

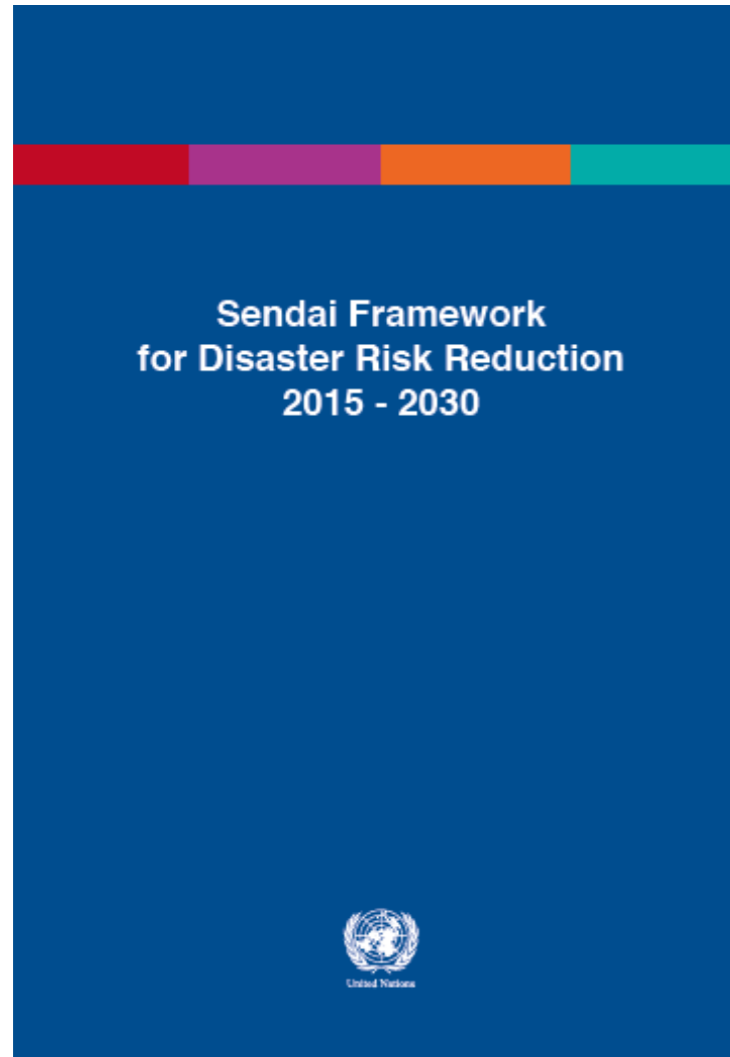
# Hazard definition and classification review

UNECE Joint Task Force on Environmental Statistics and Indicators  
4 Nov 2022



# Sendai Framework for Disaster Risk Reduction 2015-2030

---



*“To strengthen technical and scientific capacity to capitalize on and consolidate existing knowledge and to develop and apply methodologies and models to assess disaster risks, vulnerabilities and exposure to all hazards”*

(paragraph 24j)

# UNDRR/ISC Technical Working Group on the Hazard Terminology Review and Classification

---

To provide a review of Sendai Framework hazard terminology and classification for partners addressing the all-hazards paradigm

