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## Expert Forum for Producers and Users of Disaster-related Statistics

Monday 7<sup>th</sup> June 2021

# UNDRR / ISC Sendai Hazard Definition and Classification Review

Professor Virginia Murray

Head of Global Disaster Risk Reduction, Public Health England

Chair of Technical Working Group UNDRR/ISC Hazard Definitions and Classification Review

Integrated Research on Disaster Risk (IRDR) Science Committee Member



# Sendai Framework for Disaster Risk Reduction 2015 - 2030



United Nations

# Sendai Framework for Disaster Risk Reduction 2015-2030

Prevent new and reduce existing disaster risk through the implementation of integrated and inclusive economic, structural, legal, social, health, cultural, educational, environmental, technological, political and institutional measures that **prevent and reduce hazard exposure and vulnerability to disaster**, increase preparedness for response and recovery, and thus strengthen resilience: *(Paragraph 17)*

# 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 24 j)*



## General Assembly

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1 December 2016

Original: English

[https://www.preventionweb.net/files/50683\\_oiewgreportenglish.pdf](https://www.preventionweb.net/files/50683_oiewgreportenglish.pdf)

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Seventy-first session

Agenda item 19 (c)

Sustainable development: disaster risk reduction

### **Report of the open-ended intergovernmental expert working group on indicators and terminology relating to disaster risk reduction**

#### **Note by the Secretary-General**

The Secretary-General has the honour to transmit herewith the report of the open-ended intergovernmental expert working group on indicators and terminology relating to disaster risk reduction established by the General Assembly in its resolution [69/284](#) for the development of a set of possible indicators to measure global progress in the implementation of the Sendai Framework for Disaster Risk Reduction 2015-2030, coherent with the work of the Inter-Agency and Expert Group on Sustainable Development Goal Indicators, and the update of the publication entitled “2009 UNISDR Terminology on Disaster Risk Reduction”.



## 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.**

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## 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.

Annotations: Hazards may be natural, anthropogenic or socionatural in origin. **Natural hazards** are predominantly associated with natural processes and phenomena. **Anthropogenic hazards**, or human-induced hazards, are induced entirely or predominantly by human activities and choices. This term does not include the occurrence or risk of armed conflicts and other situations of social instability or tension which are subject to international humanitarian law and national legislation. Several hazards are **socionatural**, in that they are associated with a combination of natural and anthropogenic factors, including environmental degradation and climate change.

Hazards may be single, sequential or combined in their origin and effects. Each hazard is characterized by its location, intensity or magnitude, frequency and probability. Biological hazards are also defined by their infectiousness or toxicity, or other characteristics of the pathogen such as dose-response, incubation period, case fatality rate and estimation of the pathogen for transmission.

**Multi-hazard** means (1) the selection of multiple major hazards that the country faces, and (2) the specific contexts where hazardous events may occur simultaneously, cascadingly or cumulatively over time, and taking into account the potential interrelated effects.

Hazards include (as mentioned in the Sendai Framework for Disaster Risk Reduction 2015-2030, and listed in alphabetical order) biological, environmental, geological, hydrometeorological and technological processes and phenomena.

**Biological hazards** are of organic origin or conveyed by biological vectors, including pathogenic microorganisms, toxins and bioactive substances. Examples are bacteria, viruses or parasites, as well as venomous wildlife and insects, poisonous plants and mosquitoes carrying disease-causing agents.

, injury or other  
environmental

## 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.

Annotations: Hazards may be naturally occurring or human-induced. Hazards are predominantly associated with natural hazards, but human-induced hazards, are induced entirely by human activities. Hazards may include the occurrence or risk of a hazard, or the subject to international humanitarian law. Hazards they are associated with a combination of natural degradation and climate change.

Hazards may be single, sequential or cumulative. Hazards location, intensity or magnitude, frequency, infectiousness or toxicity, or other characteristics. Case fatality rate and estimation of impact.

**Multi-hazard** means (1) the selection of hazards in contexts where hazardous events occur together, taking into account the potential interactions between them.

Hazards include (as mentioned in the list in alphabetical order) biological, environmental, and phenomena.

**Biological hazards** are of organic origin and include microorganisms, toxins and bioactive substances, venomous wildlife and insects, poisons, and

**Environmental hazards** may include chemical, natural and biological hazards. They can be created by environmental degradation or physical or chemical pollution in the air, water and soil. However, many of the processes and phenomena that fall into this category may be termed drivers of hazard and risk rather than hazards in themselves, such as soil degradation, deforestation, loss of biodiversity, salinization and sea-level rise.

**Geological or geophysical hazards** originate from internal earth processes. Examples are earthquakes, volcanic activity and emissions, and related geophysical processes such as mass movements, landslides, rockslides, surface collapses and debris or mud flows. Hydrometeorological factors are important contributors to some of these processes. Tsunamis are difficult to categorize: although they are triggered by undersea earthquakes and other geological events, they essentially become an oceanic process that is manifested as a coastal water-related hazard.

**Hydrometeorological hazards** are of atmospheric, hydrological or oceanographic origin. Examples are tropical cyclones (also known as typhoons and hurricanes); floods, including flash floods; drought; heatwaves and cold spells; and coastal storm surges. Hydrometeorological conditions may also be a factor in other hazards such as landslides, wildland fires, locust plagues, epidemics and in the transport and dispersal of toxic substances and volcanic eruption material.

**Technological hazards** originate from technological or industrial conditions, dangerous procedures, infrastructure failures or specific human activities. Examples include industrial pollution, nuclear radiation, toxic wastes, dam failures, transport accidents, factory explosions, fires and chemical spills. Technological hazards also may arise directly as a result of the impacts of a natural hazard event.





