

REVIEW OF THE STRATEGIC TOOL FOR ASSESSING RISKS (STAR): Lessons learnt and moving forward Geneva, 5-6 September 2016



Meeting Report

i. Background

Identifying and characterizing priority health risks at the country level serves as the basis for planning and action to manage these risks, including informing national preparedness and response plans, and providing the evidence-base for targeted interventions to strengthen response systems before a health emergency occurs.

The Strategic Tool for Assessing Risks (STAR) is an assessment tool which was designed in 2015 and piloted in 2016 to enable countries to identify their priority health risks using an evidence-based approach so that it can be applied in a comparable, reproducible and defensible manner. In addition to identifying priority health risks, the tool also identifies the level of preparedness measures required for countries to manage their risks and develop an appropriate contingency plan.

As of July 2016, STAR has been used by over 350 participants and stakeholders in 17 countries across Africa. The risk profiling exercises are conducted in the countries over the course of two days, with the workshops facilitated by staff from the WHO Headquarters and regional and country offices and consultants.

ii. Objectives

The meeting provided an opportunity for facilitators and implementers to exchange insights and perspectives on their use of STAR based on actual findings and lessons from the field. The involvement of technical staff from all new departments of the new WHO Health Emergencies Program and other relevant departments in the meeting assisted with the review of the tool and will lead to continued synchronization of its implementation with established best practices, and generation of recommendations to increase STAR's value as a vital tool for emergency preparedness and response planning. Specific objectives included:

1. Review the results and outcomes of the past 17 risk profiling activities in Africa that utilized STAR
2. Analyse the current STAR structure and methodology and align them with existing international standards and evidence-based best practices for risk assessments and profiling
3. Identify gaps in implementation and propose recommendations for improving the utility and functionality of the tool and increasing ownership of the results among national and local stakeholders
4. Highlight key opportunities for future use of STAR

NB. The meeting agreed that until the changes recommended by the meeting are agreed by Senior Management, the tool will continue to be used as is.

iii. Proceedings

During **Day 1** meeting participants were familiarised with the STAR tool and its results. Participants presented the results from countries having carried out the risk assessments in Africa¹ and the feedback from the use of the tool in WPRO to identify hazards and risks at a regional level to inform WHO readiness. Participants were then led through a facilitated discussion to brainstorm on the overall purpose and use of STAR, and on the strengths and weaknesses of the tool as used during the pilot phase of its use.

An overview of best practices for infectious disease risk ranking was provided by ECDC before break out groups were formed to develop specific recommendations for the revision of the STAR. The three groups addressed (i) Hazard and Health Risk classification, (ii) Criteria for the determination of Risk Level, and (iii) Methods and Approaches.

The final session provided an opportunity to look to the bigger picture of activities related to risk assessment. Presentations were on the INFORM: Index for Risk Management (OCHA); on National Risk Assessments in the Context of Disaster Risk Reduction (UNISDR); Infectious Disease Forecasting & Country Prioritization (WHO/PED); and Rapid Risk Assessments for Acute Events (WHO/HIM); and Early Warning Early Action in the IASC context (WHO/ERM).

On **Day 2**, STAR working group members reconvened to review the recommendations made during Day 1, and take decisions on key changes to incorporate into the revised tool. The recommendations and agreed changes to STAR are summarised below.

iv. Feedback from meeting participants

General feedback from plenary discussions:

- Need to better document and codify the types of data used to conduct the assessment, so that on revision the baseline data is the same (and updated).
- Need to consider the Annex 2 criteria of IHR as a step to country level reporting to WHO of a potential Public Health Emergency of International Concern.
- Need to define terminology (as in interim measure, need to define “working language” in the tool)
- Need to integrate tool in an A-Z process to assist countries conduct risk assessments for a range of purposes and functions, e.g. strategic planning, emergency response planning, event risk assessment .
- Clearly articulate in the STAR, how it will improve country performance and scoring under JEE.
- Consider using the tool process to raise awareness in country so that they work to collect the necessary data for future assessments.
- Consider including the impact of health events on other sectors (e.g. tourism, travel, trade)
- Maintain s STATEGIC approach and title
- Maintain the ALL-HAZARD approach which is the real value of the tool.