Published July 2020

<https://www.undrr.org/publication/hazard-definition-and-classification-review>



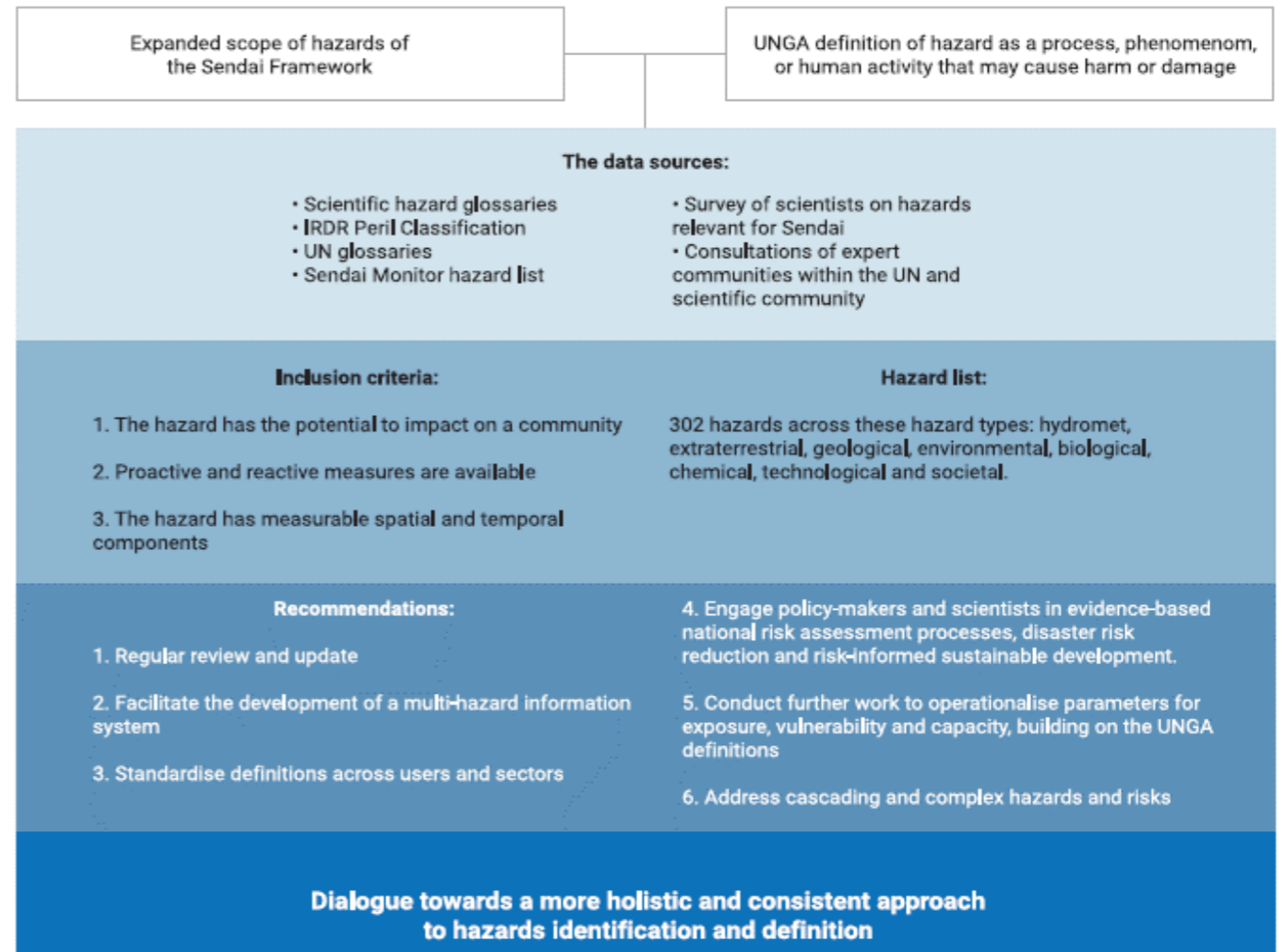
SENDAI FRAMEWORK  
FOR DISASTER RISK REDUCTION 2015-2030

International  
Science Council  
The global voice for science

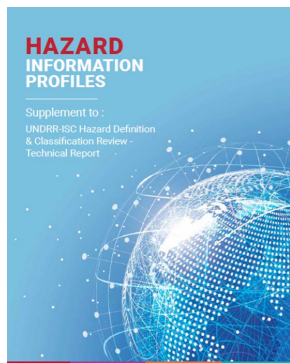
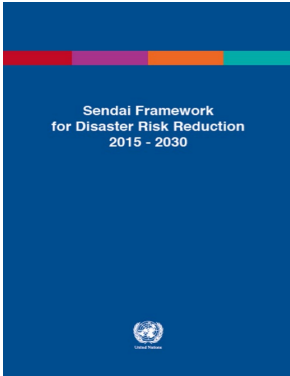
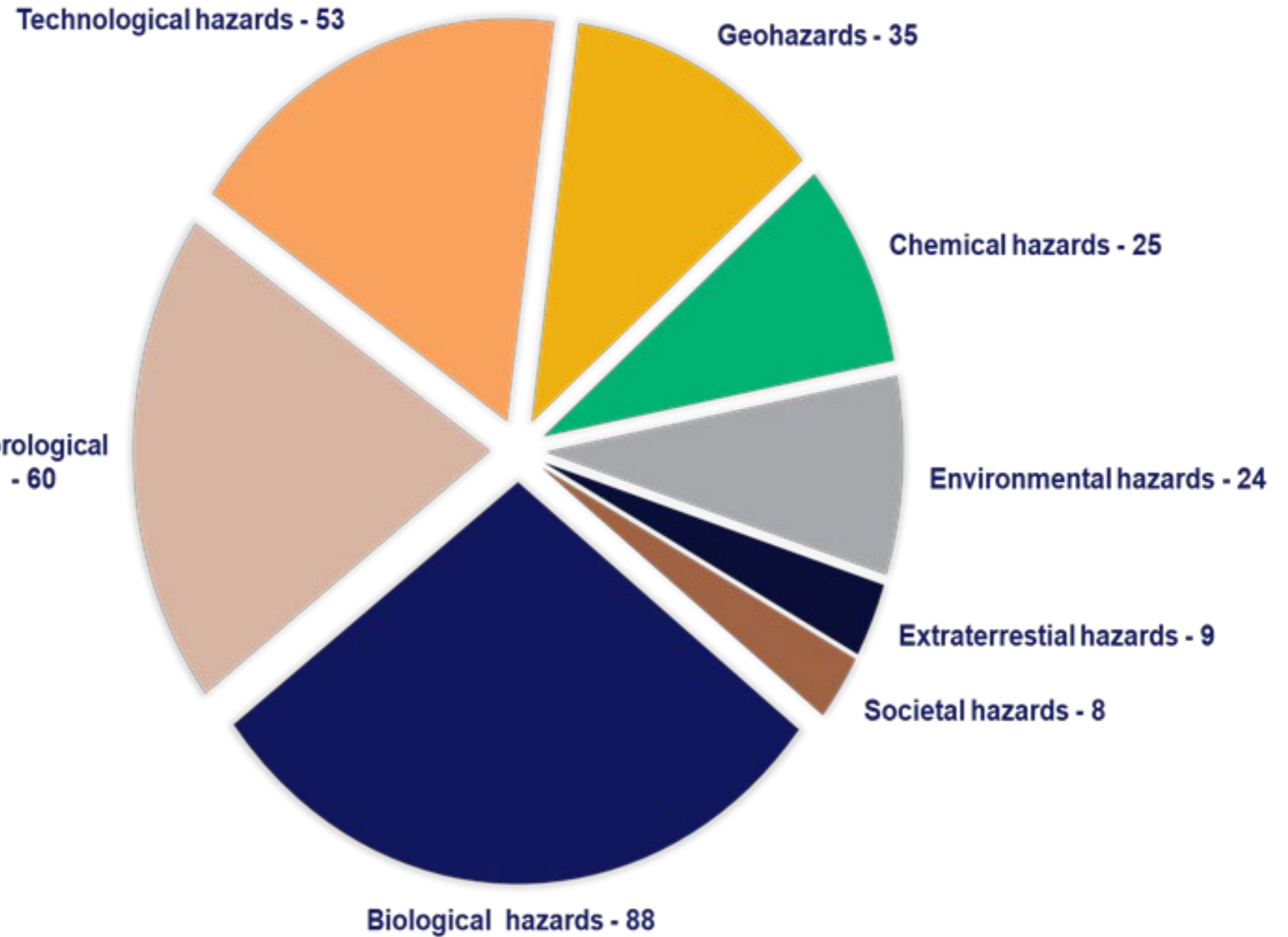
UNDRR  
UN Office for Disaster Risk Reduction