**SENGAI FRAMEWORK**  
FOR DISASTER RISK REDUCTION

LOGIN

## MEASURING IMPLEMENTATION OF THE SENDAI FRAMEWORK

ANNOUNCEMENT

### **The Sendai Framework Monitor system is now live!**

After the adoption of Sendai Framework in 2015, 38 indicators were defined to measure progress in achieving its 7 Global targets. This system is the official tool to report these indicators to both the Sendai Framework and SDG's reporting processes.

# HAZARD DEFINITION & CLASSIFICATION REVIEW

TECHNICAL REPORT



# UNDRR

UN Office for Disaster Risk Reduction



## International Science Council

UNDRR / ISC Sendai  
Hazard Definition and  
Classification Review  
TECHNICAL REPORT  
29 July 2020

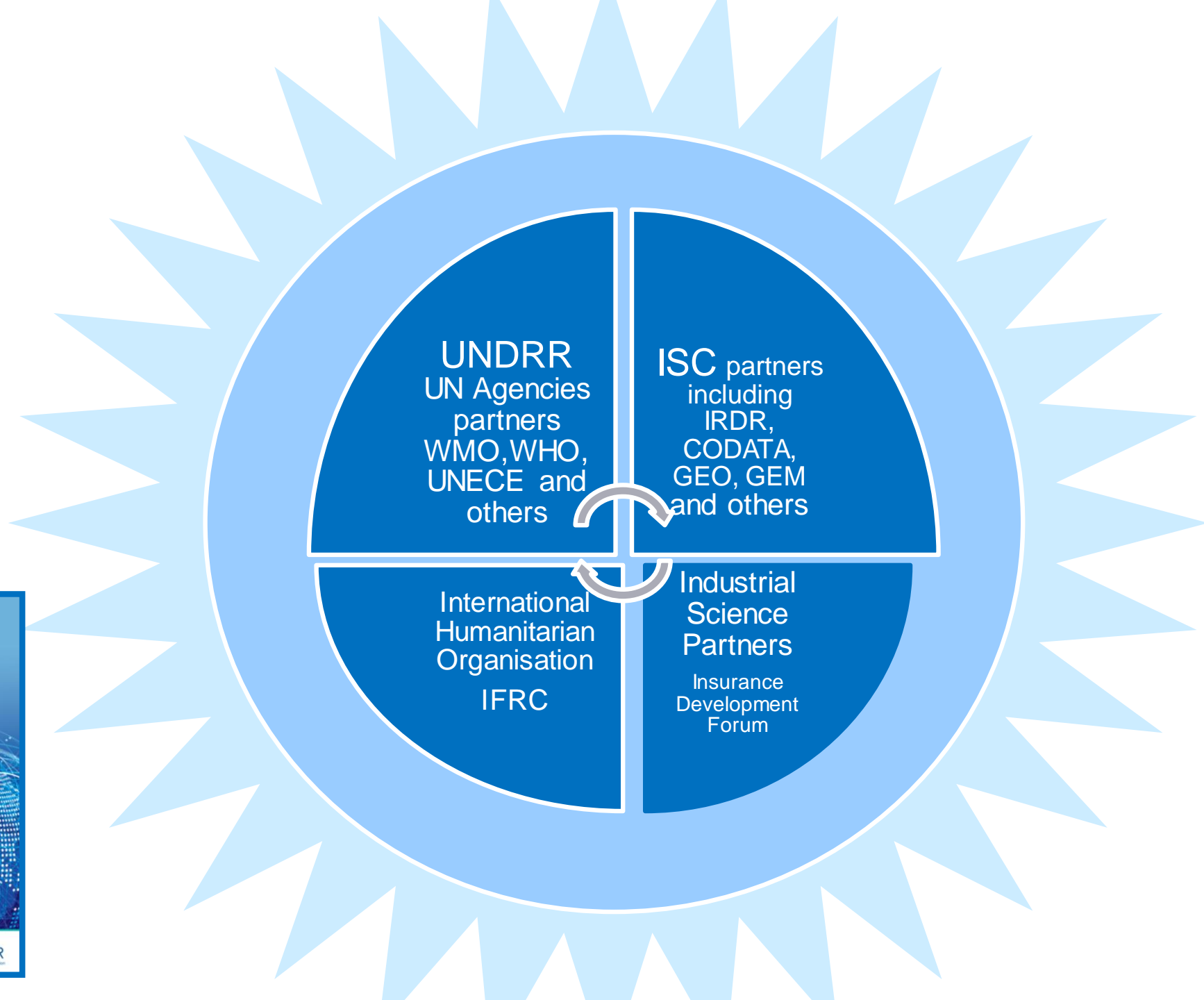
<https://council.science/publications/hazards/>  
<https://www.undrr.org/publications>

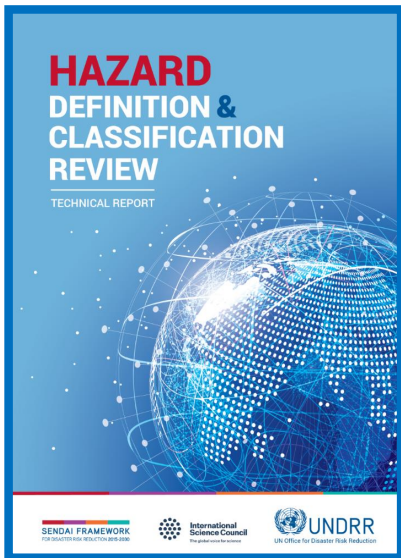
# UNDRR/ISC Technical Working Group on the Hazard Terminology Review and Classification

