Disaster Occurrences Statistics and DRSF

The 17th TWG on Disaster-related Statistics

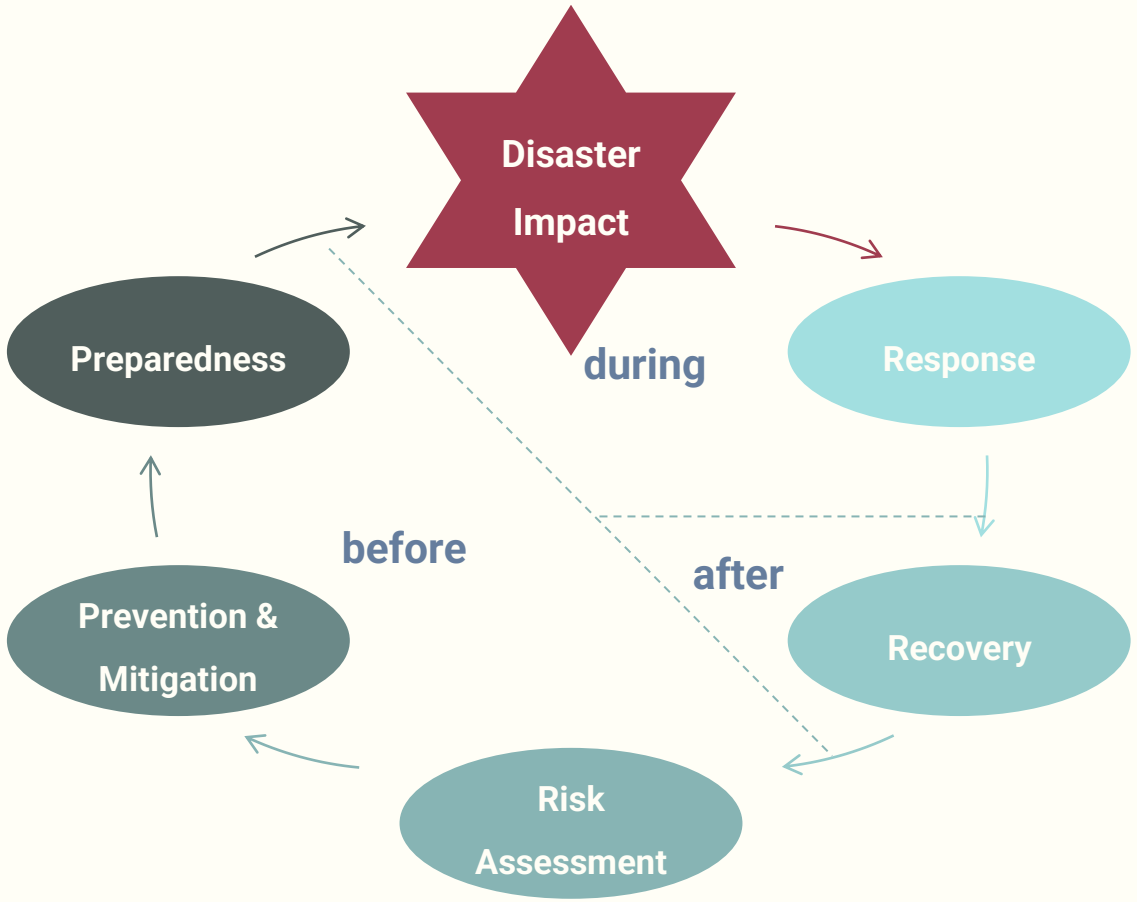
Wednesday, 27 April 2022, 14:00 – 15:30 hours, Bangkok time

Outline

- Introduction
- Basic concepts, definitions and classifications
- Data sources and existing tools and guides
- Institutional dimension
- Linkages to SDGs and Sendai Framework