# The Hazard Review and Classification Project Process

- Multi-faceted approach
  - Surveys
  - Reviewing data sources
- List of hazards shortlisted to 302 – from several hundreds!



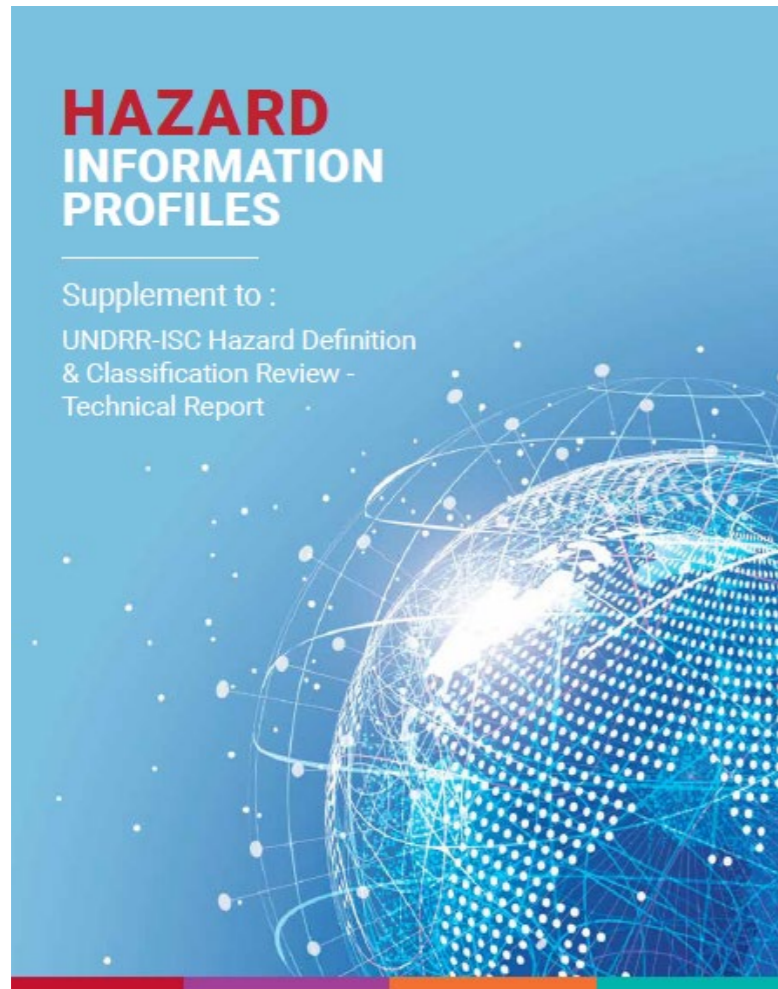
# 302 Hazards





# Hazard Information Profiles

---



***“It provides a common set of hazard definitions to Governments and stakeholders to inform their strategies and actions on risk reduction and management. Specifically, the report and this supplement could support the development and updating of national and local disaster risk reduction strategies and loss databases, as well as integrating disaster risk reduction into national statistics, legal, accounting and regulatory frameworks and public and private policy, financing and investment decisions.”***