¹ As of 1 September 2016 the following countries have used the tool : Benin, Burkina Faso, Cameroon, CAR, Chad, Côte d’Ivoire, DRC, Ethiopia, Liberia, Malawi, Mali, Mauritania, Niger, Senegal, The Gambia, Togo, and Uganda.

- Strengthen the scenario based planning component of the tool.
- Refer to the agreed GEMT hazard classification table, until the WHE decides on new classification.
- Improve the planning and pre-workshop activities.
- Focus: Maintain a focused and targeted purpose for the tool OR identify all the intended purposes and build the tool around a targeted approach. “Preparedness for a health emergency”
- The STAR Process should cross-reference data with standard or independent data (INFORM, Global Risk report, others)
- Re-consider the inclusion of non-emergency hazards. Consider including NCD experts in review.
- Consider a mixed methods approach to strengthen the decision making and avoid over-use of “group think”. This should be coupled with standardised criteria for participant selection.

Feedback from Group discussions:

Group 1 Hazard & Risks	Group 2 Criteria to determine level of risk	Group 3 Methods & approaches
<p>Health Risk The concept of “Health Risk” is not yet clear</p>	<p>Likelihood (seasonality and periodicity)</p> <p>Does ‘seasonality’ really add to ‘periodicity’ for estimation of ‘likelihood’;</p> <p>‘Periodicity’ is entirely from historical judgements?</p> <p>Should ‘likelihood’ include some forward looking probability (risk of imported case(s), climate change and other global trends)</p>	<p>Pre-workshop activities Create facilitator guidance (Tasks and responsibilities;</p> <p>Provide supporting documents; Will be helpful for regional implementation as well)</p> <p>Assign homework (research) to participants a month before the workshop.</p>
<p>Hazard</p> <p>On the categories of hazard, the 4th Column should be named "Health events " and not "examples of associated diseases " – he same in the tool to replace “health risk”.</p>	<p>Impact (Severity and Capacity)</p> <p>Severity algorithm For infectious diseases only – needs further revision, and development of other algorithms. Not sure how robust/precise the ECDC rapid RRA algorithm is as a source for this purpose, and the logic has been further altered re items included and their order in the algorithm;</p> <p>The possibility of an underlying statistical model should be considered.</p> <p>Inclusion of prevention/treatment measures doubles up with consideration under ‘capacities’?</p>	<p>Approach</p> <p>More interactive approach; Use working group approach, especially if you have a large group;</p> <p>Define role of multi-sectoral groups (non-health sector) so that they have more participation during the discussion of the health risks;</p> <p>Extend duration of workshop (½ day for briefing; 2 full days for workshop; ½ day post-workshop)</p> <p>Hold workshops outside the</p>

	<p>Is impact best estimated multiplicatively (severity x capacities) or additively with a number of additional dimensions (eg. Vulnerability, coping capacity, economic impact, public concern);</p> <p>Capacity should also discern between the capacity to manage routine events versus unusual/unexpected events.</p> <p>Should the tool objective include endemic problems/failing health services or just ‘health emergency events/situations’</p>	<p>capital.</p>
<p>Chronic diseases should not be considered for Risk Selection</p>	<p>Need to go beyond consensus mechanism for each criteria by introducing clearer non-subjective break points (or other types of check and balance) between the levels.</p>	<p>Bottom Up Vs. Top Down</p> <p>Change the language (use the term “national” instead of “top-down”) - National approach more recommended as this is seen as a national level risk assessment; Take administrative structure and political dynamic of the country into consideration (flexibility); Review of regional data can be done during the pre-workshop.</p>
<p>For evidence base required for selection, the Country should Provide a map of hazards</p>	<p>Introduce the same “dimensions” as INFORM: Hazard and Exposure; Coping Capacity; Vulnerability.</p>	<p>Post-workshop Activities and Validation of Results</p> <p>Senior management must be presented with initial results before the team leaves</p> <p>Review of the risk matrix Conducted 2-3 weeks after the workshop by the MOH, EOC, NDMA</p> <p>Decisions to be made during the review: Decide on who uses the information and for what purpose; Decide on when to review results again.</p>
<p>Biological hazards need only be sub-grouped into Animal or Insect</p>		<p>Excel Tool</p> <p>Needs to be more user friendly (i.e. currently cannot copy-paste); Must be easy to</p>

