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## ACCESSIBILITY OF MULTILINGUAL INFORMATION IN CASCADING CRISES

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### 1 Introduction

Information and communication systems and technologies are critical infrastructures within today's global society. Ensuring that they are accessible for all is paramount in cross-border and inter-cultural emergency prevention, response, and risk reduction. This is particularly relevant in the case of people with disabilities (PwD), who tend to be among the most disadvantaged populations during emergency situations (Surujlal and Gaede, 2014).

According to recent statistical data, of the 1 billion people that live with disabilities worldwide, around 20 million are affected by conflict or disaster, and approximately 6.7 million have been forced to leave their homes (OCHA, 2016). Besides, emergency situations are likely to result in an increase in the number of people with disabilities in the affected area (ibid.). This undeniable reality has led to multiple initiatives, both at national and international level, to ensure that PwD have the same access to emergency response as the general population. These initiatives advocate, among other aspects, that PwD should be aware of how to prepare an emergency plan (FEMA and American Red Cross, 2004) and that they must be given the same information provided to those without any impairments (FEMA, 2013; 2016, p. 3, p. 20). In relation to the latter, states and organizations endorsing the *Charter on Inclusion of Persons with Disabilities in Humanitarian Action* in the framework of the World Humanitarian Summit (WHS, 2016) are committed to

work towards the elimination of physical, communication, and attitudinal barriers including through systematic provision of information for all in planning, preparedness and response, and strive to ensure the accessibility of

services including through universal design in programming, policies and in all post-emergency reconstruction.

(2016, p. 3) [or 2016, clause 2.4.c]

For PwD to be able to use those communication services, however, the content needs, above all, to be in a language that they can understand. In this sense, O'Brien *et al.* (2018) distinguish two levels of accessibility of information services in crisis situations: Content may be accessible (i) if it is translated for those who need it into a language that they can read or hear, and (ii) if people with special needs can actually consume it. In the present chapter, while placing special emphasis on the latter, we explain how both levels of accessibility are, in fact, interconnected, and how an individual might be 'informationally' disabled as well simply due to the lack of sufficient competence in a given language. As stated in *The Signal Code*, information 'is a basic humanitarian need that should be afforded protection equal to other such traditional needs as food, water, shelter, and medical care' (Greenwood *et al.*, 2017, p. 6), both through *equitable* provision of communication infrastructure and capacity, and by removing cultural, linguistic and other barriers to humanitarian information, which includes supporting translation (*ibid.*, p. 51).

In the sections that follow, we first discuss the different ways in which someone could be vulnerable or 'disabled' in the event of an emergency, referring to the communication needs that different communities might have in such a situation. Then, we provide an overview of the most popular recommendations on how to meet those needs by rendering information accessible, why it would be desirable to follow them in disaster preparedness and mitigation, and by whom. Finally, in the core section of the chapter, which precedes our concluding remarks, we explore how key stakeholders in cascading crisis situations (the affected community – including functionally, culturally and linguistically diverse individuals – and humanitarian actors) might benefit from or contribute to the production of multilingual accessible information at different stages of a community's response to a crisis.

## 2 Being vulnerable or disabled in a cascading crisis

If we consider the Hyogo Framework for Action's definition of vulnerability, endorsed by the *Sendai Framework for Disaster Risk Reduction*, as 'the conditions determined by physical, social, economic and environmental factors or processes, which increase the susceptibility of a community to the impact of hazards' (UNISDR, 2015, p. 10),<sup>1</sup> one may inevitably think of people with disabilities as a clear example of a vulnerable population in the first place. Indeed, the *International Strategy for Disaster Reduction* (UNISDR, 2017, p. 91) indicates that people with physical, cognitive and sensory impairments can be at a higher risk of injury or death from disasters and, therefore, in greater need of help. Requirements in terms of assistance during crises might depend on each person's vulnerability. We refer to some of them here for illustrative purposes and with no claim of being exhaustive:

- Mobility-impaired individuals (e.g. inability to walk, to move quickly) might require accessible services including transport or replacement mobility aids.
- People with sensory impairments such as inability to see will need assistance in following routes, as well as information in alternative formats such as braille or speech.
- Hearing-impaired individuals will benefit from having sign language interpreting and having spoken information also presented in written format (e.g. warnings posted).
- People with cognitive disabilities such as processing deficit in terms of communication, language or memory will require humanitarian personnel to be patient, provide help with filling out forms or communicate through writing instead of orally.

It also worth noting that disabilities might be permanent (due to a long-term condition or to ageing) or temporary. Temporary disabilities, which have the potential of being overcome with time, may have been acquired before the disaster, caused by the crisis itself, or derived from one of its cascading effects. In addition, PwD might be local or foreign residents in the area affected by the crisis who could be either directly impacted or part of the humanitarian community. For instance, there might be impaired volunteers or humanitarian professionals from disability-related institutions who have been trained to offer assistance to members of their respective communities in the event of an emergency or a disaster. Furthermore, at the moment of the event triggering the crisis, there might be foreign visitors with disabilities in the area who might also be in need of assistance or decide to join volunteer response activities. In such a context, which would not necessarily be out of the ordinary given today's global society, humanitarian aid might need to meet the requirements of a heterogeneous community with members that represent a wide functional diversity and who are also culturally and linguistically diverse (CALD).

