERICA	ASIA	EUROPE	OCEANIA	TOTAL
Accident	190	297	589	243	18	1,337
Technological accident	21	94	86	85	4	290
Fire	36	109	229	159	30	563
Displaced people	66	9	27	7	N/A	109
Conflict	70	44	66	13	1	194



Number of disasters with a non-natural trigger by global region and type 1968-1992. accidents, which include dam bursts, building collapses, explosions and transport accidents, is by far the largest category. The recording of conflict causes some ambiguities due to uncertainties of conflict start and finish dates. However, for the purposes of this database, the declaration of an emergency appeal by the affected country and its closure has been used for entry in most cases.

TABLE 7

Annual average number of people reported killed or affected by disasters per global region and country 1968-1992

COUNTRY	KILLED	AFFECTED
Africa		
Ethiopia	48,465	2,878,569
Somalia	21 697	333 829
Sudan	16,197	1,911,767
Mozambique	11,778	2,572,159
Burundi	4,237	26,288
Liberia	1,026	128,985
Nigeria	953	130,326
Angola	553	279,665
South Africa	404	409,277
Chad	368	490,005
Algeria	132	36,466
Cameroon	130	40,586
Zaire	125	45,368
Zambia	123	103,121
Mauritania	110	263,431
Mali	103	209,188
Egypt	92	12,040
Niger	85	318,985
Burkina Faso	73	279,027
Malawi	70	459,120
Tanzania	70	134,889
Uganda	49	228,213
Kenya	48	164,120
Madagascar	48	257,349
Tunisia	45	18,417
Gambia	28	48,896
Guinea	27	41 806
Sierra Leone	27	840
Swaziland	26	62,049
Rwanda	22	181,045
Benin	21	174,423
Zimbabwe	19	184,033
Morocco	17	17,238
Senegal	17	297,056
Ghana	15	531,421
Djibouti	13	30,480
Lybia	12	
Ivory Coast	11	16,676
Togo	10	32,954
Botswana	8	173,242
Sao Tome & Principe	7	7,483
Mauritius	7	39,526
Congo	6	
Namibia	5	10,000
Reunion	4	6,728
Cent. African Rep.	3	20,573
Comoros	3	16,018
Gambia	3	405
Guinea Bissau	3	485
Cape Verde	3	304
Lesotho	2	42,180
Equatorial Guinea	1	10,013
Seychelles	0	4
Western Sahara		2,800
America		
Nicaragua	4,619	97,339
Peru	4,163	510,150
Colombia	2,970	241,134
El Salvador	999	89,742
Guatemala	989	176,797
Mexico	614	77,207
USA	542	21,887
Honduras	470	48,794
Brazil	425	1,878,252
Ecuador	180	61,192
Chile	137	170,553
