



## **Deliverable D3.4**

### **Common approaches between the vulnerable members of the civil society**

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**1: DHPOL**

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1	UIC	UNION INTERNATIONALE DES CHEMINS DE FER (COORDINATOR)	France
2	CBRNE	CBRNE LTD	UK
3	PPI	POPULATION PROTECTION INSTITUTE (MINISTRY OF THE INTERIOR OF THE CZECH REPUBLIC)	Czech Republic
4	DB	DEUTSCHE BAHN AG	Germany
6	UMU	UMEA UNIVERSITET	Sweden
7	DHPOL	DEUTSCHE HOCHSCHULE DER POLIZEI	Germany
8	RINISOFT	RINISOFT LTD	Bulgaria
9	WMP	WEST MIDLANDS POLICE AND CRIME COMMISSIONER	UK
10	ETICAS	ETICAS RESEARCH AND CONSULTING SL	Spain
11	SESU	STATE EMERGENCY SERVICE OF UKRAINE	Ukraine
12	PHE	DEPARTMENT OF HEALTH	UK
13	SPL	STATE POLICE OF LATVIA	Latvia
14	AGS	AN GARDA SÍOCHÁNA – NATIONAL POLICE FORCE IRELAND	Ireland
15	FFI	FORSVARETS FORSKNINGINSTITUTT	Norway
16	NPH	KOMENDA GLOWNA POLICJI	Poland

## Acronyms

Acronym	Definition
EU	European Union
CBRNe	Chemical, Biological, Radiological, Nuclear, and explosive
T	Task
M	Month
D	Deliverable
WP	Work Package
WS	Workshop
PM	Progress Meeting
SAB	Security Advisory Board
CSAB	Civil Society Advisory Board
PSAB	Practitioner Stakeholder Advisory Board
LEA	Law Enforcement Agency
CSO	Civil Society Organisation
SOP	Standard Operating Procedure
GDPR	General Data Protection Regulation
PPE	Personal Protective Equipment
RPE	Respiratory Protective Equipment

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## Executive summary

Whether they are accidental or intentional, CBRNe incidents can strongly affect the civil society. In particular, the behaviour of those who are directly involved can have a crucial impact on the CBRNe response. It is essential to understand how the measures of CBRNe responders can facilitate the engagement with members of the civil society prior, during and after a CBRNe incident to enhance CBRNe management.

The following deliverable 3.4 is part of the third Work Package of PROACTIVE that focuses on the Engagement of the Civil Society including vulnerable citizens. This report presents the findings and recommendations from a survey with civil society organisations representing vulnerable citizens. The survey was conducted with 91 participants from 20 different European countries.

The research identified specific needs, expectations and challenges of especially vulnerable citizens prior, during and after a CBRNe incident. It covered the accessibility of CBRNe related information and the different processes of a CBRNe incident including evacuation, medical triage, undressing, decontamination and subsequent after-care. In addition, the survey identified gaps between the needs of vulnerable people and approaches undertaken by CBRNe responders. These measures have already been identified in an earlier survey and interview study with LEAs and first responders across Europe. Consequently, the research presented approaches to address these gaps.

Findings implied that vulnerable groups need specific language formats (sign language, Braille, simple language, pictorial language, audio language, etc.) in their communication with LEAs and first responders. In addition, vulnerable groups rely on various aspects of assistance (e.g. acoustic guidance, attachment figures, etc.).

The research showed that CBRNe-related information material in adequate language formats is still too rarely provided by LEAs and first responders. Members of the vulnerable civil society were rarely involved in CBRNe exercises to prepare them for certain CBRNe related situations and to train the first responders to adequately respond. LEAs and first responders also insufficiently considered the specific needs of vulnerable groups in relevant SOPs.

To mitigate and clear these gaps, one of the recommendations emphasised an increased exchange between CBRNe practitioners and CSOs representing vulnerable groups. Overall, 15 recommendations for LEAs, first responders and relevant CSOs were developed. Following these recommendations can lead to a better understanding of the specific needs of vulnerable people in CBRNe incidents and to an improvement of CBRNe management.

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## 1. INTRODUCTION

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CBRNe incidents, whether accidental or caused by terrorists, can have a major impact on society. The goal of the European research project PROACTIVE is to increase practitioner effectiveness in managing large and diverse groups of people in a CBRNe environment and to provide in-depth research to facilitate the interaction between European LEAs, first responders and the vulnerable civil society. This is accomplished by fostering common approaches between European safety and security practitioners, in particular law enforcement agencies (LEAs) and CBRNe first responders. These measures have to be evaluated and validated against the needs of the civil society, especially considering vulnerable groups of citizens. Vulnerable citizens have specific needs and requirements with regard to CBRNe threats and responses. These groups reflect the most important societal aspects, in line with the European Security Model (e.g. perception of security, possible side effects of technological solutions, gender- and age-related behaviour, and disabilities).

The following deliverable is part of the third WP of PROACTIVE that focuses on the “Engagement of the civil society including vulnerable citizens” within the project. In this respect, a Civil Society Advisory Board was established to get valuable input into the project and at the same time verify the output of the project. Currently 32 experts in the field of vulnerable citizens are part of the CSAB. In the course of the project, a large number of meetings and WSs have already been held with the experts in order to coordinate certain project steps. The CSAB was also actively involved in this deliverable.

This deliverable presents the findings of a survey conducted by DHPol among representatives of Civil Society Organisations (CSOs) and relevant experts in regard to the vulnerable civil society. The survey analyses the expected special needs and expectations of vulnerable citizens in regard to CBRNe incidents. Focal aspects to be considered are the special needs with regard to information before, during and after a CBRNe incident, as well as steps to better prepare the vulnerable population (education, exercises, etc.). It is also important to understand the problems that arise in the course of a CBRNe incident, from evacuation to after-care for vulnerable people. The survey aims to identify perceived gaps across Europe between the needs of the vulnerable civil society on the one hand and the approaches of CBRNe practitioners to prepare for and respond to a CBRNe incident on the other hand. The results will lead to the identification of approaches across Europe to close those gaps. Those approaches will be set out in concrete recommendations for CBRNe practitioners and relevant CSOs.

The survey was conducted in different European countries and overall provides an up-to-date assessment of the specific needs of vulnerable citizens regarding CBRNe-related threats and crisis. It complements the former research D2.3 by DHPol, which already gave insight into the measures of European CBRNe practitioners.

## 2. KEY TERMS

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To ensure a coherent understanding of the terms used, the report defines the following key terms.

The term **CBRNe incidents** refers to incidents that occur in the context of terrorist attacks (being the main focus of PROACTIVE), natural hazards, accidents/technical emergencies or warfare. The term further refers to operations that require the specific use of CBRNe related SOPs (see below). The survey is only concerned with CBRNe incidents with a medium to high extent of damage. Those include, for example, accidents in a factory that affect a large number of persons inside and/or outside of the factory, and terrorist attacks with CBRNe substances that affect a large number of people. Minor damage cases, such as an oil spill or a household accident involving chemical substances are not within the scope of our project.

The term **Vulnerable Citizens** refers to members of the public with needs that differ from those of the average population when being affected by a CBRNe incident. This may include children, pregnant women, persons with physical or psychological impairments, chronic or acute medical health conditions or addictions, older persons with functional limitations and health restrictions, institutionalized individuals as well as their caregivers and companions. Vulnerable citizens also include persons with limited proficiency of the respective national languages or with restrictions regarding use of transportation, as well as individuals who are not willing to undress for decontamination due to religious reasons.

**Special needs** include but are not limited to restrictions in communication (sign language, interpreting, plain language, etc.) and restrictions in mobility (wheelchair, cane for the blind, acoustic signals, etc.).

**Practitioners** comprise of LEAs (typically police organisations), first responders (e.g. civil protection agencies, fire brigades, ambulance, etc.) and related stakeholders (e.g. private and public bodies, transport and logistic operators) who may be involved in a response in support of the official responders. Furthermore, the term refers to international, national and municipal authorities and Civil Society Organisations (CSOs) such as those that help persons with disabilities and crisis management.

The term **SOPs** comprises official instructions set up by an organisation or institution to facilitate their forces to operate in a standardized manner during complex tasks and responsibilities. Their aim is to assure that the performance represents quality, efficiency and uniformity to reduce misconceptions and failures. SOPs include for example fire service regulations, rescue service guidelines, official training policies and briefing information.

**Measures** are adapted to the specific requirements of each phase of CBRNe management. **Measures of prevention** or respectively of mitigation of CBRNe effects focus on risk analyses, the research on CBRNe agents, identity checks, sales restrictions, data networks and the like. **Measures of preparedness** for a CBRNe incident are amongst others the training of certain rules of conduct for first responders in danger areas, the implementation of corresponding guidelines, and population education. **Measures of response** include tasks like the detection and identification of the CBRNe agents, first aid, crisis communication with the public, quarantine and PPE. **Measures of recovery** comprise of the re-evaluation of the incident, the revision of the CBRNe SOPs and the opening of restricted areas.

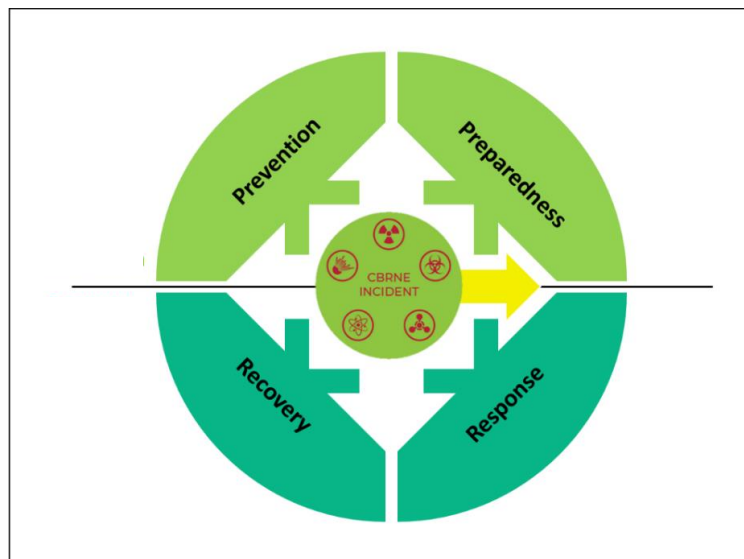
The term **Communication channels** refers to all aspects of communication in the phase of prevention and response to CBRNe related incidents. With regard to the internal communication amongst practitioners, this includes verbal and radio communication system based communication. On the other hand, media communication between practitioners and affected people on site includes social media such as Twitter, Facebook, WhatsApp and homepages as well as radio, television, newspapers and press conferences.

### 3. METHODOLOGICAL APPROACH

The following part describes the methodological approaches of the study.

#### 3.1. Research objectives

Looking at a CBRNe incident, certain phases can be distinguished from each other. Figure 1 presents the related (CBRNe) disaster management cycle that comprises the pre-incident period and the post-incident period. The pre-incident period comprises the phase in which preventive and preparatory measures are taken to prevent or mitigate the effects of a CBRNe incident. The post-incident period includes the handling of the incident and the subsequent recovering afterwards. Each phase includes a variety of measures, which are suitable for the objectives of the respective phase.



**Figure 1:** Disaster Management Cycle (adapted figure based on A.S./ON 2011)

Vulnerable citizens have specific needs and expectations regarding their vulnerabilities and the measures undertaken by first responders in the different phases. The survey analyses the needs, expectations as well as related challenges in regard to such incidents.

Thereby, the term ‘social vulnerability refers to characteristics of a person or group that affect “their capacity to anticipate, cope with, resist, and recover from the impact” of a disaster (Chen et al. 2009). However, vulnerability is not a static characteristic. “An individual is not defined as vulnerable by the nature of their vulnerability, but by their personal circumstances at the time of the emergency. [...]” (ISO 22395:2018) By understanding the special needs and expectations that create vulnerability prior to a CBRNe incident, first responders and LEAs can adapt their SOPs adequately to support capacity building and social resilience (see “social resilience” by Shaw et al. 2014). This reduces the negative impact of such incidents on the vulnerable civil society.

However, a review of guidance documents revealed that only 33 of 95 documents provided guidance for CBRNe practitioners in regard to the management of members of vulnerable groups during CBRNe incidents and even those documents provide to mainly provide generic recommendations on how to consider the special needs and expectations of the vulnerable civil society in CBRNe management (Hall et al. 2020, 18). Consequently, the survey aims to identify perceived gaps across Europe between the needs of the vulnerable civil society on the one hand and the approaches of CBRNe practitioners to prepare for and respond to a CBRNe incident on the other. The results will lead to the identification of approaches across Europe to close those gaps.

Accordingly, the following research questions are examined:

**Research question 1:** *What are the (perceived) needs of vulnerable citizens regarding information in the preparedness stage?*

**Research question 2:** *What are the (perceived) needs of vulnerable citizens with regard to information in a situation of response to an imminent CBRNe threat situation?*

**Research question 3:** *What are the (perceived) needs of vulnerable citizens with regard to scene management (triage, decontamination, evacuation, etc.)?*

**Research question 4:** *What are the (perceived) needs of vulnerable citizens in a recovery situation after a CBRNe incident?*

**Research question 5:** *What are gaps across Europe between the (perceived) needs of the vulnerable civil society on the one hand and the approaches of CBRNe practitioners to prepare for and respond to a CBRNe incident on the other hand?*

**Research question 6:** *Which approaches can be identified to close those gaps?*

To compare the results of the conducted survey with CSOs with LEAs and first responders, in the relevant sections the report refers to a former study by DHPol, which was prepared as part of the project PROACTIVE:

Arnold, A.; Carbon, D.; Siemens, M. & Görgen, T. (2020): Report on the survey and benchmarking results. Deliverable D2.3 of the PROACTIVE project.

In the following, reference is made to the study with the abbreviation “D2.3”. The combined findings will lead to the identification of approaches across Europe to close the identified gaps. In this regard, the report will formulate recommendations for CBRNe practitioners and relevant/interested CSOs that complement those in D2.3.

## 3.2. Sample design

The survey targeted representatives from CSOs and individual experts from relevant professions (such as health care or social work) which can represent the diverse vulnerable categories of citizens in a standardised survey. We aimed at this strategy since multi-national surveys among diverse vulnerable groups face well known methodological challenges (e.g. restrictive guidelines for interviewing minors, hard-to-reach members of the public, warranty of informed consent) (e.g. Kaeser 2016).

Such an approach is also recommended in other studies (e.g. CDC 2015, 11). Therefore, the presented findings refer to the perceived needs and expectations of vulnerable people as expressed by their representatives and related experts.

Inclusion criteria
<p>The quantitative standardized survey focused upon European countries represented in the PROACTIVE consortium and the Civil Society Advisory Board (CSAB).</p> <p>The survey focused on <b>stakeholders of CSOs</b> (e.g. associations, societies, aid organisations) representing one or more of the following vulnerable groups:</p> <ul style="list-style-type: none"> <li>• Children</li> <li>• Older persons</li> <li>• Persons with mental health conditions</li> <li>• Persons with mobility restrictions</li> <li>• Blind or partially sighted persons</li> <li>• Hearing impaired persons</li> <li>• Persons with no or insufficient language skills of the national language</li> <li>• Ethnic minorities</li> <li>• Pregnant women</li> </ul> <p>Furthermore, <b>experts from relevant professions</b> (e.g. health care, social work) were considered.</p>

### 3.3. Format

The quantitative and qualitative data was collected through an online survey. This online-based survey approach facilitated the access to a broad range of representatives across European countries. The target groups filled out the questionnaire online. The questionnaire took approximatively 15 minutes to complete (see Chapter 3.3.1).