## Aim of project

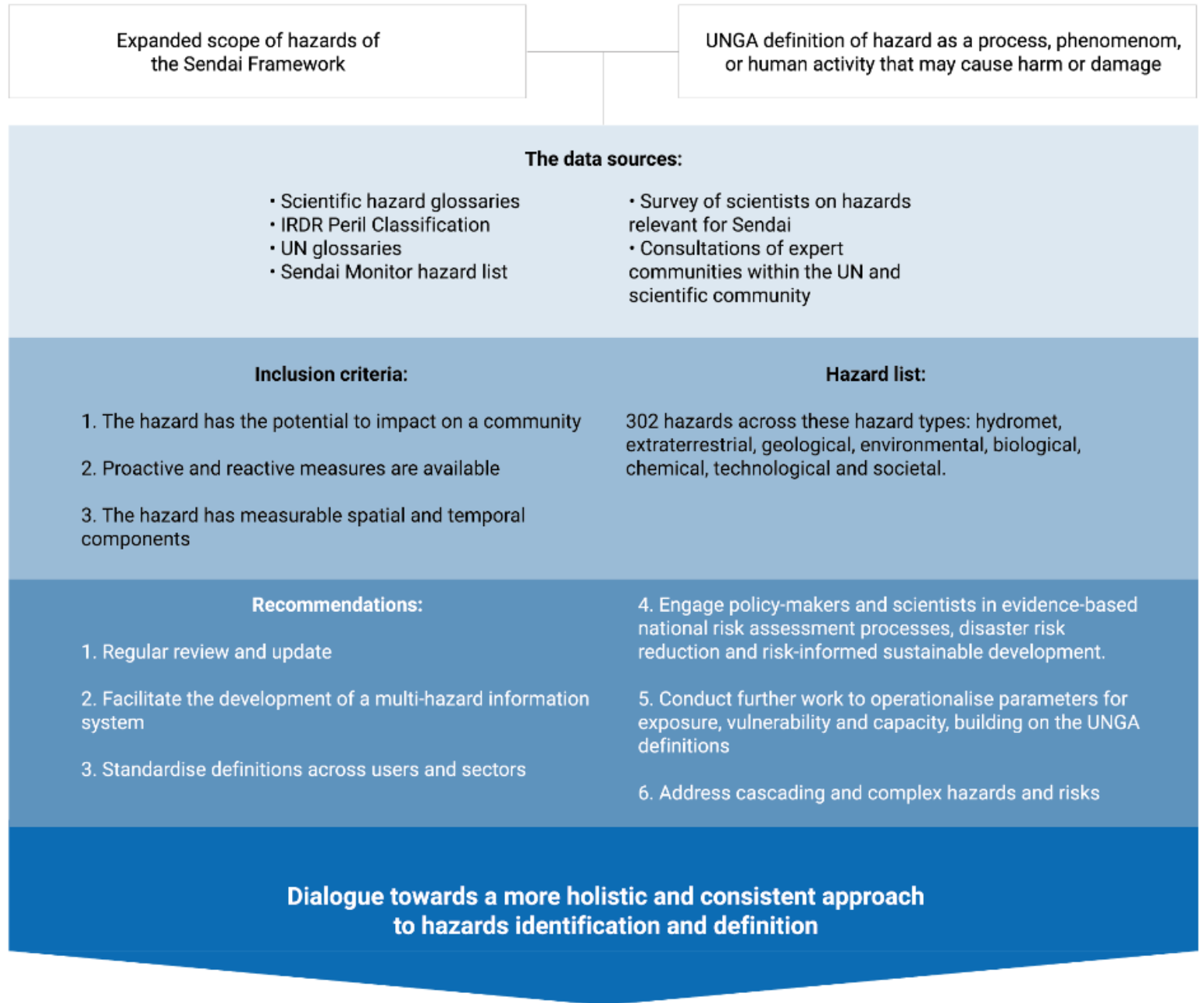
To provide a review of Sendai  
Framework hazard terminology and  
classification for partners addressing  
the **all hazards** paradigm