Dominican Republic	84	111,366
Canada	62	19,723
Venezuela	58	5,179
Bolivia	55	162,960
Puerto Rico	47	160
Haiti	43	168,153
Argentina	41	560,471
Guyana	36	10,859
Cuba	30	32,569
Jamaica	17	60,072
Panama	17	84,140
Costa Rica	10	10,565
Suriname	7	184
Bahamas	4	
Grenada	3	80
Paraguay	3	17,703
Trinidad & Tobago	3	2,000
St Lucia	2	2,920
Martinique	2	1,060
Dominica	2	3,600
Anguilla	1	
Bermuda	1	
Uruguay	1	888
St Vincent & Gren.	0	1,726
Belize		3,731
Antigua		3,000
Guadeloupe		3,000
Barbados		8
Asia		
Bangladesh	40,536	11,454,539
Cambodia	40,011	347,616
China	12,682	23,406,056
India	4,888	59,000,729
Iran	3,315	78,361
Iraq	2,918	74,006
Lebanon	2,579	274,460
Philippines	2,131	1,909,575
Indonesia	622	326,881
Sri Lanka	508	663,803
Pakistan	499	854,445
Afghanistan	456	75,218
Vietnam	288	1,598,725
Burma	275	248,442
Nepal	275	229,859
Japan	228	140,564
Yemen	227	187,560
Korea	197	192,684
Jordania	141	57,549
Thailand	117	515,767
Saudi Arabia	95	
Taiwan	57	2,921
Hong Kong	27	1,647
Malaysia	27	14,865
Korea Dem	21	1,600
Laos	12	192,000
Maldives	9	462
United Arab Em	6	
Oman	5	200
Israel	5	16
Bahrain	5	
Syria	4	7,767
Mongolia	3	
Singapore	1	
Cyprus	2	8,984
Kuwait		12,000
Macao		32
Europe		
Turkey	1,914	33,981
Soviet Union	1,228	51,670
Yugoslavia	885	195,837
Italy	203	78,296
Spain	143	32,264
Romania	106	58,230
Russian Fed.	91	1,606
France	88	33,408
Tadjikistan	82	2,540
Greece	67	29,232
United Kingdom	54	298
Canary Islands	35	
Poland	34	856
Portugal	24	13,607
Norway	23	
Belgium	18	45
Denmark	17	4
Ireland	16	
Albania	16	140,040
Germany Fed	16	220
Georgia	16	4,240
Hungaria	12	
Switzerland	11	91
Sweden	10	
Germany Dem.	10	560
Azores	10	852
Czechoslovakia	8	4
Ukraine	6	
Bulgaria	5	
Austria	4	
Uzbekistan	4	2,000
Netherlands	3	
Armenia	2	52,000
Kyrgystan	2	6,000
Azerbaidjan	2	5,820
Finland	2	
Lithuania	1	
Iceland		208
Oceania		
Papua New Guinea	97	6,824
Australia	37	3,079
Solomon Islands	15	5,347
Fiji	14	45,058
Vanuatu	4	6,944
New Zealand	2	2,010
Samoa	1	
Western Samoa	1	10,280
Kiribati	1	42
French Polynesia	1	200
Guam	1	
Tonga		5,192
Wallis & Futuna		180
Cook Islands		80
New Caledonia		80
Tokelau		68
Tuvalu		40