(Introduction, Page 19)

Published October 2021

<https://www.undrr.org/publication/hazard-information-profiles-supplement-undrr-isc-hazard-definition-classification>

SENDAI FRAMEWORK  
FOR DISASTER RISK REDUCTION 2015-2030

International  
Science Council  
The global authority for science

UNDRR  
UN Office for Disaster Risk Reduction

# Partnership Approach

Academic

Scientific

UN Agencies

Private Sector

Voluntary and Human Rights Organisations

Public Sector

7

Hazard Information Profiles – Supplement to UNDRR-IOC Hazard Definition & Classification Review – September 2021

**Authors of the Hazard Information Profiles**

We give our thanks to the time and commitment provided by all the authors of the Hazard Information Profiles (HIPs), including:

Thinker	Acrop	Inter-governmental Oceanographic Commission, United Nations Educational, Scientific and Cultural Organisation (IOC-UNESCO)
Chadi	Abdullah	UNDRR Avic STAL, Lebanese National Council for Scientific Research
Banawats	Abela-Rieder	World Health Organization
Jonathan	Abraham	World Health Organization
Sarah	Adamczyk	Overseas Development Institute
Karla	Alford	Public Health England
Shaili	Al-Dabbas	Food and Agriculture Organization for the United Nations
Irina	Aldehne	Overseas Development Institute
Kiran	Arlidge	Public Health England/Foreign and Commonwealth Development Office
Yasmine Uthair	Azizul	International Telecommunications Union
Vanessa J	Banks	British Geological Survey
Orlana	Bennett	UNDRR Avic STAL, University of Science and Technology Huzhou, Bournemouth
Christiana	Brookman	University of Geneva
Quinn	Bryson	Food and Agriculture Organization for the United Nations
Estuan	Burke	UK Meteorological Office
Miki	Burton	University of Manchester
Shawn	Caill	Food Safety and Quality Unit (AFS), Food and Agriculture Organization for the United Nations
Emly	Carroll	Massachusetts Institute of Technology
Chazara	Casey	World Health Organization
Chloe	Casey	Food and Agriculture Organization for the United Nations
Daria	Chang Ding	Inter-governmental Oceanographic Commission
Galim	Chapman	Public Health England
Lorian	Chick	Trinity College Dublin
Paul D	Cole	University of Plymouth
Simon	Cox	Committee on Earth and Environmental Sciences (COEES)
Ana Maria	Cruz	Disaster Prevention Research Institute, Kyoto University
Sharon	Daly	Institute for Risk and Disaster Reduction, University College London
Rita	De Sclafani	Lebanese National Council for Scientific Research
Francesca	Denny	Food Safety and Quality Unit (AFS), Food and Agriculture Organization for the United Nations
Faiz	Dussanoff	Food and Agriculture Organization for the United Nations
Almond	Elsland	Food and Agriculture Organization for the United Nations
Nigel	El-Yahya	Food and Agriculture Organization for the United Nations
Tina	Emmett	Public Health England
Santanna	Engwell	British Geological Survey
Lutz	Fagan	Public Health England
Rajon	Fahradini	Tombak and Taylor
Daniel	Felix	Department of Geography, National University of Singapore
Luis	Galbraith	European Commission, Joint Research Centre
Esther	Garido Camarero	Food and Agriculture Organization for the United Nations

IOC | ANEX | Contents

Hazard Information Profiles – Supplement to UNDRR-IOC Hazard Definition & Classification Review – September 2021

**Reviews of the Hazard Information Profiles**

We give our thanks to the time and commitment provided by all the reviewers of the Hazard Information Profiles (HIPs), including:

