

EM-DAT Documentation

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Data Structure and Content Description

In-depth Presentation of the Structure and Content of the Database

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1 - General Definitions and Concepts

What is a Disaster in EM-DAT?

EM-DAT was designed in 1988 based on an anthropocentric vision of disasters and emergencies¹. It considers disasters to be events involving an unexpected and overwhelming harmful impact on human beings. Formally, EM-DAT's definition of a disaster is:

Definition : Disaster

A situation or event which overwhelms local capacity, necessitating a request to the national or international level for external assistance; an unforeseen and often sudden event that causes great damage, destruction, and human suffering.

EM-DAT inventories only disasters that fit its [Inclusion Criteria](#). EM-DAT records both disasters triggered by natural hazards and technological disasters. The latter are unintentional accidents, and not situations of conflict, violence, or terrorism. For more details, we refer to the [Disaster Classification System](#).

Note

EM-DAT reports disaster impacts per country and per hazard type. However, for some disasters, this simple representation may not capture the situation's complexity, systemic and composite effects, nor its subsequent uncertainties (see [General issues](#)).

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1. Guha-Sapir, D. and Misson, C.: The Development of a Database on Disasters, *Disasters*, 16, 74–80, <https://doi.org/10.1111/j.1467-7717.1992.tb00378.x>, 1992. 

2 - Core Structure of the Database

Basic Relational Structure of the Various Components of a Disaster Event in EM-DAT

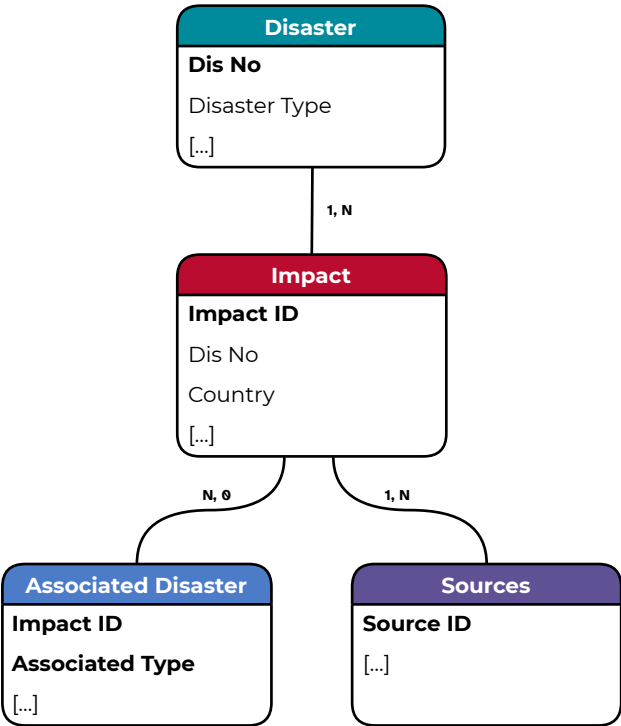
EM-DAT data model records disasters and maps their impacts at the country level. Accordingly, the EM-DAT database references disasters with a unique identifier (see `Dis No.` in [Column Description](#)). A disaster may affect more than one country. In EM-DAT, the country-specific information about the disaster is recorded as an “Impact.” The Impact is the level at which EM-DAT reports entries in the [EM-DAT Public Table](#). To document each Impact, we cross-validate and select information from the sources that are available (see [EM-DAT sources](#) and [Protocols](#)).

EM-DAT Structure in a Nutshell

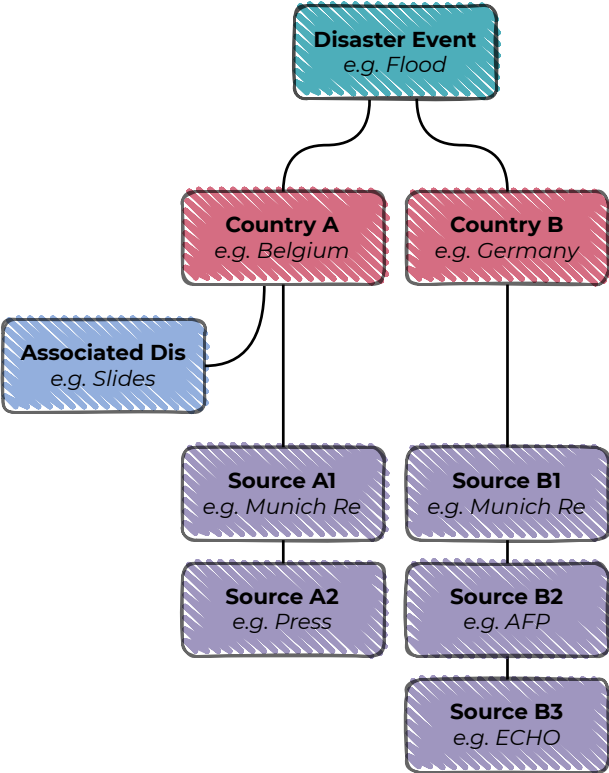
- A disaster in EM-DAT may have one or more impacts documented in different countries.
- Its impact may have one or more sources reporting country-related information.
- The country-related information, which is selected depending on the trustworthiness of the source, is reported in the public table.

The figure below provides a visual representation of the foundational structure of the EM-DAT database’s relational model. On the left is the core structure, and on the right, a hypothetical case serves as an illustrative example. To enhance clarity, the relations have been streamlined, omitting certain tables such as dictionaries, focusing solely on the main connections and the underlying logic of the database.

A. Relational Model



B. Example



EM-DAT Simplified Relational Model with an Example

Cardinality, or the nature of the relationship between entities, is denoted by numbers or the letter “N” on each link. For instance, “1, N” signifies a one-to-many relationship. A clear example of this is the link between the “Disaster” and “Impact” tables. This implies that a single disaster entry might correspond to multiple impacts across various countries. Consider a flood affecting multiple nations, such as Belgium and Germany; the connection between these entries is facilitated by the shared Dis No. attribute.

The primary [classification of a disaster](#), such as its main type, is housed in the “Disaster” table. Consequently, all impacts linked by the same Dis No. will have a consistent primary disaster type. However, EM-DAT introduces a nuance with [associated disasters](#) linked to the “Impact” table. Unlike the main type, these associated disasters can vary by country. They represent secondary disasters that either result from or occur simultaneously with the main event. An example would be a landslide triggered by a primary flood event, which is considered to be an associated disaster. It’s important to note that associated disasters are optional, leading to their zero-to-many relationship with the “Impact” table.

Each [source](#) can provide data for any given variable within the Impact category. During the validation process (as detailed in [Encoding, Quality Control, and Validation Procedure](#)), one value is chosen for each variable, which is independent of other variables. Some figures presented in the [EM-DAT Public Table](#) are aggregates of various variables and might originate from multiple

distinct sources. For example, figures for deaths and missing persons might be reported at different times after an event. After evaluating and selecting from the available data, the `Total Deaths` column might consolidate information from various sources.

3 - EM-DAT Public Table

Content and Presentation of the Database as Publicly Available

Overview

The EM-DAT Public Table is a flat representation of EM-DAT data in a single [downloadable table](#). Most impact variables are part of the public table (see [Impact Variables](#)). The public table provides a flat view of the [general structure](#) in which each record (row) corresponds to a disaster impacting a country.

About empty cells

For given [Impact Figures](#), empty cells could either refer to a disaster with no impact or a disaster with unknown or unreported impact. See also [Accounting Biases](#).