Yet, vulnerability is not solely linked to a medically-recognized condition or visible form of impairment. Experiencing a crisis might have different effects on individuals depending on their multiple social identities. For instance, a person's gender, age or sexuality might make him or her particularly vulnerable during crises and lead to longer recovery times, or a higher risk of injury or mental trauma (Blanchard *et al.*, 2017). Likewise, someone might find him or herself in a vulnerable situation as a result of the crisis environment itself; for example, being cut off from communications or being prevented from accessing safe places due to the crisis. For this reason, especially in the context of humanitarian emergencies, as suggested by Rohwerder (2014, p. 169), the term vulnerable should not be used to indicate only helplessness on the part of a given individual, but rather to reflect the scale of the challenges that a person faces. In this sense, speaking a different language from that of the disaster-stricken region or simply coming from a different cultural background could make the person 'informationally' vulnerable or disabled, given that accessing needed information would represent a challenge in its own right unless translation and/or interpreting services were to be available.

A supplementary challenge could arise if the disaster-stricken region has more than one official language and the response efforts are coordinated by those who speak only one or none of a multitude of local languages. If, in addition to the above, the informationally vulnerable person has a recognized form of impairment (either prior to the crisis or acquired as a result of it), his or her degree of vulnerability, in terms of the challenges faced, could also increase exponentially.

According to Blanchard *et al.* (2017, p. 4), cross-sectionality (also known as intersectionality) is ‘the recognition that social identities will often overlap, and increase or decrease a person’s vulnerability accordingly’. In the framework of this chapter, we are interested in the particular cross-sectionality described above, which occurs when we jointly consider the vulnerabilities and needs of functionally, culturally and linguistically diverse (FUNCALD) communities, especially in the context of access to information in a crisis situation.<sup>2</sup> The next section highlights well-known accessibility-oriented approaches and best practices that the humanitarian community could take into consideration, and puts forward a number of reasons why doing so would be beneficial for all, including both individuals affected by the crisis who are FUNCALD and translators in their role of humanitarian actors.

### 3 Creating accessible (digital) information for an effective cascading crisis response

In the event of a crisis, as Njelesani *et al.* (2014, p. 86) state, ‘the assumption cannot be made that provisions made available to the public will reach persons with disabilities, or that people will automatically have equitable access to whatever is made available’. These provisions may include, among others, specific information-sharing measures, services and devices for the event of a disaster. Surprisingly enough, the Grand Bargain Initiative,<sup>3</sup> whose signatories are committed to ensure that the needs of disaster-affected populations are heard, does not highlight the need to guarantee access to information to PwD. What is more, a recent Australia-based study by Howard *et al.* (2017) suggests that PwD tend to rely on other individuals (particularly carers and family members) to receive disaster-related information, rather than accessing it firsthand (*ibid.*, p. 142).

One of the most popular approaches aimed at avoiding this or any other situation of inequality regarding communication access, also referred to in the aforementioned *Charter on Inclusion of Persons with Disabilities in Humanitarian Action*, is to follow the principles of Universal Design (UD) (Connell *et al.*, 1997). This would imply (i) designing the communicational and interactional content and services to be *simple and intuitive, flexible* (i.e. adaptable for diverse users and user applications), *equitable to use* (i.e., equivalent, non-marginalizing, despite adaptations), and *physically easy to access and operate*; (ii) giving *perceptible* information; and (iii) *preventing errors* or allowing for quick and easy recovery from them. UD, in turn, as generally acknowledged in prior work (Galitz, 2007, pp. 625–650; Ó Broin, 2004; Rush, 2018), makes for content that is easier to translate and would, therefore, facilitate quicker access to translated information by those in need.

The principles of Easy-to-Read and the use of Plain Language are also widespread and covered by multiple national and international public recommendations. Examples may include the recent Spanish norm on Easy-to-Read guidelines (AENOR, 2018) or the European standards for making written, video and electronic (i.e. web-based) information easy to read and understand (Inclusion Europe, 2014), to mention just a few. These standards suggest, among many other aspects, not using serif fonts or italics, using large writing, keeping punctuation simple and sentences short, and avoiding difficult words. The benefits of applying these principles for FUNCALD communities have been noted by Wiley (2012, p. 16), whose study of the literature revealed that many of the issues which hamper communication for people with intellectual, visual or hearing impairments are shared by people who are not English native speakers. Similarly, after consulting different CALD community organizations and cultural groups, support services and forums operating in disaster contexts, she found out that much of the content provided in written and electronic forms by governments was very difficult to translate because of the technical nature and complexity of the writing, concluding that the principles of Plain English and Easy-to-Read should be applied to any resource that is to be translated from English into another language (*ibid.* pp. 18–24). In the same vein, a recent study by O'Brien *et al.* (2018, p. 634) examined five national approaches to disaster management in order to elicit information about language support in national crisis situations. The study reveals that the importance of using clear language for those with literacy challenges or low language competence was mentioned in three of the five approaches, but only superficially. Once more, applying accessibility-oriented best practices may reveal itself as favourable both for disaster-affected communities and for translators dealing with crisis-related documents.