Infestations, and Infectious Hazards.		use for district and regional level; More distinction between hazards and risks in the tool (include option to hide hazards)
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v. Proposed changes to the STAR tool

i. General

- A new purpose statement: *The purpose of the STAR is to identify and prioritize risks to support health emergency planning.*
- Principles agreed as:
 - A comprehensive risk management cycle: Focussing on assessment and proactive management of priority risks, rather than a reactive approach to events as they occur.
 - All-hazards: Develop, strengthen and use elements and systems that are common to the management of risks from all origin.
 - Multisectoral: Recognition that the various government ministries, private sector entities and civil society have a role to play in risk management.
 - Based on a snapshot of existing capacities and information.
- Working definitions will be provided in a glossary until the time agreed WHE definitions are available.
- Opening section on where the STAR tool fits among other types of assessment.
- Until all proposed changes are agreed by SMG, the tool will continue to be used as is.
- Include in the guide: Who is this tool for?
- Add specific criteria for participant profiles.

ii. “Hazards” and “risks”

- The hazard classification table to be revised to align with the table agreed by GEMT in 2013 (see revised table below).
- The term “risk” will be reserved to the calculation of level of risk to avoid confusion. “Health risk” now as termed “possible health consequence” in the fourth column of the hazard table, and in the excel tool.
- One line in the tool will be used to group all possible health consequences.
- A shortlist of pre-identified hazards should be drafted ahead of the workshop on the basis of historical data in the country that will be documented in the report.
- The hazard column to filled at the lowest subtype possible or (if an infectious hazard) the agent aetiology or alternative grouping.

iii. Criteria and steps:

Step 1: Hazard and Exposure

- Hazard identification to subtype level – *align with agreed hazard classification*
- Exposure – *new variable – vaccine status of at-risk populations, high-risk areas.*
- Potential Health Consequence identification – *change from “health risk”.*

- Scale – *guidance to specify that the scale described should be set at the most likely scenario that would require a national response.*

Step 2: Likelihood

- Seasonality – *no change*
 - Periodicity – *no change*
- Determination of the Likelihood of hazard *at the defined scale.*

Step 3: Vulnerability and Coping Capacity

- Severity - *to be revised so that it can take into account all hazards.*
 - Vulnerability – *new variable - vulnerable groups (or susceptible groups in the case of infectious pathogens), access to health services, public concern, community resistance.*
 - Surge Capacity – *refine the SWOT analysis.*
 - Coping Capacity – *revised variable – include indicators for each hazard type.*
- Determination of the Impact of hazard *at the defined scale.*

Step 4: Risk Ranking

- Determination of the Risk level of each hazard at the defined scale.
- Confidence interval – *new - assigned per hazard type/subtype.*
 - Review the relative risk values of each hazard.

Step 5: Emergency Preparedness Actions

- Minimum emergency preparedness actions for all hazards.
- Additional emergency preparedness actions for hazards with a high or very high risk value.

vi. Key messages for WHE Senior Management

During the course of the meeting, a number of issues were raised that have direct implications for the use, and ownership of STAR. These include:

- STAR is a country focused tool developed by WHO on a needs basis and upon request from member states. Participants agreed that the tool had already demonstrated results, and it should now be urgently revised on the basis of recommendations made.
- During the meeting, a major recommendation was to focus STAR’s overall purpose on the risk assessment of a given hazard or scenario (and all its consequences on health) as a whole, rather than on the assessment of each health consequence (or ‘health risk’). This will improve the tools use in emergency planning for specific scenarios that may lead to multiple health consequences within affected populations.
- WHE Programmatic clarity is required on the different requirements in terms of risk assessment (e.g. Rapid Risk Assessments, IHR Assessments; INFORM); other forms of assessment (e.g. JEE, Country Capacity Assessments; VRAM).
- WHE Working Terminology urgently needs to be defined to increase interoperability and decrease confusion between tools, concepts and documents (e.g. plans).
- WHE urgently needs to agree on a standard classification of hazards, noting that one has been previously agreed by the GEMT. However concerns were raised that the available hazard classification table does not enable a thorough classification of biological hazards.