#### 3.3.1. Questionnaire

In order to include consortium partners' perceptions, the different WP leaders and task partners were given the opportunity to actively participate in the design of the quantitative survey. Therefore, DHPol organised various online review meetings and presented the results during the progress meetings. The questionnaire thus reflected the interests of the entire consortium.

The final questionnaire (Appendix C) had 4 sections. The first section covered the professional background and field of activity of the participants and their respective organisations.

The following thematic block focused on general communication processes with the respective vulnerable audience within the organisation. This section allowed insights into the basic communication needs of the vulnerable civil society.

The next thematic block was dedicated to the quality of disaster management education within the respective CSO. The questions were related to the general education of related topics such as first aid and calling for help. Attention was paid to the estimated ability of members of the civil society to cope with disaster situations in general.

The last thematic block dealt specifically with CBRNe situations and the perceived behaviour of the represented vulnerable citizens regarding certain aspects (e.g. decontamination process, medical triage, etc.). Since CSOs usually do not have contact with the topic CBRNe, the survey was designed to provide a guidance through a fictional CBRNe event. The guidance approach included short describing passages and illustrations of certain CBRNe methods. In this way, insufficient or even wrong assumptions regarding CBRNe incidents ought to be reduced to ensure as accurate assessments as possible.

The questionnaire included single choice questions and multiple-choice questions. The form of scales was further used to put certain aspects in relation to each other. In addition, some of the questions offered the possibility to provide additional answer options in free text form.

### **3.3.2. Accessibility**

It was assumed that some of the participants would themselves belong to one or more of the vulnerable groups they represent. Therefore, accessibility of the questionnaire was a central focus of the survey.

First of all, it was not expected that all CSOs are accustomed to work in English. To facilitate the accessibility of the questionnaire among participants of different European countries, the entire survey and all related information was translated. In cooperation with all partners of PROACTIVE, the online survey was offered in nine different European languages among which all participants could choose: Czech, English, French, German, Latvian, Norwegian, Polish, Spanish and Swedish.

Furthermore, based on the learning outcomes from a number of webinars on vulnerable civilians in digital environments, the survey design considered not only the language comprehension but readability as well. Further lessons learned could be taken from the CSAB WS on the 1st October 2020.

In addition to the overall linguistic design of the questions, the questionnaire had to facilitate the use of linguistic assistants such as screen reading and screen magnification programmes. This kind of software enables particularly blind or visually impaired persons to access the information on the survey webpage. Since such software cannot read illustrations, all provided pictures in the questionnaire were additionally described in writing. It was also decided not to provide additional information as a PDF on the homepage of the online survey. The information was made accessible directly on the page.

Finally, selected members of the CSAB were involved in the usability check of the webpage that proved that the undertaken measures would allow different members of the vulnerable civil society to access and complete the online survey without limitations.

## 4. DATA COLLECTION

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The following part describes how the quantitative survey was conducted.

The **survey period** was extended twice. The survey period extended over nine weeks (**06.10.2020 – 06.12.2020**).

### 4.1. Recruiting survey participants

The target group of the survey was composed of representatives of CSOs and relevant experts. In this regard, all PROACTIVE partners were asked to provide a list of relevant organisations that represent at least one of the categories defined in Chapter 3.2 in their respective countries and additional countries where possible. The criteria and the procedures used to recruit the participants in the survey followed the guidance sets by D10.1: *H – Requirement no 1: The procedures and criteria that will be used to identify/recruit the research participants* (Marsh 2019).

DHPol provided the following documents, which were passed on to potential participants:

- An invitation letter (Appendix B - Invitation letter);
- A detailed information sheet;

The documents ensured that all participants were informed extensively about the project, the survey itself and data handling prior to the survey itself. To increase the willingness to participate in the survey, all documents were translated into the nine languages offered in the survey in cooperation with the respective partners. A corresponding e-mail template was also adapted to these national languages. This enabled DHPol to support the partners in their countries by contacting participants outside the English and German speaking regions in a more targeted way.

The survey was distributed using the following approaches:

- All PROACTIVE partners were asked to distribute the survey documents to relevant contacts within and beyond their countries. Candidates in 42 of the 47 countries of the Council of Europe were informed about the survey. In total, records suggest, that the PROACTIVE consortium reached out directly to at least 859 potential candidates (see Appendix D: Participants contacted in Europe). In this context, forwarding to suitable contacts within the network was always requested.
- Some partners additionally shared the survey request within their business and private social media networks (see Table 1).
- UIC continuously promoted the survey on PROACTIVE's social media channels (e.g. Twitter and LinkedIn); at that time, the PROACTIVE Twitter account had 514 followers, the LinkedIn account had 100 connections (see Table 1).

**Table 1:** Potential survey participants contacted via social media channels

Country	Connections	Medium	Reminders	Responsible partner
France	800	Twitter	2	UIC
France	500	LinkedIn	2	UIC
France	1554	Twitter	2	UIC
France	2457	LinkedIn	2	UIC
France	514	Twitter	3	PROACTIVE
France	100	LinkedIn	3	PROACTIVE
Spain	unknown	Twitter	2	ETICAS
Sweden	unknown	Twitter	2	UMU

- The CSAB was made aware of the survey during the CSAB WS on 1<sup>st</sup> October 2020. UMU later forwarded the survey to all 32 CSAB members (as of November 2020) with a request to forward the survey within their networks. On enquiry, it was confirmed that at least a couple of CSAB members shared the request internally within their organisations.
- UIC forwarded the survey link to all partnering projects and asked the respective coordinators to share the information with their networks; eNOTICE, BULLSEYE, Healthy Gateways, NO- FEAR, PERSONA, TRANSTUN, SHOTPROS.
- PROACTIVE partners forwarded the survey documents to mailing and newsletter lists of CSOs (e.g. VSC Alliance Newsletter, EU Healthy Gateways newsletter)

Most of the inquiries were sent to the representatives in personal form. Generic mail addresses and anonymous mail distribution lists were avoided as far as possible. In addition, several reminder phases were implemented to increase the number of participants. Within this framework, all participants already contacted by DHPol and other PROACTIVE partners were reminded of the ongoing study three times. Also, during the survey period, UMU reminded all CSAB members to participate several times.

## 4.2. Promotion of CSAB

The survey was further used to inform all potential participants about the CSAB. In this regard, e-mails as well as the website of the survey referred to the CSAB and offered relevant contact details. Despite the immense number of potential candidates contacted during the data collection period, only very few new organisations decided to join the CSAB after completing the survey. Occasionally, assistance for PROACTIVE was offered, nevertheless without an official agreement. As a consequence, the recruitment of new participants continues to be a challenging process, where the number of confirmed participants is not necessarily reflecting the recruitment efforts by the PROACTIVE partners.

## 5. ETHICS AND SAFETY

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The quantitative survey received the Project Ethics Officer Approval Reference:

**PROACTIVE/PEO/5/28.07.2020**

The survey was conducted by DHPol whose research activities are carried out within the framework of national and European data protection guidelines for security research. Therefore, all data was handled securely in line with the German national data protection legislation, the General Data Protection Regulation of the European Union (GDPR) and the requirements reflected in D8.1 (Clavell et al. 2019) and D8.3 (Marsh et al. 2020).

Before accessing the online questionnaire, all participants electronically -and affirmatively- agreed to an informed consent form that comprised all aspects of data handling and ethics and safety. Since the questionnaire was designed to allow accessibility in regard to multiple aspects (see Chapter 3.3), all participants were enabled to read and understand the informed consent form. Furthermore, at the end of the questionnaire, all participants electronically agreed to submit their responses to the research team officially.

Participants were offered the option of cancelling the survey at any time without giving a reason (see participant difference in Chapter 6.1). In addition, they were informed about the possibility to abstain with regard to individual questions. The participants were given the option of not answering individual questions with the options "I do not know" and "I prefer to skip this question". This was particularly important to encourage participants who were not familiar with CBRNe to respond only to those questions where they could provide valuable insights regarding the needs of those they represent.

The questionnaire only collected anonymous data. It is therefore not possible to assign the questionnaire to a specific person. Participants could voluntarily indicate the name of their CSO. However, the data was only used during the recruiting of survey participants to identify organisations that have already participated in the survey (see Chapter 4.1). In the evaluation, this assignment was not taken into account. Consequently, no statements can be assigned to a specific CSO.

Given the cross-national character of the questionnaire, the research was undertaken with an eye towards sensitivity across languages, cultures and vulnerabilities. Therefore, information about the study was designed in an appropriate form and easily understandable, non-offending language. The formulation of terms related to vulnerability followed the recommendations of the AMA Manual of Style (Christiansen et al. 2020<sup>1</sup>). Additionally, all documents related to the study were reviewed by the Project Ethics Officer.

Contact details of the research team, their ethical and data officer at DHPol and the Project Ethics Officer were provided for any queries in all provided documents and at the end of the survey.

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<sup>1</sup> Chapter 11.12.4 is dedicated to age related formulations whereas Chapter 11.12.6 deals with "Terms for Persons with Diseases, Disorders and Disabilities".

## 6. RESULTS

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The following chapter presents results of the survey.

Chapter 6.1 will describe the sample of the survey. In this context, the CSOs which completed the survey are presented regarding their area of activity, their staff and financial structure and their willingness to cooperate.

Chapter 6.2 and 6.3 are dedicated to the needs, expectations and challenges of especially vulnerable citizens in regard to information prior and during a CBRNe incident. These parts examine the general needs in terms of receiving information, as well as the extent to which certain aspects of disaster management are already known, taught and trained.

The third and fourth research objectives are addressed in Chapter 6.4 This part analyses the needs, expectations and challenges during and after a CBRNe incident in regard to scene management, evacuation and decontamination procedures. Unlike the previous chapter, this chapter focuses on the needs of vulnerable people that are directly affected by the incident within the immediate hot zone.

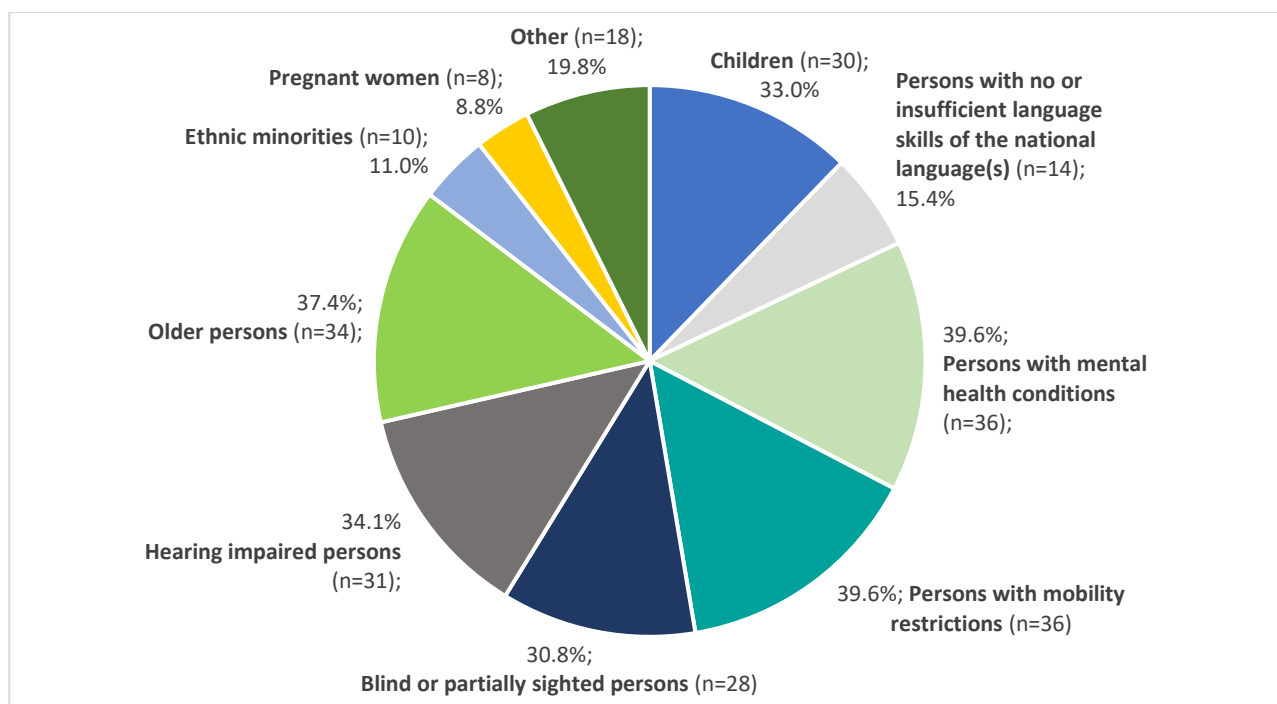
The last part explores the fifth and sixth research objective. Chapter 6.5 presents approaches to close gaps between the needs and expectations of vulnerable people and the measures of CBRNe practitioners in regard to the hot zone and the aftercare. Furthermore, measures are presented to facilitate collaboration approaches among both parties.

## 6.1. Sample description

The following chapter describes the sample of the standardized survey.

A total of 198 different respondents started to fill in the survey. Of these, 91 participants completed and officially submitted the survey. The discrepancy can be explained by the fact that the target group presumably has no or only limited experience in the field of CBRNe. Therefore, it was to be assumed that parts of the questionnaire would be answered only partially or not at all. This was especially true for the last part of the questionnaire that is dedicated to the topic CBRNe. However, at the end of the questionnaire, participants were asked to officially submit the questionnaire. If participants completed the survey without this last step, their answers could not be evaluated.

The distribution of vulnerable groups represented by the participants that took part in the survey can be found in Figure 2. Overall, all vulnerable categories defined in D3.1 (Strand & Johansson 2019) are represented by the survey participants. In comparison, there is a minor representation of organisations that represent persons with no or insufficient language skills, ethnic minorities and pregnant women. Please note that participants could indicate several categories of groups represented by their organisation. Therefore, *n* does not equal the total number of participants.

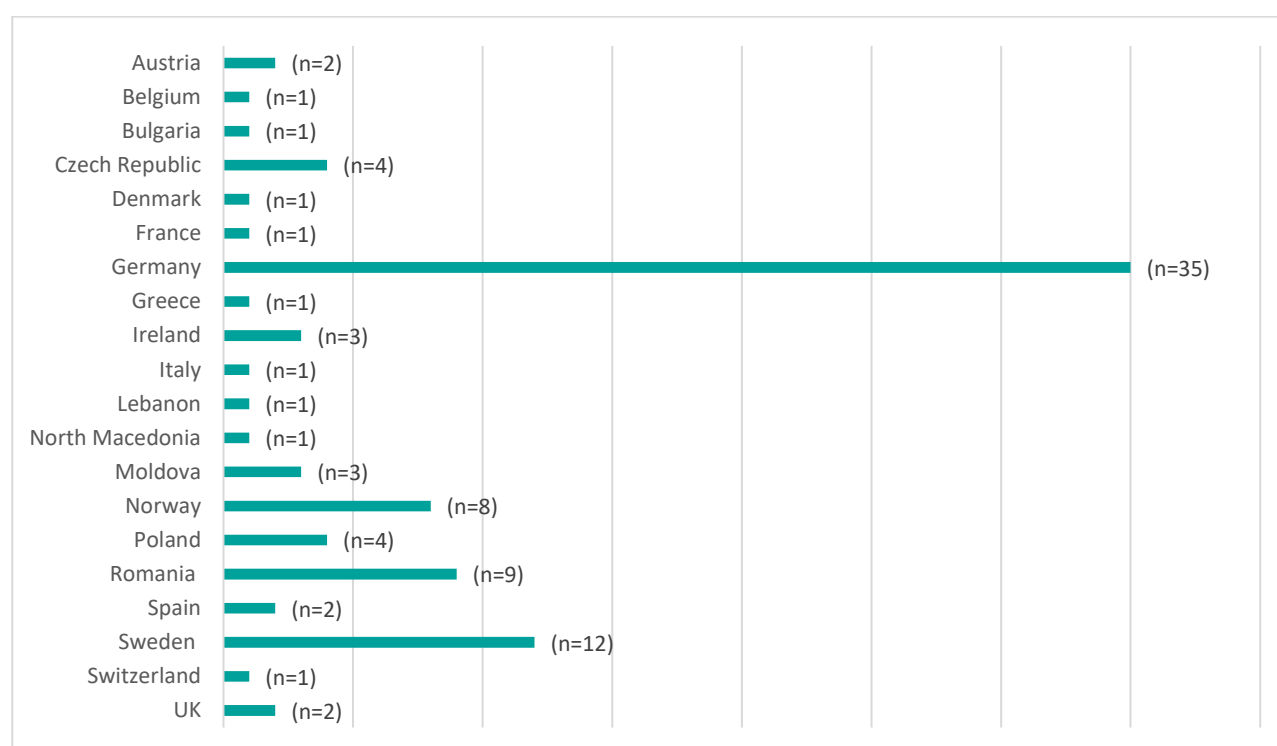


**Figure 2:** Vulnerable groups represented by survey respondents (n/%); multiple selection option (245 responses from 91 participants).