Good structure and organization are key UD principles too, particularly in large, complex, non-linear documents. Electronic formats provide powerful semantic, presentational, navigational and cross-linking mechanisms. If used wisely and sensibly, documents can be highly accessible, as information would be easily found and used. On the contrary, if those mechanisms are ignored or used without proper judgement, new barriers can be erected for many. That is why adhering to international standards on how to make digital information accessible, such as the Web Content Accessibility Guidelines 2.1 (WCAG 2.1) or the Digital Accessible Information System (DAISY),<sup>4</sup> is equally relevant for ensuring barrier-free communication. Digital content that is made accessible should also remain accessible (or increase in accessibility) in the process of localization. In order to do so, it is crucial for those involved in the translation process to know what makes certain content accessible. This implies, first of all, understanding what information is conveyed by different user agents<sup>5</sup> and how the content can be used and responds to diverse forms of user input. In addition, it requires certain technical competences, including theoretical and practical knowledge of accessibility standards, recommendations and guidelines regarding digital content and information.

For instance, in the context of web-based information, ignoring the importance and function of non-visible information such as alternative texts for images,

invisible labels for input controls, and meta-information such as document titles or document languages can make the content inaccessible. The new Success Criterion 2.5.3: *Label in Name*<sup>6</sup> from the WCAG 2.1 (Kirkpatrick *et al.*, 2018) can serve to illustrate the importance of having the aforementioned knowledge and skills. Take the need for users with motor disabilities (or unable to operate their hands due to the crisis) to input information through speech recognition in an emergency form via the internet. If the visible text or image label of the input control does not match that of the accessible (sometimes invisible) name of the control, it will be unusable through speech input. In this sense, a translation tool<sup>7</sup> should be able to extract and present the accessible name for the translator, as well as indicate how it is linked to the appropriate graphical user interface (GUI) component. Ideally, the translator would be advised by the translation software or by a QA tool about the need to ensure that the visible GUI label and the accessible name match.

Finally, if in addition to the general recommendations outlined above, we consider current best practices for internationalization of content,<sup>8</sup> creating multilingual, digital, accessible information would imply producing original content (i) that can be accessed through different devices and provides for lower bandwidth, (ii) that uses standards and universal conventions, (iii) that is easy to read and/or operate, and (iv) that can be readily adapted to a different language and culture wherever necessary.

In our view, the application of Universal Design, Easy-to-Read, internationalization, and accessibility standards would be desirable in crisis communication with FUNCALD individuals for several reasons. First, it is beneficial for all crisis-affected individuals, as they might all experience disability in one way or another. Second, as noted in the previous section, PwD may also act as humanitarian actors, and access to all relevant information should be guaranteed. Third, not providing accessible information to PwD in particular could contribute to the cascading effect, either by neglecting the needs of this group as a whole or by increasing the helplessness and stress experienced by carers and the humanitarian community, who would be compelled to try to collect additional crisis-response information specifically targeted to that group. Fourth, embracing a design-for-all approach for the production of crisis-response content facilitates a faster and more effective translation process, thanks to reduced ambiguity, higher readability, increased textual cohesion, and multimodal coherence.

#### 4 The importance of cross-language accessibility in all stages of a crisis

All in all, designing content with accessibility in mind should be a mindset adopted at all levels (governmental and institutional), by all actors involved (content owners, translators and the crisis response community, including responders and the humanitarian aid sector) and throughout disaster risk reduction, response and recovery. Concretely, Faulkner (2001) established six main stages in a 'community's

response to a crisis', which will allow us to structure this section's discussion of the importance of cross-language accessibility in cascading crises:

- (1) pre-event;
- (2) pre-crisis or prodromal;
- (3) emergency;
- (4) intermediate;
- (5) long term (recovery);
- (6) resolution.

In order to explore the implications of accessibility in the above stages, we will consider three kinds of stakeholders in relation to information flows:

- C1. The crisis response (officials and voluntary) community, including translators and intercultural mediators, either local or foreign, who must access information – produced by governments, civil society and international coordination systems – aimed at understanding the affected area and people, in order to make the most of their resources (infrastructure, maps, knowledge, experts), move around appropriately and help as many people as possible;
- C2. The crisis-affected population as a whole.
- C3. The PwD community as a group within the crisis-affected population. Among these, we can take into account three main roles:
  - C3a. PwDs as beneficiaries of specific information and services, who need to be aware of the situation at every moment and receive essential, possibly even life-saving information, and to communicate their own situation, conditions and needs.
  - C3b. PwDs as representatives of all individuals (as direct beneficiaries) in planning for crises.
  - C3c. PwDs as contributors to better preparedness, helping produce more usable information and communication processes.

In what follows, we will examine how cross-language accessibility can impact these stakeholders in the (i) pre-event, (ii) prodromal and emergency, and (iii) intermediate and recovery stages, before the resolution of the crisis. The C-codes presented above will be used to refer to the aforementioned community categories and roles whenever necessary.

#### 4.1 *Pre-event*

The 'pre-event' stage is about increasing readiness by means of prevention, assessing where the main risks and vulnerabilities in a system are, reducing potential hazards and risks as much as possible, and preparing the system for the response to crises. It also includes promoting a culture of safety and prevention, disaster-risk awareness and education, system maintenance, resilience and responsible citizenship, as stated

both in the Hyogo (2005–2015) and Sendai (2015–2030) frameworks for Disaster Risk Reduction, known as DRR (UNISDR, 2015).

In relation to this stage, we will mainly look at three aspects: Cultural-systemic elements, disability preparedness, and international humanitarian coordination. The specific consequences of making content and services accessible through specific actions will be dealt with when discussing the later stages of a crisis (prodromal and emergency, and intermediate and recovery) in Sections 4.2 and 4.3.