Column Description

Column Name	Type	Description
Dis No.	ID, Mandatory	A unique 8-digit identifier including the year (4 digits) and a sequential number (4 digits) for each disaster event (i.e., 2004-0659). In the EM-DAT Public Table, the ISO country code is appended. See column ISO below.
Historic	Yes/No, Mandatory	Binary field specifying whether or not the disaster happened before 2000, using the Start Year . Data before 2000 should be considered of lesser quality (see Time Bias).
Classification Key	ID, Mandatory	A unique 15-character string identifying disasters in terms of the Group , Subgroup , Type and Subtype classification hierarchy. See Disaster Classification System .
Disaster Group	Name, Mandatory	The disaster group, i.e., “Natural” or “Technological.” See Disaster Classification System .
Disaster Subgroup	Name, Mandatory	The disaster subgroup. See Disaster Classification System .
Disaster Type	Name, Mandatory	The disaster type. See Disaster Classification System .
Disaster Subtype	Name,	The disaster subtype. See Disaster Classification System .

Column Name	Type	Description
	Mandatory	
External IDs	IDs List, Optional	List of identifiers for external resources (GLIDE , USGS , DFO), in the format “<source>:<identifier>” and separated by the pipe character (“ ”).
Event Name	Optional	Short specification for disaster identification, e.g., storm names (e.g., “Mitch”), plane type in air crash (e.g., “Boeing 707”), disease name (e.g., “Cholera”), or volcano name (e.g., “Etna”).
ISO	ID, Mandatory	The International Organization for Standardization (ISO) 3-letter code referring to the Country . The ISO 3166 norm is used. See Spatial Information and Geocoding .
Country	Name, Mandatory	Country where the disaster occurred and had an impact, using names from the UN M49 Standard. See Spatial Information and Geocoding . If multiple countries are affected, each will have an entry linked to the same Dis No.
Subregion	Name, Mandatory	Subregion where the disaster occurred based on UN M49 standard, automatically linked to the Country field. See Spatial Information and Geocoding .
Region	Name, Mandatory	Region or continent where the disaster occurred based on UN M49 standard, automatically linked to the Country field. See Spatial Information and Geocoding .
Location	Text, Optional	Geographical location name as specified in the sources, e.g., city, village, department, province, state, or district. Used to identify corresponding GAUL Admin Units (see GAUL Index and Admin Levels).
Origin	Text, Optional	Additional specifications on the contextual factors that led to the event, e.g., “heavy rains” for floods, or “drought” for a forest fire.
Associated Types	Names List, Optional	List of secondary disaster types cascading from or co-occurring aside from the main type (optional), e.g., a landslide following a flood or an explosion after an earthquake. Separated by the pipe character (“ ”).
OFDA/BHA Response	Yes/No, Mandatory	Binary field specifying whether or not the (former) Office of US Foreign Disaster Assistance (OFDA) or the Bureau of Humanitarian Assistance (BHA) responded to the disaster.
Appeal	Yes/No, Mandatory	Binary field specifying whether or not there was a request for international assistance from the affected country.
Declaration	Yes/No, Mandatory	Binary field specifying whether a state of emergency was declared in the country.

Column Name	Type	Description
Aid Contribution	Unadjusted Monetary Amount ('000 US\$), Optional	The total amount (in thousands of US\$ at the time of the report) of contributions for immediate relief activities to the country in response to the disaster, sourced from the Financial Tracking System of OCHA (1992 to 2015). Not maintained after 2015 due to a lack of availability of information. Some aid contribution information can be found at https://fts.unocha.org/ .
Magnitude	Disaster-Type-Dependent, Optional	The intensity of a specific disaster (see Hazard and Disaster Magnitude Units).
Magnitude Scale	Disaster-Type-Dependent, Optional	The associated unit for the Magnitude column (see Hazard and Disaster Magnitude Units).
Latitude	Degrees [-90;90], Optional	North-South coordinates mainly for earthquakes and volcanic activity. Sometimes reported for floods, landslides, and storms (mostly when associated with floods).
Longitude	Degrees [-180;180], Optional	East-West coordinates mainly for earthquakes and volcanic activity. Sometimes reported for floods, landslides, and storms (mostly when associated with floods).
River Basin	Text, Optional	Name of affected river basins, typically used for floods.
Start Year	Numeric, Mandatory	Year of occurrence of the disaster.
Start Month	Numeric, Optional	Month of occurrence of the disaster. For sudden-impact disasters, this field is well defined. For disasters developing gradually over a longer time period (e.g., drought) with no precise onset date, this field can be left blank.
Start Day	Numeric, Optional	Day of occurrence of the disaster. For sudden-impact disasters, this field is well defined. For disasters developing gradually over a longer time period (e.g., drought) with no precise onset date, this field can be left blank.
End Year	Numeric, Optional	Year of disaster conclusion.
End Month	Numeric, Optional	Month of conclusion of the disaster. For sudden-impact disasters, this field is well defined. For disasters developing gradually over a longer time period (e.g., drought) with no precise end date, this field can be left blank.
End Day	Numeric, Optional	Day of conclusion of the disaster. For sudden-impact disasters, this field is well defined. For disasters developing

Column Name	Type	Description
		gradually over a longer time period (e.g., drought) with no precise end date, this field can be left blank.
Total Deaths	Numeric, Optional	Total fatalities (deceased and missing combined, see Human Impact Variables).
No. Injured	Numeric, Optional	Number of people with physical injuries, trauma, or illness requiring immediate medical assistance due to the disaster (see Human Impact Variables).
No. Affected	Numeric, Optional	Number of people requiring immediate assistance due to the disaster (see Human Impact Variables).
No. Homeless	Numeric, Optional	Number of people requiring shelter due to their house being destroyed or heavily damaged during the disaster (see Human Impact Variables).
Total Affected	Numeric, Optional	Total number of affected people (No Injured , No Affected , and No Homeless combined, see Human Impact Variables).
Reconstruction Costs ('000 US\$)	Unadjusted Monetary Amount ('000 US\$), Optional	Costs for replacement of lost assets in thousands of US dollars ('000 US\$) relative to Start Year , unadjusted for inflation (see Economic Impact Variables).
Reconstruction Costs, Adjusted ('000 US\$)	Adjusted Monetary Amount ('000 US\$), Optional	Reconstruction Costs ('000 US\$) , adjusted for inflation using the Consumer Price Index (CPI column, see Economic Adjustment).
Insured Damage ('000 US\$)	Unadjusted Monetary Amount ('000 US\$), Optional	Economic damage covered by insurance companies, in thousands of US dollars ('000 US\$), relative to Start Year , unadjusted for inflation (see Economic Impact Variables).
Insured Damage, Adjusted ('000 US\$)	Adjusted Monetary Amount ('000 US\$), Optional	Insured Damage ('000 US\$) adjusted for inflation using the Consumer Price Index (CPI column, see Economic Adjustment).
Total Damage ('000 US\$)	Unadjusted Monetary Amount ('000 US\$), Optional	Value of all economic losses directly or indirectly due to the disaster, in thousands of US dollars ('000 US\$), relative to Start Year , unadjusted for inflation (see Economic Impact Variables).
Total Damage, Adjusted ('000 US\$)	Adjusted Monetary	Total Damage ('000 US\$) adjusted for inflation using the Consumer Price Index (CPI column, see Economic

Column Name	Type	Description
	Amount ('000 US\$), Optional	Adjustment).
CPI	Conversion Ratio, Optional	Consumer Price Index from OECD used to adjust US\$ values for inflation relative to Start Year (see Economic Adjustment).
Admin Units	JSON Array of Objects, Optional	Collection of impacted Administrative Units from the FAO GAUL 2015 referential (Global Administrative Unit Layers 2015). Individual objects correspond to Level-1 or Level-2 Administrative Units, with the corresponding fields <code>adm1_code</code> , <code>adm1_name</code> or <code>adm2_code</code> , <code>adm2_name</code> providing the unique identifier to the geometry in the GAUL layer and the name of the unit, respectively. Geocoding is maintained for non-biological natural hazards from 2000 onwards (see Spatial Information and Geocoding).
Entry Date	Date, Mandatory	The day on which the event record was created in EM-DAT.
Last Update	Date, Mandatory	The last modification of the event or one of its associated records in EM-DAT. This may not result in a modification of the information in the EM-DAT Public Table as modifications to private fields are recorded as well.