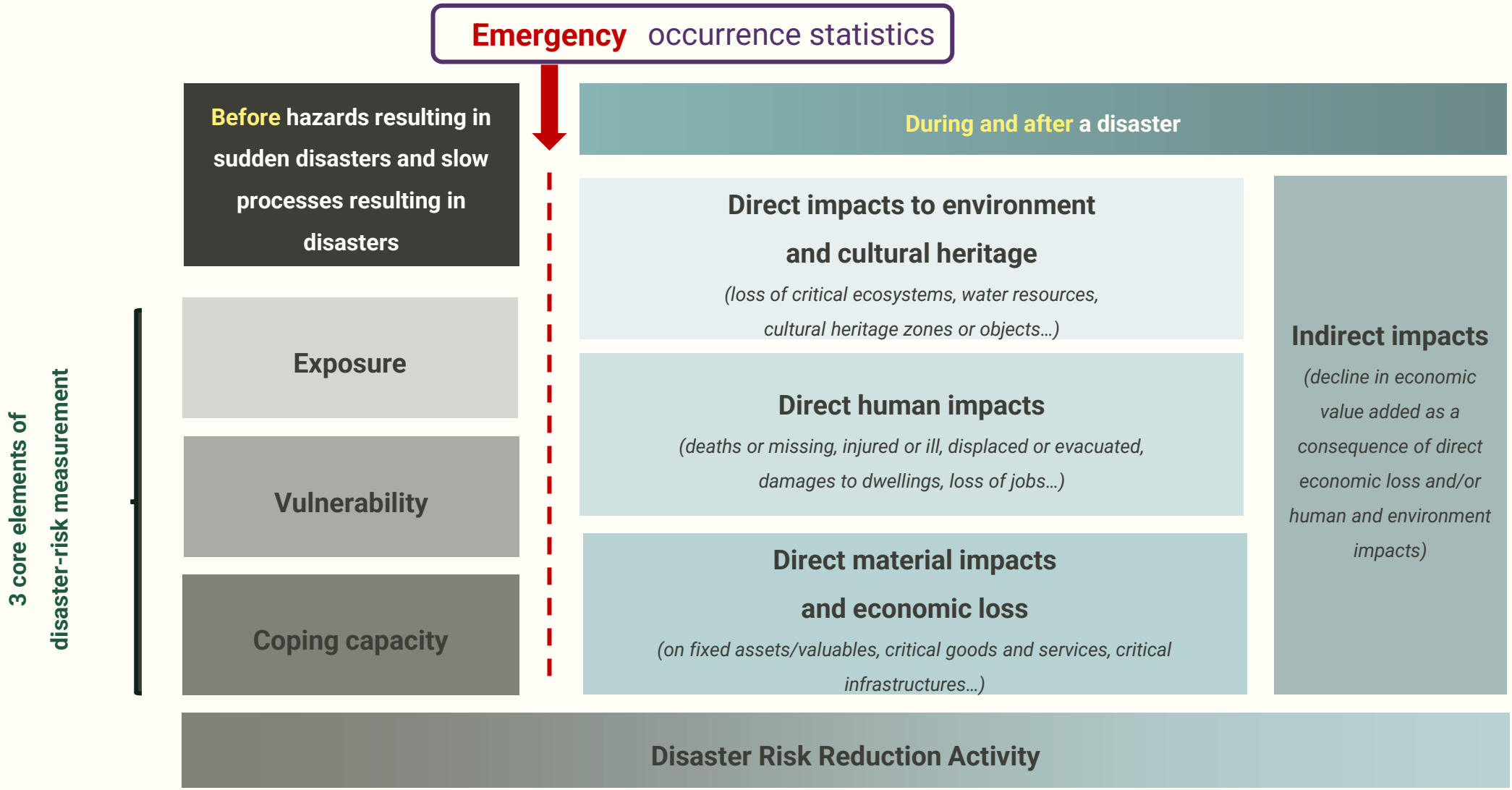
INTRODUCTION

Cycle of disaster risk management

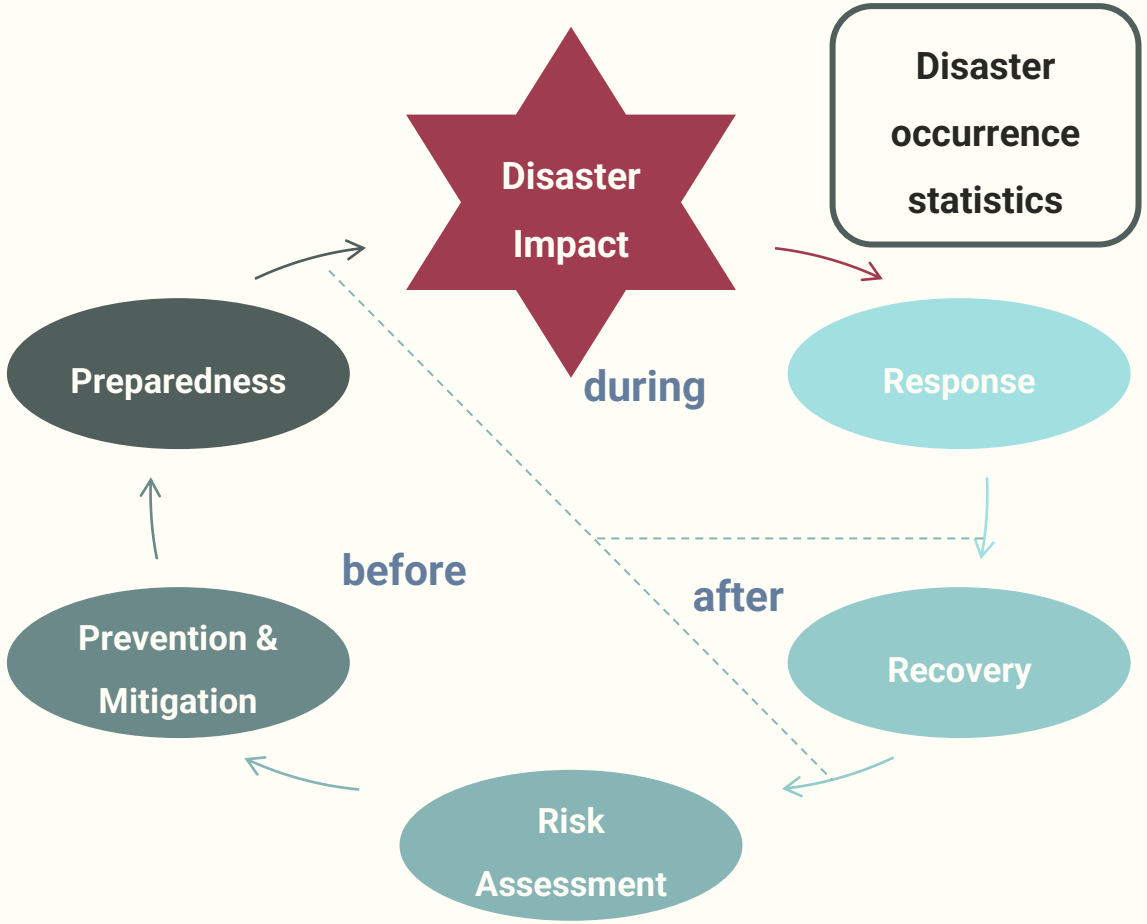


Source: Diagram adapted from Thailand Department of Disaster Prevention and Mitigation (DDPM)