#### 4.1.1 Culture and education

Providing for accessible content and interactions in the event of crises typically involves a cultural-systemic change that foregrounds a Design for All approach. This means not only considering the specific risks and vulnerabilities (UNISDR, 2017, p. 93) of as wide a range of functionally-diverse people as possible – rather than thinking of the unreal ‘average’ user – but following the seven principles of Universal Design previously referred to in this chapter. The Design for All strategy must start with education and a proactive rights-based approach for DRR for people with disabilities, including local and visiting people not speaking the official or working languages of the country or region (C3a). Having a foreign, non-official, or minority language or culture, as well as disabilities, are common cross-sectional sources of inequities in access to education, preparedness and opportunities for community participation (Samant Raja and Narasimhan, 2013, p. 4).

Education and information designed in inclusive formats from the start, which necessitates participation and feedback from the communities of PwD (C3c), is not only the best way to reduce vulnerability for those communities. It is also the most cost-effective method, as it avoids the need for redesign or the development of multiple versions for different target groups, it prevents breaches of those communities’ rights (O’Brien *et al.*, 2018, p. 628) – and ensuing lawsuits –, and it makes both those communities and the population in general (C3b) more resilient.

Common perception is that inclusion and accessibility only matter to a small percentage of the population and thus are not cost effective. Leaving aside the fact that persons with disabilities are not a small and irrelevant percentage, accessible and disability inclusive approaches in fact benefit many others. Elderly persons are one of the most affected groups in a disaster or emergency situation. Aging and disability are linked with each other, and many persons develop disabling conditions as they age including limited mobility, low vision, and hearing difficulties. They will significantly benefit from physical and communication accessibility in disaster preparedness, evacuation, relief, and recovery. Similarly, providing information in multiple formats beyond text such as graphical and oral formats can make this important information available and accessible to people with low or no literacy as well as children.

*(Samant Raja and Narasimhan, 2013, p. 6)*

The same applies to ‘improving language access’ to education, preparedness and community participation, which ‘can be viewed as a risk reduction tool, and thus contributes to overall community resilience’ (O’Brien *et al.*, 2018, pp. 627–628). The combination of translation and accessibility can play a larger-than-expected role. On the one side, translating crisis-related educational materials and making them accessible can broaden the learner base and reach more users (and their families). On the other, encouraging the learning of other languages by PwD can help these become future translators, as well as accessibility evaluators for translated content (C3c). What is more, analysing educational content and methodologies both to make them accessible<sup>9</sup> and to translate them can feed off one another (Torres-del-Rey and Rodríguez Vázquez, 2016, pp. 975–977). Both approaches are excellent ways in which to improve the content’s general usability (clearness, logic, consistency, adequate structure, and so on), pedagogical soundness, and correctness for everyone (C2).

A *twin-track* approach, as advocated for disability inclusiveness by many (Buscher and Pearce, 2014; Ito, 2014; O’Meara *et al.*, 2012, p. 6; Rohwerder, 2014; Samant Raja and Narasimhan, 2013; Stork-Finlay, 2014; van Ek and Schot, 2017) can be very useful to effect cultural change in disaster education and preparedness as regards linguistic, cultural and functional diversity. A *twin-track* approach aims for inclusion – rather than tokenism (O’Meara *et al.*, 2012, p. 4; UNISDR, 2017, p. 93) – at both the systemic and the individual level, particularly since targeted groups are not homogeneous (Samant Raja and Narasimhan, 2013, p. 29). This means not only mainstreaming general, ordinary and specialized services (translation, use of assistive devices, and other inter-linguistic and inter-semiotic modes like sign language, Braille, augmentative and alternative communication, and so on), but (i) enhancing the empowerment of persons with disabilities and ‘other’ languages and cultures, through initiatives especially aimed at capacity building, autonomy, improving self-representation and self-determination, and (ii) giving each one of them the means to meaningfully participate in the design of the DRR system, including education, to ultimately achieve equality of rights and opportunities for all.

The usefulness of combining both tracks to linguistic and functional disability, and of integrating linguistic and cultural mediation, can clearly be seen in initiatives such as the field-based disability inclusion workshops designed and piloted by the Women’s Refugee Commission (WRC) in partnership with UNHCR, in various places around the world:

Critical to the success of the workshops is the active participation of refugees with disabilities, bridging the gap between them and programme implementers, and highlighting their skills and capacities. (...) This approach ensures that the key actions identified are based on the expressed needs and ideas of those affected. By highlighting their own ideas in the workshop, attitudinal change among participants is promoted towards viewing refugees with disabilities as partners, not just beneficiaries, with skills and capacities to contribute to organizations and the community.

(Buscher and Pearce, 2014, p. 36)

### 4.1.2 Preparedness

We can analyse disaster preparedness of the communities not only in terms of their access to education and information, but in how inclusive the DRR system is. The way the emergency and safety options are communicated in cross-linguistic, accessible terms will be dealt with in subsequent phases, but we shall now briefly look at two ways in which PwD with a language other than the official or working ones can contribute to the general information system.

First of all, both peri-linguistic<sup>10</sup> local communities and foreign-language visitors and migrants should be allowed to test the safety and emergency information systems by being encouraged to exchange their views on their needs and by participating in disaster drills with their own communication devices. By contributing (C3c) to make safety and emergency information documents, as well as interactive applications, accessible and responsive to their own needs (C3a), PwD are also providing great benefits to the general population (C3b) for three main reasons: (i) because of the general lessons learnt in the analysis, as discussed earlier; (ii) because many accessibility concerns coincide with general usability aspects, like learnability, efficiency, memorability, error prevention and recovery, feedback, and so on (Nielsen, 1995, 2012; Shneiderman *et al.*, 2017); and (iii) because people may acquire a permanent or temporary disability due to the disaster itself, as mentioned earlier in this chapter. This, in turn, would point to another important lesson for inclusive education: It is useful to design inclusive educational information not only to embrace persons with disabilities as a complementary service, but to make everyone aware of what the needs of others may be, and, crucially, because one may be needing such accessible provisions at one point or another, as we will see later on.