Of the 18 participants who state that they represent other vulnerable groups, the majority refer to specific aspects of the above categories. In this regard, participants mainly stressed the importance of people with cognitive restrictions like a developmental disorder (*n*=2) or a learning disability (*n*=2). Individual causes of mental impairment were also emphasized as particularly noteworthy in regard to CBRNe incidents. In this regard, especially people with dementia (*n*=2), with autism spectrum disorders (*n*=2) and with a chronic fatigue syndrome (CFS) / Myalgic encephalomyelitis (ME) (*n*=1) are considered vulnerable. The idea of focusing attention not only on the vulnerable person

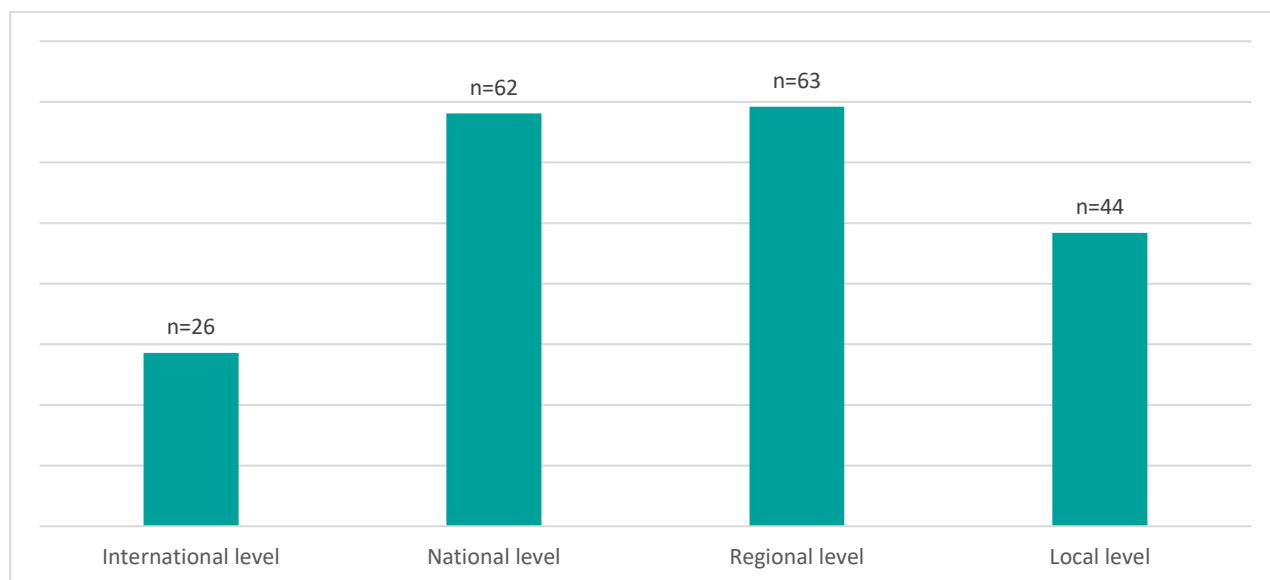
themselves is expressed especially for mentally restricted members of the family. Relatives of vulnerable people are considered to be a vulnerable category of their own (n=3). In addition to the category of ethnic minorities and language restrictions, two participants emphasize further social groups that should be considered when speaking about vulnerability in society. Those comprise people dealing with poverty (n=1) and people with migration background regardless of their ethnic background (n=1).

In total, the responses show that the organisations represented operate in 20 different countries. With regard to the countries in the consortium, 10 out of 12 countries are represented. No participants from Ukraine and Latvia completed the online survey. Figure 3 highlights that Germany (37.1%) provides the largest percentage of participants. Additionally, participants from Sweden (13.5%) and Romania (10.1%) contribute significantly to the survey results. In the remaining countries, participation ranges from 1.1% (1 participant) to 8.5% (8 participants) per country.



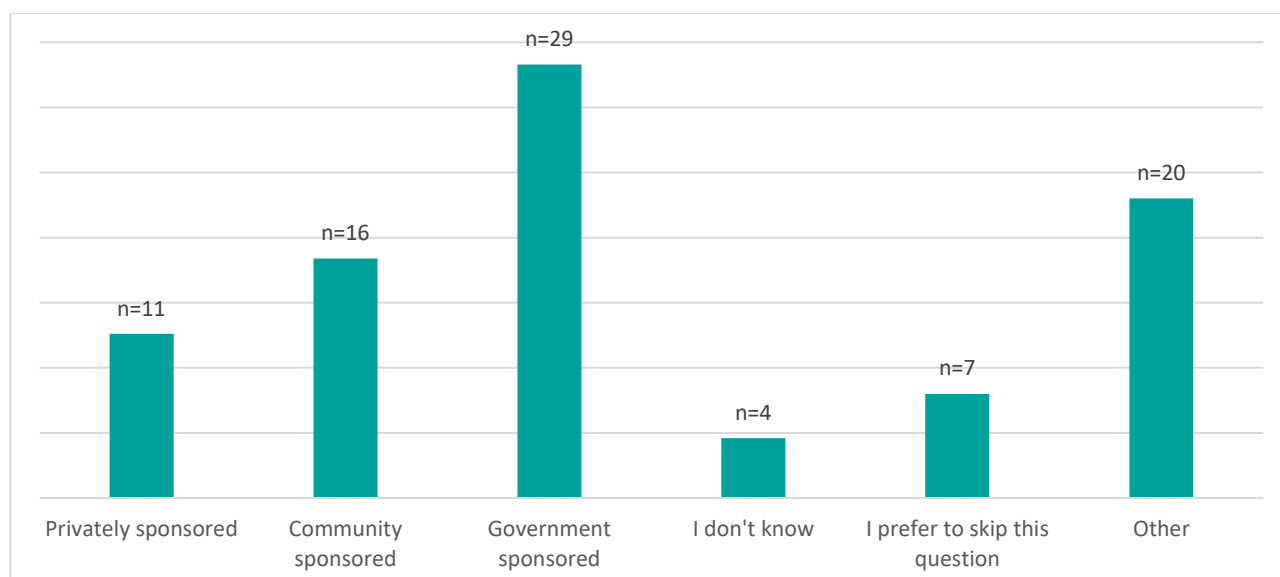
**Figure 3:** Countries in which represented CSOs are active; multiple selection option (94 responses from 89 participants)

The assignment of the participants and their CSO to a specific country is not always possible. Since participants could list more than one country in which their respective organisation operates, representatives indicate several countries in 6.7% of cases. In some cases participants refer to the organisation's engagement in countries outside of Europe, especially in Asia and Africa. Generally, it appears that the borders of the area of operation cannot be clearly defined in all cases. A total of five participants state that they represent the interests of the vulnerable civil society on an international level and one participant specifies Europe as a field of operation. Therefore, it is important to note that all in all 5 participants (6.7%) had a point of view which covers several EU Member States and beyond.



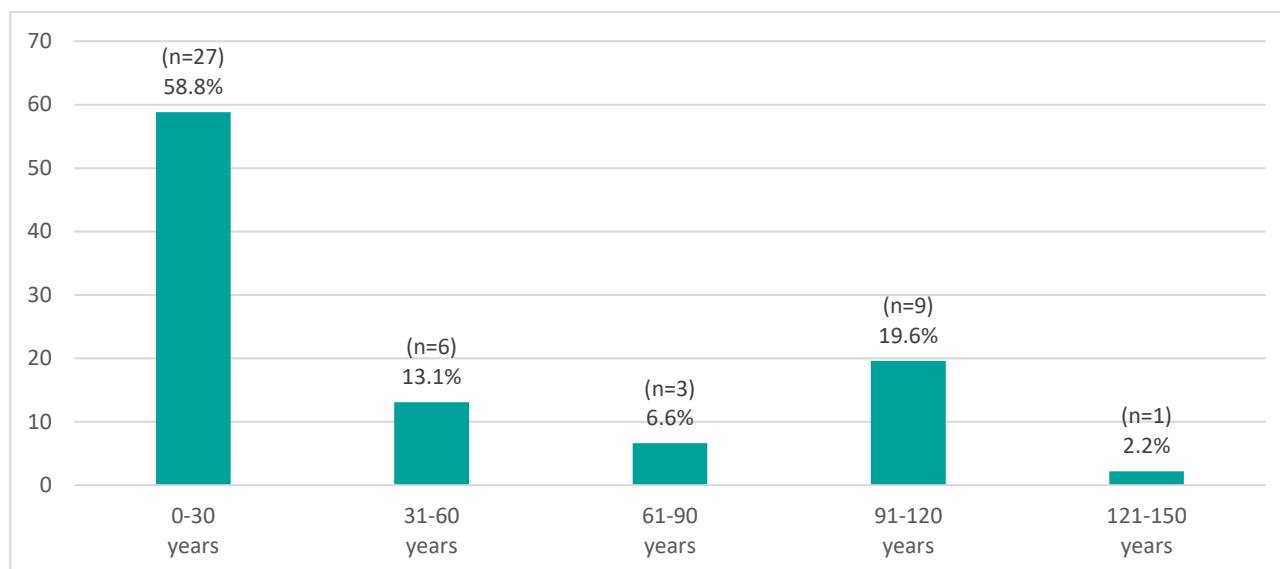
**Figure 4:** Operational level of CSOs; multiple selection option (195 responses from 91 participants)

Similar results are found when asked about the operational level of their organisation. The majority of respondents states that they mainly operate within their country (see Figure 4). Thereby, the interests of vulnerable population groups are represented primarily at regional and national level. On the other hand, contact persons are less often available at the local level. While the international level is lower than the national/regional ones, the absolute number of answers received which have an international coverage cannot be neglected.



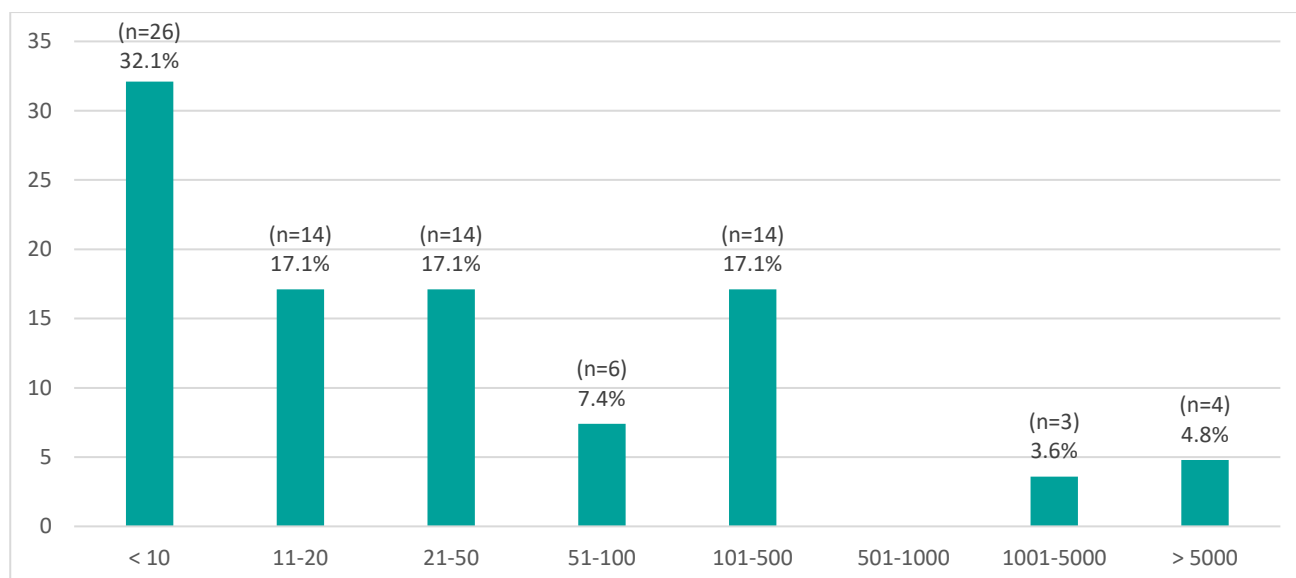
**Figure 5:** Financial model of CSOs (n=87)

With regard to the financing model of the organisations (see Figure 5), it appears that the work for and with members of the vulnerable civil society is based primarily on municipal and state financing.



**Figure 6:** Years of organisation's activities (n/%) (n=46)

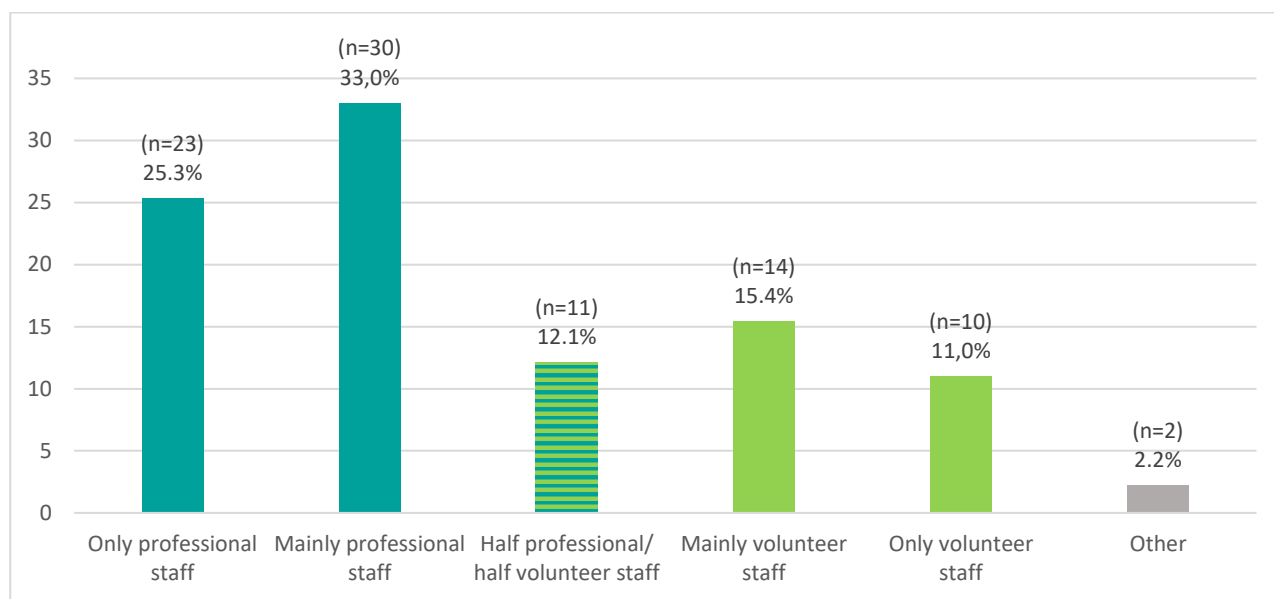
Most of the organisations that participated in the survey have less than thirty years of experience in dealing with vulnerable people (see Figure 6). However, it is interesting to note that the second largest share represents organisations that have been in existence for 91-120 years. In the sample it is noticeable that in addition to the well-established large CSOs with a long history of experience, like the Red Cross, the interests of vulnerable populations appear to be represented primarily through small organisations with fewer than 50 employees (see Figure 7).