Components of the DRSF



Cycle of disaster risk management

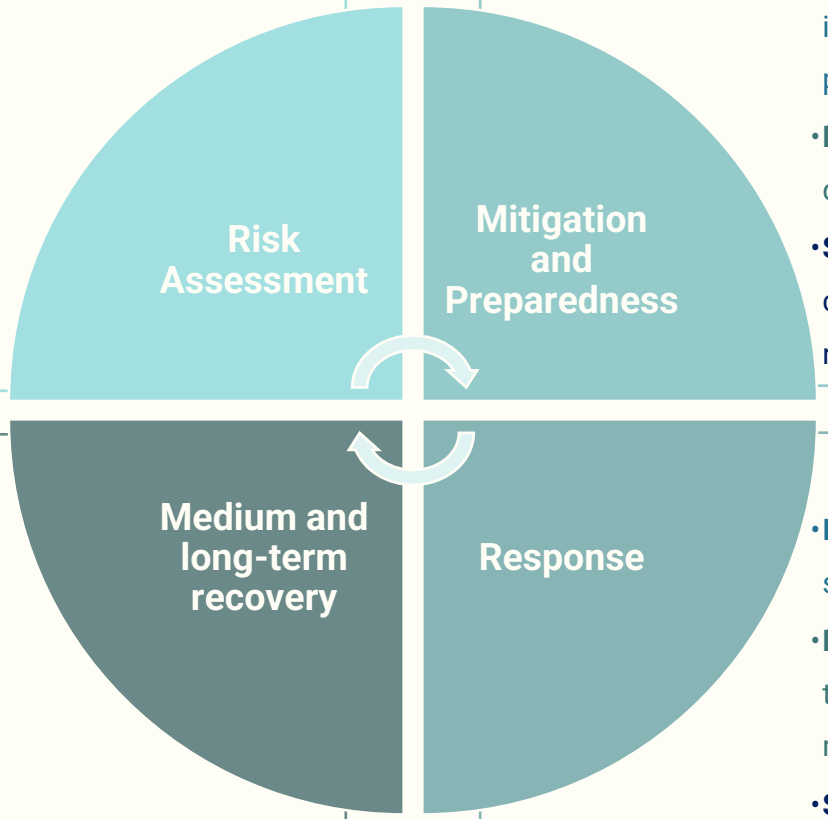


Source: Diagram adapted from Thailand Department of Disaster Prevention and Mitigation (DDPM)

Statistics in disaster-risk reduction decision making:

Uses of occurrence statistics (selected)

- **Issue:** Development investments should be informed by risk profiles
- **Decision & plan:** How to invest in development while avoiding new risks
- **Statistics:** Dynamic hazard profiles (magnitude, temporal and spatial distribution)



- **Issue:** Risk profiles are changing as new information becomes available and development in potentially vulnerable areas takes place
- **Decision & plan:** Whether and how to discourage development in hazardous areas
- **Statistics:** Scale, locations and other characteristics of investment in disaster risk reduction

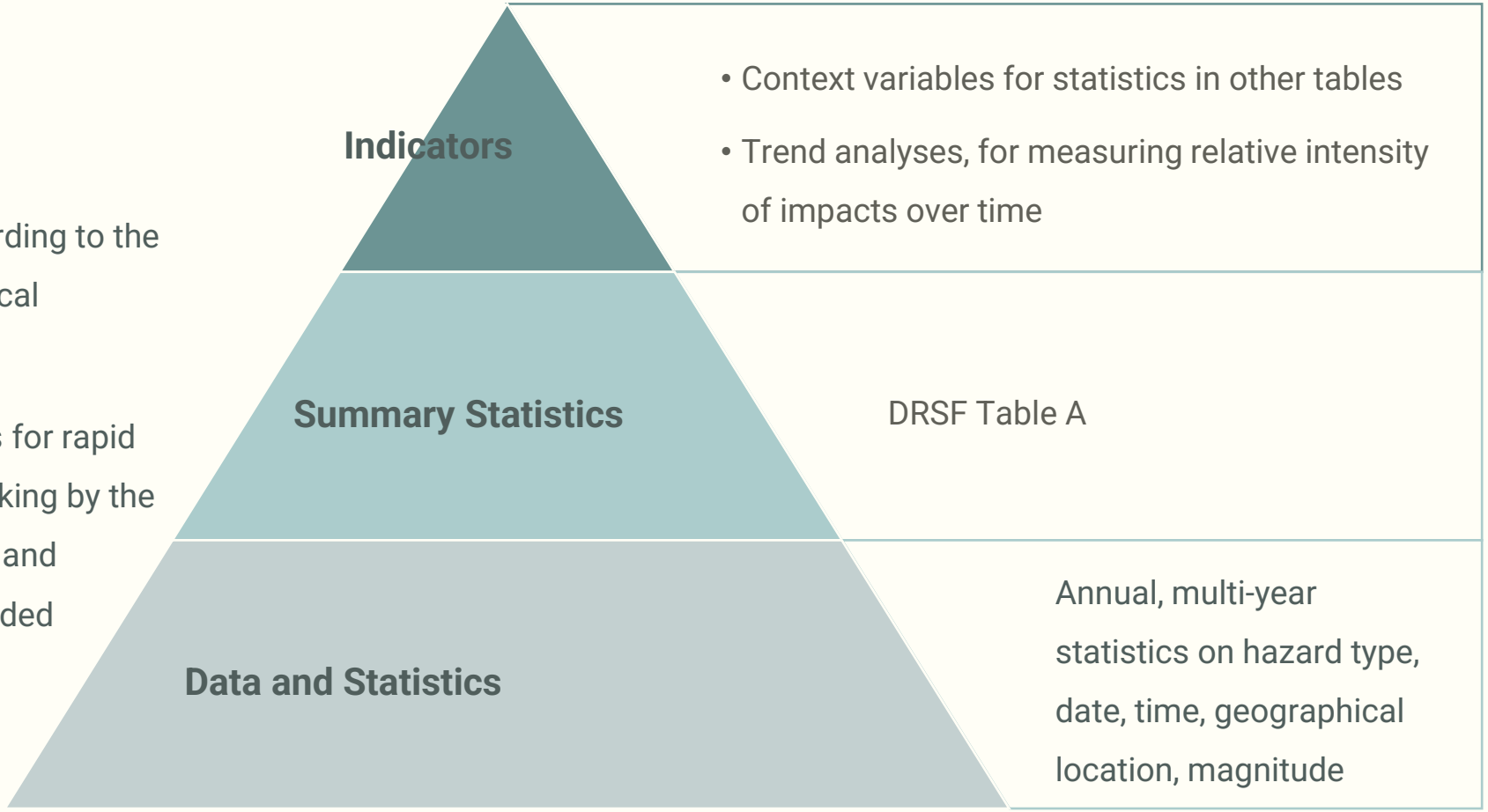
- **Issue:** Risk that fragile communities could regress into a new emergency crisis if recovery needs are not met
- **Decision & plan:** How to determine appropriate level of investment required for complete recovery from impacts for disasters
- **Statistics:** Dynamic hazard profiles (magnitude, temporal and spatial distribution)

