

CALCULATING RISK IN HUMANITARIAN CRISES TO IMPROVE RESPONSE CAPACITY

METHODOLOGY NOTE JULY 2021



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Executive summary

Risk assessment plays a critical role in creating on-the-ground preparedness for governments, NGOs, and crisis-affected people. An effective risk methodology not only decreases preventable deaths but also allows for a more efficient allocation of organisations' vital resources in staffing, funding, and operational efficiency. The more accurate the risk methodology, the more impactful and targeted the response can be.

This report is addressed to humanitarian actors, including international organisations, foundations, donor governments, risk assessment companies, and others, with a view to inform and improve decision-making in the sector. The research seeks to identify ways in which humanitarian actors can increase their capacities to use risk assessment methodologies to improve response and preparedness practices.

First, the report provides an overview of the stakeholders in the risk assessment sector and a variety of methodologies used (both probabilistic and non-probabilistic). Classifying existing methodologies provides a basis for further inquiries into potential gaps. The report then identifies the lack of technical capabilities and quality data as key impediments in performing accurate risk assessment across the sector. Finally, the report provides three main recommendations aimed at addressing these issues.

Methodology

This report is the result of research requested by ACAPS and conducted by a team of master's students from the Graduate Institute of International and Development Studies (Geneva, Switzerland) between April–December 2020.

The classification of methodologies proposed in this report was created to illustrate what tools and methods are preferred by different actors. The assumptions on industry practices of humanitarian risk assessment were drawn from a literature review of risk assessment methodologies, as well as from consultations with risk assessment experts working in both public and private sectors (the UK Centre for Disaster Protection and AXA). The findings and recommendations on filling organisational capacity gaps rely on two multilateral interviews with risk assessment practitioners.



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GAPS IN RISK ASSESSMENT: KEY FINDINGS

Although unable to determine to what extent probabilistic risk methodologies are or are not sufficient at estimating humanitarian crises, the research team identified areas where humanitarian organisations experience barriers to using these methodologies:

- **Capacity deficit:** Limitations on internal organisational capacities have a negative effect on the accuracy of risk assessment methodologies.
- **Funding bottleneck:** Insufficient donor funding leads to inadequate staffing, limiting the potential for high-quality output.
- **Partnerships:** A lack of partnerships and sharing of good practices across the sector leads to the inefficient use of financial and human resources.
- **Data streams:** Issues in locating new and varied data sources – including a limitation in access to field data, poor and inconsistent monitoring of events that could turn into hazards, an overall lack of standardisation, and poor data validation – are still a major challenge for humanitarian responders.

Summary of recommendations

Increasing partnerships, creating an ecosystem. The goal is for organisations to create an ecosystem of available data sources and existing risk assessment tools to share among humanitarian actors. This would better equip the sector to address larger and more complex hazards. As a result of increased operational coordination and resource distribution management, it could also be a driver of more partnerships.

Building organisational capacity. Organisations can improve their in-house analytical processes by hiring data scientists, statisticians, econometricians, and other specialists.

Increasing methodological and analytical capacity. Actors' methodological capacity can be improved by developing risk assessment methodologies to calculate the plausibility of new humanitarian crises growing yearly in impact and number of people affected. Increased analytical capacity can be achieved through improved data collection from reliable sources and using existing, open-source, and back-tested data at each stage of analysis.



Limitations

This research is based on a limited sample size of data points. The analysis could be expanded by incorporating the perspectives of other risk assessment actors and including a more comprehensive discussion of how different methodologies are used. The report also does not look at specific qualitative methods. Interviews for this research focused on risk assessment experts as sources. Bringing together the four identified groups of humanitarian organisations, risk assessment actors, private sector actors, and donors could offer a more robust perspective.

The report does not discuss how civil society and NGOs could play a role in collecting primary data or monitoring situations to expand data sources as part of a risk assessment methodology. Future efforts could investigate how such role can be operationalised and outline actionable steps for individual organisations.