There has to be a broader and a more people-centred preventive approach to disaster risk. Disaster risk reduction practices need to be multi-hazard and multisectoral, inclusive and accessible in order to be efficient and effective. While recognizing their leading, regulatory and coordination role, Governments should engage with relevant stakeholders, including women, children and youth, persons with disabilities, poor people, migrants, indigenous peoples, volunteers, the community of practitioners and older persons in the design and implementation of policies, plans and standards.

(UNISDR, 2015, p. 10)

One of the ways in which inclusive education and participation from the community can be most successful is in designing and producing Easy-to-Read materials on disaster preparedness for people with reading comprehension difficulties (due to intellectual disabilities, age (e.g. children), or conditions caused by the disaster itself, particularly if combined with potentially limited ability to read the local main language in such groups including migrants, tourists, and peri-linguistic local communities). In fact, the above-mentioned European and Spanish standards require end-user participation in the validation of Easy-to-Read content.<sup>11</sup>

Second, local, visiting and migrant persons with disabilities (C3) need to be made aware of the importance of being recorded in a registry of persons requiring assistance during disasters (Samant Raja and Narasimhan, 2013, pp. 45–46). This would probably be best done taking a strictly Design for All while discreet approach, as follows, for example:

- Asking *everyone* (C2) periodically and at crucial entry points (migrants, tourists) what their disabilities are, regardless of whether they are officially recognized as such or not – for instance, starting with simple, widespread issues like short-sightedness, walking or running disabilities, or long-term memory issues.
- Providing accessible translations of crisis-related documentation prior to the outset of a crisis into all local majority and minority languages, languages of neighbouring and migrant countries, and most widely spoken world languages.
- Allowing people to enter their details privately and being asked tactfully and in linguistically and culturally appropriate terms, as not everyone would want to acknowledge their disabilities due to fear of stigma and also different cultural conceptions of disability (Albrecht *et al.*, 2008).
- And providing the service and opportunities for disclosing disabilities in accessible multilingual forms.

An internationalization approach, as well as knowledge of accessibility aspects by translators, would be paramount for multilingual accessible disaster preparedness, requiring appropriate translation and localization of documents, interfaces and services such as ‘early warning mechanisms and priority evacuation’ (Samant Raja and Narasimhan, 2013, p. 30) information and assistance. Otherwise, crucial accessibility features can be left out or downgraded (Rodríguez Vázquez, 2016, pp. 341–354). Here, again, the combination of translation- and accessibility-oriented approaches can be mutually beneficial, as both always strive for a balance between preserving the originally intended meaning and function, on the one hand, and providing for alternative, specific and local meanings and functions, on the other. Just as functionally diverse users (C3a) benefit from having content translated and from providing feedback on the utility of the translation and on content left out from translation (C3c), translators and interpreters (C1) can gain great knowledge of the actual needs of persons with disabilities if they become involved in participatory approaches, as described above, thus engaging in what is known as user-centred translation (Suojanen *et al.*, 2015). Connecting these stakeholders would similarly provide an opportunity for these communities to build common networks to address specific DRR and alert strategies.

#### 4.1.3 International cooperation

There are two other groups that would greatly benefit from multilingual, accessible content and services, which in turn would be advantageous for all. First, those

in the international humanitarian community (C1) who have certain disabilities and speak alternative languages, and whose collaboration may be essential not only because of their particular crisis-related and humanitarian expertise, but also because PwD can play a fundamental role in the creation of content and testing it for accessibility (C3c). Second, translators with disabilities, who, as ‘specialized’ users, need to analyse, interpret and adjust the meaning and intentions of content by fitting them into a different linguistic and cultural system. Both groups within the humanitarian community (C1) can help in identifying general barriers for documents and processes.

Finally, national authorities have acknowledged the need to communicate, and have ready-to-use, DRR data for international humanitarian coordination systems, including main hazards, vulnerabilities, maps of populations and infrastructures, and information on vulnerable populations (UNISDR, 2015, pp. 25–27). This means structuring and translating data into the internationally agreed-upon DRR categories. Thinking in universal and international design terms for the data categories and the input-output interface will benefit all in response and recovery stages. In this vein, the international system of categories and descriptions can be enhanced by local DRR agencies by pointing at useful information that does not fit in the current system, either for it to be included as complementary data or for the system to be enriched or modified. Translating information and experiences into both others’ and one’s own local language, culture or capacities is an excellent way to contribute to inclusively enhance the system and promote coordination and cooperation.

## 4.2 Prodromal and emergency

*Prodromal* is the detection phase, i.e. ‘when it becomes apparent that the crisis is inevitable’; where the key is removing as much risk and uncertainty as possible (Faulkner, 2001, pp. 137, 140). Here, efficient, timely communication of the inevitability of the crisis (Bell, 2011) is one of the essential aspects. However, what we will focus on in this stage is covering the informational needs for people with disabilities (C3a), which will depend to a large degree on the way information has or has not been inclusively prepared.