- **Issue:** Imperative is to act quickly and efficiently to save lives and mitigate unnecessary suffering
- **Decision & plan:** Determine the geographic scale of the disaster and prioritize needs for emergency relief
- **Statistics:** Disaster occurrence, including temporal, and spatial spread of the event

Information, data, statistics and indicators:
occurrence statistics

Concept

- Number of occurrences according to the hazards, scale and geographical classifications;
- Provide background statistics for rapid assessment and decision-making by the disaster response authorities and allotting resources where needed



DRSF Tables

- The basic range of disaster related statistics is organized according to generic tables or categories of tables, as follows:
  - **A**: Summary tables of **disaster occurrences**
  - **B**: Selected **background statistics and exposure to hazards**
  - **C**: Summary tables of **human impacts**
  - **D**: Summary tables of **direct material impacts in physical terms**
  - **E**: Summary tables of **direct material impacts in monetary terms**
  - **F**: Summary of **material impacts to agriculture**
  - **G**: Summary table of **direct environmental impacts**
  - **DRRE**: **Disaster risk reduction expenditure accounts**

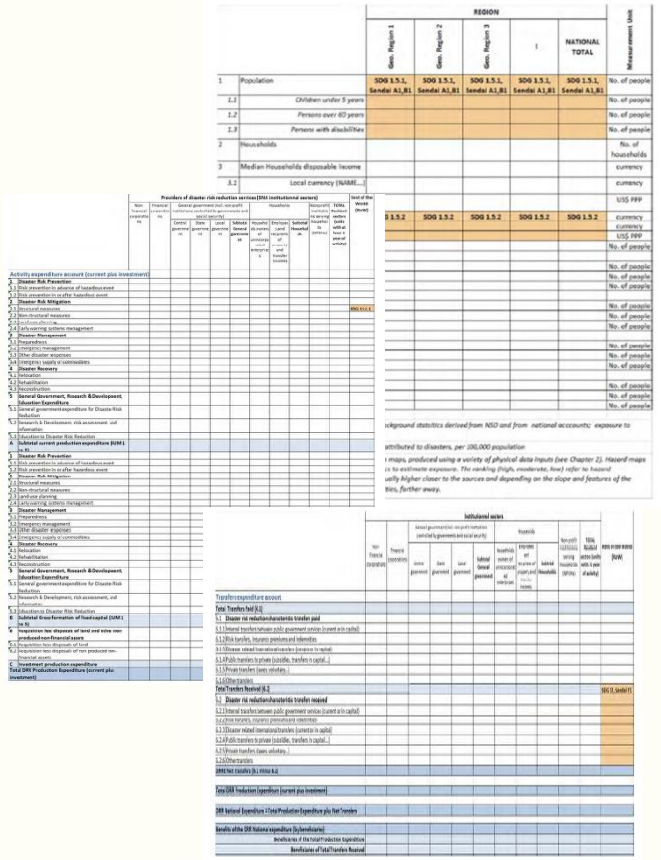


Table A1: Summary table of disaster occurrences, by hazards types, scale, and geographic region

- Hazard types
  - Geo-physical
  - Hydrological
  - Meteorological & Climatological
  - Biological
  - Other
- Scale
  - Very large events
  - National scale medium to large events
  - Local scale events
- Geographical region
  - Geo Region 1
  - Geo Region 2
  - Geo Region 3

A Summary of disaster occurrences

A1 Summary table of disaster occurrences, by hazards types, scale, and geographic region

Measurement units: counts of occurrences

	Geo Region 1				Geo Region 2				Geo Region 3				...				Adjustment for multiple counting of events by regions/states (-)				Adj. National total			
	Large	Medium	Small (local scale)	Total	Large	Medium	Small (local scale)	Total	Large	Medium	Small (local scale)	Total	Large	Medium	Small (local scale)	Total	Large	Medium	Small (local scale)	Total	Very large events	National scale medium to large	Small (local scale)	Total
Geo-physical																								
Hydrological																								
Meteorological & Climatological																								
Biological																								
Other																								
Total																								

Data source: *NDMA, national register of disaster occurrences, according to official national designation*

International definition for a disaster: *"A serious disruption of the functioning of a community or a society at any scale due to hazardous events interacting with conditions of exposure, vulnerability and capacity, leading to one or more of the following: human, material, economic and environmental losses and impacts." (UNGA, 2015)*

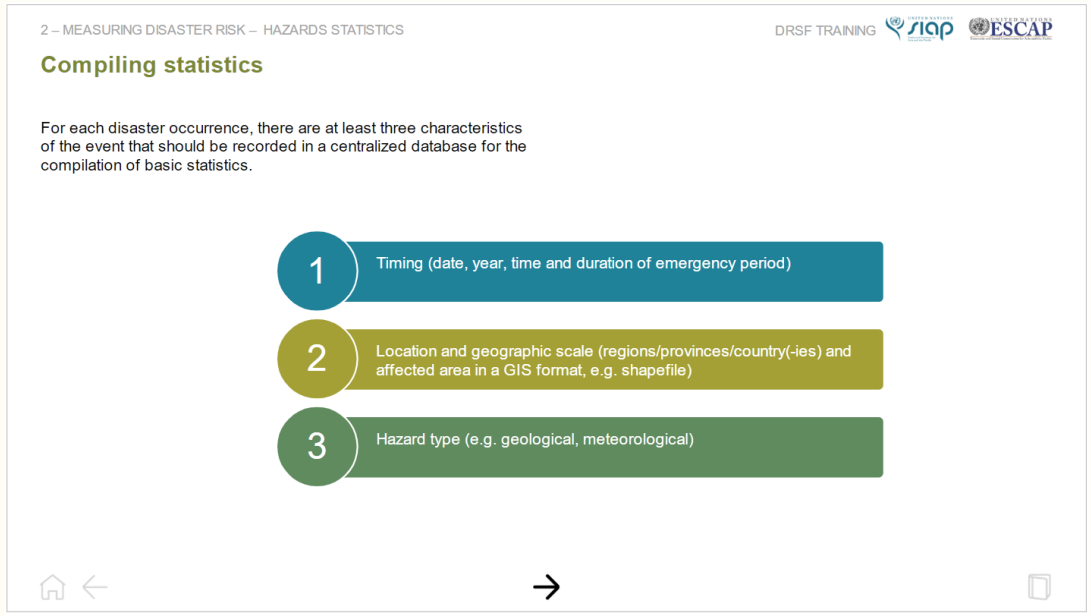
Suggested variable for classifying scale of disasters: *geographic scope of emergency (e.g. local scale, province-level, or national emergency). Generally, Large disasters are prone to extensive individual reporting while other events are reported on a statistical basis. The difference between calls for emergency at national and other scales will depend on the*