## The Hazard Review and Classification project: the process





#BanLeadPaint

## LEAD IS TOXIC

 BRAIN  
  KIDNEYS  
  LIVER  
  BLOOD  
  REPRODUCTIVE SYSTEM

**In adults**  
lead exposure increases the risk of:

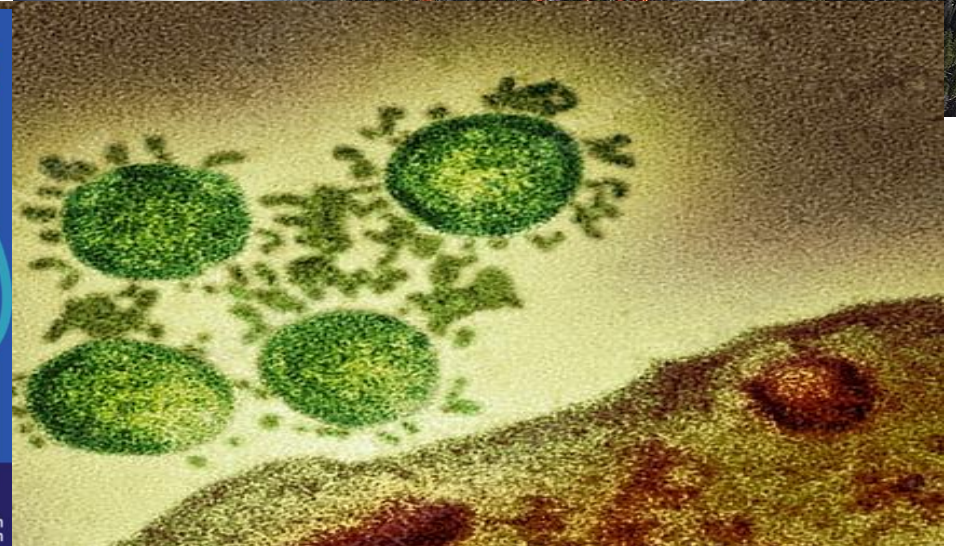
- ischaemic heart disease
- stroke

**In pregnant women**  
lead exposure damages many organs but also affects:

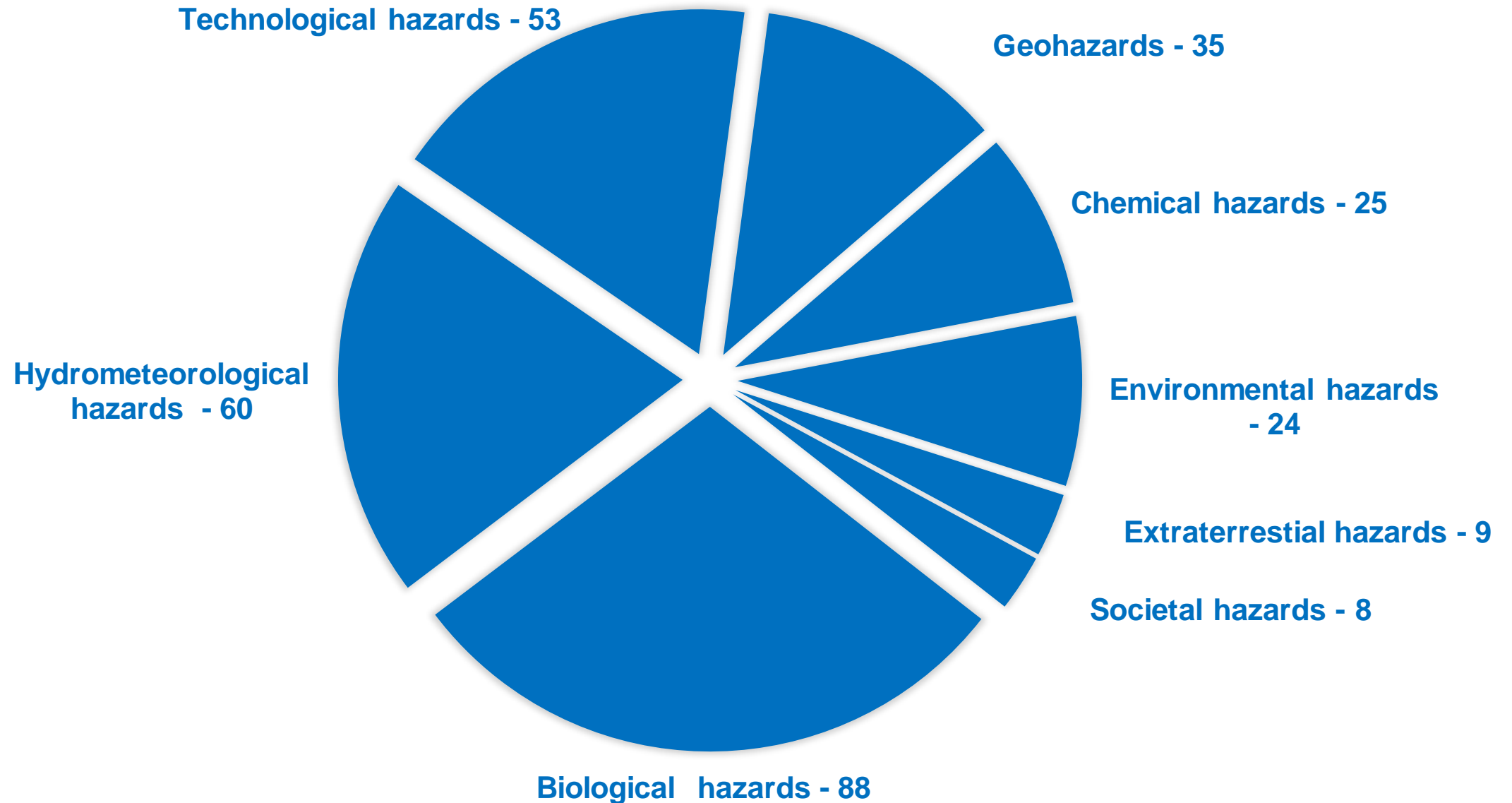
- the developing foetus




There is no safe level of lead exposure

 World Health Organization


# In total 302 hazards are currently included in the Hazard List



## Primary definition

Brief Definition of hazard: this should be no more than 3 lines/2 sentences.

This should be sourced from the highest possible authority and be applicable to all parties and is preferably a simple UN definition but also recognised as the highest level that UN member states can use and apply.

REFERENCE/ [hyperlink](#)/Web site

## Scientific definition

Expanded scientific definition that is preferably measurable, modellable and statistically relevant

REFERENCE/ [hyperlink](#)/Web site

## Metrics, numerical limits or defined guidelines

Any globally agreed metrics, numerical limits or guidelines defined

Should be globally agreed as a recognised standard, if it is only at a regional level than state this as a reference.