**Figure 7:** Staff size in CSOs (n/%) (n=81)

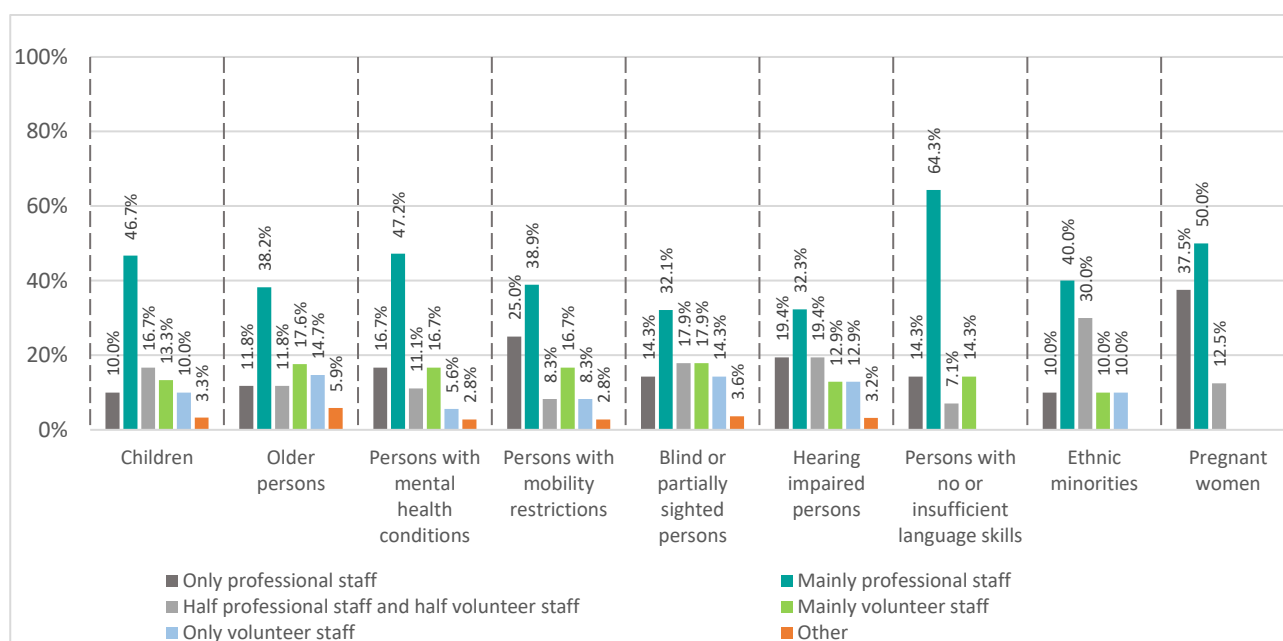
Also interesting is the relationship between permanent employees and volunteers in the CSOs (see Figure 8). More than half of the respondents states that only or mainly professionals are engaged in their organisation. This means that professional employment is mentioned twice as often as

voluntary employment. In about one third of the cases, the staff consists only, mainly or half of volunteers.



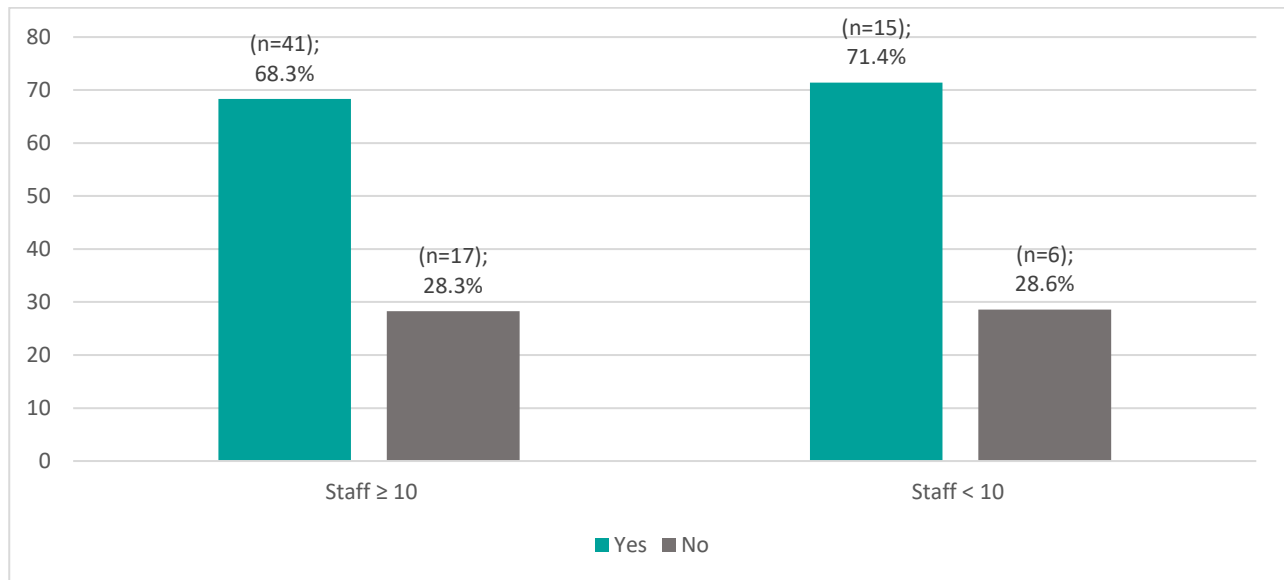
**Figure 8:** Employment status of staff in CSOs (n/%) (n=90)

It appears that not all groups represented are equally represented by volunteer staff (see Figure 9). It should be taken into account that volunteers often have less time available to additionally engage in joint activities with emergency organisations. Therefore, when establishing a cooperation with CSOs, first responder organisations should identify the frame in which the respective CSO can engage in joint activities.



**Figure 9:** Employment status of staff in CSOs by vulnerable category represented (Children: n=30; Older persons: n=34; Persons with mental health conditions: n=36; Persons with mobility restrictions: n=36; Blind or partially sighted persons: n=28; Hearing impaired persons: n=31; Persons with no or insufficient language skills: n=14; Ethnic minorities: n=10; Pregnant women: n=8)

There seems to be a pronounced exchange between different CSOs (see attached Figure 34). 65.9% of all 91 respondents indicate, that their organisation is already affiliated with other relevant organisations and interest groups. In contrast, only 27.5% negate and 3.3% are unaware of any respective cooperation. The same low number of participants abstained. In this context, the size of the organisations seems to have no effect on the willingness to establish cooperation (see Figure 10).



**Figure 10:** CSO's engagement in cooperation by staff size (n/%) (Staff ≥ 10: n=58; Staff < 10: n=21)

Cooperation should be sought to intensify the exchange between civil protection organisations on the one hand and CSOs on the other hand. Depending on the preference of practitioners, it becomes apparent, that there are many likely cooperation partners at local, regional as well as national level. Two-thirds of the surveyed CSOs are already involved in cooperation. Practitioners need to be aware, however, that organisations are heavily reliant on volunteers who have a limited amount of time for such engagement.

### **6.1.1. Methodological challenges of the sample to be considered**

A few methodological points in regard to the sample have to be considered prior to the evaluation of the results.

A clear division cannot be always made between the individual groups observed. Members of the vulnerable civil society might fit in more than one category. Particularly with regard to older persons, it is evident that physical and psychological limitations are present in this group. Findings relating to people with hearing, visual and mobility impairments, are therefore also partly valid for older people.

On the other hand, CSOs do not necessarily represent only one interest group. This has to be considered in regard to the evaluation process. There may be overlaps in the statements if participants are counted for two or more groups. Participants may have made statements only with regard to one of the groups represented. However, this allocation cannot be methodologically distinguished.

Furthermore, not all vulnerable groups are represented to the same extent (e.g. ethnic minorities versus hearing impaired people). This becomes particularly noticeable when comparing the individual groups with each other in the comparative figures. Due to the number of cases, the different findings can only describe trends, especially for pregnant women, ethnic minorities and people with no or insufficient language skills. For this reason, the latter groups are given less consideration in the more concrete evaluation and the respective recommendations.

In addition, the distribution of the countries represented is not balanced. However, the present study did not aim to compare countries but to provide insights into the needs and expectations of vulnerable citizens across Europe. In this respect, data was collected from 20 different European countries.

Due to a lack of experience with CBRNe incidents<sup>2</sup>, the findings are partially based on the respondents' assumptions of expected behaviour in regard to a hypothetical CBRNe incident. The questionnaire was therefore designed to describe such a scenario in as much detail as possible for people who are not familiar with this topic. It was therefore not necessary to build on the respondents' prior knowledge about CBRNe. The expertise in relation to the represented vulnerable groups is the actual essence of their assessment. However, as a result, the report does not discuss necessary actions for practitioners, but provides impulses and recommendations based on the suggestions of representatives of CSOs.

More details on the overall limitations of this study can be found in Chapter 7.

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<sup>2</sup> Chapter 6.3.1 further investigates this topic.

## 6.2. Needs, expectations and challenges of especially vulnerable citizens in regard to communication channels and formats prior, during and after a CBRNe incident

In order to prepare and respond adequately to emergencies such as CBRNe incidents, the population needs information. Thereby, the exchange of information between practitioners and the population must be designed in such a way that all those affected are able to participate in the communication process.

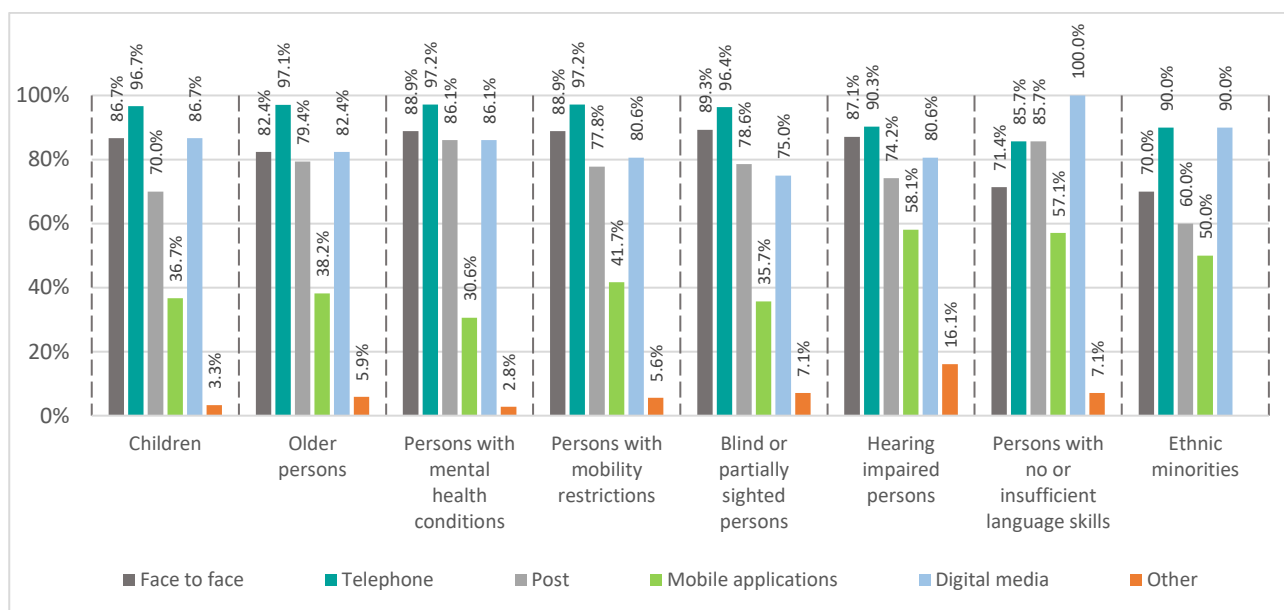
In scientific literature, there is a broad range of guidance in regard to crisis communication in general and in regard to CBRNe incidents in particular (e.g. Rubin et al. 2012; Ruggiero & Vos 2014; Ruggiero et al. 2015; Stanciugelu et al. 2016). A review of guidance documents for CBRNe practitioners revealed that only 53 of the 95 guidance documents provided contain information on how to communicate with the general public (Hall et al. 2020, 13). Furthermore, an online survey and interview study with LEAs and first responders across Europe revealed that besides the content to be communicated during the different CBRNe phases, the needs and expectations of especially vulnerable civilians in information processes are insufficiently recognised and addressed:

*"It turned out that asking for the general consideration of vulnerable civilians in communication strategies, about a quarter of the online survey respondents stated that their organisation's communication strategy for major emergencies does not take vulnerable groups into account. A further quarter of the respondents was unaware of whether vulnerable groups are focused in the communication strategy. When vulnerable groups are taken into account, the communication strategy mainly focuses on people with mobility restrictions (22.4%), the elderly (20%) and children (16.4%). Hearing impaired people (10.3%), visually impaired people (10.3%), mentally ill people (10.3%), pregnant women (9.7%) and ethnic minorities (7.9%) are very rarely considered in the communication strategy. Similar results are found in the interview study. The majority does not consider vulnerable groups of people at all or only to a certain extent in measures of response." (D2.3).*

CBRNe practitioners should understand the needs and preferences of the vulnerable civil society and adapt their communication strategies accordingly (e.g. Campbell et al. 2020b, 17). The following chapter analyses the special needs of vulnerable citizens with regard to such communication processes (based on the assessment of their representatives). The chapter does not focus on the different information contents that need to be communicated to the public in the different phases of a CBRNe incident (see Ruggiero & Vos 2014, 139). The way in which the content of information is designed is also not further examined (e.g. Ruggiero & Vos 2014, 145; Table 3: *Overview of Good Practices in Communicating with citizens in terrorism-related chemical, biological, radiological and nuclear crises*). Regardless of any vulnerabilities, information should be clear, precise and truthful (e.g. Davidson et al. 2019, 25). Instead, the focus is on appropriate communication channels and formats that facilitate the accessibility of CBRNe related information for members of the vulnerable civil society. Therefore, the chapter examines the peculiarities in the communication between the vulnerable civil society and CSOs that are already attuned to the needs of those they represent. The results indicate which communication channels and strategies prove to be a good medium to engage with different categories of the vulnerable civil society. However, LEAs and first responders have to be aware that regardless of the affiliation to one of the represented groups, the age plays an important role in the preference for certain communication channels. Therefore, a closer examination of the different vulnerable groups by age would be interesting but was not considered in the context of this study. The (perceived) needs that emerge are then compared with the measures undertaken by first responders and LEAs as examined in D2.3.