4 - Disaster Classification System

Historical and Current Classification System of Disasters

A Brief History of the EM-DAT Classification System

EM-DAT’s classification system originally started with a simple 20-type list¹. However, in 1992, CRED and other international stakeholders proposed a hierarchical classification system² that distinguishes natural and man-made disasters (described as technological disasters in EM-DAT). A further distinction was based on the timing of disasters: slow vs. rapid onset disasters.

In the 2000s, CRED collaborated with [Munich Re](#) and other stakeholders on a common classification system³. Since then, EM-DAT’s main classification system has followed the logic of referring to the hazard or event triggering the disaster. Consequently, some disasters were reclassified, and some types were removed from the primary classification system. This was the case for famines reclassified as drought for the most part⁴. However, “famine” offers more information than “drought.” Therefore, in order not to lose this added value, EM-DAT has adopted the secondary classification system of [Associated Disasters](#). This describes disasters that coincide with or result from the primary type.

In 2014, the [Integrated Research on Disaster Risk \(IRDR\)](#) working group, which included CRED, established a new reference called the [Peril Classification and Hazard Glossary](#). This document is currently the primary reference for classifying natural hazards in EM-DAT, which divides them into six main groups: Geophysical, Hydrological, Meteorological, Climatological, Biological, and Extra-terrestrial. EM-DAT also includes more detailed subtypes.

Geophysical

Earthquake

Mass Movement (dry)

Volcanic activity

Hydrological

Flood

Landslide

Wave action

Meteorological

Storm

Extreme temperature

Fog

Climatological

Drought

Glacial lake outburst

Wildfire

Biological

Animal accident

Epidemic

Insect infestation

Extra-terrestrial

Impact

Space weather

Natural Hazards Subgroups and Types in the IRDR Peril Classification and Hazard Glossary

Note

More recently, in 2021, the ISC and UNDRR released [Hazard Information Profiles \(HIPs\)](#). This document regroups and defines more than 300 hazards that have the potential to impact a community. In March 2023, the CRED discussed HIPs during its Scientific and Technological Advisory Group (STAG) meeting in Brussels. As a result, the CRED is working on a roadmap to make its classification system interoperable with HIPs.

Main Classification Tree

Changes in the Classification Tree

In September 2023, the EM-DAT Classification Tree was updated and simplified to facilitate user queries and filtering. The current tree, which is based on four depth levels, replaces the former tree with three plus two optional depth levels. The ‘Complex’ disaster group was removed (14 entries). If you wish to establish the correspondence between new and former disaster types, you may [download this backup of EM-DAT](#) prior to the update and join the two datasets based on the `Dis No.` column.

The main classification tree has four levels of depth, so disasters are divided into groups, subgroups, types, and subtypes, as presented in the [EM-DAT Public Table](#) columns. The two EM-DAT disaster groups are ‘Natural’ and ‘Technological’. The table below shows the complete tree for the ‘Natural’ and ‘Technological’ groups, with the occurrence for each subtype. Their corresponding definitions are available in the [Classification Glossary](#).

Classification					
Key	Group	Subgroup	Type	Subtype	Count ⁵
nat-bio-ani-ani	Natural	Biological	Animal incident	Animal incident	1
nat-bio-epi-bac	Natural	Biological	Epidemic	Bacterial disease	781
nat-bio-epi-dis	Natural	Biological	Epidemic	Infectious disease (General)	142
nat-bio-epi-fun	Natural	Biological	Epidemic	Fungal disease	0
nat-bio-epi-par	Natural	Biological	Epidemic	Parasitic disease	51
nat-bio-epi-pri	Natural	Biological	Epidemic	Prion disease	0
nat-bio-epi-vir	Natural	Biological	Epidemic	Viral disease	547

Classification Key	Group	Subgroup	Type	Subtype	Count ⁵
nat-bio-inf-gra	Natural	Biological	Infestation	Grasshopper infestation	16
nat-bio-inf-inf	Natural	Biological	Infestation	Infestation (General)	9
nat-bio-inf-loc	Natural	Biological	Infestation	Locust infestation	67
nat-bio-inf-wor	Natural	Biological	Infestation	Worms infestation	3
nat-cli-dro-dro	Natural	Climatological	Drought	Drought	804
nat-cli-glo-glo	Natural	Climatological	Glacial lake outburst flood	Glacial lake outburst flood	3
nat-cli-wil-for	Natural	Climatological	Wildfire	Forest fire	317
nat-cli-wil-lan	Natural	Climatological	Wildfire	Land fire (Brush, Bush, Pasture)	92
nat-cli-wil-wil	Natural	Climatological	Wildfire	Wildfire (General)	53
nat-ext-imp-air	Natural	Extra-terrestrial	Impact	Airburst	0
nat-ext-imp-col	Natural	Extra-terrestrial	Impact	Collision	1
nat-ext-spa-ene	Natural	Extra-terrestrial	Space weather	Energetic particles	0
nat-ext-spa-geo	Natural	Extra-terrestrial	Space weather	Geomagnetic storm	0
nat-ext-spa-rad	Natural	Extra-terrestrial	Space weather	Radio disturbance	0
nat-ext-spa-sho	Natural	Extra-terrestrial	Space weather	Shockwave	0
nat-geo-ear-gro	Natural	Geophysical	Earthquake	Ground movement	1544
nat-geo-ear-tsu	Natural	Geophysical	Earthquake	Tsunami	57
nat-geo-mmd-ava	Natural	Geophysical	Mass movement (dry)	Avalanche (dry)	5
nat-geo-mmd-lan	Natural	Geophysical	Mass movement (dry)	Landslide (dry)	30
nat-geo-mmd-roc	Natural	Geophysical	Mass movement (dry)	Rockfall (dry)	9
nat-geo-mmd-sub	Natural	Geophysical	Mass movement (dry)	Sudden Subsidence (dry)	1
nat-geo-vol-ash	Natural	Geophysical	Volcanic activity	Ash fall	249
nat-geo-vol-lah	Natural	Geophysical	Volcanic activity	Lahar	0