REFERENCE/ [hyperlink](#)/Web site

## Any essential annotations

Such as 'drivers' to cause the hazard and any secondary hazards which may be caused by this hazard (if applicable)

REFERENCE/ [hyperlink](#)/Web site

## Ownership of Definition(s)

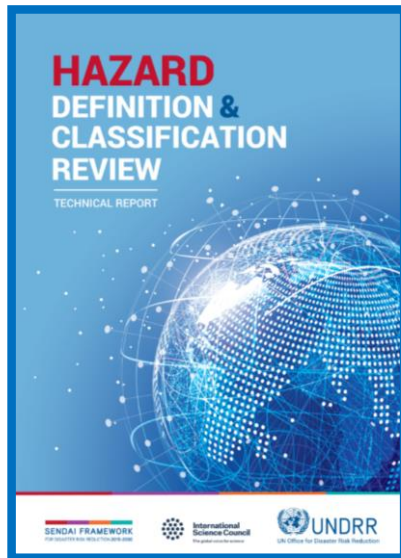
UN or Scientific Agency or Organisation who holds the updating responsibility for the Primary Definition

**Name of Contributor/s to hazard definition and dates**, updating using version control



# Recommendations

1. **Regular review and update**
2. Facilitate the development of a **multi-hazard information system**
3. Engaging with users and sectors for **greater alignment and consistency of hazard definitions**
4. 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**
5. Conduct further work to operationalise parameters for exposure, vulnerability and capacity, building on the UNGA definitions
6. **Address cascading and complex hazards and risks**



# Technical Working Group members

**Virginia Murray Chair of Technical Working Group, Public Health England**

Jonathan Abrahams, World Health Organization

Chadi Abdallah, UNDRR Arab STAG (Lebanese National Council for Scientific Research)

Lucille Angles, United Nations Educational, Scientific and Cultural Organization

Djillali Benouar, UNDRR Africa STAG (University of Science & Technology Houari Boumediene)

Alonso Brenes Torres, Integrated Research for Disaster Risk

Chang Hun Choe, International Federation of Red Cross and Red Crescent Societies

Simon Cox, Committee on Data for Science and Technology (CODATA)

James Douris, World Meteorological Organization

Qunli Han, Integrated Research for Disaster Risk

John Handmer, International Institute for Applied Systems Analysis; Integrated Research on Disaster Risk programme; School of Science, RMIT, Australia University

Simon Hodson, Committee on Data for Science and Technology (CODATA)

Wirya Khim, Food and Agriculture Organization of the United Nations

Nick Moody, Insurance Development Forum Risk Modelling Steering Group

Oswaldo Luiz Leal Moraes, UNDRR Panama Office Science Group (Brazilian Early Warning Monitoring Centre for Natural Disasters)

**Michael Nagy, United Nations Economic Commission for Europe**

James Norris, Group on Earth Observations Secretariat

Urbano Fra Paleo, UNDRR European STAG

Pascal Peduzzi, UN Environment

Aslam Perwaiz, UNDRR Asia-Pacific STAG (Asian Disaster Preparedness Center)

Katie Peters, Overseas Development Institute

Jack Radisch, Organisation for Economic Co-operation and Development

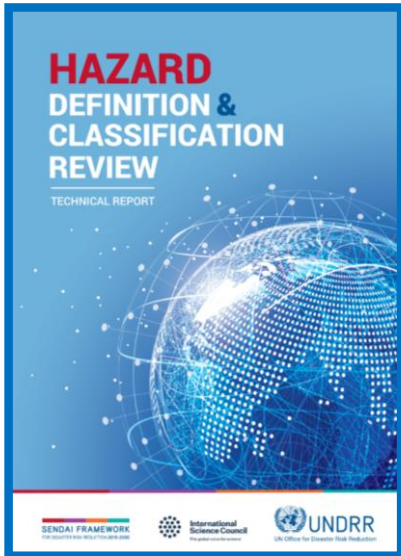
Markus Reichstein, Knowledge Action Network on Emergent Risks and Extreme Events

John Schneider, Global Earthquake Model Foundation

Adam Smith, UNDRR North America STAG (National Oceanic and Atmospheric Administration)

Claire Souch, Insurance Development Forum Risk Modelling Steering Group

Annisa Triyanti Young Scientist, UNDRR Global STAG (Utrecht University)



## Co-facilitators

Anne-Sophie Stevance, International Science Council

Irina Zodrow, United Nations Office for Disaster Risk Reduction

## Project support team

Project support lead:

- Lucy Fagan, Public Health England (March 2019-July 2020)
- Maddie Weir Public health England (September 2020 onwards)

Lidia Mayner Flinders University, Adelaide, South Australia

Rajinder Sagoo, supported by UNDRR (September – December 2019)

Olga Shashkina-Pescaroli, supported by International Science Council, (September – December 2019)

Zhenya Tsoy, International Science Council

**Kanza Ahmed Public Health England (September 2020 onwards)**

Robert Verrecchia, Public Health England (April- September 2019)

Sarah Walker, Public Health England (April - August 2019)

Natalie Wright, Public Health England (September 2019 – March 2020)

Paula Gabriela Villavicencio Arciniegas, Public Health England - supported by the Universities of Excellence Scholarship from the Ecuadorian Government (November – December 2019)

Sonny Greenley, Public Health England (August 2019)

**Library services** Claire Allen, Evidence Aid . Anne Brice, Public Health England, Caroline De Brún, Public Health England, Mike Clark, Queens University, Belfast, Emma Farrow, Public Health England, Benjamin Heaven Taylor, Evidence Aid, Lidia Mayner, Flinders University, Australia

## Review of the technical report

Anne Bardsley, University of Auckland, Center for Informed Futures, New Zealand

Melody Brown Burkins, Dartmouth, United States

Andrew Hancock, Chair, UN Expert Group on International Statistical Classifications