Adjusted National Total columns *refers to the national total for number of disaster events, by scale and hazard type, adjusting for multiple counts across geographic regions.*

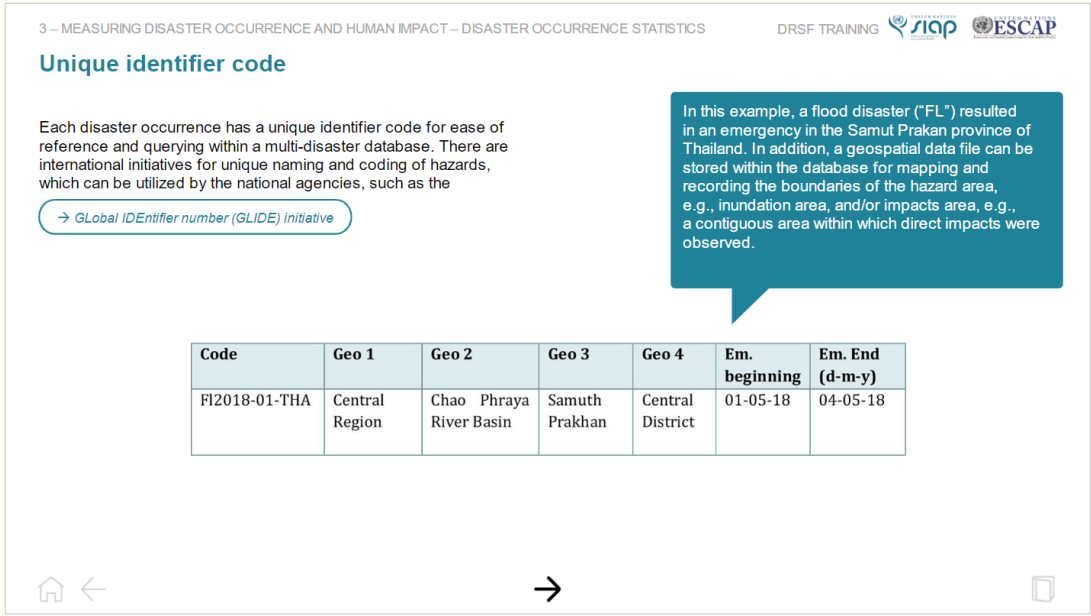
Metadata of each disaster: hazard type, scale, date, location

DRSF E-learning Course:
occurrence statistics

- Module 2



- Module 3



BASIC CONCEPTS, DEFINITIONS AND CLASSIFICATIONS

Disaster characteristics

1. Timing
   - date, year, time and duration of emergency period
2. Geographical location
   - regions/provinces/country(ies) and affected area in GIS format (e.g. shapefile)
3. Hazard type
   - e.g. geological, meteorological
4. Disaster scale/ magnitude
   - e.g. national emergency, local emergency
   - no impact thresholds for Sendai Framework Monitoring

	Code	Geo 1	Geo 2	Geo 3	Geo 4	Em. Beginning (dd-mm-yy)	Em. End (dd-mm-yy)
			2	4		1	
3	FL2018-000001-THA	Central Region	Chao Phraya River Basin	Samut Prakan	Central District	01-05-18	04-05-18

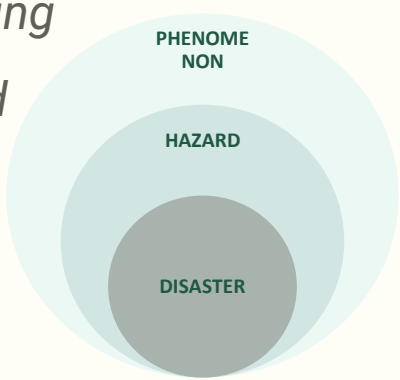
Concepts and definitions:
Occurrence statistics

Hazard

- *"A process, phenomenon or human activity that may cause loss of life, injury or other health impacts, property damage, social and economic disruption or environmental degradation."* (UN, 2015)

Disaster

- *"A serious disruption of the functioning of a community or a society at any scale due to hazardous events interacting with conditions of exposure, vulnerability and capacity, leading to one or more of the following: human, material, economic and environmental losses and impacts."* (UN, 2015)



Timing and scale

Emergency

- WHO (2015) defines an emergency as a managerial decision or response in terms of extraordinary measures.
- A “**state of emergency**” demands to “**be declared**” or imposed by somebody in authority.

EM-DAT disaster criteria

- **10 or more** people **dead**;
- **100 or more** people **affected**;
- The **declaration** of a state of **emergency;**
- A call for **international assistance**

Timing and scale *(Cont.)*

Large disasters

Large-scale disaster: "*a type of disaster affecting a society which requires national or international assistance.*" (UNGA, 2016)

- Emergency at a national (or higher) scale
- Relatively rare BUT extensive and long-term effects
- Often covered by post-disaster assessment studies
- Impacts cross administrative boundaries, thus, multiple reporting regions

Medium and small-scale disasters

Small-scale disaster: "*a type of disaster only affecting local communities which require assistance beyond the affected community.*" (UNGA, 2016)

- Emergencies at smaller than national geographic scales
- On aggregate, across disasters, tend to cause greater impacts because more frequent than large disasters
- defined by a threshold of impacts causing emergency reaction from authorities

Timing and scale *(Cont.)*

Sudden vs. slow-onset disasters

Slow-onset disaster

*"A slow-onset disaster **emerges gradually over time**. Slow-onset disasters could be associated with, e.g., drought, desertification, sea level rise, epidemic disease."* (UNGA, 2015)

Sudden-onset disaster

*"A sudden-onset disaster is one triggered by a hazardous event that **emerges quickly or unexpectedly**. Sudden-onset disasters could be associated with, e.g., earthquake, volcanic eruption, flash flood, chemical explosion, critical infrastructure failure, and transport accident."* (UNGA, 2015).