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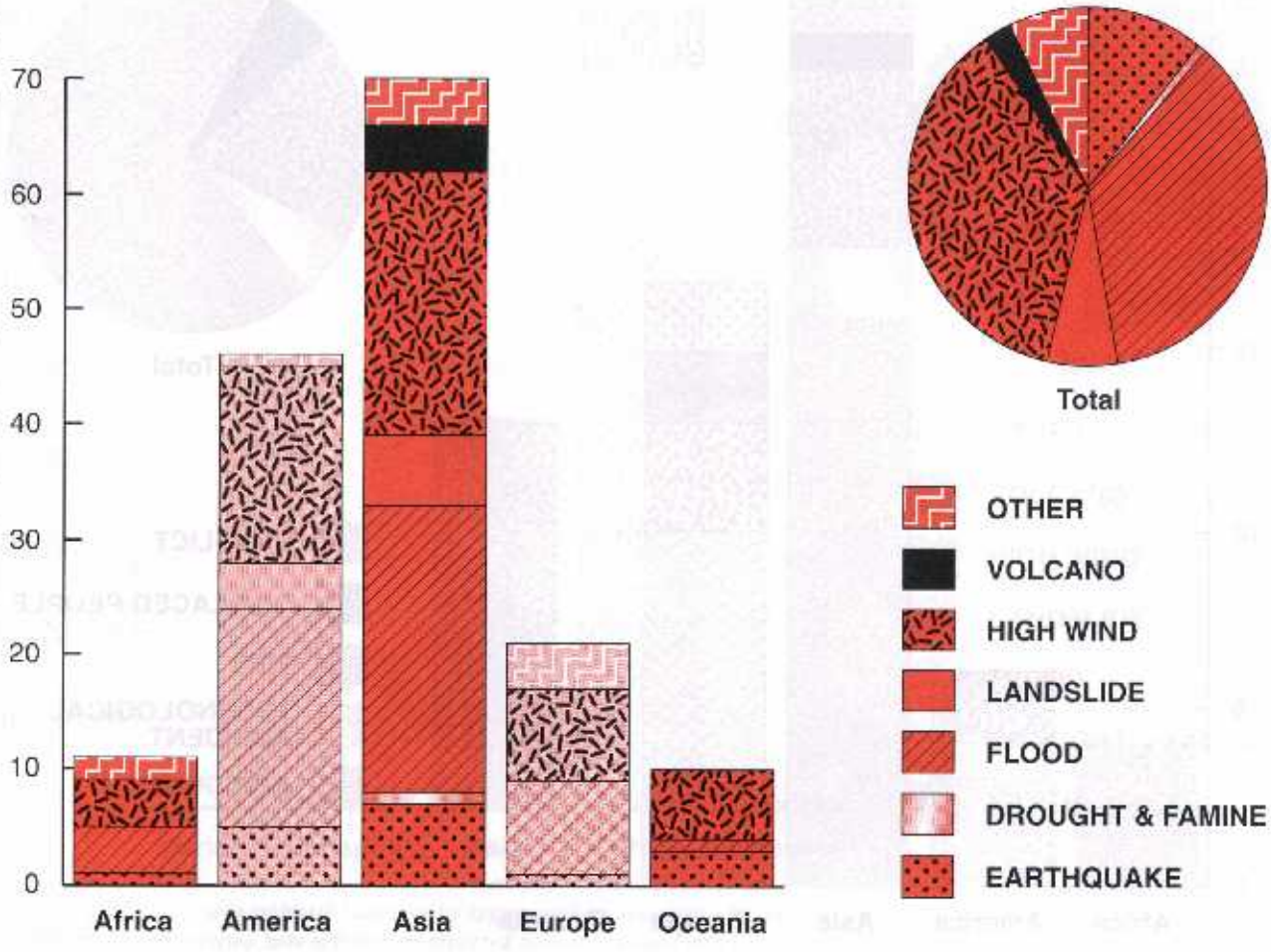
Annual average number of people reported killed by disasters per global region and country 1968-1992: the leading countries for disaster-related mortality in Africa are those which are drought-prone, affected by floods and have had civil conflicts. In Asia, Bangladesh, India and China are less conflict affected but are highly exposed to natural-trigger disasters In the Americas, Peru and Columbia are prone to natural hazards, while El Salvador and Nicaragua experienced civil conflict. Turkey's top ranking in Europe reflects its vulnerability to earthquakes, with their typically large death tolls