## 6.2.1. Preferences in the use of communication channels

For a start, commonalities and differences between the preferences of the vulnerable civil society on how to get in touch emerge. Regarding the preference of the vulnerable civil society, 95.6% of participants indicate that those they represent contact them via **telephone** (see attached Figure 35). Twice, representatives optionally indicate the use of text-based telephony for visually (n=1) and hearing impaired persons (n=1). Representatives of hearing impaired persons additionally indicate that those they represent use videotelephony (n=3) and fax (n=1). Video based communication such as Facetime, WhatsApp Video, Messenger Video, Skype, Zoom and MS Teams is further indicated by representatives in regard to older persons (n=2), persons with mental health conditions (n=1) as well as persons with mobility (n=1) and visual restrictions (n=1). Overall, many representatives stress the use of telephone-based communication in the optional section in the communication part of the questionnaire. This preference for telephone-based communication is followed by **face-to-face contact** (86.8%) and contact via **digital media** (83.5%) and the **postal service** (79.1%). This indicates that it is above all the personal exchange on a telephone and real-life level that is preferred by members of the vulnerable civil society. In contrast, only 35.2% of participants report that those they represent use special **mobile applications to receive information from their CSO**<sup>3</sup>.



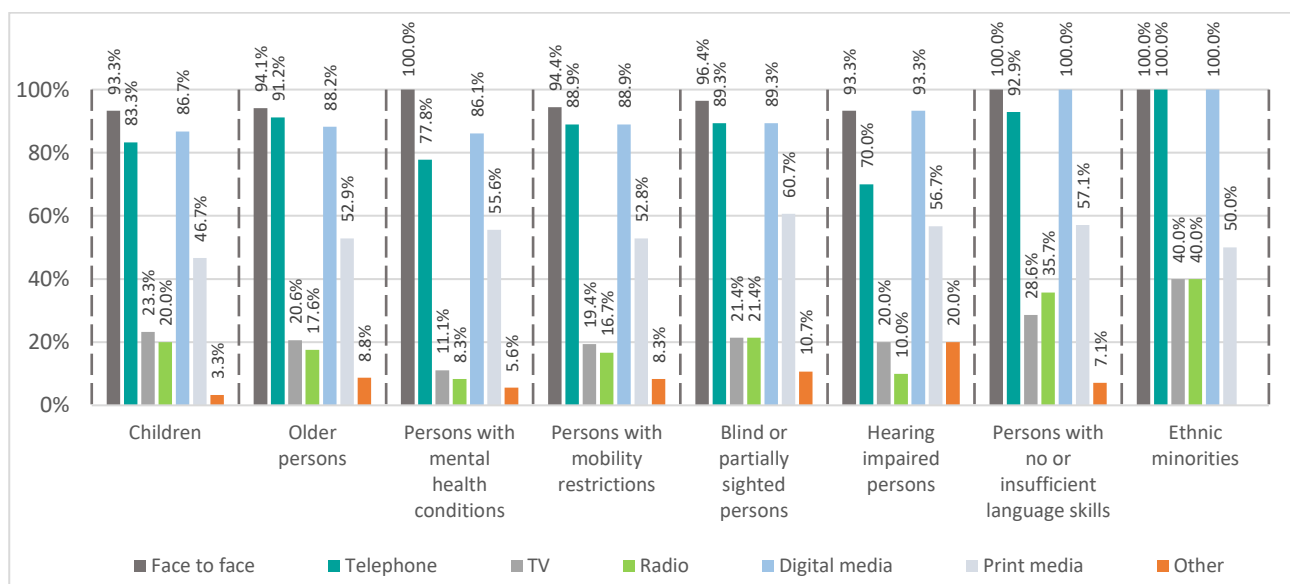
**Figure 11:** Vulnerable citizen's use of certain communication channels to get in touch with their CSOs by vulnerable category represented; multiple selection option (Children: n=30; Older persons: n=34; Persons with mental health conditions: n=36; Persons with mobility restrictions: n=36; Blind or partially sighted persons: n=28; Hearing impaired persons: n=31; Persons with no or insufficient language skills: n=14; Ethnic minorities: n=10)

Compared to the other communication channels, mobile applications are thereby by far the least used way to communicate with representatives and experts. Besides the direct communication between members of the vulnerable civil society and their respective CSOs, communication is

<sup>3</sup> Those mobile applications do not refer to social media such as WhatsApp. Rather, it is about applications that specifically address the needs of special vulnerable groups of people. One example of this is the HandHelp app, which support a barrier-free emergency call. Another example is the Be My Eyes app that provides a network of volunteers who support people with visual impairment in their daily lives.

sought via relatives or the local group on part of people with mental health conditions (n=1) and mobility restrictions (n=1). Overall, there are no strong differences among the group's needs of getting in touch with their representatives (see Figure 11). However, participants indicate that hearing impaired people, persons with no or insufficient language skills and ethnic minorities tend to have a higher preference for mobile applications to get in touch with their representatives.

As CSOs have adapted to the needs of the groups they represent, overall, the preferences for outreach are essentially those of the vulnerable civil society. It shows that the organisations also place a strong emphasis on personal interaction with those they represent, and that the information strategy thus meets their needs. 94.4% of participants indicate a **face-to-face** communication as the medium of choice when engaging with their represented vulnerable group (see attached Figure 36). Personal communication is also optionally mentioned. Representatives of older persons indicate the use of meetings and gatherings to get in touch with those they represent (n=3). The same applies to representatives of persons with mobility restrictions (n=1), visual impairments (n=1) and persons with mental health restrictions (n=1). There is also a similar reliance on **digital media** for communication in 83.3% of the cases. This also meets the strong desire for digital media as a way of communication on part of the represented groups. Digital media is closely followed by communication with **telephone** which accounts for 80.0% of the cases. Similar to those they represent, representatives of hearing impaired persons optionally refer to videophone and different video conference systems (n=3). One participant representing people with no or insufficient language skills (n=1) confirms the use of such a video-based communication. The vulnerable civil society will expect information via these three information channels much more than through media such as **radio** (12.2%) and **TV** (11.1%). Half as often as digital media, the representatives indicate to offer **print media** (42.2%). If digital media are indicated, in line with the preference of their audience, CSOs least frequently refer to special **mobile applications** (21.3%) as a way to get in touch with those they represent (see attached Figure 37). Additionally, with regard to the individual vulnerable groups, the ratio between the channels used is quite similar for representatives of all groups (see Figure 12).



**Figure 12:** CSOs' use of certain communication channels to get in touch with those they represent by vulnerable category represented; multiple selection option (Children: n=30; Older persons: n=34; Persons with mental health conditions: n=36; Persons with mobility restrictions: n=36; Blind or partially sighted persons: n=28; Hearing impaired persons: n=30; Persons with no or insufficient language skills: n=14; Ethnic minorities: n=10)

CSOs therefore appear to offer a basic role model for first responders and LEAs in establishing the most appropriate way of communication with the vulnerable population. At first glance, the overall measures of the practitioners in regard to CBRNe communication seem to at least meet the needs of the vulnerable public to a fair extent<sup>4</sup>. While an extensive **personal communication** between vulnerable people and emergency organisations would be desirable in view of the high demand, this would be difficult to implement in reality. However, 31.1% of practitioners indicated face-to-face communication as a used channel to distribute CBRNe-related information for the public (see D2.3: Figure 26). Furthermore, 34.9% of the practitioners indicated to offer **digital information** for the public (see D2.3: Figure 25). But in comparison to the 83.5%, in which representatives refer to the preference for digital media on part of the vulnerable civil society, those efforts should be overall intensified (for more details please see D2.3: Chapter 7.1.1). As **mail** was also mentioned by vulnerable civil society as a preferred medium to contact their representatives, it would be worth considering transmitting the leaflets (22.5%), brochures (16.1%) and briefing notes (11.9%) already used by practitioners (see D2.3: Figure 25) via this channel.

As it turns out, there does not seem to be an increased need and expectation for **mobile applications**<sup>5</sup> on the part of the vulnerable population or their representatives. This finding is valuable with regard to WP5. About one-tenth of the respondents (11%) indicated that their organisation uses mobile applications to engage with the public (see D2.3: Figure 25). It must be taken into account that not every organisation provides its own app. There are usually only a small number of different apps that publish timely information about CBRNe incidents within a country (e.g. Katwarn, NINA, Red Cross Emergency app, etc.). Interviewees from Belgium, Spain and Germany confirmed the use of such apps in their countries (see D2.3). To increase the level of use, these apps should be reviewed in terms of their accessibility to the vulnerable population. Furthermore, it is likely that cooperation with CSOs could help to raise awareness of the apps among those they represent and demonstrate the benefits of such tools.

In regard to telephone services, a practitioner from Belgium indicated the interconnection between such an app with an SMS service that informs the public about incidents (see D2.3). Interviewees from Ukraine, France and Poland confirm the use of an SMS notification system without the end users having to be registered via an app. Furthermore, a participant from Norway indicated the implication of such a system. The quantitative survey in D2.3 further revealed that unlike CSOs, **radio** (34.0%) and **TV** (28.3) are used quite often by practitioners to share information for the vulnerable population (see D2.3: Figure 26). Although only 8.7% of practitioners indicated to offer TV material dedicated to CBRNe related information (see D2.3: Figure 25). Since this study is based on the perceived needs of the represented vulnerable population, it is not possible to make concrete

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<sup>4</sup> The following statistics regarding practitioners do not refer to the respondents' preference for contacting the public via certain communication channels. Rather, practitioners were asked about their use of specific communication channels through which CBRNe related material is shared with the public. The assessment of the comparative results between the needs and expectations of the vulnerable persons and the measures of the practitioners should take this into account.

<sup>5</sup> However, the survey with CSOs did not refer to warning apps as communication channel. It is therefore unclear to what extent certain vulnerable groups use alarm apps. A representative survey at the University of Greifswald found that the current use of such alerts is 22% on average in Germany (Rahn et al. 2020, 22). Currently, it is unknown how the numbers have evolved due to Covid-19.

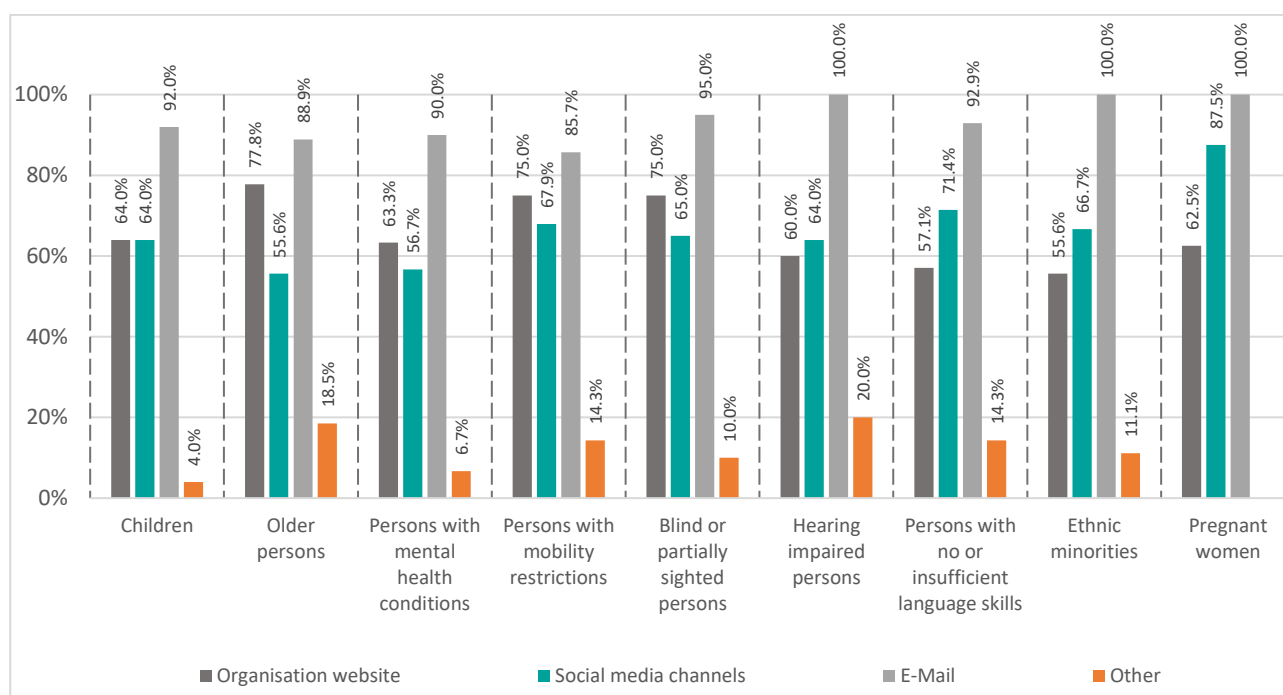
statements about their private TV and radio behaviour. Therefore, it can only be assumed that such media are used to obtain information in the event of a CBRNe incident.

In regard to the individual needs of different vulnerable groups in terms of ways to communicate, the needs do not differ much. For all groups, a strong wish for face-to-face and telephone communication is indicated, as well as digital media, followed by print media.

Overall, no strong gaps can be found when comparing the needs and expectations of the vulnerable population to the offered services of the practitioners in regard to general ways of communication. Differences become more apparent when taking a closer look at the digital media and social media channels preferred by members of the vulnerable public and CSOs and by practitioners.

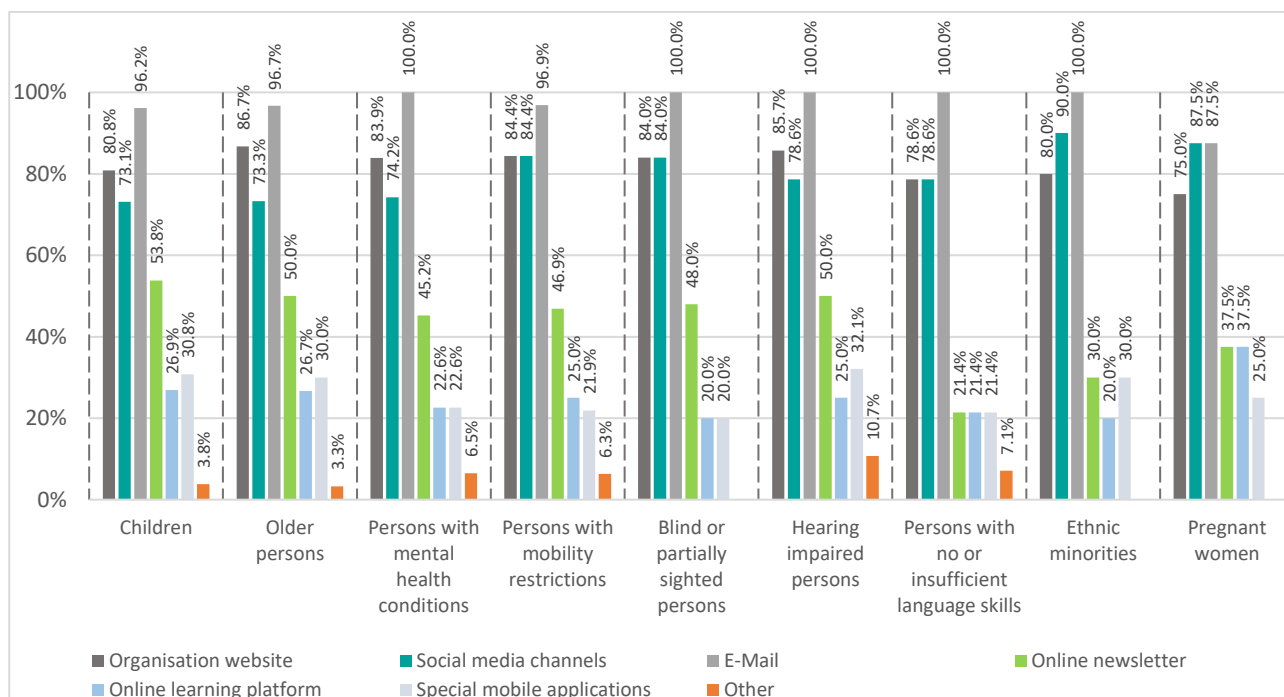
### 6.2.2. The use of digital media

It is noticeable that not all **digital mediums** are used to the same extent. If representatives of vulnerable groups confirm the use of digital mediums by their organisation, 96.0% indicate the use of **e-mails** as a medium to get in touch with those they represent (see attached Figure 37). This means that almost every organisation identifies e-mail-based communication as the medium of choice to get in touch with their vulnerable audience on a digital level. The type of vulnerability does not seem to have a negative impact on the perceived usefulness of e-mails. In this case, there would be lower numbers because all organisations with a specific vulnerable group that cannot use this medium of communication would not indicate it (see Figure 13). In fact, 93.2% of participants indicate that those they represent also use e-mail communication when it comes to digital communication (see attached Figure 38). E-mails are thus the digital medium most used by vulnerable persons. A look at the individual preferences of the individual vulnerable groups also shows that emails are a digital medium used very considerably by all groups (see Figure 13). But in comparison, only 23.6% of practitioners indicated e-mails as a way to distribute CBRNe-related digital information for the public (see D2.3: Figure 26). In this case, as already mentioned in case of postal communication, consideration should be given to sending the leaflets, brochures and briefing notes already used by practitioners via this medium. Furthermore, in cooperation with representatives, such information can be forwarded via the e-mail distribution and newsletter lists of CSOs, if necessary, adapted to the respective special needs.