The Tampere Convention on the Provision of Telecommunication Resources for Disaster Mitigation and Relief Operations realized the critical importance of sharing information and telecommunication resources as early as 1998. However, currently, ICT, smartphones and related technologies like SMS and e-mail need to be inclusively embraced to produce early content, warnings, alerts and directions ‘in multiple formats across different dissemination channels’ (Samant Raja and Narasimhan, 2013, p. 37).

Critical *infrastructure* is identified as a potential amplifier of subsidiary disasters in cascading crises, which ‘provides a mechanism for spreading cascades in space and time’, and to create secondary events which sometimes are more severe than the original source of disaster (Pescaroli and Alexander, 2015, p. 65). ICT infrastructure constitutes and traverses interconnected human-made sub-systems which, on

the one hand, may offer numerous new possibilities for PwD (if designed with accessibility in mind) and, on the other, may create dependence which, in turn, might cause dysfunctionality in case of failure (Pescaroli and Alexander, 2015, p. 64). ICT infrastructure can include not only the technological channels, but also the authoring tools and repositories to make the best use of those channels, the internal structure of the information and the way in which it is produced (including translation).

The prodromal is (or should be) a pro-active rather than a re-active stage that is crucial in reducing the severity of the crisis and of damage (Boudreaux, 2005, p. 10). It can be exponentially more successful if immediate, intelligent, focused action is taken on the basis of *robust* digital content provided in the pre-event stage. Robustness (the fourth principle in WCAG 2) means allowing for redundancy<sup>12</sup> and planning for alternative content production, with a clear digital text base but always trying to use other complementary methods of communication. People with disabilities who are migrants, tourists or within a language minority (C3) must understand that probably not all their languages can be covered for preventive information communication immediately. In view of that, however, the DRR strategy must provide for prodromal *ease of translation* (including automatic translation) and for *accessible* life-saving information. The combination of both these aspects is crucial. Take, as an example, evacuation information which is in paper format and posted on streets or in accommodation premises: If a QR code is included as well (ideally also at wheelchair height, and pre-marked in Braille), or if the information is transmitted in specific notification channels or by Bluetooth proximity technologies, a digital page could be accessed – ideally well structured, clearly written and with illustrative images – and machine translated (at least, as a provisional translation) by the people in need of that information, including the alternative text description of the images. If the information is not accessible, it will also take more time and effort to be translated and accessibly published by humans, when the crisis is already well into the emergency – rather than the prodromal – stage.

Additionally, selecting key safety and evacuation information in the event of a disaster and making it digitally accessible and responsive (i.e. adapting to different formats and devices) can be essential for people to receive key alerts in a timely and efficient way. If such information is conveyed with appropriate structure, semantics, and dynamic role-assignments – for instance, by coding different sections, relations, and types of information (e.g. using `<time>` HTML elements or WAI-ARIA alert roles to indicate an imminent evacuation) and by tagging it according to specific media or required media features –, it would also be easily comprehended, filtered and transformed into other formats, including auditory or print (for example, if power is temporarily down), as needed. The *Disaster Relief 2.0* reports on the suitability of old-technologies, such as paper, in these terms:

Paper itself is not the problem: It is a durable, cheap, lightweight, and high-resolution method that requires no power to use and allows for annotations

by multiple individuals. The problem is the method of creating the content that goes onto paper.

(Crowley and Chan, 2011, p. 11)

In terms of the acute or *emergency* stage, having produced robust information both for PwD (C3) and for the international relief community (C1) is a key aspect from a humanitarian and an accessibility point of view; and the integration of translation, localization and internationalization best practices can help maintain robustness efficiently. In the networked age, 'ICTs and the collection and analysis of data are increasingly central to how humanitarian actors determine need and manage responses, as well as to how affected communities access essential services' and become more resilient (Greenwood *et al.*, 2017, p. 37): This means using open data standards (Harvard Humanitarian Initiative, see Crowley and Chan, 2011, pp. 41–42); and having structured, interconnected and semantically-annotated content and interactive elements pre-defining agreed-upon terminology, category dictionaries, and other less universal elements such as abbreviations, proper or local names, etc. All this allows for the interoperability of different systems – including those used for translation, localization and content management –, and for the possibility of (i) establishing connections between different types of data from different sources, and (ii) freeing experts from having to handle and process every piece of data, rather than focusing on interpreting them and making critical decisions based on those data (*ibid.*, pp. 10, 17–19), as it should be.

At the same time, periodically translating and recording basic national DRR information and important new data as it is produced (through translation memory or terminology database entries)<sup>13</sup>, will come in very handy for the prodromal or emergency translator, who would be able to cognitively and contextually process the time-sensitive information faster and translate it more accurately. Classifying and tagging key concepts and actions and assigning them understandable icons and images is also a good way to produce quick, basic information, but attention must be paid to appropriately localizing such icons and images for alternative cultures (Surujlal & Gaede, 2014).

Not only are people with disabilities, migrants, the elderly, ethnic minorities and tourists at high risk due to reduced mobility, speed, sensory abilities (UNISDR, 2017, pp. 90–92) and/or cognition; they are also a key source of systemic *vulnerability* (Pescaroli and Alexander 2015, pp. 61–65), potentially putting everyone at risk (C2). For example, when escape routes, exits or communication channels are not accessible, operable or clearly perceptible and understandable to some of the more vulnerable communities, such routes or channels may become saturated, obstructed or damaged for the whole population by being overused or misused, thus leading to other potentially negative consequences.