Ranking patterns for affected closely mirror those for mortality. The former Yugoslavia's prominent position is due to the on-going conflict, Albania's to poverty from politico-economic transformation, while Italy ranks third in large part because of its vulnerability to earthquakes, of which there were four in this period. As a developed country, mortality is controlled, but large numbers of people are nevertheless affected.

TABLE 8
Number of disasters with a natural trigger by global region and type 1993

	AFRICA	AMERICA	ASIA	EUROPE	OCEANIA	TOTAL
Earthquake	1	5	7	1	3	17
Drought & Famine	0	0	1	0	0	1
Flood	4	19	25	8	1	57
Landslide	0	4	6	0	0	10
High Wind	4	17	23	8	6	58
Volcano	0	0	4	0	0	4
Other*	2	1	4	4	0	11

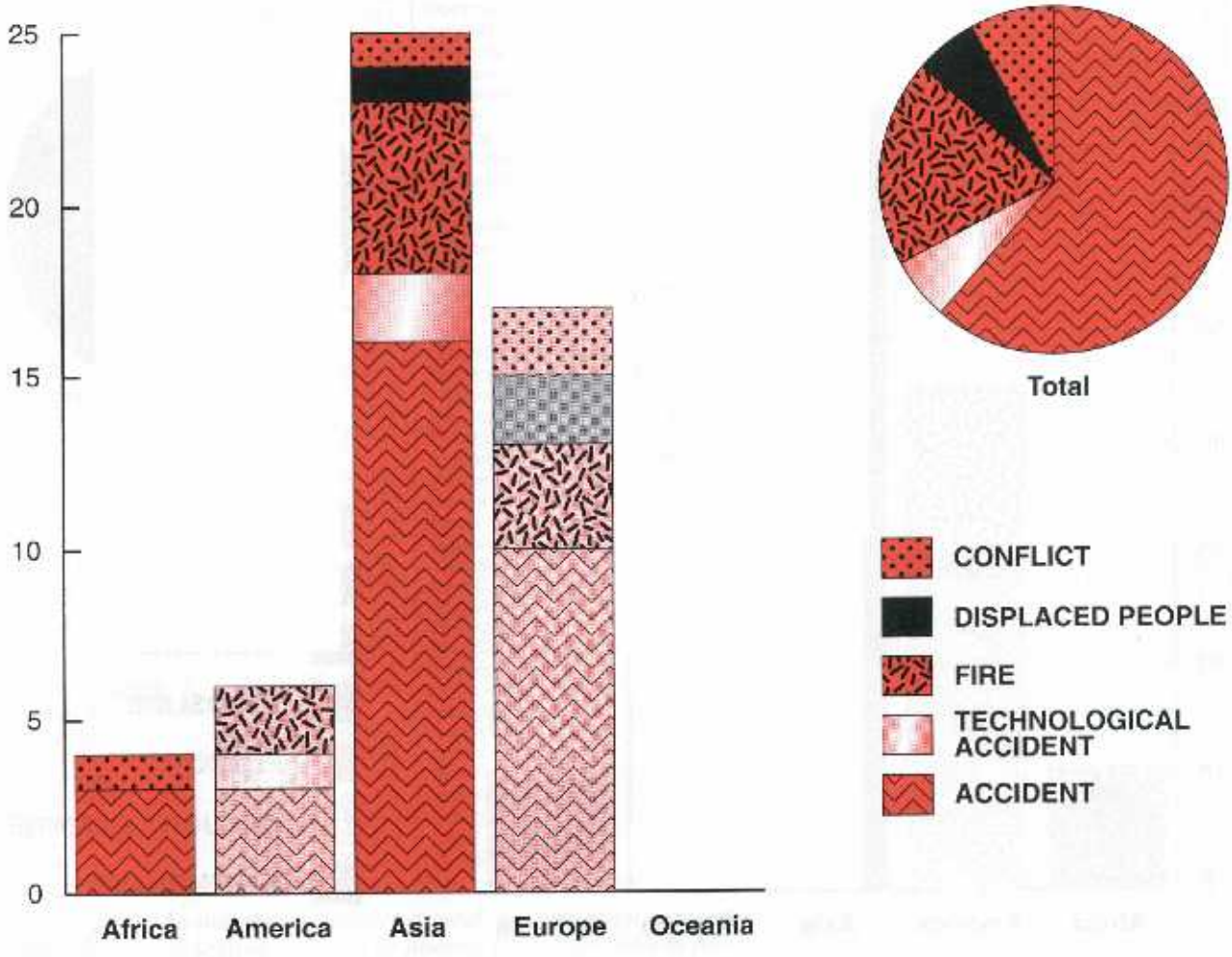
* Other includes: avalanche, cold wave, heat wave, insect infestation, tsunami.



Number of disasters with a natural trigger by global region and type 1993: "Other" includes: avalanche, cold wave, heat wave, insect infestation and tsunami. See also comment for Table 9.

TABLE 9
Number of disasters with a non-natural trigger by global region and type 1993