Review coordinator:	Anna	Proprietor	International Science Council
Jonathan	Abraham	World Health Organization	
Karla	Alford	Public Health England	
Kathryn	Alford	World Health Organization	
Jared	All	Centre National de la Recherche Scientifique (CNRS)	
Therese	Allen	Geoscience Australia	
Chang	Arnold	Geoscience Australia	
Yasmine Uthair	Azizul	International Telecommunications Union	
Almond	Banks	World Meteorological Organization	
Warner	Balogh	World Meteorological Organization	
Vanessa J	Banks	British Geological Survey	
Rebecca	Barnes	Honorary Consultant, Royal Free Hospital	
Nandimasing	Bartholomew	Nagoya University	
Simon	Bates	British Geological Survey	
Subhro	Bartington	University of Birmingham	
Tara	Beal	Safe Systems Solutions, Australia	
Tom	Barnes	British Geological Survey	
Eric	Berthel	World Health Organization	
Lynette	Berthel	Australian Bureau of Meteorology	
Alexander	Birkbaum	United Nations Economic Commission for Europe	
Paul	Björnsdóttir	University of Canberra	
Nicholas	Bonnie	Public Health England	
Francesca	Caill	Basel, Rotterdam, and Stockholm Conventions	
John-Lee	Chapman	Institute for Technology and Development (ITD)	
Raffaello	Chen	Universita degli Studi di Firenze	
Sam	Chen	Geoscience Australia	
Elizabeth	Conant	University degli Studi di Milano	
Katharina	Cowser Nease	Tombak and Taylor	
Arthur	Craig	World Meteorological Organization	
Rafael	Cui	World Health Organization	
Kim	Curtis	University of Stirling	
Michael	Dalmer	Changshu Health University	
Caroline	de Bruin	Public Health England	
Eric	De Sclafani	Lebanese National Council for Scientific Research	
Wingyue	Ding	World Meteorological Organization	
Just	Dittber	United Nations Environment Programme	
James	Down	World Meteorological Organization	
John Henderson	Duffus	The Edinburgh Centre for Technology	
KID	Edwards	University of Huddersfield	
Mark	Edwards	Geoscience Australia	
Shirley	El Tebbaloni	Overseas Development Institute	
Tina	Esteban	Public Health England	

IOC | ANEX | Contents

Hazard Information Profiles – Supplement to UNDRR-IOC Hazard Definition & Classification Review – September 2021

Robin	Ge	Global Earthquake Model Foundation
Johnnie Gering	Gottschalk	Global Risk Modelling Centre
Raegen	Gu	Food and Agriculture Organization for the United Nations
John	Hadlow	Integrated Research for Disaster Risk
Sarah	Hawes	Brunel University
Olivia	Hewitt	Durham University
Emma	Hudson-Doyle	Massachusetts Institute of Technology
Ko	Ito	Public Health England
Rydzka	Jankovic	Leeds University
Kristen	Jarvis	Inter-governmental Oceanographic Commission of United Nations Educational, Scientific and Cultural Organisation (IOC-UNESCO)
Laila	John	Public Health England
Milena	Jouret des Combes	Food and Agriculture Organization for the United Nations
Suzanne	Jurkovic	Earth Observation Programme
Andreas A	Jurkovic	International Monetary Fund
Kendra	Jurkovic	Global Earthquake Model Foundation
Arlo	Karim	Food and Agriculture Organization for the United Nations
Elihuah	Krausman	European Commission Joint Research Centre
Christopher	Kilburn	University College London
Geoffrey	Kin	World Meteorological Organization
Gail	Lambelle	Food and Agriculture Organization for the United Nations
Julianne M	Lambert	World Health Organization
Ronald	Law	Department of Health Philippines
Jeffrey	Leblond	Food Safety and Quality Unit (AFS), Food and Agriculture Organization for the United Nations
Esther	Leung	United Nations Environment Programme
Susan	Loughlin	British Geological Survey
Yan	Lu	World Meteorological Organization
Joan	Lubchenco	Food and Agriculture Organization for the United Nations
Richard	Luskett	British Geological Survey
Dina	Mannor-El	Overseas Development Institute
Larry	Mead	US Geological Survey
Lilla	Meyer	Flinders University, Australia
Paul C	McGowan	King's College London
Sonia	McNally	Food and Agriculture Organization for the United Nations
Nick	Miles	Insurance Development Forum Risk Modelling Steering Group
Paul P	Milne	Food and Agriculture Organization for the United Nations
Osvaldo Lutz	Mirnes	UNDRR Panama Office, Brazilian Early Warning Monitoring Centre for Natural Disasters
Virginia	Murray	Public Health England
Stella	Nishi	World Meteorological Organization
Felix	Nyamu	Food and Agriculture Organization for the United Nations
James	Nyutu	Group on Earth Observations
Paul	Palazzi	United Nations Environment Programme
Amel	Palmerman	Food and Agriculture Organization for the United Nations
Adam	Parsons	UNDRR Asia-Pacific (UNDRR Japan Disaster Preparedness Centre)
Giuliana	Percivali	University College London
Laura E.L	Peters	Oregon State University/University College London
Patricia	Peters	Overseas Development Institute
Jeremy	Phillips	University of Bristol

IOC | ANEX | Contents

Hazard Information Profiles – Supplement to UNDRR-IOC Hazard Definition & Classification Review – September 2021