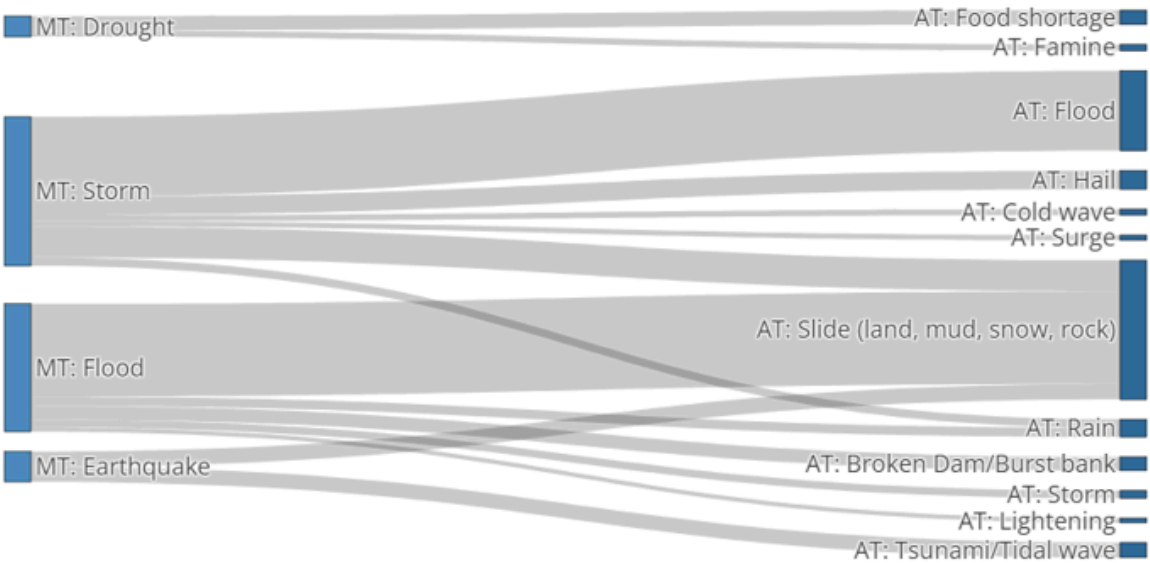
Classification Key	Group	Subgroup	Type	Subtype	Count ⁵
nat-geo-vol-lav	Natural	Geophysical	Volcanic activity	Lava flow	10
nat-geo-vol-pyr	Natural	Geophysical	Volcanic activity	Pyroclastic flow	4
nat-geo-vol-vol	Natural	Geophysical	Volcanic activity	Volcanic activity (General)	9
nat-hyd-flo-coa	Natural	Hydrological	Flood	Coastal flood	85
nat-hyd-flo-fla	Natural	Hydrological	Flood	Flash flood	831
nat-hyd-flo-flo	Natural	Hydrological	Flood	Flood (General)	2283
nat-hyd-flo-ice	Natural	Hydrological	Flood	Ice jam flood	0
nat-hyd-flo-riv	Natural	Hydrological	Flood	Riverine flood	2657
nat-hyd-mmw-ava	Natural	Hydrological	Mass movement (wet)	Avalanche (wet)	121
nat-hyd-mmw-lan	Natural	Hydrological	Mass movement (wet)	Landslide (wet)	609
nat-hyd-mmw-mud	Natural	Hydrological	Mass movement (wet)	Mudslide	79
nat-hyd-mmw-roc	Natural	Hydrological	Mass movement (wet)	Rockfall (wet)	3
nat-hyd-mmw-sub	Natural	Hydrological	Mass movement (wet)	Sudden Subsidence (wet)	1
nat-hyd-wav-rog	Natural	Hydrological	Wave action	Rogue wave	0
nat-hyd-wav-sei	Natural	Hydrological	Wave action	Seiche	0
nat-met-ext-col	Natural	Meteorological	Extreme temperature	Cold wave	311
nat-met-ext-hea	Natural	Meteorological	Extreme temperature	Heat wave	259
nat-met-ext-sev	Natural	Meteorological	Extreme temperature	Severe winter conditions	79
nat-met-fog-fog	Natural	Meteorological	Fog	Fog	1
nat-met-sto-bli	Natural	Meteorological	Storm	Blizzard/Winter storm	226
nat-met-sto-der	Natural	Meteorological	Storm	Derecho	6
nat-met-sto-ext	Natural	Meteorological	Storm	Extra-tropical storm	148
nat-met-sto-hai	Natural	Meteorological	Storm	Hail	111

Classification Key	Group	Subgroup	Type	Subtype	Count ⁵
nat-met-sto-lig	Natural	Meteorological	Storm	Lightning/Thunderstorms	189
nat-met-sto-san	Natural	Meteorological	Storm	Sand/Dust storm	20
nat-met-sto-sev	Natural	Meteorological	Storm	Severe weather	263
nat-met-sto-sto	Natural	Meteorological	Storm	Storm (General)	898
nat-met-sto-sur	Natural	Meteorological	Storm	Storm surge	7
nat-met-sto-tor	Natural	Meteorological	Storm	Tornado	296
nat-met-sto-tro	Natural	Meteorological	Storm	Tropical cyclone	2492
tec-ind-che-che	Technological	Industrial accident	Chemical spill	Chemical spill	108
tec-ind-col-col	Technological	Industrial accident	Collapse (Industrial)	Collapse (Industrial)	181
tec-ind-exp-exp	Technological	Industrial accident	Explosion (Industrial)	Explosion (Industrial)	778
tec-ind-fir-fir	Technological	Industrial accident	Fire (Industrial)	Fire (Industrial)	219
tec-ind-gas-gas	Technological	Industrial accident	Gas leak	Gas leak	61
tec-ind-ind-ind	Technological	Industrial accident	Industrial accident (General)	Industrial accident (General)	124
tec-ind-oil-oil	Technological	Industrial accident	Oil spill	Oil spill	8
tec-ind-poi-poi	Technological	Industrial accident	Poisoning	Poisoning	76
tec-ind-rad-rad	Technological	Industrial accident	Radiation	Radiation	9
tec-mis-col-col	Technological	Miscellaneous accident	Collapse (Miscellaneous)	Collapse (Miscellaneous)	305
tec-mis-exp-exp	Technological	Miscellaneous accident	Explosion (Miscellaneous)	Explosion (Miscellaneous)	220
tec-mis-fir-fir	Technological	Miscellaneous accident	Fire (Miscellaneous)	Fire (Miscellaneous)	788

Classification Key	Group	Subgroup	Type	Subtype	Count ⁵
tec-mis-mis-mis	Technological	Miscellaneous accident	Miscellaneous accident (General)	Miscellaneous accident (General)	275
tec-tra-air-air	Technological	Transport	Air	Air	1089
tec-tra-rai-rai	Technological	Transport	Rail	Rail	645
tec-tra-roa-roa	Technological	Transport	Road	Road	2857
tec-tra-wat-wat	Technological	Transport	Water	Water	1624

Associated Disasters




In addition to the main classification system, EM-DAT makes it possible to refer to “associated disasters” to describe disaster events in more details (see Associated Dis in [EM-DAT Public Table](#)). They represent subsequent or co-occurring hazards that may have contributed to the disaster impact. These associated disasters may not fit into the main classification system and do not have a hierarchical structure. This additional tagging system allows for a better description of disaster events, particularly multi-hazard ones. The figure below shows the main associations found in the database.



Sankey diagram of the associations between main disaster types (MT) and associated disaster types (AT) in EM-DAT. The figure only reports MT-AT associations having an occurrence ≥ 50 in

the database. Gray band sizes between MT and AT are proportional to the occurrence of the association in EM-DAT. Last updated: September 5, 2023.

About 14% of disaster entries in EM-DAT have an associated disaster type, and only 3% mention two associated types. The most common associations are floods with landslides (24% of associations), storms with floods (21%), and storms with landslides (8%). Earthquakes are sometimes associated with landslides (4%) and tsunamis (4%) when their damage is deemed negligible compared to ground movement damage.

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1. Guha-Sapir, D. and Misson, C.: The Development of a Database on Disasters, *Disasters*, 16, 74–80, <https://doi.org/10.1111/j.1467-7717.1992.tb00378.x>, 1992. 
 2. DHA-UNDRO, IDNDR, UNEP, WFP, WHO/PAHO, USAID/FHA, IFRC, and CRED: Proposed principles and guidelines for the collection and dissemination of disaster-related data, Brussels, Belgium, 1992. 
 3. Below, R., Wirtz, A., and Guha-Sapir, D.: Disaster Category Classification and peril Terminology for Operational Purposes, Centre for Research on the Epidemiology of Disasters, Munich Re, Brussels, Belgium, 2009. 
 4. Below, R., Grover-Kopec, E., and Dilley, M.: Documenting Drought-Related Disasters: A Global Reassessment, *The Journal of Environment & Development*, 16, 328–344, <https://doi.org/10.1177/1070496507306222>, 2007. 
 5. Number of disasters that occurred at the country level in EM-DAT (1900-present) as of September 5, 2023. 

5 - Classification Glossary

Definitions of Disaster Types

EM-DAT's definitions related to the group of natural hazards mainly refer to the IRDR Peril Classification and Hazard Glossary (see [A Brief History of the EM-DAT Classification System](#)). These are reported in the following sections by disaster subgroups.

EM-DAT definitions related to the groups of complex disasters and technological hazards are listed separately in the [Complex and Technological Hazards](#) section. These are legacy definitions from the EM-DAT project and do not refer to a particular glossary serving as an international standard.











About Definitions

Some definitions have undergone minor modifications or derivations, which are noted at the end of each section. Some terms, which are not explicitly defined in the referenced glossaries, have been left undefined. As notified in the [Disaster Classification System](#), the [Hazard Information Profiles \(HIPs\)](#) serve as a comprehensive glossary for those interested in the definitions of different hazard types that are beyond the EM-DAT scope.