**Figure 13:** Vulnerable citizen's use of certain digital media to get in touch with their CSOs by vulnerable category represented; multiple selection option (Children: n=25; Older persons: n=27; Persons with mental health conditions: n=30; Persons with mobility restrictions: n=28; Blind or partially sighted persons: n=20; Hearing impaired persons: n=25; Persons with no or insufficient language skills: n=14; Ethnic minorities: n=9; Pregnant: n=8)

In fact, 49.3% of the surveyed representatives indicate the use of **online newsletters** to provide those they represent with additional digital information (see attached Figure 37). Different preferences emerged for those they represent. Half of all representatives of children, older people and people with mental, mobility, visual and hearing impairments mention online newsletters as one of their used digital media (see Figure 14). In contrast, this digital medium is rarely used for people with language barriers, ethnic minorities and pregnant women. In relation to other digital media, online newsletters are in fourth place after e-mails, websites and social media channels by all groups represented as a medium to exchange information.



**Figure 14:** CSO's use of certain digital media to get in touch with those they represent by vulnerable category represented; multiple selection option (Children: n=26; Older persons: n=30; Persons with mental health conditions: n=31; Persons with mobility restrictions: n=32; Blind or partially sighted persons: n=25; Hearing impaired persons: n=28; Persons with no or insufficient language skills: n=14; Ethnic minorities: n=10; Pregnant: n=8)

A high percentage of representatives states that their organisation furthermore digitally communicates via its **website** (89.3%) (see attached Figure 37). Depending on the group represented, the confirmation that this medium is used by CSOs thereby varies between 75-87% (see Figure 14). In contrast, 61.6% indicate the use of websites as the medium of choice in regard to those they represent (see attached Figure 38). Looking at the individual groups, none of the groups seem to be particularly interested or uninterested in this medium (see Figure 13). The indicated use of this medium ranges between 56-78%. In contrast, 75.5% of first responders and LEAs indicated to offer information via their website and via their partnering websites (29.3%) (see D2.3: Figure 26). Consequently, there seems to be no urgent need for action on the part of the practitioners to increase the overall number of websites. However, differences in the use of certain media between different vulnerable groups do not only reflect a personal taste, but also the lack of accessibility of these media. Using online shops as an example, the Swiss foundation "Access for all" conducts accessibility audits of websites and web applications in Switzerland. The latest study covered a total of 41 online shops, including sites of federal and state authorities. The result revealed that under a quarter of the analysed websites could be categorised as offering good accessibility (see Access for all 2020). There is a broad range of national regulations that strengthen the rights of vulnerable citizens. The Web Content Accessibility Guidelines (WCAG 2.0) are an international standard for the accessible design of websites. Since 2019, public institutions in the EU must meet the requirements of level AA for new websites. Since 2020, this also applies to already existing websites. From 2021, the law will also apply to mobile applications. Presumably, the preference for certain mediums offered by first responders might increase if the degree of accessibility increases. Therefore, first responders should revise their existing webpages. Organisations such as "Access for all" offer checklists that can be used to analyse the accessibility of webpages.

**Online learning platforms** (21.3%) appear to be the least frequently used digital media to provide information for those they represent (see attached Figure 37). On average, 20-25% of participants confirmed that they offer learning platforms for the respective groups represented. Again, there was not a strong emphasis on any particular group (see Figure 14).

A very intensively used digital medium is **social media**. In 77.3% of cases in which digital mediums are used, participants indicate to use this kind of channels as a way of communicating (see attached Figure 37). Overall, the use of social media channels is highly reported by representatives of all vulnerable groups (see Figure 14). In detail, 90% of the participants were in favour of social media with regard to ethnic minorities. This was only proportionally less true for representatives of children (73.1%), older persons (73.3%) and people with mental disabilities (74.2%). In general, organisations seem to contact the represented group more often via social media channels than conversely. In comparison, 61.6% of participants indicate that their audience also uses this medium (see attached Figure 38). Social media channels are therefore, apart from e-mails, the most used digital media. All represented groups report to make extensive use of this medium (see Figure 13). In comparison, in line with the offer on part of CSOs, participants indicate less frequently that people with mental health problems and older people use this medium. Interestingly, the agreement with regard to children is not higher than in the other categories. Altogether, the participants' assessment indicates that the young generation does not rely solely on social media channels for information. Based on this, no trend can be identified that the use of social media by this generation will significantly dominate other digital media in the coming years. However, some interviewees of the D2.3 study considered social media to be the future in relation to the traditional communication technologies (see D2.3). Of those practitioners that indicated to use digital media, 59.4% use social media channels to distribute CBRNe-related information for the public (see D2.3: Figure 26).

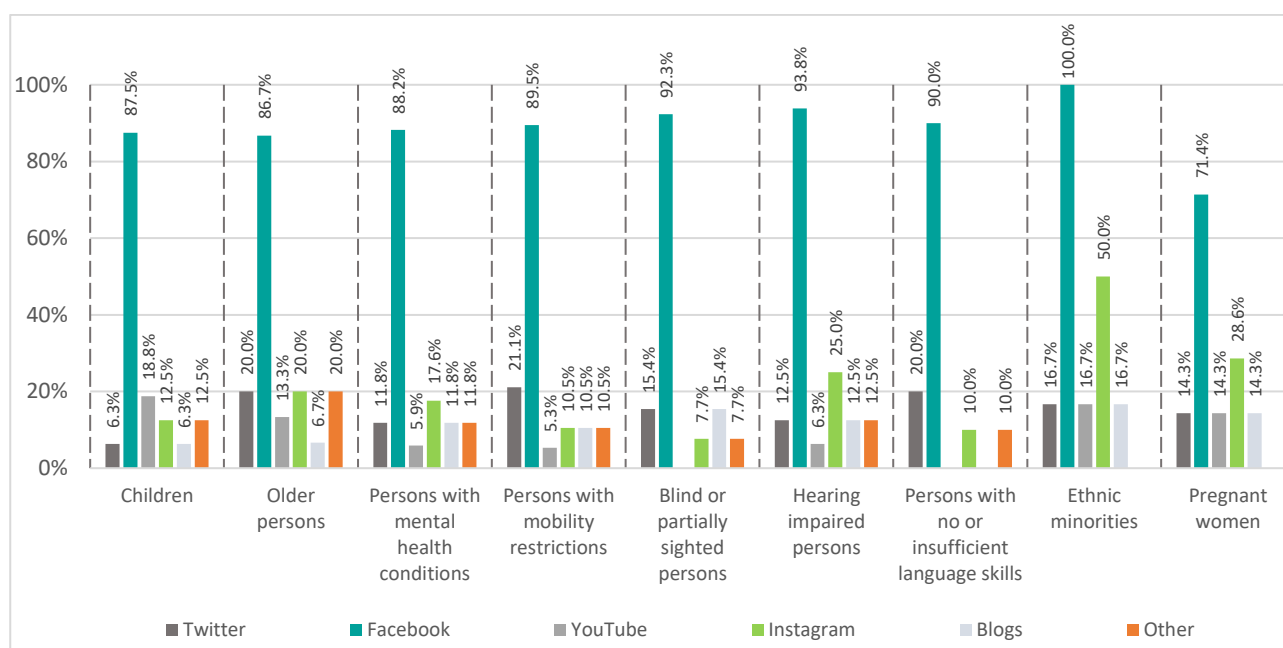
As with the needs and expectations of different vulnerable groups in terms of ways to communicate, those for digital media do not differ much. A strong use of e-mails followed by the use of the respective organisations website and social media channels are indicated for all groups as a way to get in touch with their representatives via a digital media. Considering the overall considerable indication of digital media, practitioners will likely be addressed by vulnerable groups through these digital media channels. These digital channels also seem to be the most suitable ones for contacting members of the vulnerable civil society and providing them with CBRNe related material. In addition, online newsletters seem to be worthwhile, especially for children, older people, and people with mental, mobility, visual and hearing impairments.

### 6.2.3. The use of social media

Asked about the preferences of social media channels, the representatives indicate in 93.2% of the cases that those they represent favour the platform **Facebook** (see attached Figure 40). All vulnerable groups use this channel far more than all other social media channels (see Figure 15). Especially in relation to ethnic minorities, all respondents indicate that those they represent tend to use Facebook. This response is least pronounced in relation to pregnant women (71.4%). Accordingly, in 94.7% of cases representatives state that their organisation uses the same platform to get in touch with those they represent (see attached Figure 39). Similarly, representatives of all vulnerable groups indicate that they use this channel (see Figure 16). The proportion coincides with the demand on the part of those they represent. In some cases, such as children and pregnant women, an even higher proportion of respondents indicate the use of this channel themselves than their group. Optional, the use of internal Facebook groups for those they represent is mentioned (n=2). Overall, the findings indicate, that practitioners should consider Facebook as an important communication channel that enables them to reach a diverse population, regardless of vulnerability.

Since **WhatsApp** is generally used as a two-way communication channel, it can be assumed that the vulnerable civil society also makes frequent use of this medium when looking at the high amount of cases in which the representatives indicate the usage (47.4%) (see attached Figure 39). In contrast to Facebook, however, there are clear differences when looking at the different vulnerable groups represented. In general, this channel is similarly indicated as a medium used by representatives of all groups (see Figure 16). It can be seen however that mainly CSOs representing people with no or little language skills (90.9%) use WhatsApp. In comparison, this applies less frequently to representatives of older persons (45.5%), children (47.4%), persons with visual impairments (47.6%) and persons with mobility impairments (48.1%).

In contrast to Facebook and WhatsApp, there is a different trend towards the preferences of the vulnerable civil society and their representatives in regard to other social media platforms. In this context, whereas the vulnerable civil society appears to make only minor use of **Twitter** (11.4%) (see attached Figure 40), the representatives mention this in four times as many cases as a used social media platform (40.4%) (see attached Figure 39). The individual vulnerable groups also seem to use Twitter to varying degrees. Only representatives of persons with mobility impairments (21.1%), persons with language impairments (20.0%) and older persons state somewhat often that those groups communicate with their organisation via this medium. This is least frequently stated by only 6.3% of the representatives of children (see Figure 15). This distribution is different among the various CSOs. Here, only 11.1% of the representatives of ethnic minorities and 18.2% of the representatives of hearing impaired people report using Twitter (see Figure 16). In contrast, this is the case for 36.8% of representatives of children. The most frequent users of Twitter appear to be representatives of pregnant women (42.9%), persons with mobility impairments (40.7%) and persons with mental disabilities (39.1%). Thereby, it must be considered that unlike Facebook and WhatsApp, Twitter is less of a two-way communication platform. The vulnerable population therefore seems to receive information to a greater extent via Twitter and comparative platforms, than they themselves use it as a way to get in contact with those providing information. Appropriately, the interview study in D2.3 revealed that Facebook and Twitter have indeed been the most frequently used social media channels by practitioners (see D2.3).

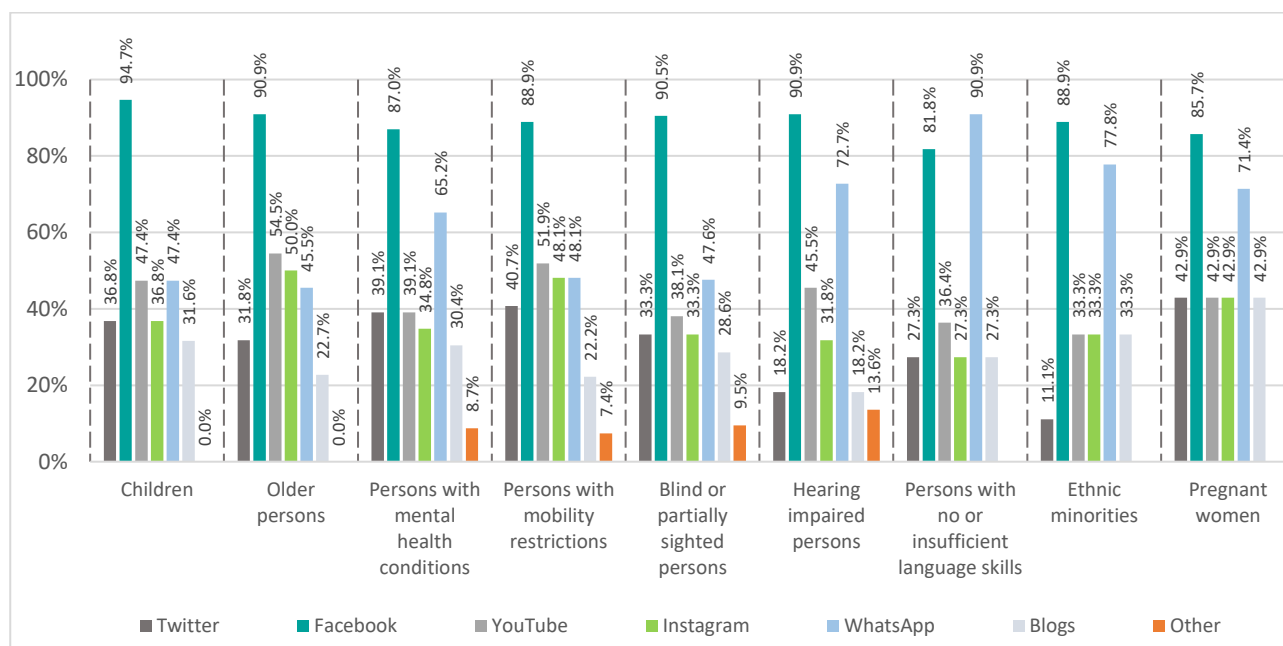


**Figure 15:** Vulnerable citizen's use of certain social media channels to get in touch with their CSOs by vulnerable category represented; multiple selection option (Children: n=16; Older persons: n=15; Persons with mental health conditions: n=17; Persons with mobility restrictions: n=19; Blind or partially sighted persons: n=13; Hearing impaired persons: n=16; Persons with no or insufficient language skills: n=10; Ethnic minorities: n=6; Pregnant: n=7)

Similar to Twitter, the nature of platforms like Instagram, Blogs and YouTube is more designed to provide one-sided information. Whereas 22.7% of participants indicate the usage of **Instagram** by those they represent (see attached Figure 40), the number of cases related to their organisation is twice as high (42.1%) (see attached Figure 39). Also, on Instagram, representatives of all vulnerable groups say that those they represent use this platform (see Figure 15). Looking closer, half of all ethnic minority representatives surveyed confirm that this group uses Instagram to connect with them. This is witnessed by only 28.6% of representatives of pregnant women, followed by 25.0% of representatives of hearing impaired people. Interestingly, 20.0% of representatives of older persons report the use by those they represent, whereas this was true for only 12.5% of representatives of children. The data here does not always correspond with the CSOs' use of Instagram (see Figure 16). In comparison, only 33.3% of the representatives states that they contact ethnic minorities via Instagram. Instead, it is most frequently stated by 50.0% of representatives of older people, although this only applies to 20.0% of them themselves. In comparison, 36.8% of children are also contacted via Instagram by their CSOs themselves. Interestingly, none of the interview participants in the study with practitioners explicitly mentioned to use Instagram as a platform to forward information (see D2.3: Chapter 7.5). This indicates an unmet demand. However, as the survey did not specifically ask about platforms, it is not possible to provide more detailed statistics on the use of individual social media platforms by practitioners. The same applies to YouTube and Blogs.