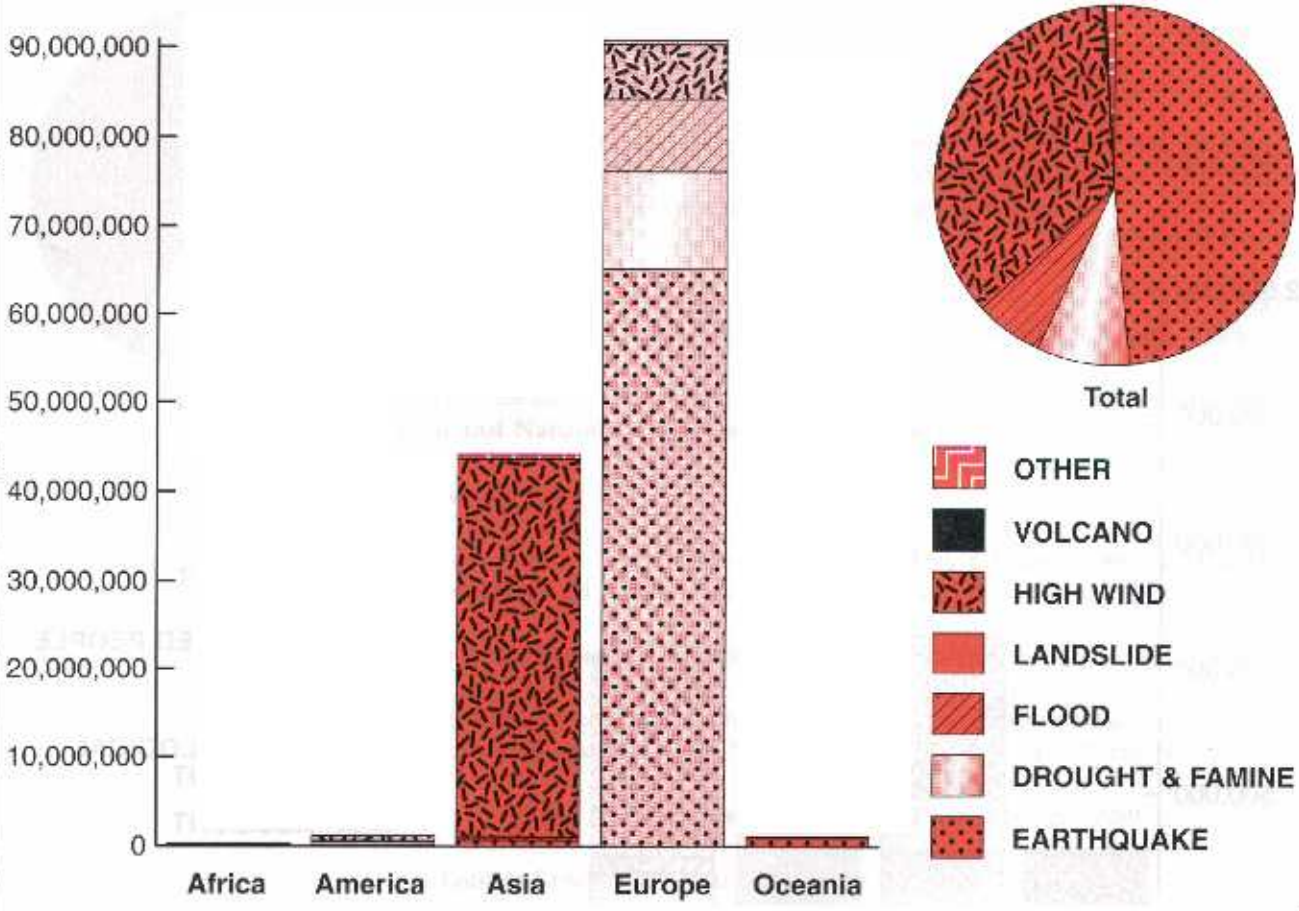
	AFRICA	AMERICA	ASIA	EUROPE	OCEANIA	TOTAL
Accident	3	3	16	10	0	32
Technological accident	0	1	2	0	0	3
Fire	0	2	5	3	0	10
Displaced people	0	0	1	2	0	3
Conflict	1	0	1	2	0	4



Number of disasters with a non-natural trigger by global region and type 1993: primary sources - governments, international agencies, insurance companies - rarely finalise disaster statistics until the end of their working year. CRED compiles final statistics from all sources only around the middle of the following year. As this report goes to press, several sources had not sent in data, or had sent only partial lists.

TABLE 10
Average estimated damage by region and by disasters with a natural trigger 1988-1992 in thousands US $