Santanna	Engwell	British Geological Survey
Amelia	Esteban-Campano	Genova FoodBuilding Platform
Luis	Fagan	Public Health England
Rajon	Fahradini	Tombak and Taylor
Margherita	Favonetti	UN Environment/Office for the Coordination of Information Systems
Alexandra	Fleischmann	World Health Organization
Anne-Claire	Foran	World Meteorological Organization
Esther	Francis	Food and Agriculture Organization for the United Nations
Nick	Ge	Public Health England
Christine	Gottschalk	Global Risk Modelling Centre
Philippe	Gu	World Health Organization
Renee	Grimshaw	IMF Atlantic
David	Hadlow	Massachusetts Institute of Technology
Martin	Hadlow	United Nations Environment Programme
Geoffrey	Hawes	World Health Organization
John	Henderson	ITD, International Institute for Applied System Analysis, IMT
Miki	Hewitt	RAL, Spain
David	Humann	Brunel University
David	Hyatt	Chatham House
Amel	Hyatt	World Health Organization
Amel	Hui	Scripps Institution of Oceanography
Odette	Husain	World Health Organization
Salman	Inayat Hussain	Petroleum National Bureau (PETRONAS)
Juliana	Jankovic	Overseas Development Institute
Milena	Jouret des Combes	National Disaster Management Office of the Republic of the Marshall Islands
Gary	Jones	UNESCO
Arlo	Karim	Food and Agriculture Organization for the United Nations
Kathryn	Kathryn	National Oceanic and Atmospheric Administration (NOAA)
Renee	Katmer	Disaster Competence Network, Austria
Nicholas	Kay	International Risk and Safety Institute
Willy	Klein	World Health Organization
Martin	Kin	World Meteorological Organization
Paul	Konrad	The Institute for Catastrophic Loss Reduction
Martin	Le Trester	University College Cork
Reinoud	Leung	World Health Organization/Emergencies Programme, University of Ottawa
Mika	Lewis	World Health Organization
Luigi	Loughlin	British Geological Survey
Juan	Lubchenco	Food and Agriculture Organization for the United Nations
Richard	Luskett	British Geological Survey
Dina	Mannor-El	ROSI
Marta	Mannor-El	World Health Organization
Mark	Mannor-El	Overseas Development Institute
Lilla	Meyer	Flinders University, Australia
Miki	McNally	Food and Agriculture Organization for the United Nations
Holly	McMichael	World Health Organization
Margaret	Montgomery	World Health Organization

IOC | ANEX | Contents

Hazard Information Profiles – Supplement to UNDRR-IOC Hazard Definition & Classification Review – September 2021

Julio	Pinto	Food and Agriculture Organization for the United Nations
Raz	Rahman	Food and Agriculture Organization for the United Nations
Melba	Rahman	Food and Agriculture Organization for the United Nations
Andry	Ratamaly	Food and Agriculture Organization for the United Nations
David	Rubin	School of Engineering, University of Edinburgh
Rajshree	Segun	UNDRR
Shirley	Sethuraman	Food and Agriculture Organization for the United Nations
John	Schwabe	Global Earthquake Model Foundation
Katherine	Schoof	Inter-governmental Oceanographic Commission of United Nations Educational, Scientific and Cultural Organisation (IOC-UNESCO)
Chloe	Seibold	UK, England and NI, Improvement
Devin Chang	Shen	Tsunami Use IOC-UNEP/FAO Technical Secretary/Coastal Observation & Services Section, UNESCO/IOC
Olga	Shimada-Pearson	International Science Council
Joy	Shimokuni	World Meteorological Organization
Adam	Smith	UNDRR North America STAL, NOAA
Richard	Shone	Global Earthquake Model Foundation
Elizabeth	Taylor	Food and Agriculture Organization for the United Nations
Shel	Takada	Japanese National Institute of Advanced Industrial Science and Technology
David	Taylor	British Geological Survey
Public	Therese	British Geological Survey
Leana	Tin	Tombak and Taylor
Annela	Tygart	Coastal Institute of Sustainable Development, Utrecht University, The Netherlands
Alisa	Van Eaton	US Geological Survey
Mark	Venema	National Institute for Health and Care Excellence
Robert	Venema	Public Health England
Paula	Villaverde-Arce	Public Health England and University College London
Sophie	Von Storch	Food and Agriculture Organization for the United Nations
Walter	Walker	Public Health England
Sarah	Wallace	Public Health England
Maddie	Wells	Public Health England
Melita	Wier	Food and Agriculture Organization for the United Nations
David	Williams	World Health Organization
Mark	Woolhouse	University of Bristol
Natalie	Wright	Public Health England
Wenling	Zhao	Food and Agriculture Organization for the United Nations

Hazard Information Profiles – Supplement to UNDRR-IOC Hazard Definition & Classification Review – September 2021

IOC | ANEX | Contents



BI0015 / BIOLOGICAL / Infectious Diseases (Human and Animal)

## Anthrax

### Definition

Anthrax is a disease caused by the spore-forming bacteria *Bacillus anthracis*. Anthrax is primarily a disease of herbivorous animals, although all mammals, including humans can contract it. In humans, anthrax manifests itself in three distinct patterns (cutaneous, gastrointestinal, inhalational) (adapted from WHO, FAO and OIE, 2008; CDC, 2020).