6.8% of participants imply **Blogs** to be used by those they represent (see attached Figure 40). This is true for 22.8 % of the respondents themselves (see attached Figure 39). In this case, respondents indicate that no people with no or insufficient language skills use this platform (see Figure 15). Also, children (6.3%) and older persons (6.7%) do not seem to make strong use of blogs to communicate with their CSOs. The percentage is slightly higher for people with physical (10.5%), mental (11.8%) or hearing (12.5%) impairments. In comparison, ethnic minorities (16.7%), visually impaired people (15.4%) and pregnant women (14.3%) seem to use this platform the most. Therefore, compared to

other social media, traditional blogs do not seem to be a suitable medium to provide CBRNe related information to a wide range of the population. Nevertheless, representatives of all groups report using blogs to get in touch with those they represent (see Figure 16). The percentage varies mainly between 20-30%. In comparison, CSOs representing hearing impaired people are the least likely to use blogs (18.2%). In contrast, 42.9% of representatives of pregnant women confirm their use. The findings indicate that blogs are indeed suitable to provide certain vulnerable groups with information, although they tend to not use it as a way to communicate with the information provider.



**Figure 16:** CSO's use of certain social media channels to get in touch with those they represent by vulnerable category represented; multiple selection option (Children: n=19; Older persons: n=22; Persons with mental health conditions: n=23; Persons with mobility restrictions: n=27; Blind or partially sighted persons: n=21; Hearing impaired persons: n=22; Persons with no or insufficient language skills: n=11; Ethnic minorities: n=9; Pregnant: n=7)

The differences in the preference between vulnerable groups and those they represent become even more obvious for **YouTube** (9.1% against 52.6%; see attached Figures 40 and 39). As with blogs, not all representatives indicate that this platform is used by their respective group to contact them (see Figure 15). Like with Blogs, CBRNe related information appears not to be communicated to people with language limitations. However, 33.3% of respondents indicate that blogs are used on the part of CSOs (see Figure 16). Children (18.8%) seem to use YouTube most frequently (see Figure 15). For this group, this is overall the most used social medium after Facebook. 16.7% of representatives of ethnic minorities also indicate that the latter use the platform. Similar agreement is seen in regard to pregnant women (14.3%) and older people (13.3%). In comparison, only 5-8% of representatives of the other groups indicate such a use. In contrast, CSOs from all groups use this platform to get in touch with the represented vulnerable group (see Figure 16). Organisations representing ethnic minorities are reported among the least likely to do so (33.3%). 47.4% of representatives of children report using YouTube. The most frequent users appear to be representatives of older people (54.5%). Therefore, YouTube seems to be a suitable instrument to communicate relevant CBRNe information.

Optional, representatives refer to **LinkedIn** as a medium used by those they represent to get in touch with the CSO (n=2).

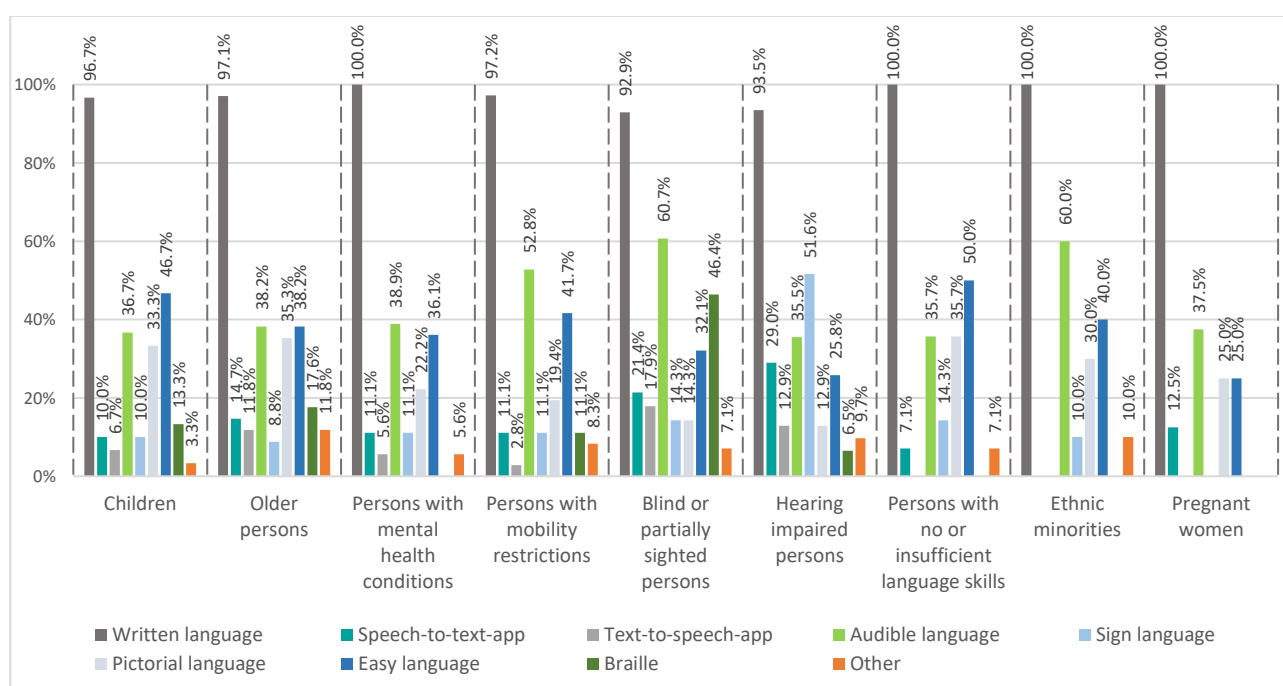
The needs and expectations are not as strongly homogeneous as in terms of general ways of communication and compared to digital channels in general. Basically, Facebook seems to be the social media channel through which the vulnerable civil society will contact representatives to get information, regardless of their vulnerability. In addition, a considerable number of ethnic minorities will seek contact through Instagram. This should also be considered with regard to pregnant women and the hearing impaired. These two channels are by far the most indicated social media channels in this respect. Contact via Twitter is less likely. Practitioners can basically communicate information through all social media channels and thus reach a large part of all vulnerable groups. In general, Facebook, YouTube and WhatsApp seem to be particularly suitable for children. The same applies to older people. For persons with mental impairments, WhatsApp seems to be an important source of information in addition to Facebook. For people with mobility impairments, in addition to Facebook, a considerable amount will presumably have expectations with regard to Twitter, YouTube, Instagram and WhatsApp. Blind people are more likely to expect contact via Facebook and WhatsApp. These two channels are also very likely to be used by hearing impaired people.

It is evident that CSOs use a very wide range of ways of communication, channels and media in order to provide the best possible access to information to those they represent. Different communication strategies are applied depending on the vulnerability category. This should serve as a model for practitioners. If they cannot directly contact the vulnerable population themselves, it would be advisable to communicate the information in close cooperation with civil organisations.

## 6.2.4. The use of special language formats

When communicating with vulnerable populations, it is not only how information is conveyed that is important. Above all, the language format in which the information is presented is crucial. Assuming that services offered by CSOs meet the needs of the vulnerable groups they represent, certain needs for action on part of first responders and LEAs can be identified. Figure 17 demonstrates that practitioners should always provide written information as this seems to be the most important language format when dealing with a diverse population. In this respect, sufficient large and high contrast written language should be provided.<sup>6</sup>

But besides the predominantly **written language** format (95.6%) (see attached Figure 41), other formats appear to be also important in order to communicate adequately with the vulnerable population.



**Figure 17:** CSO's provision of certain language formats by vulnerable category represented; multiple selection option (Children: n=30; Older persons: n=34; Persons with mental health conditions: n=36; Persons with mobility restrictions: n=36; Blind or partially sighted persons: n=28; Hearing impaired persons: n=31; Persons with no or insufficient language skills: n=14; Ethnic minorities: n=10; Pregnant: n=8)

In this regard, 35.2% of representatives of CSOs refer to **audible language** as a frequently used language format to get in touch with the vulnerable civil society (see attached Figure 41). Optional, the use of podcasts (n=2) and videos is indicated (n=4). Looking at the individual vulnerable groups represented, participants indicate, that they use audible language especially while communicating with blind and partially sighted persons (60.7%), ethnic minorities (60.0%) and persons with mobility restrictions (52.8%) (see Figure 17). It is striking that this format, along with written information,

<sup>6</sup> The same applies to illustrations. Additionally, the use of different symbols instead of different colours is emphasized to support colour-blind people to differentiate content.

appears to be the most frequently used format for all three groups. Therefore special attention should be paid to those distinct three groups as a considerable audience of audible messages. For the other groups too, audible language seems to be a frequently used format apart from written language. This also applies for hearing impaired persons. 35.5% of participants indicate the use of audible formats to get in touch with those they represent. Consequently, practitioners should use audible language as an important language format in general. However, audio messages (17.4%) are overall rarely used to provide CBRNe related information on part of first responders and LEAs (see D2.3: Figure 51). There is an urgent need for action in this regard. Nevertheless, practitioners should not rely solely on written and audible language to convey information. Only 35.7% of participants refer to persons with no or insufficient language skills when using audible language (see Figure 17). In this regard, half of all participants indicate the use of easy language (50.0%) and pictorial language (35.7%) as an equally important language format.

Overall, 29.7% of representatives of CSOs confirm to use **easy language** for communication (see attached Figure 41). This applies to all groups, regardless of the vulnerability represented (see Figure 17). Indeed, 70.6% of the surveyed practitioners indicate that their organisation offers plain language (see D2.3: Figure 51). Similar results were found in the interviews (see D2.3). Looking at the different vulnerable groups, about half of the participants representing people with no or insufficient language skills indicate that simple language is used (see Figure 17). Along with written information and audible material, it is thus the most important language format to communicate with this group. Similar results emerge for representatives of children (46.7%), people with mobility restrictions (41.7%) and ethnic minorities (40.0%). The use of simple language also appears to be important among older persons (38.2%), people with mental disabilities (36.1%) and visually impaired people (32.1%). Participants least frequently state the use of easy language in relation to hearing impaired people (25.8%) and pregnant women (25.0%). However, it is not only the general extent of easy language in regard to each of the vulnerable groups that should be considered, but also the relationship to the other formats. Looking at the proportion of simple language to the overall communication with hearing and visually impaired persons, the use of this format in regard to the other formats seems to be quite low.

As with plain language, representatives report the use of **pictorial language** for all vulnerable groups (see Figure 17). In absolute terms, this format seems to be used mainly for children (33.3%), older persons (35.3%), people with insufficient language skills (35.7%) and ethnic minorities (30.0%). In relation to the other language formats, this format also seems to be particularly suitable for these groups. Pictorial language seems to be used least in communication with people with mobility impairments (19.4%), as well as with visually impaired people (14.3%) and hearing impaired people (12.9%). Whereas in general only 15.4% of respondents indicate to offer pictorial language to facilitate communication with those they represent (see attached Figure 41), it appears that 45.9% of practitioners indicated the use of pictorial language to distribute information (see D2.3: Figure 51). Similarly, the use of pictorial language was mentioned in seven out of 18 interviews (see D2.3). This shows that there is already an awareness of the importance of this format on the part of the practitioners.

Conversely, it is found that 14.3% of respondents indicate the use of **braille** on the part of CSOs (see attached Figure 41), whereas the supply by practitioner appeared to be lower (5.5%) (see D2.3: Figure 51). In this context, the representatives state that this format is not used in communication with all vulnerable groups (see Figure 17). However, it is noteworthy that participants do not use

braille only in the context of visual impairment. Although this group still represents the highest proportion (46.4%), Braille is also used by representatives of older persons (17.6%), children (13.3%), people with mobility impairments (11.1%) and the hearing impaired (6.5%). Even though the overall share of braille in communication with vulnerable people appears to be lower than formats such as written and audio, practitioners should still take into account that almost half of the participants consider this format important to provide information to visually impaired people. Therefore, practitioners should increase the provision of this format, in the best case based on simple language.

Very rarely, the use of special translation apps is indicated to facilitate communication with certain members of the vulnerable population (Speech-to-text-app: 12.1%; text-to-speech-app: 7.7%; see attached Figure 41). As a language format, representatives of visually impaired persons (17.9%), hearing impaired persons (12.9%) and older persons (11.8%) report using **text-to-speech-apps** (see Figure 17). The format is rarely mentioned by representatives of children (6.7%), mentally impaired persons (5.6%) and mobility impaired persons (2.8%). The format does not show up as a distinctive format in any of the groups compared to other applied formats. The same is true with regard to **speech-to-text apps**. This format is used by CSO for all groups except those representing ethnic minorities. Participants report an apparent use of the format especially among hearing (29.0%) and visually impaired (21.4%) groups. D2.3 does not provide any comparable data in this regard.

Besides audible and easy language, **sign language** is frequently mentioned (18.7%) to support vulnerable civilians in accessing information (see attached Figure 41). There are major differences depending on the category of vulnerability. Basically, this format is mentioned by participants in relation to almost all vulnerable groups, except pregnant women (see Figure 17). Predominantly, the share of sign language in the overall communication with the respective groups is small in relation to other formats. However, it appears, that hearing impaired people strongly depend on receiving information in this format, unless it is transmitted in written format. Figure 17 shows that 51.6% of the participants use this communication format to communicate with their hearing impaired represented group. This is especially interesting with regard to communication in the hot zone and related press events. So far, only 12.8% of the surveyed practitioner indicated the use of sign language to provide CBRNe related information to the public (see D2.3: Figure 51). Cooperation with respective CSOs would help to bring in suitable interpreters more quickly and effectively for the communication processes with regard to CBRNe incidents. Besides interpreters for sign language, optional, representatives indicate the use of speech-to-text interpreter (n=3).

In the context of language diversity, it should be considered that sign language also differs from country to country and from region to region. Overall, of the 34 participants that further explain to offer additional languages in the category "Other", eight confirm to provide more than one sign language. Thereby, international sign language is indicated five times. In addition, they mention German, Romanian and African sign language. Furthermore, one participant refers to the simultaneous transcription of spoken words as an additional option to inform a certain vulnerable group. This goes along with the related cases where speech-to-text apps are used.

Civilians who generally lack sufficient language skills of the respective country or region are particularly vulnerable during a CBRNe incident since they cannot access the information provided. Information in **additional languages** can therefore support those citizens to better cope with a CBRNe incident. Whereas 5.6% of the respondents could not make a concrete statement in this

regard, 50% of respondents denied respective efforts (see attached Figure 42). However, 40.0% of participants state that their CSO offers information in additional language(s). Of the 34 participants that further explain to offer additional languages, 26 imply to provide information in English. Besides English, in reflection of the CSO's location, a stronger trend towards further Western and Eastern languages can be observed. Overall, romance languages are frequently mentioned including regional languages such as Basque and Catalan. In comparison, other EU languages are explicitly mentioned only in three or fewer cases whereas six participants indicate Turkish. With regard to the Asian region, six representatives point out the offering of Asian languages. Among them were Chinese, Thai, Vietnamese, Urdu, Farsi, Hindi, Dari, Bengali and Sorani. All of those participants indicate Arabic. In comparison, the numbers are even lower referred to African languages. Four of the 34 participants mention Tigrinya, Amharic, Oromo, and Somali. However, those four participants are the same that indicate the use of Asian languages<sup>7</sup>. The qualitative study with practitioners revealed, that all countries represented by interview participants offer information in at least two different languages (see D2.3: Chapter 7.5.3). The online survey provided a different picture. Of 109 surveyed first responders and LEAs only nearly a half (46.8%) indicated that their organisation generally provides CBRNe-related information resources in additional languages (see D2.3: Figure 51). 39.4% of the respondents negated this.