Hazard types

- IRDR Peril and Hazard Glossary (IRDR, 2014) as recommended in Technical Guidance for monitoring the Sendai Framework indicators

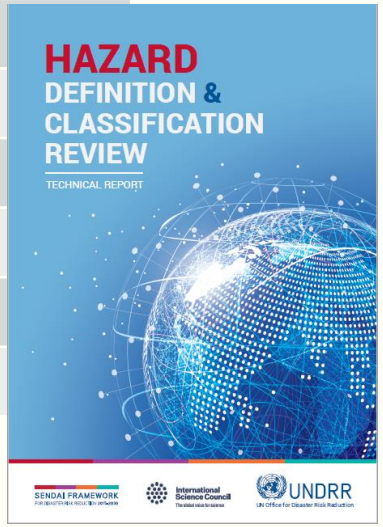
HAZARD FAMILY
Geophysical
Hydrological
Meteorological
Climatological
Biological
Extraterrestrial
Environment degradation*
Technological*

*Two additional categories of hazards defined for the Sendai Framework

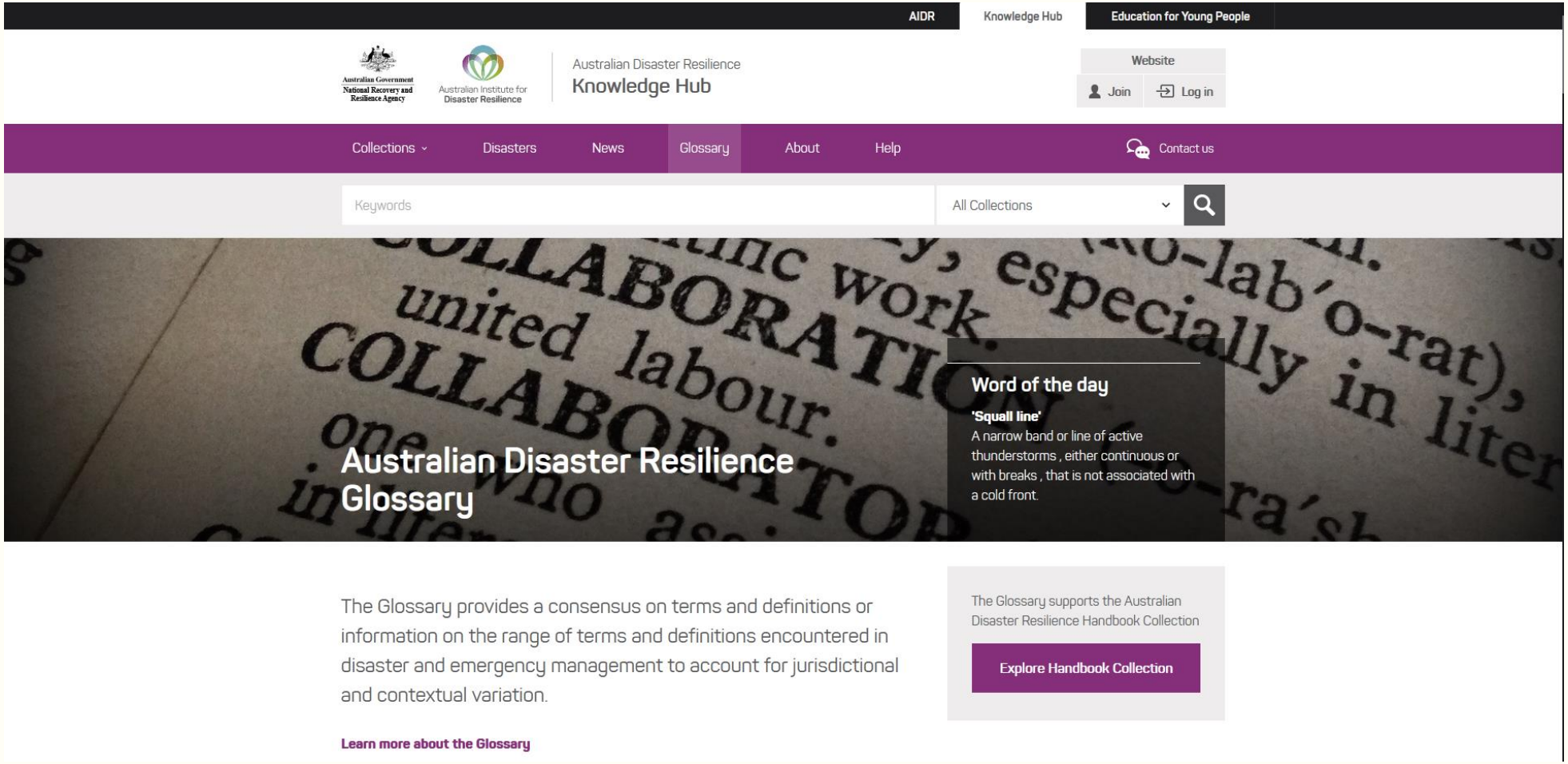
- Hazard Definition and Classification Review (UNDRR-ISC, 2020)

HAZARD TYPE
Geohazard
Meteorological and Hydrological**
Biological
Chemical
Extraterrestrial
Environmental
Technological
Societal