Finally, it is worth considering the comparative advantage that some PwD have over non-disabled people in certain circumstances in the event of disasters. They 'are not deprived of certain capacities – as in the case of blind people, whose

sensorial skills may provide them with a unique ability to evacuate an earthquake-stricken building in the dark' (UNISDR, 2017, p. 91). There are a few examples:

- Blind people are able to operate a mobile phone with a broken screen or in the dark.
- Those who are physically disabled and are used to using speech-to-text recognition software may be able to launch a help signal or communicate to the rescue services when a group of disaster-stricken people are trapped and unable to physically reach a smartphone.
- Deafness may make other sensory functions like sight more acute.
- Autistic people often have unique strengths like non-verbal reasoning skills, perceptual motor skills, or excellent memory (Autism Canada, 2018; Mottron, 2011).

If people who are thus functionally-advantaged in these circumstances cannot speak or read the language of the area, or if supporting universal or localized modes of communication like images are not provided, that vital comparative advantage would be lost. In short, the larger the community of potential recipients, the better for all, not only for particular functionally and/or linguistically diverse communities. Redundant and accessible information (i.e. in various languages, formats, targeting functionally and cognitively diverse people) is a fundamental DRR strategy.

### 4.3 *Intermediate and long-term recovery*

Before reaching 'resolution', the intermediate stage is 'when the short-term needs of the people affected must be dealt with ... to restore the community to normality as quickly as possible' (Faulkner, 2001, p. 140). At this point, it is vital not only to restore basic telecommunications and connectivity, but to re-produce, as quickly and inclusively as possible, information on basic needs and facilities (health, food, communication with relatives). Doing so would be easier if provisions had also been made in the pre-event stage to prepare and identify translatable information, so that it remains perceptible, operable, understandable and robust for people with disabilities.

Here again, a twin-track approach could help, by providing inclusive mainstream services but also specialized services such as translation and interpretation (including sign language), and assistive devices, which would enable disabled persons' participation in mainstream short-term and long-term recovery activities, and empower them to be more autonomous and contribute to the system (Samant Raja and Narasimhan, 2013, p. 29).

One of the best practices identified as a priority for the intermediate and long-term recovery of CALD communities after a crisis situation is getting 'community radio and migrant and CALD media up and running following disaster' (Wiley, 2012, p. 6). The media is a key stakeholder for the Sendai Framework, which can 'take an active and inclusive role at the local, national, regional and global level'

(UNISDR, 2015, p. 24), by ‘providing important information to tourists’, migrants and peri-linguistic local people about ‘the restoration of services’ and ‘safety matters’ (Faulkner, 2001, pp. 142, 145). Therefore, efforts should be made to help the media provide updated redundant information in both auditory and visual form, and in different languages, as ‘translated information alongside the English version is a good idea because, due to cultural differences, translations do not always convey exactly the same information’ (Wiley, 2012, p. 9).

Often in the long-term recovery stage, particularly for those in the local community who do not speak the official language,

a vicious cycle is set in motion as persons with existing disabilities or those who acquire disabilities in a disaster face greater inequities during recovery and reconstruction due to challenges in re-integrating into the workforce, finding accessible housing, getting access to health and social services, and increasing dependency due to inaccessible infrastructure

*(Samant Raja and Narasimhan, 2013, p. 4)*

Again, and to round up this discussion, the concept of Universal Design is more than helpful in this case. This is also true for those with acquired disabilities, who may not find themselves or the system ready to let them go back to anything close to their previous occupations, routines, livelihood, and so on. Claiming post-crisis assistance, for instance, can become extremely challenging and frustrating when persons with disabilities are required to fill in inaccessible forms (which can also be due to unclear language or culturally-specific references) or if they are unaware of alternative means of access to information and actionable elements such as forms, menus, and so on. Here, once more, education and linguistic and cultural translation can be a great asset when making all aware of people’s diverse needs, possibilities and ways of being and communicating, irrespective of – or depending on – functional and linguistic diversity.

To ‘Build back better’ – the fourth priority for action in the aforementioned Sendai Framework – means using the recovery, rehabilitation and reconstruction phase, ‘supported by strengthened modalities of international cooperation’ (UNISDR, 2015, p. 10) as a ‘critical opportunity’ (ibid., p. 21) to universally and internationally design the DRR system while enhancing the participation of functionally and linguistically diverse communities, as well as language, culture and disability mediators.

## 5 Concluding remarks

This chapter has examined the notions of disability and accessibility in the context of crisis communication. We have emphasized that, as in the case of translation, multilingual accessibility can mitigate cascading effects or even prevent them. By

highlighting the importance of adhering to accessibility-oriented standards and adopting a Design for All approach to create and translate crisis-related information, we have advocated for the development of perceptible, understandable and robust disaster communication procedures and documents, with which all crisis-affected individuals would be able to interact more efficiently.

Similarly, we have explained what it means to be functionally, linguistically and culturally disabled in a disaster environment. We have argued that the degree of vulnerability typically associated with PwD may be reduced or exacerbated in a crisis situation. Reduction or exacerbation depend on how embedded accessibility best practices are in the system, both in terms of information usability and multilingualism. We also argued that accessibility in information and communication may have the potential of preventing increased temporary vulnerability. Throughout the chapter, we have brought to the forefront the multiple facets of PwD in crisis situations: As beneficiaries of communication services, as representatives of all individuals and as contributors to better preparedness. Additionally, we have emphasized their functional advantage in emergency stages of a crisis, thanks to their inherent capacity to overcome certain obstacles in a more effective way than non-disabled individuals, thus contributing to increased social resilience. Finally, we have argued that disaster management initiatives should not only involve PwD in planning for crisis, but also offer training to relevant stakeholders, including translators and intercultural mediators, on this community's potential communication needs in crisis environments.