5.1 - Biological Hazards


Term	Level	Definition	Source
Biological hazard	Subgroup	A hazard caused by exposure to living organisms and/or their toxic substances (e.g., venom, or mold) or vector-borne diseases that they may carry. Examples are venomous wildlife and insects, poisonous plants, algae blooms, and mosquitoes carrying agents that causes disease such as parasites, bacteria, or viruses (e.g., malaria).	IRDR
Animal incident	Type Subtype	Human encounters with dangerous or exotic animals in both urban and rural environments.	IRDR
Epidemic	Type	Either an unusual, often sudden, increase in the number of cases of an infectious disease that already existed in the region (e.g., flu, or E. coli) or the appearance of an infectious disease previously absent from the region (e.g., plague, or polio).	EM-DAT ¹
Infectious disease	Subtype (General)	Either an unusual, often sudden, increase in the number of cases of an infectious disease that already existed in the region (e.g., flu, or E. coli) or the appearance of an infectious disease previously absent from the region (e.g., plague, or polio).	IRDR ¹
Bacterial disease	Subtype	An unusual increase in the number of cases caused by exposure to bacteria either through skin contact, ingestion, or inhalation. Examples include salmonella, Methicillin-Resistant Staphylococcus Aureus (MRSA), and cholera, among others.	IRDR ²
Parasitic disease	Subtype	An unusual increase in the number of cases caused by exposure to a parasite, i.e., an organism living on or in a host. Exposure to parasites occurs mostly through contaminated water, food, or contact with insects, animals, etc. Examples are malaria, Chagas disease, giardiasis, and Trichinellosis.	IRDR ²
Viral disease	Subtype		
Fungal disease	Subtype	An unusual increase in the number of cases caused by exposure to fungi either through skin contact, ingestion, or inhalation of spores. Examples are fungal pneumonia, fungal meningitis, etc.	IRDR ²
Prion disease	Subtype	A type of biological hazard caused by prion proteins. Prion diseases or transmissible spongiform encephalopathies (TSEs) are a family of rare progressive neurodegenerative disorders that affect both humans and animals. They are characterized by long incubation periods and neural loss. Examples are Bovine Spongiform Encephalopathy (BSE), Creutzfeldt-Jakob Disease (CJD), Kuru, etc.	IRDR ²
Infestation	Type Subtype (General)	The pervasive influx, swarming and/or hatching of insects, worms, or other animals affecting humans, animals, crops, and perishable goods.	IRDR ³
Grasshopper infestation	Subtype	Infestation of grasshoppers (insects).	IRDR ³


Term	Level	Definition	Source
Locust infestation	Subtype	Infestation of locusts (insects).	IRDR ³
Worm Infestation	Subtype	Infestation of worms.	IRDR ³

1. The “Infectious disease” definition corresponds to the definition of “Disease” in the IRDR glossary. The same definition is used to define “Epidemic” in the EM-DAT glossary.  
2. With minor modifications.    
3. These definitions have been adapted and derived from the IRDR definition of “Insect infestation”.    

5.2 - Climatological Hazards


Term	Level	Definition	Source
Climatological hazard	Subgroup	A hazard caused by long-lived, meso- to macro-scale atmospheric processes ranging from intra-seasonal to multi-decadal climate variability.	IRDR
Drought	Type Subtype	An extended period of unusually low precipitation that produces a shortage of water for people, animals, and plants. Drought is different from most other hazards in that it develops slowly, sometimes even over the years, and its onset is generally difficult to detect. Drought is not solely a physical phenomenon because its impacts can be exacerbated by human activities and water supply demands. Drought is therefore often defined both conceptually and operationally. Operational definitions of drought, i.e., the degree of precipitation reduction that constitutes a drought, vary by locality, climate, and environmental sector.	IRDR
Glacial lake outburst flood	Type Subtype	These floods occur when water held back by a glacier or moraine is suddenly released. Glacial lakes can be at the front of the glacier (marginal lake) or below the ice sheet (sub-glacial lake).	IRDR ¹
Wildfire	Type Subtype (General)	Any uncontrolled and non-prescribed combustion or burning of plants in a natural setting such as a forest, grassland, brush land or tundra, which consumes natural fuels and spreads based on environmental conditions (e.g., wind, or topography). Wildfires can be triggered by lightning or human actions.	IRDR
Forest fire	Subtype	A type of wildfire in a wooded area.	IRDR
Land fire (Brush, Bush, Pasture)	Subtype	A type of wildfire in a brush, bush, pasture, grassland, or other treeless natural environment.	IRDR ²

1. The definition of “Glacial lake outburst flood” corresponds to the definition of “Glacial lake outburst” in the IRDR glossary. 

2. Not defined in the IRDR glossary but adapted from the “Wildfire” and “Forest fire” definitions. 

5.3 - Extra-terrestrial Hazards



Term	Level	Definition	Source
Extra-terrestrial hazard	Subgroup	A hazard caused by asteroids, meteoroids, and comets as they pass near to the Earth, enter the Earth's atmosphere, and/or strike the Earth, and by changes in interplanetary conditions that effect the Earth's magnetosphere, ionosphere, and thermosphere.	IRDR
Impact	Type	A type of extra-terrestrial hazard caused by the collision a meteoroid, asteroid, or comet with the Earth.	IRDR
Airburst	Subtype	An explosion of a comet or meteoroid within the Earth's atmosphere without striking the ground.	IRDR
Collision	Subtype	An impact caused by the collision of a meteoroid, asteroid, or comet with the Earth's ground.	IRDR ¹
Space weather	Type	A general term for extra-terrestrial weather conditions driven by solar eruptions such as geomagnetic storms, radio disturbances, and solar energetic particles.	IRDR
Energetic particles	Subtype	Emissions from solar radiation storms consisting of pieces of matter (e.g., protons and other charged particles) moving at very high speed. The magnetosphere and atmosphere block (solar) energetic particles (SEP) from reaching humans on Earth but they are damaging to the electronics of space-borne technology (such as satellites) and pose a radiation hazard to life in space and aircraft traveling at high altitudes.	IRDR
Geomagnetic storm	Subtype	A type of extra-terrestrial hazard caused by solar wind shockwaves that temporarily disturb the Earth's magnetosphere. Geomagnetic storms can disrupt power grids, spacecraft operations, and satellite communications.	IRDR
Shockwave	Subtype	A shockwave carries energy from a disturbance through a medium (solid, liquid, or gas) similar to the action of a wave, though it travels at much higher speed. It can be a type of extra-terrestrial hazard caused by the explosion (airburst) or impact of meteorites that generate energy shockwaves capable of shattering glass, collapsing walls, etc.	IRDR
Radio disturbance	Subtype	Triggered by x-ray emissions from the Sun hitting the Earth's atmosphere and causing disturbances in the ionosphere such as jamming of high and/or low frequency radio signals. This affects satellite radio communication and Global Positioning Systems (GPS).	IRDR