**Climate-related disaster

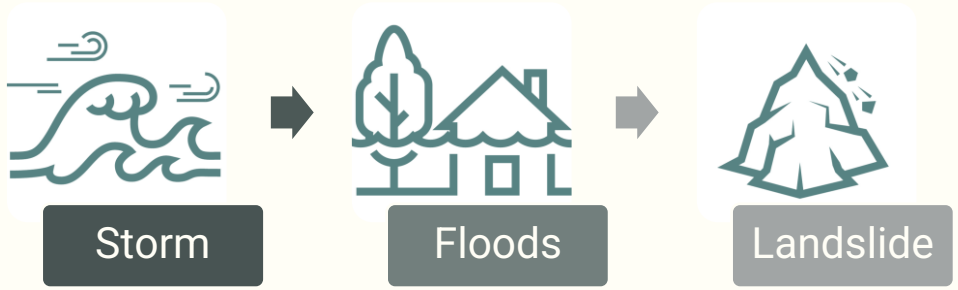


National glossary



www.knowledge.aidr.org.au/glossary/

Cascading multiple-hazard disaster occurrence

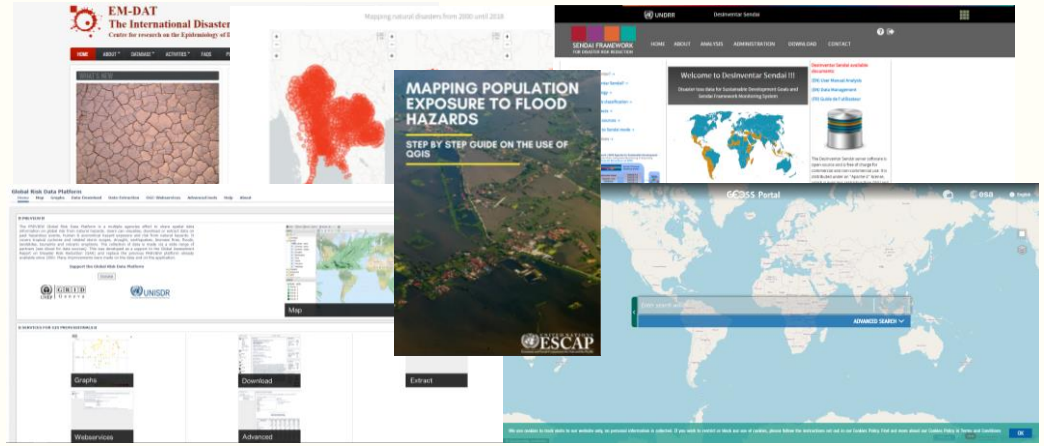


A disaster in which **one type of hazard** (such as a strong storm) **causes one or more additional hazards** (e.g. flooding or landslides), creating combined impacts to the population, infrastructure and the environment.

DATA SOURCES AND EXISTING TOOLS AND GUIDES

Data sources and existing tools and guides

- NDMA or national emergency response agencies
- National meteorological, geological, hydrological organisations



Occurrences and impacts data and mapping

- CRED's EM-DAT
  - EM-DAT Atlas
- UNDRR's DesInventar
- UNEP GRID-Geneva's PREVIEW Global Risk Data Platform
- Group on Earth Observations' Geoportal
- ESCAP's Mapping Population Exposure to Flood Hazards (selected steps)

INSTITUTIONAL DIMENSION

Needs for coordination between NSO and NDMA

- To assure quality of statistics, these dimensions should be considered:
  - ✓Relevance
  - ✓Accuracy
  - ✓Reliability
  - ✓Timeliness
  - ✓Punctuality
  - ✓Accessibility
  - ✓Clarity
  - ✓Coherence
  - ✓Comparability
- Conceptual harmonisation, including in occurrence statistics will facilitate production of impact and risk statistics.
- Classifications, definitions and methodologies should be coherent and aligned with national and international reporting frameworks

- **Metadata** explains fundamental information about data (definitions, classifications, scaling, etc.) and bridges gaps of data from different domains, such as socio-economic and environmental statistics.
- **Unique identifier code** for each occurrence links disaster chrematistics of an event to impact statistics and could be used for further analyses.

From disaster occurrence to disaster impact statistics collection

Disaster: *"A serious disruption of the functioning of a community or a society due to hazardous events interacting with conditions of exposure, vulnerability and capacity, leading to one or more of the following: human, material, economic and environmental losses and impacts."*

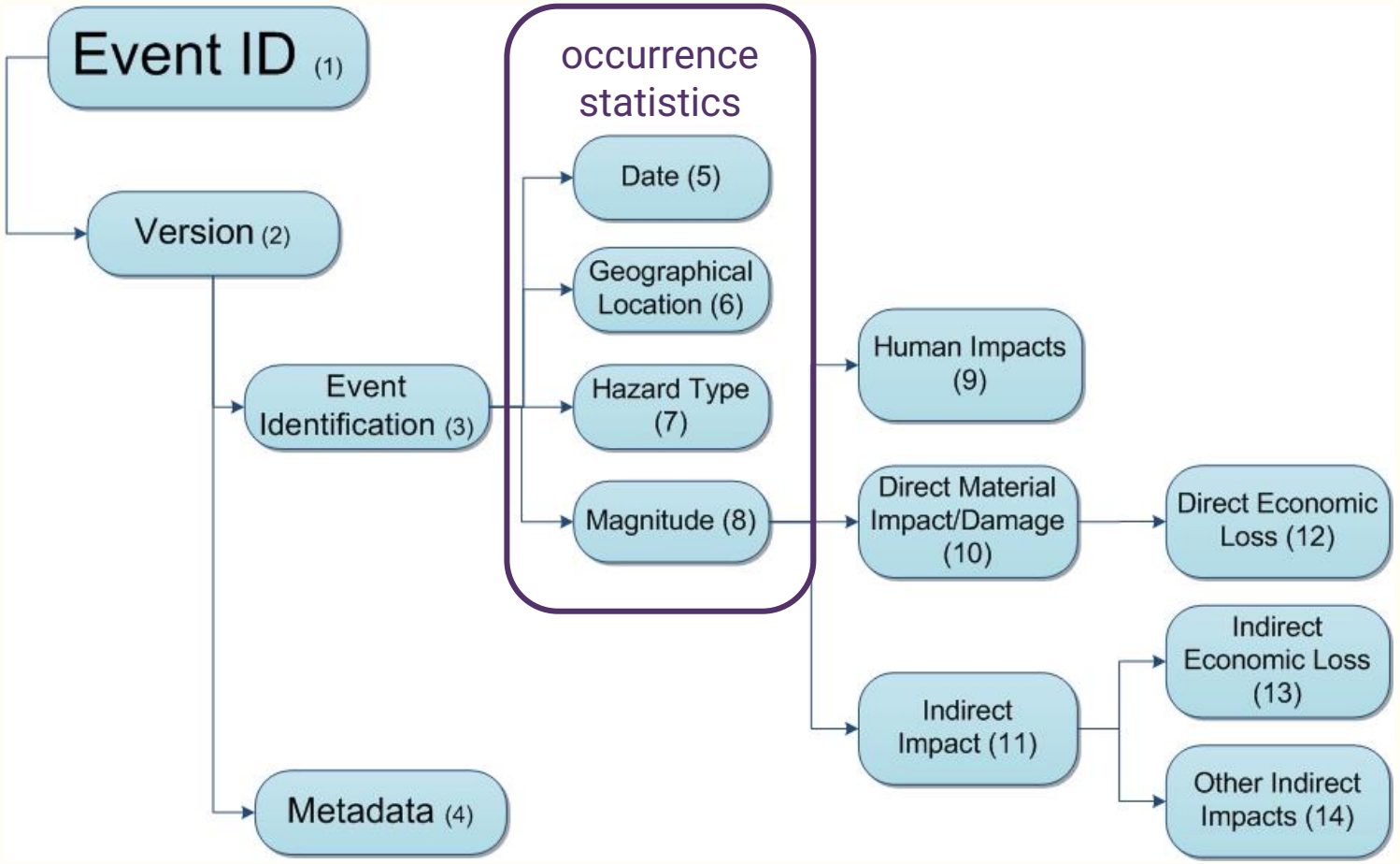
1st Criterion: A "*serious disruption*", which creates an action, i.e.: an emergency