vii. Next steps for PST

1. New version of tool and guide to be available November 2016
 - a. Revised tool (including facilitator notes)
 - b. Working definitions / glossary
2. Define new data and methodology standards.
3. Review with all RO's and HQ.
4. Launch for use by end of 2016.

Annex 1 – Meeting agenda

DAY 1: SEPTEMBER 5

8:45 – 9:00 Registration
9:00 – 9:30 Opening and Introduction
Welcome Address Dr Stella Chungong, <i>Coordinator, Global Capacities, Alert and Response, WHO</i>
Moderator Dr Catherine Smallwood, <i>Technical Officer, Global Capacities, Alert and Response, WHO</i>
Discussion Points <ul style="list-style-type: none">• Present the background and context of the meeting• Provide an overview of the meeting agenda and the schedule of activities• Provide an overview of the STAR evaluation survey• Introduce meeting participants
9:30 – 10:15 STAR Overview
Moderators Mr Denis Charles and Mr David Cuenca, <i>Consultants, Global Preparedness, Surveillance and Response</i>
Discussion Points <ul style="list-style-type: none">• How STAR was developed and how it is currently being used• Structure and methodology
10:15 – 10:30 Coffee Break
10:30 – 12:00 STAR Report: Findings from the Field
Moderator Mr Mark Shapiro, <i>Consultant, Global Preparedness, Surveillance and Response</i>
Presenter/s <ul style="list-style-type: none">• Present overall findings from risk profiling exercises conducted in Africa - Ms Weanne Estrada, <i>Intern, Preparedness Support Team, Global Capacities, Alert, and Response, WHO</i>• Initial application to readiness activities in WPRO - Dr Nevio Zagaria, <i>Team Lead, Emergency and Humanitarian Action (by video-link)</i>
12:00 – 12:30 Best Practices for Strategic Risk Assessments and Profiling
Presenter Dr Graham Fraser, <i>Senior Expert Health Systems and Preparedness, European Centre for Disease Prevention and Control (ECDC)</i>
Discussion Points <ul style="list-style-type: none">• Present ECDC's report on best practices in ranking emerging infectious disease threats• Propose methodology to evaluate STAR using the best practices recommendations

12:30 – 13:30 Lunch Break

13:30 – 15:15 Applying Best Practices: Recommendations for STAR

Group 1: Hazards and Risks	Group 2: Criteria for Determining Risk	Group 3: Methods and Approaches
<p>Discussion Points</p> <ul style="list-style-type: none">• Review current hazard & risk selection method• Criteria for hazard / risk selection• Process of grouping hazards or risks• Minimum evidence base required for hazard / risk selection	<p>Discussion Points</p> <ul style="list-style-type: none">• Review current criteria and formulas for risk• Improvements to severity algorithm(s).• Inclusion of other criteria (e.g. vulnerability / coping capacity)• Minimum evidence base required for scoring	<p>Discussion Points</p> <ul style="list-style-type: none">• Review of current methodology / approach• Pre-workshop needs and activities• Bottom-up vs top-down approaches• Validation of results and post-workshop activities to increase preparedness
<p>Groups to feedback recommendations in plenary.</p>		

15:15-15:30 Coffee Break

15:30-16:45 The Bigger Picture: Related Activities at WHO and Beyond

Moderator

Mr Jonathan Abrahams, *Technical Officer, Policy, Practice and Evaluation, WHO*

Presenters

- **INFORM: Index for Risk Management** – *Mr Andrew Thow, UN Office for the Coordination of Humanitarian Affairs (OCHA)*
- **National Risk Assessments in the Context of Disaster Risk Reduction** - *Dr Chadia Wannous, Senior Advisor, UN Office for Disaster Risk Reduction (UNISDR)*
- **Infectious Disease Forecasting & Country Prioritization** - *Dr Asheena Khalakdina, Technical Officer, Control of Epidemic Diseases, WHO*
- **Rapid Risk Assessments for Acute Events** – *Dr Philippe Barboza, Team Lead, Health information and Risk Assessment, WHO*

Discussion Points

- How can we increase interoperability with these streams of work in terms of criteria, terminology, and outcomes?