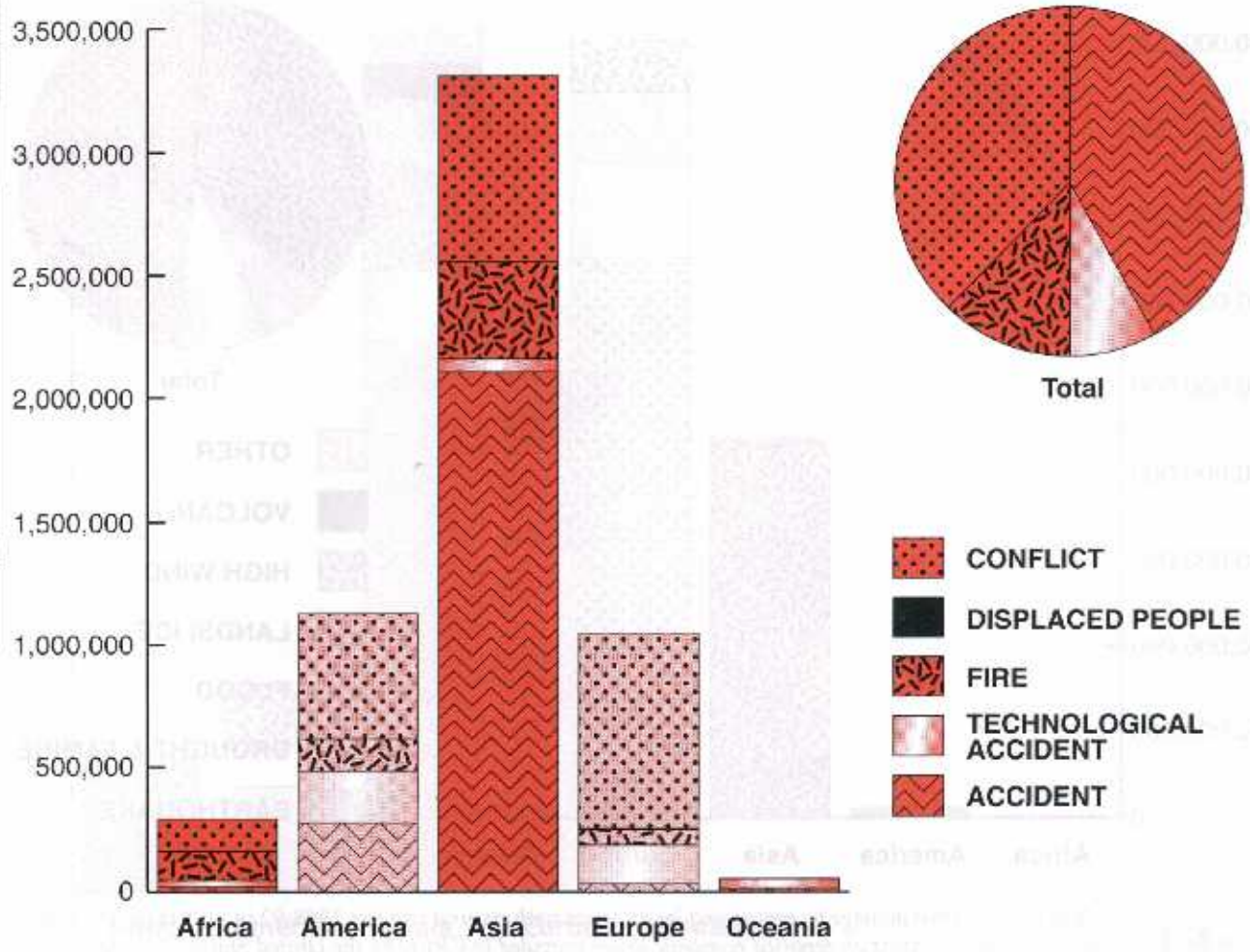
	AFRICA	AMERICA	ASIA	EUROPE	OCEANIA	TOTAL
Earthquake	89,600	151,300	678,608	65,115,088	1,000,000	67,034,596
Drought & Famine	N/A	333,880	1,000	11,008,020	N/A	11,342,900
Flood	95,060	156,755	390,210	8,031,457	1,200	8,674,682
Landslide	N/A	400	5,400	24,100	N/A	29,900
High Wind	112,098	490,013	42,493,602	6,100,094	120,201	49,316,008
Volcano	N/A	10,000	73,333	N/A	N/A	83,333
Other*	47,000	101,833	474,722	486,000	N/A	1,109,555



Average estimated damage by region and by disasters with natural triggers 1988-92 in US$ 000s: the data presented here is based on reported economic losses provided to CRED by the United States Office for Foreign Disasters Assistance (41%), insurance companies (33%), the United Nations Department of Humanitarian Affairs (14%) and governments (6%). Despite biases in the data, they serve as an indicator of the general trend and magnitude of the problem. Despite the multiple sources that have generated more than 9,000 events for the EM-DAT database, only 24% have information on economic losses. The averages have therefore been calculated on the basis of only those events that have any losses reported. The data presented here are grouped over the past five years to minimise the effects of currency variation that would have had to be accounted for in the calculation. In-depth research on this data, along with supplementary information, is underway and analytical comments will be published in future editions of the World Disasters Report.

TABLE 11
Average estimated damage by region and by disasters with a non-natural trigger 1988-1992 in thousands US $

	AFRICA	AMERICA	ASIA	EUROPE	OCEANIA	TOTAL
Accident	20,385	275,810	2,105,845	33,273	14,400	2,449,713
Technological accident	24,750	206,339	52,099	153,122	38,000	474,310
Fire	116,550	132,055	400,644	63,528	N/A	712,777
Displaced people	N/A	N/A	N/A	2,077	N/A	2,077
Conflict	129,000	515,000	750,000	794,900	N/A	2,188,900



Average estimated damage by region and by disasters with non-natural triggers 1988-92 in US$ 000s: (See caption for table 10)