### References

CDC, 2020. Anthrax. Centres for Disease Control and Prevention (CDC). [www.cdc.gov/anthrax/index.html](http://www.cdc.gov/anthrax/index.html) Accessed 11 October 2020.

WHO, FAO and OIE, 2008. Anthrax in Humans and Animals. 4th Ed. World Health Organization (WHO), Food and Agriculture Organization of the United Nations (FAO), World Organisation for Animal Health (OIE). [www.who.int/csr/resources/publications/anthrax\\_webs.pdf](http://www.who.int/csr/resources/publications/anthrax_webs.pdf) Accessed 11 October 2020.

### Annotations

#### Synonym

Not identified.

#### Additional scientific description

Until the introduction and widespread use of effective veterinary vaccines, Anthrax was a major cause of fatal disease in cattle, sheep, goats, camels, horses, and pigs throughout the world. Anthrax continues to be reported from many countries in domesticated and wild herbivores, especially where livestock vaccination programmes are inadequate or have been disrupted (WHO, no date).

Humans generally acquire the disease directly or indirectly from infected animals, or occupational exposure to infected or contaminated animal products. Control in livestock is therefore the key to reduced incidence in humans. The disease is generally regarded as being non-contagious (WHO, no date).

The infected host sheds the vegetative bacilli onto the ground and these sporulate on exposure to the air. The spores, which can persist in soil for decades, may displace up to the topsoil, following grass growth or flooding, creating favourable conditions for anthrax. Grazing animals may take up the spore and get infected, when germination and multiplication can again take place upon the site of infection. Flies appear to play an important role in large outbreaks in endemic areas. Humans acquire anthrax from handling carcasses, hides, bones, etc. from animals that died of the disease (WHO, FAO and OIE, 2008).

More than 95% of human anthrax cases take the cutaneous form and result from handling infected carcasses or hides, hair, meat or bones from such carcasses. All three forms (cutaneous, gastrointestinal, inhalational) are potentially fatal if untreated, but the cutaneous form is more often self-limiting. Data from pre-antibiotic and vaccine days indicate that 10%–40% of untreated cutaneous cases may be expected to result in death with some geographical and temporal variations (WHO, FAO and OIE, 2008).

04/01/2023

*Bacillus anthracis* has always been high on the list of potential agents with respect to biological warfare and bioterrorism. It has been used in that context on at least two occasions, prepared for use on several other occasions and been the named agent in many threats and hoaxes (WHO, FAO and OIE, 2008).

### Metrics and numeric limits

Not available.

### Key relevant UN convention / multilateral treaty

Codex Alimentarius (FAO and WHO, no date).

International Health Regulations (2005), 3rd ed (WHO, 2016).

WTO Agreement on the Application of Sanitary and Phytosanitary Measures (SPS Agreement) (WTO, no date).

UN Recommendations on the Transport of Dangerous Goods - UN Model Regulations Model Regulations Nature, Purpose and Significance of the Recommendations (UNECE, no date).

### Examples of drivers, outcomes and risk management

The Food and Agriculture Organization of the United Nations provides information on anthrax outbreaks via its guidance on for improved prevention, control and heightened awareness (FAO, 2018). Anthrax provides a good platform for a 'One Health' approach which can be operationalised through locally adapted approaches for prevention and control. These efforts should be supported by enhanced intersectoral collaboration and coordination between the veterinary and medical authorities, particularly at the field level, for information and report exchange, integration of surveillance data, joint case investigations, coordination of community awareness messaging and implementation, and effective delivery of vaccination campaigns (FAO, 2018).

In the World Organisation for Animal Health (OIE) Terrestrial Animal Health Code chapter on anthrax, it is reported that there is no evidence that anthrax is transmitted by animals before the onset of clinical and pathological signs. It provides guidance on early detection of outbreaks, quarantine of affected premises, destruction of diseased animals and fomites, and implementation of appropriate sanitary procedures at abattoirs and dairy factories will ensure the safety of products of animal origin intended for human consumption (OIE, 2019).

### References

FAO, 2018. Anthrax Outbreaks: a Warning for Improved Prevention, Control and Heightened Awareness. Food and Agriculture Organization of the United Nations (FAO). [www.fao.org/3/a-i6124e.pdf](http://www.fao.org/3/a-i6124e.pdf) Accessed 11 October 2020.

FAO and WHO, no date. About Codex Alimentarius. Food and Agriculture Organization of the United Nations (FAO) and World Health Organization (WHO). [www.fao.org/fao-who-codexalimentarius/about-codex/en](http://www.fao.org/fao-who-codexalimentarius/about-codex/en) Accessed 11 October 2020.