16:45 - 17:15 Summary, Close and Next Steps

DAY 2: SEPTEMBER 6

(Working Group only)

9:00 – 10:15 Best Practices: Hazards and Risks

- Review recommendations from Day 1
- Decide on revisions to tool
- Assign tasks as necessary

10:15 – 10:30 Coffee Break

10:30 – 11:30 Best Practices: Criteria for Determining Risk

- Review recommendations from Day 1
- Decide on revisions to tool
- Assign tasks as necessary

11:30 – 12:30 Best Practices: Methods and Approaches

- Review recommendations from Day 1
- Decide on revisions to tool
- Assign tasks as necessary

12:30 – 13:00 AOB and Close

- Summary of outcomes from Day 2
- Next steps

Lunch

Annex 2 – List of Participants

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Annex 3 – Proposed Working Definitions

[From WHO's Public Health Emergency Operations Centre Framework \(WHO 2015\)](#)

Activation level - A level of readiness or emergency response describing an EOC's activities in response to predetermined criteria related to the severity of an incident.

All-hazards - An approach to the management of the entire spectrum of emergency risks and events based on the recognition that there are common elements in the management of these risks, including in the responses to virtually all emergencies, and that by standardizing a management system to address the common elements, greater capacity is generated along with specific measures to address the unique characteristics of each event.

Capacity - A combination of all the strengths, attributes and resources available within an organization, jurisdiction, society or community that can contribute to managing and reducing the level of risk and strengthening resilience. Capacity can include infrastructure and physical means, institutions, social coping abilities, or economic assets as well as human knowledge, skills and collective attributes such as social relationships, leadership and management capability.

Capability - Possessing the demonstrable ability to perform a particular task.

Comprehensive emergency (risk) management programme - A corporate or government programme that commits resources to a range of measures to implement prevention and mitigation, preparedness, response and recovery (also disaster (risk) management programme). Typically, this programme includes the full range of capacities for managing risks associated with emergencies and disasters.

Context - As applied to emergency (risk) management, context is described by a number of factors related to the setting, circumstances and environment of risks and events. These include the cultural, social, political, legal, regulatory, financial, technological, economic, natural and competitive environment—whether local, national, regional or international—and those factors related to the governance, organizational structure, roles, accountabilities, policies, objectives, and strategies that are in place to achieve those objectives. They also include the capabilities of and relationships between the internal and external actors and stakeholders.

Contingency plan - A plan to deal with particular aspects of a specific threat that is different from other threats. For example: while the general management of emergencies is similar for most, and therefore efficiently addressed by a generic (all hazards) approach, the specific resources and actions that would be required to address a communicable disease outbreak are different from those used to respond to an earthquake. Each would require a different contingency plan (see plans).

Disaster - A type of event which causes serious disruption to the functioning of a community or a society due to hazards interacting with conditions of vulnerability, exposure and insufficient capacity to reduce risks or cope with consequences, leading to widespread human, material, economic and environmental losses and impacts. The impact of a disaster is often widespread and can last for a long period of time. The impact may test or exceed the capacity of a community or society to cope using its own resources, and therefore may require assistance from external sources, which could include neighbouring jurisdictions, or national or international sources. Consequences may include injuries, disease and other negative effects on human physical, mental and social wellbeing, together with damage to property, loss of services and environmental degradation.

Emergency - A type of event or imminent threat that produces or has the potential to produce a range of consequences, and which requires coordinated action, usually urgent and often non-routine. Emergencies have effects that may be considered on a continuum from local emergencies with limited consequences to wide area disasters with catastrophic consequences. Incidents or events are often referred to as emergencies, with the terms used interchangeably, but not all incidents or events are emergencies.