Willi Harz, Federal Statistical Office of Germany

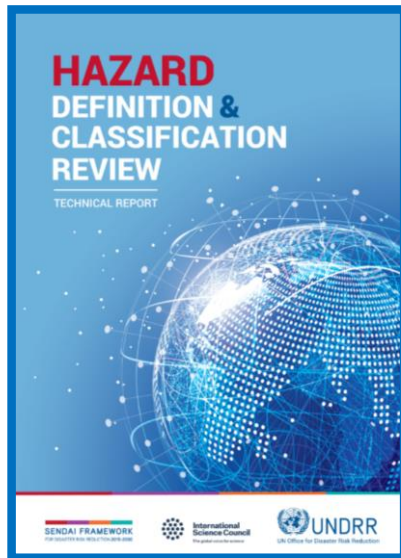
Alik Ismail-Zadeh, Karlsruhe Institute of Technology, Germany

David Johnston, Massey University, New Zealand

Coleen Vogel, University of Witwatersrand, South Africa

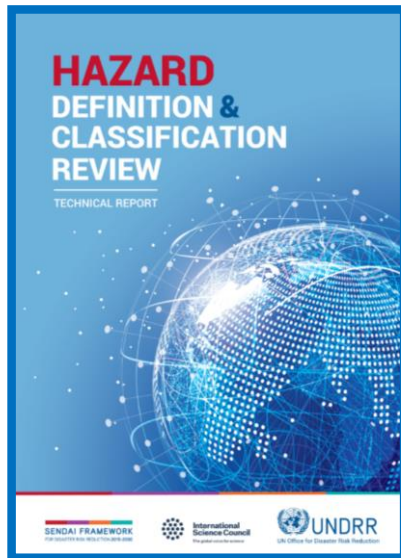
UNDRR Asia Pacific Science Technology and Academia Advisory Group

**Thanks to Advisory Group - over 400 colleagues volunteered to join the UNDRR/ISC Sendai Hazard Definition and Classification Review Advisory Group and have been very engaged, committed and supportive of the work – we thank them for their support.**



# Authors of the Hazard Information Profiles (HIPs)

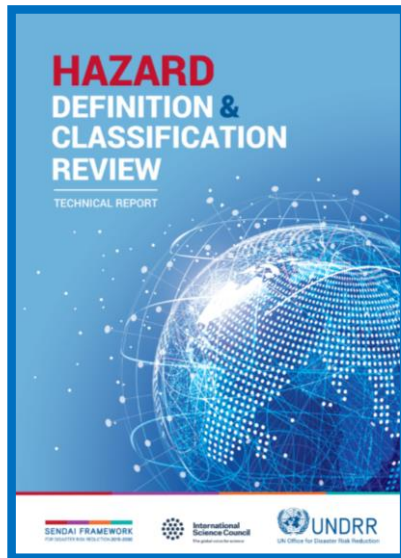
Thorkild Aarup, Intergovernmental Oceanographic Commission, Chadi Abdallah, UNDRR Arab STAG (Lebanese National Council for Scientific Research), Sarah Adamczyk, Overseas Development Institute, Bernadette Abela-Ridder, World Health Organization, Jonathan Abrahams, World Health Organization, Irina Ardeleanu, Coventry University, Kiran Attridge, Public Health England, Djillali Benouar, UNDRR Africa STAG (University of Science & Technology Houari Boumediene), Costanza Bonadonna, University de Genève ANNEX | 47  
Gracia Brisco, Food and Agriculture Organization of the United Nations, Sarah Cahill, Food and Agriculture Organization of the United Nations, Emily Campbell, Massey University, Zhanat Carr, World Health Organization, Denis Chang-Seng, Intergovernmental Oceanographic Commission, Callum Chapman, Public Health England, Lorcan Clarke, London School of Economics and Political Science Paul D Cole, University of Plymouth, Simon Cox, CODATA, Shoki Al Dobai, Food and Agriculture Organization of the United Nations, Sophie Von Dobschuetz, Food and Agriculture Organization of the United Nations, James Douris, World Meteorological Organization, Eleonora Dupouy, Food and Agriculture Organization of the United Nations, Fazil Dusunceli, Food and Agriculture Organization of the United Nations, Maged El-Kahky, Food and Agriculture Organization of the United Nations, Tina Endricks, Public Health England, Lucy Fagan, Public Health England, Esther Garrido Gamarro, Food and Agriculture Organization of the United Nations, Robin Gee, Global Earthquake Model Foundation, Johann Goldammer, Global Fire Monitoring Center, Baogen Gu, Food and Agriculture Organization of the United Nations, John Handmer, Integrated Research for Disaster Risk, Claire Horwell, Durham University, Maria van Hove, National Institute for Health and Care Excellence, Emma Hudson-Doyle, Massey University, Ko Ida, Public Health England, Ahmed El Idrissi, Food and Agriculture Organization of the United Nations, Evgenia Ilyinskaya, Leeds University, Lydia Izon-Cooper, Public Health England, Susanna Jenkins, Earth Observatory Singapore, Akiko Kamata, Food and Agriculture Organization of the United Nations, Elizabeth Kausman, European Commission Joint Research Center, Geunhye Kim, World Meteorological Organization, Gael Lamielle, Food and Agriculture Organization of the United Nations, Jostacio Lapitan, World Health Organization, Ronald Law, Department of Health, Philippines Esteban Leon, United Nations Human Settlements Programme, Dina Mansour-Ille, Overseas Development Institute, Pablo Tierz Lopez, British Geological Survey, Susan Loughlin, British Geological Survey, Juan Lubroth, Food and Agriculture Organization of the United Nations, Lidia Mayner, Flinders University, Australia, Peter McGowran, King's College London, Samia Metwally, Food and Agriculture Organization of the United Nations, Nick Moody, Insurance Development Forum Risk Modelling Steering Group, Peter F. Moore, Food and Agriculture Organization of the United Nations, Susan Loughlin, British Geological Survey, Osvaldo Luiz Leal Moraes, UNDRR Panama Office Science Group (Brazilian Early Warning Monitoring Centre for Natural Disasters), Virginia Murray, Public Health England, Felix Njeumi, Food and Agriculture Organization of the United Nations, James Norris, Group on Earth Observations, Pascal Peduzzi, UN Environment, Aslam Perwaiz, UNDRR Asia-Pacific STAG (Asian Disaster Preparedness Center), Gianluca Pescaroli, University College London, Katie Peters, Overseas Development Institute, Laura Elizabeth Peters, Oregon State University, Jeremy Phillips, University of Bristol, Julio Pinto, Food and Agriculture Organization of the United Nations, Eran Raizman, Food and Agriculture Organization of the United Nations, Melba Reantaso, Food and Agriculture Organization of the United Nations, Andriy Rozstalnyy, Food and Agriculture Organization of the United Nations, Rajinder Sagoo, UN Office for Disaster Risk Reduction, Independent Consultant, Rita Der Sarkissian, Lebanon National Council for Scientific Research, Shiroma Sathyapala, Food and Agriculture Organization of the United Nations, John Schneider, Global Earthquake Model Foundation, Chloe Sellwood, NHS England, Olga Shashkina-Pescaroli, International Science Council Adam Smith, UNDRR North America STAG (National Oceanic and Atmospheric Administration), Richard Styron, Global Earthquake Model Foundation, Elisabetta Tagliatti, Food and Agriculture Organization of the United Nations, Shinji Takarada, Japanese National Institute of Advanced Industrial Science and Technology, Annisa Triyanti Young Scientist, UNDRR Global STAG (Utrecht University), Robert Verrecchia, Public Health England, Paula Villavicencio, Public Health England, Ian Walker, Public Health England, Sarah Walløe, Public Health England, David Williams, World Health Organization, Mark Woodhouse, University of Bristol, Natalie Wright, Public Health England, Weining Zhao, Food and Agriculture Organization of the United Nations