1. The “Collision” definition is derived from the IRDR “Impact” and “Airburst” definitions. 

5.4 - Geophysical Hazards

Term	Level	Definition	Source
Geophysical hazard	Subgroup	A hazard originating from solid earth. This term is used interchangeably with the term geological hazard.	IRDR
Earthquake	Type	Sudden movement of a block of the Earth's crust along a geological fault and associated ground shaking.	IRDR
Ground movement	Subtype	Surface displacement of earthen materials due to ground shaking triggered by earthquakes or volcanic eruptions.	IRDR
Tsunami	Subtype	A series of waves (with long wavelengths when traveling across the deep ocean) that are generated by a displacement of massive amounts of water through underwater earthquakes, volcanic eruptions, or landslides. Tsunami waves travel at very high speed across the ocean, but as they begin to reach shallow water they slow down, and the wave grows steeper.	IRDR
Mass movement (dry)	Type	Any type of downslope movement of earth materials under hydrological dry conditions.	IRDR ¹
Avalanche (dry)	Subtype	A large mass of loosened earth material, snow, or ice that slides, flows, or falls rapidly down a mountainside under the force of gravity. Debris Avalanche: The sudden and very rapid downslope movement of a mixed mass of rock and soil. There are two general types of debris avalanches. A cold debris avalanche usually results from an unstable slope suddenly collapsing whereas a hot debris avalanche results from volcanic activity leading to slope instability and collapse.	IRDR
Landslide (dry)	Subtype	Any kind of moderate to rapid soil movement incl. lahars, mudslides, and debris flows (under dry conditions). A landslide is the movement of soil or rock controlled by gravity and the speed of the movement usually ranges between slow and rapid, but it is not very slow. It can be superficial or deep, but the materials must make up a mass that is a portion of the slope or the slope itself. The movement has to be downward and outward with a free face.	EM-DAT
Rockfall (dry)	Subtype		
Sudden subsidence (dry)	Subtype	Sinking of the ground due to groundwater removal, mining, dissolution of limestone (e.g., karst sinkholes), extraction of natural gas, and earthquakes. In this case, the sinking occurs under dry conditions as a result of a geophysical trigger.	IRDR ²
Volcanic activity	Type Subtype (General)	A type of volcanic event near an opening/vent in the Earth's surface including volcanic eruptions of lava, ash, hot vapor, gas, and pyroclastic material.	IRDR
Ash fall	Subtype	Fine (less than 4 mm in diameter) unconsolidated volcanic debris blown into the atmosphere during an eruption; can remain airborne for long periods of time and travel a considerable distance from the source.	IRDR



Term	Level	Definition	Source
Lava flow	Subtype	The ejected magma that moves as a liquid mass downslope from a volcano during an eruption.	IRDR
Pyroclastic flow	Subtype	Extremely hot gases, ash, and other materials with a temperature of more than 1,000 degrees Celsius that rapidly flow down the flank of a volcano (at more than 700 km/h) during an eruption.	IRDR
Lahar	Subtype	Hot or cold mixture of earthen material flowing down the slope of a volcano either during or between volcanic eruptions.	IRDR

1. The definition of “Mass movement (dry)” is adapted from the “Mass movement” IRDR definition. 
2. The first definition sentence of “Sudden subsidence (dry)” is the definition of “Subsidence” in the IRDR glossary. The second sentence has been added to distinguish this class from “Sudden subsidence (wet)” in the hydrological group. 

5.5 - Hydrological Hazards

Term	Level	Definition	Source
Hydrological hazard	Subgroup	A hazard caused by the occurrence, movement, and distribution of surface and subsurface freshwater and saltwater.	IRDR
Flood	Type Subtype (General)	A general term for the overflow of water from a stream channel onto normally dry land in the floodplain (riverine flooding), higher-than-normal levels along the coast (coastal flooding) and in lakes or reservoirs as well as ponding of water at or near the point where the rain fell (flash floods).	IRDR
Coastal flood	Subtype	Higher-than-normal water levels along the coast caused by tidal changes or thunderstorms that result in flooding, which can last from days to weeks.	IRDR
Flash flood	Subtype	Heavy or excessive rainfall in a short period of time that produces immediate runoff, creating flooding conditions within minutes or a few hours during or after the rainfall.	IRDR
Riverine flood	Subtype	A type of flooding resulting from the overflow of water from a stream or river channel onto normally dry land in the floodplain adjacent to the channel.	IRDR
Ice jam flood	Subtype	The accumulation of floating ice restricting or blocking a river's flow and drainage. Ice jams tend to develop near river bends and obstructions (e.g., bridges).	IRDR
Mass movement (wet)	Type	Types of mass movement that occur when heavy rain or rapid snow/ice melt send large amounts of vegetation, mud, or rock down a slope driven by gravitational forces.	IRDR ¹
Avalanche (wet)	Subtype	A large mass of loosened earth material, snow, or ice that slides, flows, or falls rapidly down a mountainside under the force of gravity. Snow Avalanche: Rapid downslope movement of a mix of snow and ice.	IRDR
Landslide (wet)	Subtype	Any kind of moderate to rapid soil movement incl. lahars, mudslides, and debris flows (under wet conditions). A landslide is the movement of soil or rock controlled by gravity and the speed of the movement usually ranges between slow and rapid, but it is not very slow. It can be superficial or deep, but the materials must make up a mass that is a portion of the slope or the slope itself. The movement has to be downward and outward with a free face.	EM-DAT
Rockfall (wet)	Subtype		
Sudden subsidence (wet)		Sinking of the ground due to groundwater removal, mining, dissolution of limestone (e.g., karst sinkholes), extraction of natural gas, and earthquakes. In this case, the sinking occurs under wet conditions as a result of a hydrological trigger (e.g., rain).	IRDR ²
Mudslide	Subtype		
Wave action	Type	Wind-generated surface waves that can occur on the surface of any open body of water such as oceans, rivers, or lakes. The size of the wave depends on the	IRDR



Term	Level	Definition	Source
		strength of the wind and the distance traveled (fetch).	
Rogue wave	Subtype	An unusual single crest of an ocean wave far out at sea that is much higher and/or steeper than other waves in the prevailing swell system.	IRDR
Seiche	Subtype	A standing wave of water in a large semi- or fully-enclosed body of water (lakes or bays) created by strong winds and/or a large barometric pressure gradient.	IRDR

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- 1. The “Mass movement (wet)” definition is adapted from the IRDR definition of “Debris flow, mud flow, rock fall”. 
 - 2. The first definition sentence of “Sudden subsidence (wet)” is the definition of “Subsidence” in the IRDR glossary. The second sentence has been added to distinguish this class from “Sudden subsidence (dry)” in the geophysical group. 

5.6 - Meteorological Hazards

Term	Level	Definition	Source
Meteorological hazard	Subgroup	A hazard caused by short-lived, micro- to meso-scale extreme weather and atmospheric conditions that last from minutes to days.	IRDR
Extreme temperature	Type	A general term for temperature variations above (extreme heat) or below (extreme cold) normal conditions.	IRDR
Cold wave	Subtype	A period of abnormally cold weather. Typically, a cold wave lasts for two or more days and may be aggravated by high winds. The exact temperature criteria for what constitutes a cold wave may vary by location.	EM-DAT
Heat wave	Subtype	A period of abnormally hot and/or unusually humid weather. Typically, a heat wave lasts for two or more days. The exact temperature criteria for what constitutes a heat wave may vary by location.	EM-DAT
Severe winter conditions	Subtype	Damage caused by snow and ice. Winter damage refers to damage to buildings, infrastructure, traffic (esp. navigation) inflicted by snow and ice in the form of snow pressure, freezing rain, frozen waterways etc.	EM-DAT
Fog	Type Subtype	Water droplets that are suspended in the air near the Earth's surface. Fog is, in fact, simply a cloud that is in contact with the ground.	IRDR ¹
Storm	Type Subtype (General)		
Derecho	Subtype	Widespread and usually fast-moving windstorms associated with a convection/convective storm. Derechos include downburst and straight-line winds. The damage from derechos is often confused with the damage from tornadoes.	IRDR
Hail	Subtype	Solid precipitation in the form of irregular pellets or balls of ice more than 5 mm in diameter.	IRDR
Lightning / Thunderstorms	Subtype	A high-voltage, visible electrical discharge produced by a thunderstorm and followed by the sound of thunder.	IRDR ²
Sand/Dust storm	Subtype	Strong winds carrying particles of sand aloft, but generally confined to less than 50 feet (15 m), especially common in arid and semi-arid environments. A dust storm is also characterized by strong winds but carries smaller particles of dust rather than sand over an extensive area.	IRDR
Storm surge	Subtype	An abnormal rise in sea level generated by a tropical cyclone or other intense types of storm.	IRDR
Tornado	Subtype	A violently rotating column of air that reaches the ground or open water (waterspout).	IRDR