Emergency response plan (ERP) - A document that describes how an agency or organization will manage its response to emergencies of various types by providing a description of the objectives, policy and concept of operations for the response to an emergency; and the structure, authorities and responsibilities for a systematic, co-ordinated and effective response. In this context, emergency plans are agency- or jurisdiction-specific, and detail the resources, capacities and capabilities that the agency or organization will employ in its response (see plans). Also referred to as an emergency or operations plan.

Emergency operations centre (EOC) - A place within which, in the context of an emergency, personnel responsible for planning, coordinating, organizing, acquiring and allocating resources and providing direction and control can focus these activities on responding to the emergency. An EOC is a generic concept, embracing a range of emergency management facilities from an on-scene incident command post at an emergency site to a national emergency coordination centre providing strategic direction and resources to multiple jurisdictions and agencies in a wide-area disaster. An EOC usually sits between these extremes and provides strategic policy, logistical and operational support to site-level responders and response agencies— see also public health emergency operations centre (PHEOC).

Event - Under the International Health Regulations (2005) (Article 1) an event is defined as ‘a manifestation of disease, or an occurrence that creates a potential for disease’.

Hazard - A potentially damaging physical event, phenomenon, substance, human activity or condition that may cause loss of life, injury or other health impacts, property damage, loss of livelihoods and services, social and economic disruption, or environmental degradation.

Health emergency - A type of event or imminent threat that produces or has the potential to produce a range of health consequences, and which requires coordinated action, usually urgent and often non-routine. A health emergency may pose a substantial risk of significant morbidity or mortality in a community.

Incident management system (IMS) - An emergency management structure and set of protocols that provides an approach to guiding government agencies, the private sector, non-governmental organizations and other actors to work in a coordinated manner primarily to respond to and mitigate the effects of all types of emergencies. The incident management system may also be utilised to support other aspects of emergency management, including preparedness and recovery. Also incident command system.

Mitigation - Activities designed to reduce or limit risks to persons or property or to lessen the actual or potential effects or consequences of an incident. Mitigation measures may be implemented prior to, during or after an incident. Mitigation involves ongoing actions to reduce hazards and vulnerability and exposure to hazards, and to increase capacities.

Plans - Generic reference to documents designed to identify, at various levels, responsibility for a range of activities and intended objectives, strategies and tactics. The purpose of plans is to maximize effectiveness and minimize response time to events, and to standardize routine activities associated with response and management so that additional capacities can be focused on addressing the unique characteristics of each event. Plans are specific to their intended users. See also contingency plan, EOC plan and support plan.

Preparedness - The knowledge and capacities of governments, response and recovery agencies, communities and individuals that allow them effectively to anticipate, respond to, and recover from the impacts of a wide range of likely, imminent or current events. A state of preparedness is the product of a combination of planning, allocation of resources, training, exercising, and organizing to build, sustain, and improve operational capabilities based on risk assessments.

Prevention - Activities and measures taken, based on risk assessments, to avoid existing and new risks. Prevention and mitigation are often used interchangeably, as they aim to reduce the probability or consequences of disasters, and communities' vulnerability thereto. Prevention measures can also be implemented in response and recovery to stop specific consequences from occurring.

Public health emergency - An occurrence, or imminent threat, of an illness or health condition that poses a substantial risk of a significant number of human fatalities, injuries or permanent or long-term disability. Public health emergencies can result from a wide range of hazards and complex emergencies.

Public health emergency of international concern (PHEIC) - (IHR definition) An extraordinary event which is determined, as provided in the [International Health] Regulations: (i) to constitute a public health risk to other States through the international spread of disease and (ii) to potentially require a coordinated international response.

Risk - The combination of the probability of an event and its consequences, which results from interactions between natural and human-induced hazards, vulnerability, exposure and capacity.

Risk assessment - The process of determining those risks to be prioritised for risk management by the combination of risk identification, risk analysis, and evaluation of the level of risk against predetermined standards, targets, risks or other criteria. Risk assessments include a review of the technical characteristics of hazards, analysis of exposures and vulnerability, and evaluation of the effectiveness of prevailing coping capacities in respect of likely risk scenarios.