## Notes

- 1 This definition of vulnerability is preferred in the context of this chapter because it is in line with the current understanding of 'disability', shared by the authors, as a complex phenomenon that goes beyond body function-related impairments. See, for instance: [www.who.int/topics/disabilities/en/](http://www.who.int/topics/disabilities/en/) (Accessed 20 March 2019). In addition, the definition highlights the fact that vulnerability is directly influenced by the person's environment, as in the case of the modern concept of disability. The European Parliament (2019) also provides an interesting definition, considering vulnerable adults as those who 'are temporarily or permanently unable to manage their personal affairs or their property because of an impairment or insufficiency of their personal faculties'. However, the emphasis is on a specific population sub-group (i.e. adults) rather than the community as a whole.
- 2 We are aware (i) that an individual's degree of vulnerability and needs may also vary depending on their socioeconomic and geopolitical background (e.g. level of education, social integration, digital literacy, etc.), and that (ii) more complex intersectionality cases can emerge in a crisis communication context (e.g. children, women, ethnic minorities, etc.). However, a comprehensive analysis of these aspects in combination with disability, language and cultural factors falls outside the scope of this contribution.
- 3 'The 'Grand Bargain' is an agreement between the biggest donors and humanitarian aid organizations, initially signed on May 2016. It aims to get more means into the hands of people in need and to improve the effectiveness and efficiency of humanitarian action'. <https://interagencystandingcommittee.org/grand-bargain-hosted-iasc> (Accessed 20 March 2019).
- 4 The WCAG 2.0 were approved in 2012 as an ISO standard (ISO/IEC 40500:2012). In June 2018, the Web Accessibility Initiative (WAI) of the W3C published the WCAG 2.1

- as an official recommendation. The four WCAG 2.1 principles (perceptibility, operability, understandability and robustness) are divided into a total of 13 guidelines, which include a series of testable success criteria. Digital Accessible Information System (DAISY) 3 was approved as a NISO standard (ANSI/NISO Z39.86–2005) in 2012 too, as ‘a means of creating digital talking books for people who wish to hear – and navigate – written material presented in an audible format; many such listeners have print disabilities including blindness, impaired vision, dyslexia or other issues’. [www.daisy.org/daisypedia/daisy-digital-talking-book](http://www.daisy.org/daisypedia/daisy-digital-talking-book) (Accessed 20 March 2019).
- 5 In the context of digital accessibility, user agent refers to ‘any software that retrieves and presents Web content for users’. This may include web browsers and assistive technologies, such as screen readers. (Kirkpatrick *et al.*, 2018).
  - 6 ‘For user interface components with labels that include text or images of text, the name contains the text that is presented visually’. (Kirkpatrick *et al.*, 2018)
  - 7 Or the software preparing and processing the content for translation. See, for instance, the discussion on extracting and enriching XLIFF tools in Torres-del-Rey and Morado Vázquez (2015, p. 601).
  - 8 Internationalizing means creating content or products in a way that ensures they will work well for, or can be easily adapted for, all users, regardless of their language, culture or, region. Best practices may include separating translatable content from source code or facilitating the proper handling of different character encodings, among many others (Ishida and Miller, 2018).
  - 9 Overall, Universal Design for Learning (UDL) can be ‘an effective teaching methodology for improving the learning process for all’, (Capp, 2017) by acting upon its three main principles, that is, allowing and providing for multiple ways of: (i) Representing knowledge; (ii) Action and expression; and (iii) Engagement (*ibid*).
  - 10 In the context of this chapter, this term is used for describing *local* communities who speak, read and understand languages which are different from the official or working languages of the country or region affected by the cascading crisis.
  - 11 See, for instance, the ‘Do not write for us without us’ methodological document produced by Inclusion Europe with the support of the Lifelong Learning initiative by the European Commission: [https://easy-to-read.eu/wp-content/uploads/2014/12/EN\\_Methodology.pdf](https://easy-to-read.eu/wp-content/uploads/2014/12/EN_Methodology.pdf) (Accessed 20 March 2019) or the compulsory validation phase with PwD included in the Spanish UNE 153101:2018 EX norm: <https://revista.une.org/4/primer-norma-tecnica-sobre-lectura-facil.html> (Accessed 20 March 2019).
  - 12 In the same fashion as Pescaroli and Alexander (2015, p. 61) see the ‘need to find redundancy and reliable alternatives’ for infrastructures and activities in a crisis situation, we assimilate informational redundancy (i.e. conveying the same message using different but complementary mechanisms and languages to allow for multiple contexts of use) to robustness in content design for all.
  - 13 Basic or important information may include specific emergency provisions for PwD; appropriate alternative texts for key safety, emergency or evacuation icons and symbols; and key terminology and phraseology, both for use by the crisis response community and for communication to PwD. Consistent phrasing and terminology is fundamental for accessible messages, which can be facilitated by an appropriate use of translation and terminology resources. Besides, as information must take into account the various assistive technologies that the latter may use, it could be useful to include annotations about maximum character length, typically associated images, textual or interactional context, among others, on terminology database entries or translation memory units, if possible.

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