OIE, 2019. Terrestrial Animal Health Code. Vol II Section 8 Ch 8.1 Anthrax. World Organisation for Animal Health (OIE). [www.oie.int/index.php?id=169&L=0&htmfile=chapitre\\_anthrax.htm](http://www.oie.int/index.php?id=169&L=0&htmfile=chapitre_anthrax.htm) Accessed 11 October 2020.

UNECE, no date. UN Recommendations on the Transport of Dangerous Goods - Model Regulations Nature, Purpose and Significance of the Recommendations. [www.unece.org/trans/danger/publi/unrec/rev13/13nature\\_e.html](http://www.unece.org/trans/danger/publi/unrec/rev13/13nature_e.html) Accessed 11 October 2020.

WHO, no date. Anthrax Emergencies Preparedness and Response. World Health Organization (WHO). [www.who.int/csr/disease/Anthrax/en](http://www.who.int/csr/disease/Anthrax/en) Accessed 11 October 2020.

WHO, 2016. International Health Regulations (2005), 3rd ed. World Health Organization (WHO). [www.who.int/ihr/publications/9789241580496/en](http://www.who.int/ihr/publications/9789241580496/en) Accessed 3 October 2020.

WHO, FAO and OIE, 2008. Anthrax in Humans and Animals. 4th Ed. World Health Organization (WHO), Food and Agriculture Organization of the United Nations (FAO), World Organisation for Animal Health (OIE). [www.who.int/csr/resources/publications/anthrax\\_webs.pdf](http://www.who.int/csr/resources/publications/anthrax_webs.pdf) Accessed 11 October 2020.

WTO, no date. The WTO Agreement on the Application of Sanitary and Phytosanitary Measures (SPS Agreement) (1994). World Trade Organization (WTO). [www.wto.org/english/tratop\\_e/sps\\_e/spsagr\\_e.htm](http://www.wto.org/english/tratop_e/sps_e/spsagr_e.htm) Accessed 11 October 2020.

### Coordinating agency or organisation

Food and Agriculture Organization of the United Nations, World Health Organization, World Organisation for Animal Health (OIE).



# Six Recommendations

---

Regular review and update

Facilitate the development of a multi-hazard information system

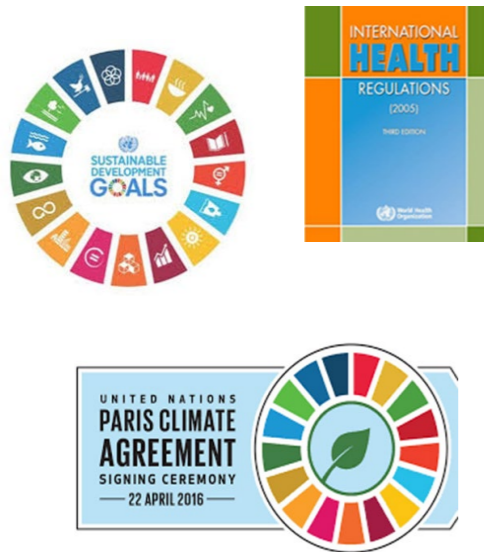
Engaging with users and sectors for greater alignment and consistency of hazard definitions

Use this hazard list to actively engage policymakers and scientists in evidence-based national risk assessment processes, disaster risk reduction and risk-informed sustainable development, and other actions aimed at managing risks of emergencies and disasters

Conduct further work to operationalise parameters for exposure, vulnerability and capacity, building on the UNGA definitions

Address cascading and complex hazards and risks

# How Can Hazard Information Profiles Be Used Operationally?



# Applications in Health of the Hazard Classification

---

- UK used the HIP to inform the development of the UK Health Security Agency and national risk registers.
- Nigeria developed links IHR and Global Health Security project
- WHO included a reference to the hazard report in the WHO Guidance on Research Methods for Health and Disaster Risk Management

# Disaster Related Statistics

*“A growing sense of urgency to integrate disaster measurements with statistics, and the **need for better data and statistical measurement to improve the understanding of disaster risk reduction, including strengthening resilience and preparedness.**”*

(UN Statistical Commission)

<https://unstats.un.org/unsd/envstats/meetings/2019-Caricom%20Region/documents/Session%206.3.1%20UNSD%20-%20Disaster-related%20Statistics.pdf>





UK Health  
Security  
Agency



## UNECE Task Force on Measuring Hazardous Events and Disasters: **Statistical review of the “Hazard definition and classification review”**

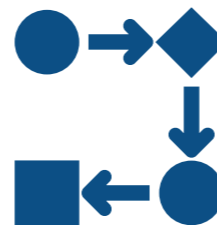


---

## Primary Objective of the Pilot



To provide feedback from a statistical point of view on the applicability of the reviewed hazard classification and its HIPs.



This will be an important input in the planned review and update of the classification, including addressing possible gaps and shortcomings.



It also provides a fundamental basis for development of practical implementation guidelines.



**Thank you!**