# Review of the HIPs

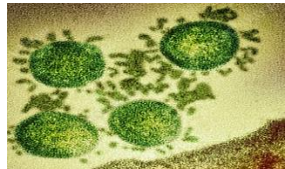
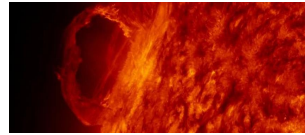
Review coordinator: Anda Popovici, International Science Council

**Reviewers:** Kathryn Alberti, World Health Organization, Javed Ali, Centre national de la recherche scientifique (CNRS), Trevor Allen, Geoscience Australia, Craig Arthur, Geoscience Australia, Barbara Bannister, Honorary Consultant, Royal Free Hospital, Tom Beer, Safe System Solutions, Australia, Lynette Bettio, Australian Bureau of Meteorology, Alex Blackburn, United Nations Economic Commission for Europe, Peter Bridgewater, University of Canberra, Francesca Cenni, Basel, Rotterdam and Stockholm Conventions, Jean-Luc Chotte, Institut de recherche pour le développement (IRD), Raffaello Cioni, Università degli Studi di Firenze, Emanuela Corsini, Università degli Studi di Milano, Fuqiang Ciu, World Health Organization, Kim Currie, University of Otago, Maral Dadvar, Stuttgart Media University, John Henderson Duffus, The Edinburgh Centre for Toxicology, Alexandra Fleischmann, World Health Organization, Kaushal Raj Gnyawali, Himalayan Risk Research Institute, Bernd Grambow, IMT Atlantique, Dave Griggs, Monash University, Martin Guard, UN Environment Programme, Santosh Gurung, World Health Organization, Michael Hapgood, RAL Space, David Heymann, Chatham House, Stefan Hoyer, World Health Organization, Qudsia Huda, World Health Organization, Salmaan Inayat-Hussain, Petroliam Nasional Berhad (PETRONAS), Yvan Hutin, World Health Organization, Hélène Jacot des Combes, National Disaster Management Office of the Republic of the Marshall Islands, Gary Jones, UNAIDS, René Kastner, Disaster Competence Network Austria, Hannes Kern, IRIS - Industrial Risk and Safety Solutions, Hwirin Kim, World Meteorological Organization, Paul Kovacs, ICLR – The Institute for Catastrophic Loss Reduction, Mike Long, University College Dublin, Melanie Marti, World Health Organization, Holly Michael, University of Delaware, Margaret Montgomery, World Health Organization, Osvaldo Moraes, Centro Nacional de Monitoramento e Alertas de Desastres Naturais (CEMADEN), Brazil, Brayton Noll, University of Twente, Elizabeth Mumford, World Health Organization, David Olson, World Health Organization, Peter Olumese, World Health Organization, Orhan Osmani, International Telecommunication Union, Ursula Oswald Spring, Universidad Nacional Autónoma de México, Ana Ake Patolo, Tonga National Emergency Management Office, Edmund Penning-Rowell, Middlesex University, Laura Elizabeth Peters, Oregon State University, Ingrid Rabe, World Health Organization, Christian Resch, Disaster Competence Network Austria, Olivier Ronveaux, World Health Organization, Cathy Roth, DFID, Linda Rowan, UNAVCO, Rita Der Sarkissian, Lebanon National Council for Scientific Research, Michael Schwenk, In den Kreuzäckern; IUPAC, Jane Sexton, Geoscience Australia, Jana Sillmann, CICERO Center for International Climate Research, Devendra Narain Singh, Indian Institute of Technology, Bombay, Anthony Solomon, World Health Organization, Christoph Steffen, World Health Organization, Val Swail, Emeritus Scientist, Environment and Climate Change Canada, Kuniyoshi Takeuchi, University of Yamanashi, Graham Tallis, World Health Organization, Norbert Tchouaffé, University of Dschang, Cameroon, Ian Thomson, British Geological Survey, Richard Thornton, Bushfire and Natural Hazards CRC, Martin Le Tissier, University College Cork, Andrea Vacca, University of Cagliari, Daniel Vallero, Duke Civil and Environmental Engineering, Raman Velayudhan, World Health Organization, Martin Visbeck, GEOMAR Helmholtz Centre for Ocean Research Kiel, Emilia Wahlstrom, UN Environment Programme, Susan Wang, World Health Organization, Abel Wilson Walekhwa, Africa Youth Advisory Board for Disaster Risk Reduction, Soichiro Yasukawa, UNESCO Disaster Risk Reduction, Wenqing Zhang, World Health Organization