Term	Level	Definition	Source
Winter storm/Blizzard	Subtype	A low-pressure system in winter months with significant accumulations of snow, freezing rain, sleet, or ice. A blizzard is a severe snowstorm with winds exceeding 35 mph (56 km/h) for three or more hours, producing reduced visibility (less than 0.25 miles (400 m)).	IRDR
Extra-tropical storm	Subtype	A type of low-pressure cyclonic system in the middle and high latitudes (also called a mid-latitude cyclone) that primarily gets its energy from the horizontal temperature contrasts (fronts) in the atmosphere. When associated with cold fronts, extra-tropical cyclones may be particularly damaging (e.g., European winter/windstorm, or Nor’easter).	IRDR
Tropical cyclone	Subtype	A tropical cyclone originates over tropical or subtropical waters. It is characterized by a warm-core, non-frontal synoptic-scale cyclone with a low-pressure center, spiral rain bands and strong winds. Depending on their location, tropical cyclones are referred to as hurricanes (Atlantic, Northeast Pacific), typhoons (Northwest Pacific), or cyclones (South Pacific and Indian Ocean).	IRDR
Severe weather	Subtype		

1. Note: the only “Fog” entry in EM-DAT is the Great London SMOG, 1952, which was also accompanied by air pollution. 
2. The “Lightning/Thunderstorm” definition corresponds to the definition of “Lightning” in the IRDR glossary. 

5.7 - Complex and Technological Hazards

Term	Level	Definition	Source
Complex disaster	Group Subgroup Type Subtype	Major famine situation for which drought was not the main causal factor. Removed from EM-DAT in September 2023. ¹	EM-DAT
Industrial accident	Subgroup Type Subtype (General)	Disaster type term used in EM-DAT to describe technological accidents of an industrial nature/involving industrial buildings (e.g. factories).	EM-DAT
Miscellaneous accident	Subgroup Type Subtype (General)	Disaster type term used in EM-DAT to describe technological accidents of a non-industrial or transport nature (e.g., involving houses).	EM-DAT
Chemical spill	Type Subtype	Accident release occurring during the production, transportation, or handling of hazardous chemical substances.	EM-DAT
Collapse (Industrial) (Miscellaneous)	Type Subtype	Accident involving the collapse of a building or structure. Can either involve industrial structures or domestic/non-industrial structures.	EM-DAT
Explosion (Industrial) (Miscellaneous)	Type Subtype	Explosions involving buildings or structures. Can involve industrial structures.	EM-DAT
Fire (Industrial) (Miscellaneous)	Type Subtype	Urban fire involving buildings or structures. Can involve industrial structures.	EM-DAT ²
Gas leak	Type Subtype		
Oil spill	Type Subtype		
Poisoning	Type Subtype	Poisoning of atmosphere or water courses due to industrial sources of contamination.	EM-DAT
Radiation	Type Subtype		
Transport accident	Subgroup	Disaster type term used to describe technological transport accidents involving mechanized modes of transport. It comprises four disaster subtypes (i.e., Air, Water, Rail, and Road).	EM-DAT
Air	Type Subtype	Transport accidents involving airplanes, helicopters, airships, and balloons.	EM-DAT
Water	Type Subtype	Transport accidents involving sailing boats, ferries, cruise ships, and other vessels.	EM-DAT
Rail	Type Subtype	Transport accidents involving trains.	EM-DAT

Term	Level	Definition	Source
Road	Type Subtype	Transport accidents involving motor vehicles on roads and tracks.	EM-DAT



- 1. EM-DAT substantial modifications and references to legacy data are available in the release note section. 
- 2. Urban fire is a former class that is now either described as “Fire (industrial)” or “Fire (miscellaneous).” 

6 - Hazard and Disaster Magnitude Units

Additional Information About the Hazard Extent

Some disaster types may have a reported magnitude in the `Magnitude` and `Magnitude Scale` columns of the [EM-DAT Public Table](#). EM-DAT disaster magnitude scales vary depending on the disaster type. The table below specifies magnitude property and units for related disaster types.

Disaster Type	Magnitude property	Magnitude Unit or Scale
Earthquake	Size of the earthquake derived from its physical properties	Moment Magnitude ¹
Flood	Flood extent (area)	km ² (square kilometers)
Drought	Drought extent (area)	km ² (square kilometers)
Extreme temperature	The recorded extreme temperature (maximum or minimum depending on whether it is a heat or a cold wave)	°C
Epidemic	Number of vaccinated people	Vaccinated people ²
Wildfire	Wildfire extent (area)	km ² (square kilometers)
Storm	Recorded wind speed	kph (kilometer per hour)
Industrial accident (Chemical spills)	Chemical discharged volume	m ³ (cubic meter)

1. See the following [USGS Document](#). 
2. As the magnitude column provides additional hazard-specific information, it is used to report the number of vaccinated people for epidemics. However, it may not be a good indicator of the magnitude of the epidemic, which is also captured by the health impact. 

7 - Impact Variables

What Type of Information Is Collected to Evaluate the Impact of a Disaster? How Is It Aggregated, Reported, or Adjusted?

7.1 - Human Impact Variables

People Affected and Death Toll

Five variables describe the human impact of disasters in the [EM-DAT Public Table](#):

Human Impact Variables

1. Total Deaths , which includes reported deaths and missing people,
2. No. Injured ,
3. No. Affected ,
4. No. Homeless , and
5. Total Affected , which is the sum of No. Injured , No. Affected , and No. Homeless .

The reported total number of deaths (column `Total Deaths`) includes confirmed fatalities directly imputed to the disaster plus missing people whose whereabouts since the disaster are unknown and so they are presumed dead based on official figures.

Aside from fatalities, the number of injured people (column `No. Injured`) is entered when the term “injured” is written in the source. Any related word like “hospitalized” is considered as injured. If no precise number is given, such as “hundreds of injured,” 200 injured will be entered (although this figure is probably an underestimate).

The number of affected people (column `No. Affected`) is often mentioned and is widely used by different actors to convey the extent, impact, or severity of a disaster in non-spatial terms. If only the number of families affected or houses damaged are reported, the figure is multiplied by the average family size for the affected area ($\times 5$ for developing countries, $\times 3$ for industrialized countries, according to the UNDP country classification).

Calculation of `No. Affected` (Examples)

- Number of houses damaged: $50 \times 5 = 250$ affected (although this figure is probably an underestimate).

- If the value ranges from a minimum to a maximum: the average is taken.
- Thousands affected: 2,000 affected (although this figure is probably an underestimate).

Similarly, the indicator `No. Homeless` is mentioned whenever it is found in reports. If only the number of families that are homeless or houses that are destroyed are reported, the figure is multiplied by the average family size for the affected area (x5 for developing countries, x3 for industrialized countries, according to the UNDP country list).

Calculation of `No. Homeless` (Examples)

- Number of houses destroyed: $50 \times 5 = 250$ homeless (although this figure is probably an underestimate).
- If the value ranges from a minimum to a maximum: take the average.
- Thousands homeless: 2,000 homeless (although this figure is probably an underestimate).

Finally, the indicator `Total Affected` is the total of injured, affected, and homeless people. For each disaster and its corresponding sources, the population referred to in these statistics and the apportionment between injured, affected, homeless, and the total is carefully checked by CRED staff members.

Human Impact and Conceptual Uncertainties

The terms “dead,” “injured,” and “homeless” are more straightforward than “affected persons.” The definition of “affected persons” varies across sources and lacks a universal standard. Besides, for disasters such as droughts or heatwaves, which have ambiguous spatiotemporal boundaries, determining the number of casualties can be challenging. CRED directly uses numbers in EM-DAT as they appear in original sources, even if there are uncertainties in these figures. More details on these uncertainties can be found in the section on [General Issues](#).

Usually, at least the field `Total Deaths` or `Total Affected` are found in EM-DAT records as these numbers are involved as entry criteria. However, records often contain incomplete impact statistics (see [Accounting Biases](#)).