a)Timing (date and duration of emergency)
b)Location and scale (country, region, district, spatial area)
c)Hazard type (e.g. geological,

2nd Criterion: Objectively observable "*human material, economic and environmental losses and impacts*"

Observation of direct material and human impacts

Damage and loss database structures



Source: adapted version of a diagram in European Commission-JRC (2015)

LINKAGES TO SDGS AND SENDAI FRAMEWORK

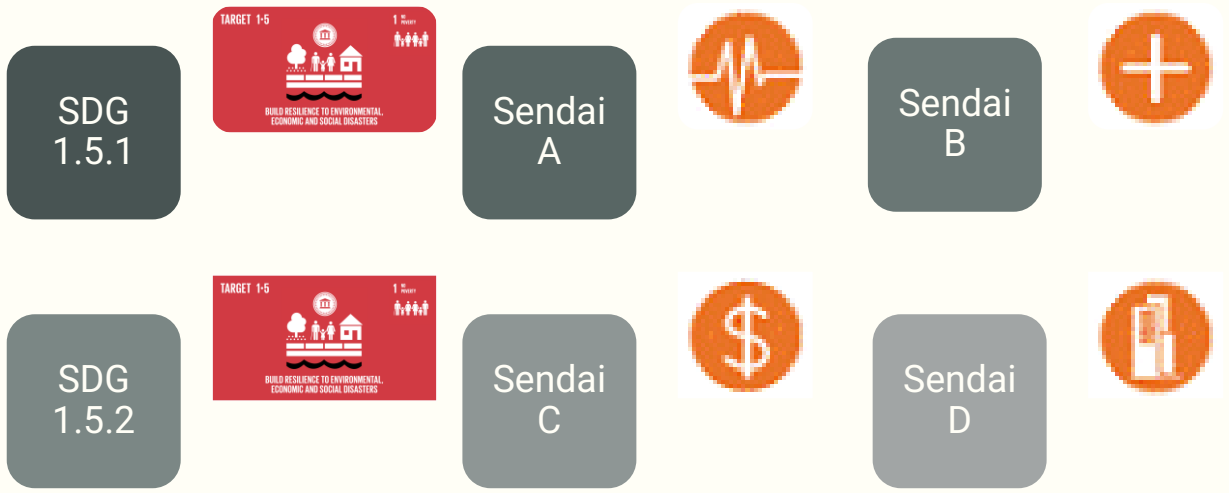
SDGs and Sendai Framework

SDGs and Sendai Framework *(Cont.)*

SDG Indicators	Description	Sendai Framework Indicators
Goal 1. End poverty in all its forms everywhere		
1.5.1	Number of deaths, missing persons and directly affected persons attributed to disasters per 100,000 population	**A1 and B1**
1.5.2	Direct economic loss attributed to disasters in relation to global gross domestic product (GDP)	**C1**
1.5.3	Number of countries that adopt and implement national disaster risk reduction strategies in line with the Sendai Framework for Disaster Risk Reduction 2015-2030	**E1**
1.5.4	Proportion of local governments that adopt and implement local disaster risk reduction strategies in line with national disaster risk reduction strategies	**E2**
Goal 11. Make cities and human settlements inclusive, safe, resilient and sustainable		
11.5.1	Number of deaths, missing persons and directly affected persons attributed to disasters per 100,000 population	**A1 and B1**
11.5.2	Direct economic loss in relation to global GDP, damage to critical infrastructure and number of disruptions to basic services, attributed to disasters	**C1, D1, D5**
11.b.1	Number of countries that adopt and implement national disaster risk reduction strategies in line with the Sendai Framework for Disaster Risk Reduction 2015-2030	**E1**
11.b.2	Proportion of local governments that adopt and implement local disaster risk reduction strategies in line with national disaster risk reduction strategies	**E2**
Goal 13. Take urgent action to combat climate change and its impacts		
13.1.1	Number of deaths, missing persons and directly affected persons attributed to disasters per 100,000 population	**A1 and B1**
13.1.2	Number of countries that adopt and implement national disaster risk reduction strategies in line with the Sendai Framework for Disaster Risk Reduction 2015-2030	**E1**
13.1.3	Proportion of local governments that adopt and implement local disaster risk reduction strategies in line with national disaster risk reduction strategies	**E2**

SDGs with targets related to disaster risk

- Table A1: Summary table of disaster occurrences, by hazards types, scale, and geographic region
  - Aggregated by geography, timing, hazard type for multiple targets/indicators



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