HUMANITARIAN RISK ASSESSMENT ACTORS

The purpose of humanitarian risk assessment is to identify plausible futures with significant negative humanitarian consequences. Assessment results are used by humanitarian actors and governments for improved preparedness, timely response, and mitigation of crises. Below are four groups of stakeholders involved in humanitarian risk assessment:

1. **humanitarian organisations conducting humanitarian operations** (including NGOs, government development agencies, international organisations, civil society organisations, etc.)
2. **humanitarian risk assessment organisations, both public and private, that design and use risk assessment methodologies and/or provide monitoring and evaluation services** (including the academia, think tanks, research centres, etc.)
3. **insurance companies** (private sector structures or entities performing risk assessment)
4. **donors who provide financial and/or technical support to groups two and three.**

Humanitarian organisations tend to work directly with crisis-affected people. While focusing mostly on delivering aid assistance, some of them may also use risk assessment methodologies to identify and anticipate risks as part of their emergency preparedness strategies. Working in tandem with humanitarian responders, humanitarian risk assessment organisations use quantitative and/or qualitative methodologies aggregating considerable amounts of data. Insurance companies have robust methodologies to assess risks that can be expanded to the humanitarian sphere. Donors comprise governments, international organisations, and foundations, some of which have the capacity to undertake their own risk assessments.



CLASSIFICATION OF RISK ASSESSMENT METHODOLOGIES

As humanitarian risk assessment covers a broad range of crises and disasters, a variety of methodologies exists to consider specific factors and variables in each situation. For this report, 21 methodologies of risk assessment utilised by groups one, two, and four were analysed and classified as in table 1 based on the nature of their output data (a probabilistic value, an index, qualitative data, or mixed data):

Type of methodology	Pure probability	Composite indicator	Qualitative	Mixed
Output	Probabilistic	Index	Qualitative data	Qualitative and/or index
Examples	Global Seismic Hazard Assessment Program/ Global Human Settlement/ UNDRR Global Assessment Report/FAO/ Emergency Events Database/ Centre for Research on the Epidemiology of Disasters	Famine Early Warning Systems Network/ Conflict Barometer	Asian Disaster Preparedness Center/ Baharmand et al. (2017) on humanitarian logistics	IFRC/Oxfam/ Hammer et al. (2019) on communicable disease

Table 1. Typology of humanitarian risk assessment methodologies

Two types of **quantitative methodologies** exist in the sector. The first type includes pure probability models that use a wealth of data to ascertain some probability of risk. These models often use large, fine-grained datasets in the form of population demographic, epidemiological, climate history, remote-sensing, and other forms of geographic information system data for analysis. They find most of their applications in the humanitarian sector in the field of climate modelling and monitoring of geological risks (as used, for example, by ACAPS). Another family of quantitative methods are ‘composite indicators’, which transform various indicators from a range of sources for easy cross-comparison and aggregate the data to produce an overarching likelihood value (index) for overall risk. They are widely used where there is a need for categorisation of a risk occurring (e.g., high risk vs low risk) rather than precise estimates (as used by the Cambridge Centre for Risk Studies, FAO, ISDR, OCHA, UNHCR, UNICEF, and others).

Qualitative methodologies are used to assess long-term vulnerabilities and other contextual data that may affect a particular community (e.g. when there is a risk of a communicable disease outbreak where environment-specific issues may be vital). The benefit of qualitative methodologies is that they uncover detailed information on a particular environment. A common framework requiring such data is vulnerability and capacity assessments to evaluate vulnerability, coping capacity, and risk. These assessments are used by organisations such as the IFRC and Oxfam (Chiwaka and Yates n.d.; Hammer et al. 2019; Morchain and Kelsey 2016; ProVention Consortium 2010; IFRC 2007).

Methodologies that generate both quantitative and qualitative data fall under the mixed category. These have the potential to provide various forms of data (Asian Disaster Preparedness Center et al. 2010; Baharmand et al. 2017).



ANALYSIS: BARRIERS USING RISK ASSESSMENT METHODOLOGIES

Interviews with risk experts revealed that, although the methodologies may be available and generally sound, there are still widespread barriers for many humanitarian actors to using these risk methodologies. The appropriate utilisation of the various tools available is the main challenge.

Across the network of humanitarian risk assessment actors, two major capacity deficits that prevent the widespread adoption of probabilistic risk assessment methodologies are (1) a lack of technical staff capabilities and (2) a lack of available data sources.