7.2 - Economic Impact Variables

Total Economic Damage, Reconstruction Costs, and Insured Damage

Six variables describe the economic impact of disasters in the [EM-DAT Public Table](#):

Economic Impact Variables

1. Reconstruction Costs ('000 US\$) ,
2. Reconstruction Costs, Adjusted ('000 US\$) ,
3. Insured Damage ('000 US\$) ,
4. Insured Damage, Adjusted ('000 US\$) ,
5. Total Damage ('000 US\$) , and
6. Total Damage, Adjusted ('000 US\$) .

These six statistics are the three same statistics (Reconstruction Costs ('000 US\$) , Insured Damage ('000 US\$) , and Total Damage ('000 US\$)) repeated to also provide an amount corrected for inflation, i.e., “Adjusted” (See [Economic Adjustment](#)). Damage and costs are converted and expressed in thousands of US dollars ('000 US\$).

Underreporting of Economic Losses

Economic damage resulting from disasters is largely underreported. In EM-DAT, figures tend to be available only for high-impact disasters in countries with insurance and reinsurance coverage. This issue is described in the [Specific Biases](#) section, in particular, in the [Accounting Biases](#) section.

Reconstruction costs are different from total damages as they must consider the current construction or purchase costs of goods, as well as the additional cost of prevention and mitigation measures designed to reduce damage from future disasters. Hence, when reconstruction costs are specified, they are usually greater than the total damage.

Insured damage is usually reported by reinsurance companies that publish figures about disaster losses, e.g., MunichRe, SwissRe, or AON. When insured damage is reported, the total damage is generally reported from the same source for consistency.

8 - Spatial Information and Geocoding

Standards for Administrative Regions

Country Codes (ISO-3)

In the [EM-DAT Public Table](#), the `ISO` column indicates a 3-letter (alpha-3) code representing a specific country, e.g., “BEL” for Belgium. This code is presented according to the international standard [ISO-3166](#) determined by the International Organization for Standardization (ISO). Due to historical changes in the countries’ denomination or boundaries, you may find country codes that are not found in the current ISO 3166 alpha-3 country codes. These extensions are listed in the table below.

Disclaimer

The extensions to the ISO 3166-1 alpha-3 norm are the results of historical changes in the norms used. Please note that CRED aims to deliver data within an accurate spatiotemporal context. The way the EM-DAT data is presented and documented on this website does not reflect any geopolitical views held by the CRED, or the views of our partners, including the United States Agency for International Development or the United States Government.

Country codes are particularly useful to link the EM-DAT tabular data to a spatial layer using a Geographic Information System (GIS), spatial database, or geoprocessing programming library.

United Nations M49 Standard Country or Area Codes

The UN M49, also known as the [Standard Country or Area Codes for Statistical Use \(Series M, No. 49\)](#), is a set of area codes formulated by the United Nations for data analytics. This standard is curated and upheld by the United Nations Statistics Division. The UN M49 alpha-3 codes largely overlaps with the ISO-3166 alpha-3 norm.

From September 2023 onward, the [EM-DAT Public Table](#) refers to the `Country`, `Region`, and `Subregion` names as found in the UN M49 standard. Codes used for the EM-DAT extensions to the ISO alpha-3 codes and UNM49 are listed in the table below.

Alpha-3 Code	Country Name	Region	Subregion
ANT	Netherlands Antilles	Americas	Latin America and the Caribbean
AZO	Azores Islands	Europe	Southern Europe
CHA	Channel Islands	Europe	Western Europe
CSK	Czechoslovakia	Czechoslovakia	Eastern Europe
DDR	German Democratic Republic	Europe	Western Europe
DFR	Germany Federal Republic	Europe	Western Europe
SCG	Serbia Montenegro	Europe	Southern Europe
SPI	Canary Islands	Africa	Northern Africa
SUN	Soviet Union	Europe	Eastern Europe
YMD	People's Democratic Republic of Yemen	Asia	Western Asia
YMN	Yemen Arab Republic	Asia	Western Asia
YUG	Yugoslavia	Europe	Southern Europe
TWN	Taiwan (Province of China)	Asia	Eastern Asia

GAUL Index and Admin Levels

Since 2014, EM-DAT has relied on the Global Administrative Unit Layers (GAUL) implemented by the Food and Agriculture Organization (FAO). EM-DAT provides loss statistics at the country level, which corresponds to GAUL Admin-0 level. In addition, the [EM-DAT Public Table](#) mentions in the `Admin Units` column which region is affected by the disaster up to the Admin-2 level (e.g., districts). The mapping of EM-DAT disaster events at this higher level of geographical precision has only been completed for data since 2000. Nevertheless, the Admin-0 human and economic impact variables at the country level are not disaggregated between regions at the Admin-1 or Admin-2 level. Hence, only the occurrence is available at a more precise administrative level, and the impact variables remain representative of the country level.

GAUL Maintenance

Since 1990, GAUL has provided the most reliable spatial information on Administrative Units for all countries in the world down to the second administrative level (e.g., districts). However, it has no longer been maintained since its last version was released in 2015. In the future,

EM-DAT may depend on alternative datasets such as the [GADM Database of Global Administrative Areas](#).

For disaster loss dataset mapping EM-DAT with GADM, you may refer to:

Rosvold, E. L. and Buhaug, H.: GDIS, a global dataset of geocoded disaster locations, *Sci Data*, 8, 61, <https://doi.org/10.1038/s41597-021-00846-6>, 2021.

9 - EM-DAT Sources of Information

Where Do the EM-DAT Figures Come From?

The EM-DAT database is compiled from various sources, including United Nations, governmental and non-governmental agencies, insurance companies, research institutes, and the press. As of September 2023, the most common sources are included in the table below. For further inquiries on the data collection and selection process, see EM-DAT [Protocols](#).

Source name	Category	Type of disasters covered
Office for the Coordination of Humanitarian Affairs (OCHA) / ReliefWeb	United Nations	Natural hazards
World Food Programme (WFP) ¹	United Nations	Drought/Famine
World Meteorological Organization (WMO)	United Nations	Natural hazards
World Health Organization (WHO)	United Nations	Epidemics
Food and Agriculture Organization (FAO) ¹	United Nations	Drought/Famine
United Nation Environment Programme (UNEP)	United Nations	Natural hazards
National Governments (Reports)	National Gov.	Natural and technological hazards
Federal Emergency Management Agency (FEMA)	United States	Natural hazards (America)
National Oceanic and Atmospheric Administration (NOAA)	United States	Natural hazards
Office of US Foreign Disaster Assistance (OFDA)	United States	Natural and technological hazards
US Geological Survey (USGS)	United States	Earthquakes
Centers for Disease Control and Prevention (CDC)	United States	Epidemics
National Centers for Environmental Information (NCEI, formerly the National Geophysical Data Center - NGDC) ¹	United States	Natural hazards
European Civil Protection and Humanitarian Aid Operations (ECHO)	European Union	Natural hazards
Dartmouth Flood Observatory (DFO)	Research center	Floods, landslides and storms
International Federation of Red Cross and Red Crescent Societies (IFRC)	Humanitarian aid organization	Natural and technological hazards
World Bank (Reports)	Inter-Governmental Organizations	Major natural hazards and disasters

Source name	Category	Type of disasters covered
SwissRe	ReInsurance Companies	Natural and technological hazards
MünichRe	Reinsurance Companies	Natural hazards
AON Benfield	Reinsurance Companies	Natural hazards
Lloyd's casualty magazine (paid subscription) ¹	Reinsurance Companies	Natural hazards
Agence France Press (paid subscription)	Press/Other	Natural and technological hazards
Reuters ¹	Press/Other	Natural and technological hazards
The new humanitarian (former IRIN News) ¹	Press/Other	Natural and technological hazards (mostly Africa)
FloodList	Press/Other	Floods
Wikipedia	Press/Other	Natural and technological hazards
Plane Crash Info	Press/Other	Transport accidents (Air)

1. Historical source no longer used      