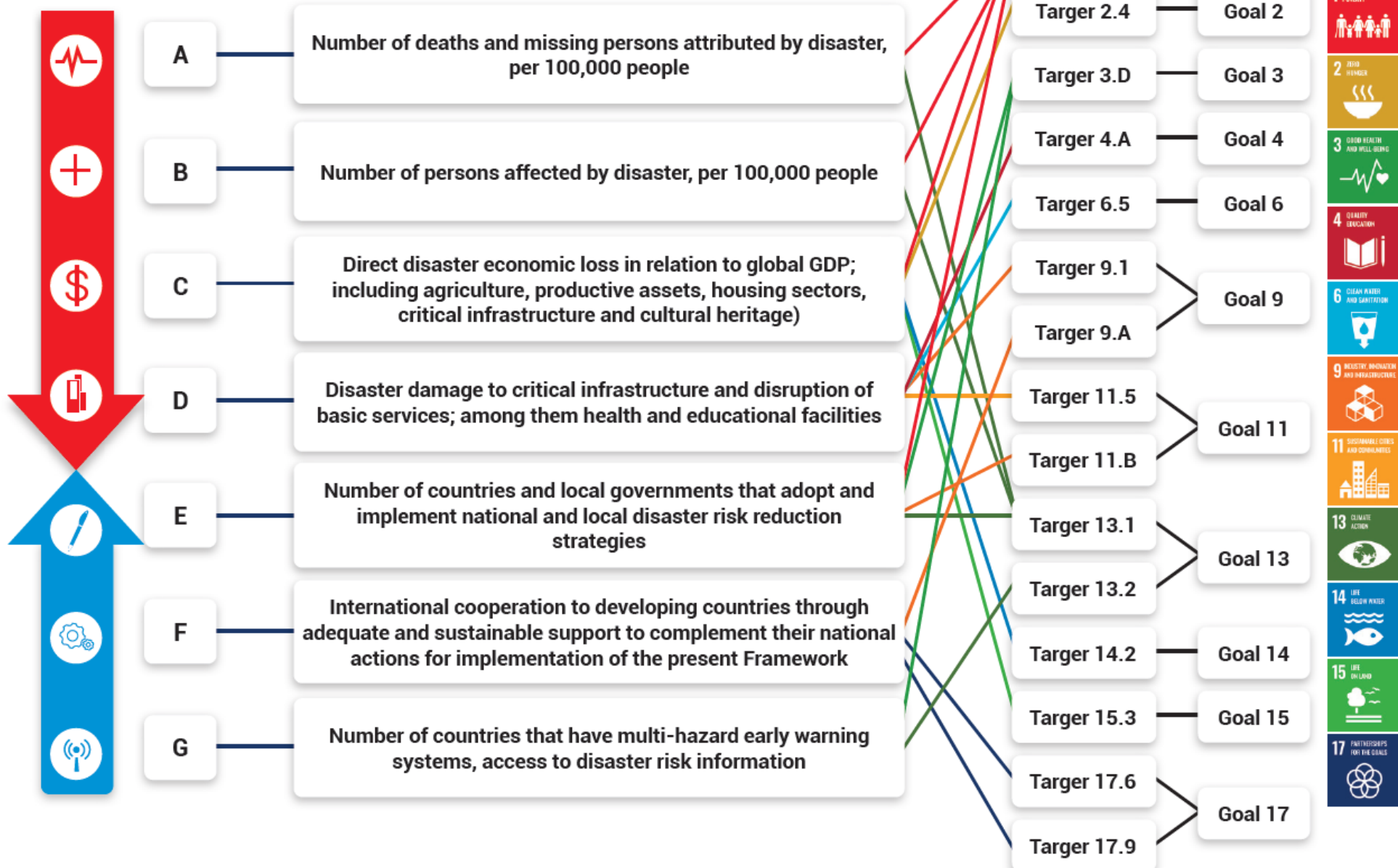


In 2015 the United Nations adopted three landmark agreements: Sendai Framework for Disaster Risk Reduction 2015–2030; the Sustainable Development Goals of Agenda 2030 and the Paris Agreement on Climate Change.

**The UNDRR/ISC Sendai Hazard Definition and Classification Review Technical Report supports all three by providing a common set of hazard definitions for monitoring and reviewing implementation which calls for “a data revolution, rigorous accountability mechanisms and renewed global partnerships”.**



**Seven Targets of the Sendai Framework and the Sustainable Development Goals**



# Proposed way forward

UNECE is currently suggesting a statistical review and pilot of the UNDRR/ISC Hazard Definition and Classification Review Technical Report – in part to determine the usefulness of the definitions for statistical reporting in particular relating to

- 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

Proposal to set up a series of small pilots -- to assess opportunities and challenges (volunteers welcome)