The lack of technical staff capabilities includes underutilisation of analytical frameworks, inadequate training of employees, and a lack of subject matter experts, applied statisticians, and data practitioners, as well as other risk assessment professionals. To improve the accuracy of risk assessment tools, the assessors themselves need to be better equipped to use them. Traditionally, face-to-face, qualitative-type methodologies have been favoured in the humanitarian sector, while probabilistic methods only started gaining traction in the last decade (Read et al. 2016). As emerged during interviews with risk experts, a reason for this bottleneck is limited donor funding. Once an organisation's technical capacity is improved, investment can then be made to increase the analytical accuracy of its risk methodologies.

The second capacity deficit is linked to the challenges faced by humanitarian actors in locating actionable data sources, including a limitation in access to primary data, poor or inconsistent monitoring of events that can potentially turn into hazards, and an overall lack of industry standardisation in determining indicators and utilising a methodology (Subrahmanian and Kumar 2017). This leads to data quality control problems, including unreliable data and the inability to verify datasets. Another fundamental problem is the set of gaps in humanitarian-specific probabilistic models, including metrics to measure man-made hazards such as conflict, internal displacement, or civil unrest, as compared to natural hazards, which can rely on more standardised scientific modelling frameworks.

RECOMMENDATIONS

A lack of humanitarian risk analysis is a clear disadvantage for all stakeholders working to respond to and pre-emptively plan for hazards. For humanitarian actors to increase their impact, the areas of capacity deficit need to be addressed. This report identifies three areas where improvement would maximise both sectoral and organisational capacity with regard to humanitarian risk assessment: increasing partnerships, building operational capacity, and improving analytical solutions.



Increasing partnerships, creating an ecosystem

Capacity can be improved by increasing partnerships among humanitarian risk assessment actors and ensuring a coherent use of probabilistic risk assessment methodologies. The goal is for organisations to create an ecosystem of available data sources and probabilistic assessment tools to share among humanitarian actors. These partnerships could be inter-donor collaborations with the pooling of funds earmarked for risk analysis.

Such collaborations would better equip the sector to address larger and more complex hazards and could also be a driver of more local partnerships as a result of increased operational coordination and resource distribution management. At the centre of the actors' ecosystem is group two, humanitarian risk assessment organisations, who could cross-coordinate on methodological, analytical, and modelling frameworks to improve the accuracy and rigour of their risk assessment capacities. This group of actors could engage private sector organisations for data consulting to ensure high quality of information and also partner with think tanks and governments where appropriate. At the operational level, humanitarian organisations working directly with crisis-affected people could cross-coordinate to better understand their own resource and aid distribution in any geographical landscape, which would improve overall response when hazards do occur.

With stronger vertical integration, actors could coordinate and cooperate up and down the chain of humanitarian risk assessment. On the operational level, actors feed into the analytical system by participating in more data monitoring and collection in addition to aid delivery. This would, in turn, improve the robustness and accuracy of the work of risk assessment agencies, ultimately improving the response mechanism of humanitarian responders.

Building organisational capacity

For radical change to take place in humanitarian risk assessment, each actor needs to improve and build its own organisational capacity. With regard to group two, the technical capabilities of staff need to be increased. Organisations can improve their in-house analytical processes by hiring data scientists, statisticians, econometricians, and other specialists.

A potential challenge resulting from this is unnecessary competition within this group and possible duplication of efforts, with multiple agencies providing similar services. In line with partnerships, a better approach might be for risk assessment actors in groups one and two to outsource more challenging modelling to specialised agencies. Lastly, building organisational capacity relies on ensuring transparency in risk analysis to encourage good practices across the sector.



Increasing methodological and analytical capacity

For the humanitarian risk assessment sector to increase capabilities, there needs to be an overall improvement in the methodological capacity of actors. The first recommendation is to prioritise the collection of data from reliable sources. This could include using existing, open-source, back-tested data at each stage of analysis or pooling operational data from multiple humanitarian actors into a centralised database. For risk calculations that are human hazards, one expert has recommended creating a more standardised and robust humanitarian-focused methodology. To achieve this, it may be necessary to identify better operational data collection and monitoring mechanisms, including partnering with operational agencies to help with the data collection process. This could include sourcing or better utilising already existing operational reports and datasets such as baseline surveys, beneficiary profiles, and demographic information, which NGOs already routinely prepare, as well as reports like impact evaluations or vulnerability studies. Such reports can also provide insights into the potential impacts of a man-made hazard. If the data streams used by risk assessment actors are improved, then not only will their modelling and estimations become more accurate, but it will also justify upskilling the assessors themselves to better handle the more robust incoming data.