Risk management - Coordinated activities to direct and control an organization or entity with regard to risk. The systematic approach and practice of managing uncertainty to minimize potential harm and loss (of life, assets and resources, injury, illness and other adverse effects). Activities include conducting risk assessments, implementing risk treatment measures, and evaluation, monitoring and review.

Sector - A division or collective aspect of a geographical area, economy or society.

Strategic The defining characteristic of something 'strategic' is that it deals with relatively longterm, high-level, big picture concepts in order to integrate an organization's major goals, policies, and

action sequences into a cohesive whole. It may also have a normative or standard-setting component.

Surge capacity The ability to draw on additional resources to sustain operations and increase capacity, usually for emergency response, as required.

Tactical Those activities, resources and manoeuvres that are directly applied at a task level in order to achieve goals. Compare with strategic. The tactical level is the level (below strategic level and above operational level) at which the response to an emergency is managed.

[From WHO's RRA manual \(2012\)](#)

Confidence - Confidence describes how sure the assessment team is of an estimate. It reflects what some disciplines call the certainty or uncertainty around an estimate.

Health Consequence - The downstream effects that result from a hazard that may be negative or positive. A negative public health consequence causes or contributes to ill health.

Risk - The likelihood of the occurrence and the likely magnitude of the consequences (impact) of an adverse event during a specified period.

Vulnerability - A position of relative disadvantage. The extent to which an individual or population is unable or unlikely to prevent or respond to hazards.

[From the IASC's Emergency Response Preparedness Manual \(2015\)](#)

Likelihood - The probability of a hazard occurring.

Risk - An attribute of a hazard representing the combination of likelihood and impact.

Risk Analysis - The process of determining the likelihood and impact of a hazard in a defined period, and consequently the risk that the hazard possesses.

Impact - The humanitarian consequences of a hazard, if it occurs.

Annex 4 - Proposed Hazard Classification

NB. The classification of biological hazards is subject to change.

Groups and sub-groups		Types	Subtypes	
Natural	Geological	Earthquake (G1)	Ground shaking Tsunami	
		Mass movement (G2)		
		Liquefaction (G3)		
		Volcanic activity (G4)	Ash fall Lahar Pyroclastic flow Lava flow	
	Hydrometeorological	Hydrological	Flood (H1)	Riverine flood Flash flood Coastal flood Ice jam flood
			Landslide (H2)	Avalanche (snow, mud flow, debris, rockflow)
			Wave action (H3)	Rogue wave
				Seiche
		Meteorological	Storm (M1)	Extra-tropical storm Tropical storm Convective storm
			Extreme temperature (M2)	Heatwave
				Coldwave Severe weather condition (snow/ice, frost/freeze, dzud)
		Fog (M3)		
		Climatological	Drought (C1)	
			Wildfire (C2)	Landfire Forest fire
	Glacial lake outburst (C3)			
	Biological	Emerging diseases (B1)		
		Epidemics and pandemics (B2)		
		Insect infestation (B3)	Grasshopper	
			Locusts	
	Foodborne outbreaks (B4)			
	Extra terrestrial	Impact (E1)	Airbust	
		Space weather (E2)	Energetic particles	
			Geomagnetic storms Shockwave	

Human-induced	Technological	Industrial hazards (T1)	Chemical spill
			Gas leak
			Collapse
			Explosion
			Fire
			Radiation
		Structural collapse (T2)	Building collapse
			Dams/bridge failures
		Transportation (T3)	Air
			Road
	Rail		
	Water		
	Air pollution (T4)	Haze	
	Hazardous materials in air, soil, water (T5)	Biological	
		Chemical	
		Radionuclear	
	Power outage (T6)		
	Explosions/fire (T7)		
	Food contamination (T8)		
	Societal	Armed conflict (S1)	International
Non-international			
Civil unrest (S2)			
Terrorism (S3)		Chemical	
		Biological	
		Radiological	
		Nuclear	
		Explosive weapons	
Financial crisis (S4)		Currency crisis	
		Hyperinflation	