D2.3 revealed that only 29.4% of CBRNe practitioners rated the effectiveness of their CBRNe related material for the public as "rather high". In fact, 31.2% of respondents rated the effectiveness to be "medium" and an additional considerable share of practitioners classified the effectiveness as "rather low" (16.5%) (see D2.3: Figure 27). Additionally, it must also be taken into account that these statements were made in relation to the general public and not specifically in relation to vulnerable groups. It can be assumed that the figures here are lower. The findings in this report (Chapters 6.4.1 to 6.4.4) reveal, that in general, none of the vulnerable groups is expected to be completely excluded from the provision of CBRNe related material. However, there are some weak points, such as the provision of more audible materials. The review of the websites and the language offer could also be expanded. In general, the findings suggest a strong need to offer information through different communication channels, ranging from traditional media such as TV and radio to social media channels such as Facebook. Research confirms the effectiveness of this multi-channel dissemination approach also with regard to (temporary) failures of individual channels (e.g. blackout, loss of Wi-Fi connection, etc.) (e.g. Hall et al. 2020, 14).

In view of the immense linguistic diversity and specific needs in the population, overall stronger cooperation should be implemented with CSOs that can facilitate the communication with these groups before, during and after a CBRNe incident. Such joint communication approaches are found across different studies. Campbell et al. (2020b, 15) imply that "partners that work with the groups of interest may be able to help develop culturally relevant messages, translate messages into multiple languages, identify useful information channels, and provide feedback to improve their impact."

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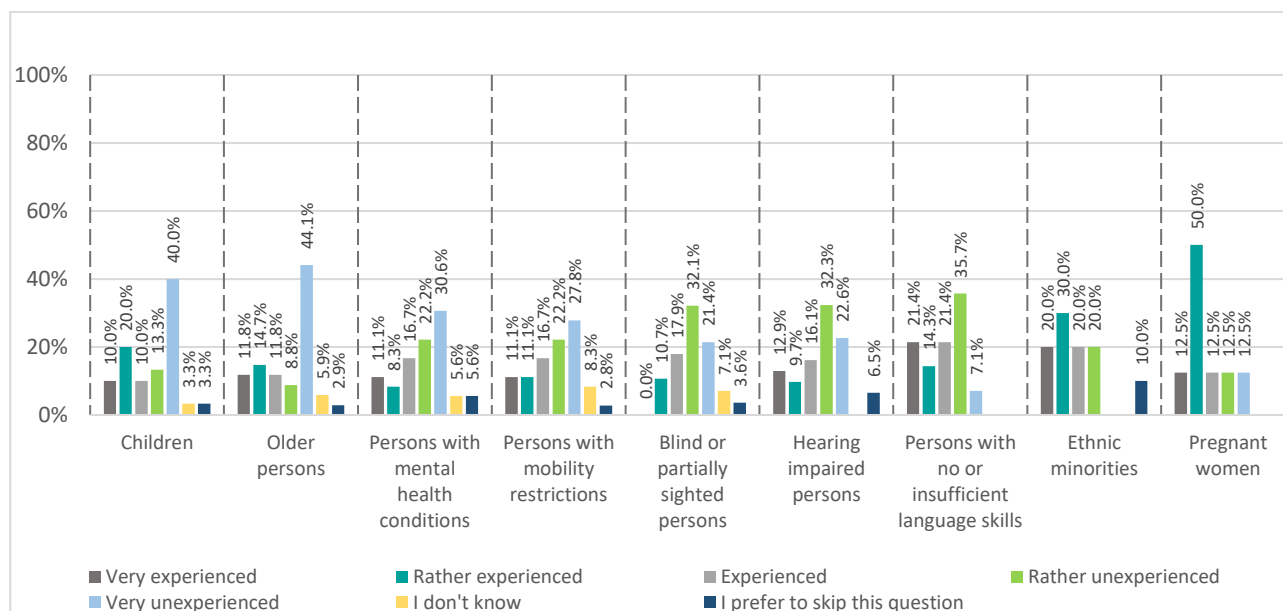
<sup>7</sup> Those participants are representatives of ethnic minorities and people with no or only limited language skills.

### 6.3. Needs, expectations and challenges of especially vulnerable citizens prior to a CBRNe incident

In regard to an (imminent) CBRNe incident, it is important whether the population has already gained experience of disaster events in general and CBRNe incidents in particular. Whether such scenarios are already communicated and trained can strengthen the cooperation between members of the vulnerable civil society and responders in the event of an incident. This includes the availability of relevant information material prior to an event as well as dedicated disaster education programmes.

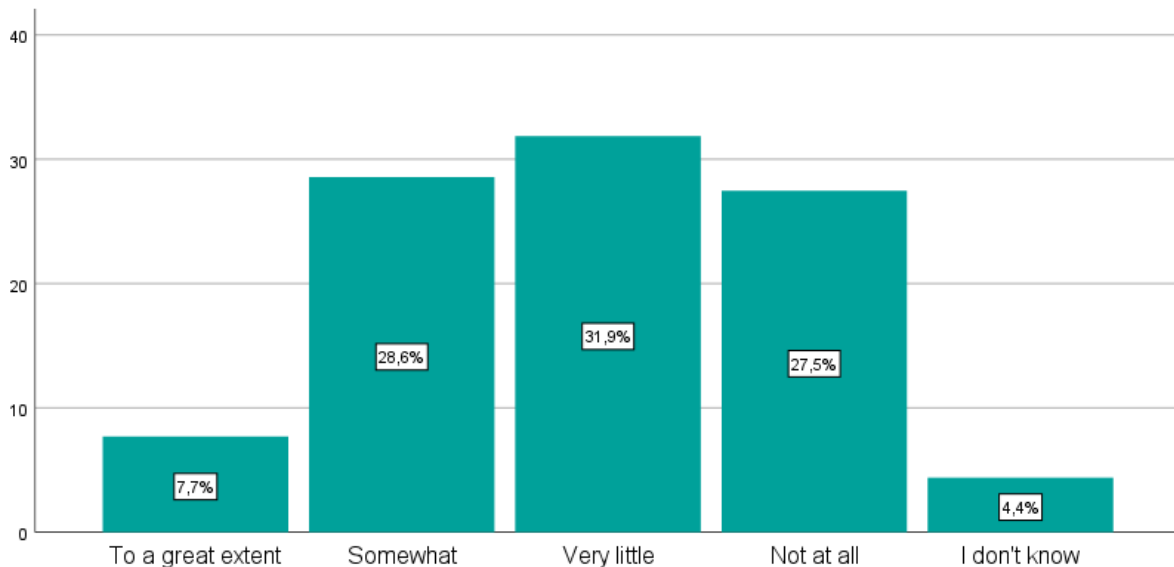
#### 6.3.1. Experience with the topic of disaster events / Information to prepare for a disaster event

With regard to the topic of CBRNe or more generally to the topic of disaster events, it is of interest to know whether the CSOs surveyed have already gained experience in this regard. 16.5% of the respondents indicate that their organisation is very experienced or rather experienced with this topic (see attached Figure 43). Furthermore, 13.2% of the representatives states that their organisation is experienced with the issue of disaster events. In contrast, a large percentage of the respondents (59.4%) indicate that their organisation is rather unexperienced or very unexperienced with this topic. When looking at the organisational representatives by vulnerable group represented, slight differences stand out in the "very experienced" category. 7.1% of the representatives of blind persons, indicate that their organisation is very experienced with the topic of disaster events. In contrast, 21.4% of representatives who represent persons with limited proficiency in the relevant national language indicate this. The values for all other groups considered are in between (see Figure 18).



**Figure 18:** Responders' assessment of the general organisational experience with the topic of disaster events by vulnerable category represented (Children: n=30; Older persons: n=34; Persons with mental health conditions: n=36; Persons with mobility restrictions: n=36; Blind or partially sighted persons: n=28; Hearing impaired persons: n=31; Persons with no or insufficient language skills: n=14; Ethnic minorities: n=10; Pregnant: n=8)

Few of the organisational representatives indicate that their organisation is very experienced with the topic of disaster events. In this context, it is not surprising that only 7.7% of the respondents indicate that their organisation provides information to a great extent to the group they represent on how to behave in the case of a disaster event (see Figure 19). 28.6% of the survey participants state that their organisation distributes some information to the group they represent in this regard. In contrast, a majority of the respondents (59.4%) indicate that their organisation very rarely or not all provide the represented group with information on how to behave during a disaster event.

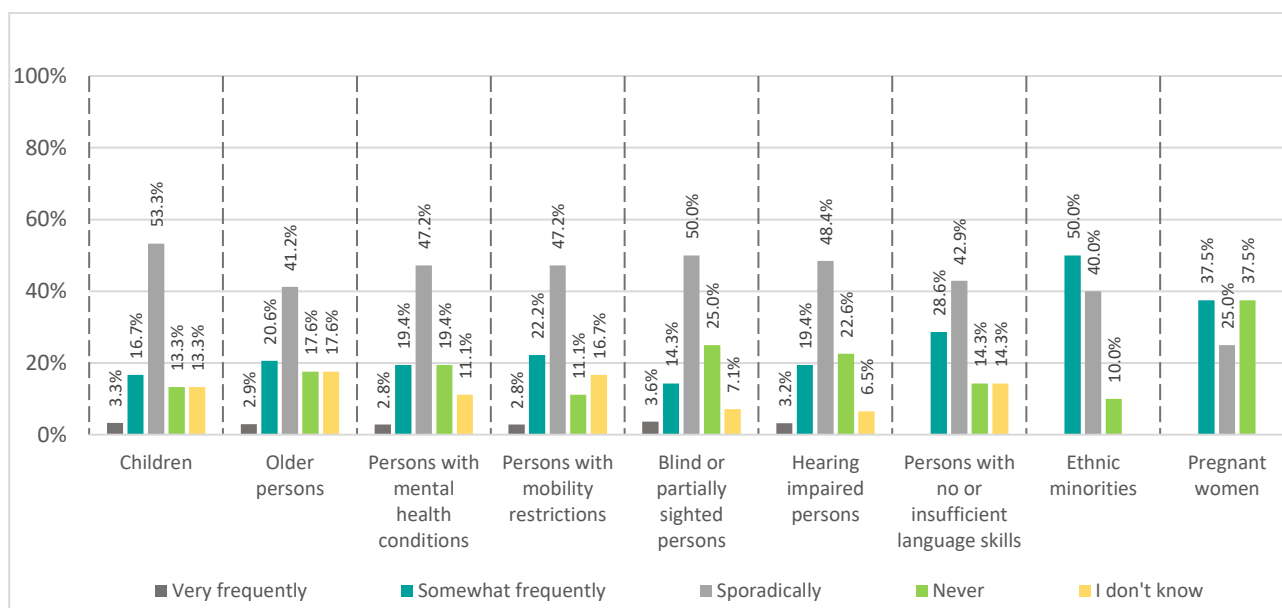


**Figure 19:** Extent to which CSOs provide information for those they represent on how to behave during a disaster event (n = 91)

Presumably, this pattern correlates with the related information material provided by practitioners such as civil protection authorities. Those information materials comprise official emergency agency websites, information campaigns and other sources. Less than one-fifth of the representatives (19.8%) indicate that they very frequently or somewhat frequently came across such publicly available information that they considered useful to the group they represent in preparing for a disaster event (see attached Figure 44). In addition, more than half of the survey participants (50.5%) indicate that they encountered information in this regard only sporadically. Furthermore, about one-fifth of the respondents (20.9%) state that they never came across publicly available informational materials that they thought would be useful in preparing the represented vulnerable group for a disaster event. When looking at the organisational representatives of each vulnerable group separately, no major differences can be noticed. 61.8% of the representatives of older people (see Figure 20) indicate, that they somewhat frequently or sporadically came across publicly available information material that they thought would be suitable for the preparation of older people for a disaster event. In contrast, this value is 72.5% for organisational representatives whose organisations represent pregnant women. All other groups, except for the ethnic minority group (90%), fall in between.

The overall result is certainly related with the formats in which the information materials are offered. Chapter 6.2.4 already stressed the need for special language formats such as Braille or audible language. In general, those additional formats have proved to be only rarely offered on part of LEAs

and first responders to distribute information<sup>8</sup>. Increased use of such formats on the part of LEAs and first responders dealing with disaster events would expand the circle of people for whom information about disaster events are accessible.



**Figure 20:** Responders' assessment of the frequency with which they came across publicly available information materials they thought are adequate in preparing those they represent for a disaster event by vulnerable category represented (Children: n=30; Older persons: n=34; Persons with mental health conditions: n=36; Persons with mobility restrictions: n=36; Blind or partially sighted persons: n=28; Hearing impaired persons: n=31; Persons with no or insufficient language skills: n=14; Ethnic minorities: n=10; Pregnant: n=8)

Overall, it can be summarized that a majority of the respondents indicate that their organisation has little experience in the area of disaster events. A gap can be identified between first responders and CSOs representing vulnerable groups. Such a gap is not surprising since emergency personnel deal with the issue of disaster events on a professional basis. In this respect, it appears difficult or even impossible to completely close this gap. However, the aim should be to raise awareness of this issue among the civil society. Through an expanded awareness / expanded knowledge in this area, the vulnerable groups represented by the corresponding organisations can be prepared more effectively for such incidents. In addition to civil society's own initiative in this area, government agencies (civil protection authorities, LEAs, fire brigades, etc.) are also needed. Government agencies should use the knowledge they have in the area of disaster events more extensively to reach out to CSOs representing vulnerable groups, or more extensively to reach out to civil society in general. As more information is provided by government agencies in this regard, there will certainly be a change in the extent to which CSOs provide information to the vulnerable groups they represent on how to behave in the event of a disaster.

However, it is not only the amount of information distributed that is important, but also the usefulness of the information in preparing the civil society for a disaster event. As shown, only about one-fifth of the respondents indicate that they very frequently or somewhat frequently came across publicly available information materials that they thought would be useful in preparing the represented

<sup>8</sup> However, it must be mentioned restrictively that within the framework of D 2.3, only the formats in which emergency services / authorities offer information on the subject of CBRNe incidents to the public were examined.

vulnerable group for a disaster event. In this context, authorities or practitioners are asked to better tailor their information materials to the needs of the civil society or to the needs of vulnerable groups. However, since it is difficult for authorities / practitioners - and time-intensive - to cover the needs (e.g. with regard to the language formats of the information provided) of diverse vulnerable groups, civil society groups representing the relevant groups are also in demand. Through cooperation between CSOs and practitioners, information materials can be targeted to meet the needs of the relevant vulnerable group. This process also takes time. Overall, however, resources on part of LEAs and first responders can be saved by cooperating with CSOs. In cooperation, the CSOs can develop a suitable format (Braille, children's language, etc.) for the information materials provided by the authorities / practitioners, so that the information is understandable for the represented vulnerable group. CSOs can thus play an important intermediary role in the distribution of information materials by authorities / practitioners to vulnerable groups by preparing the information materials in appropriate formats. Through initiative / cooperation of both sides (practitioners / CSOs), the goal of optimally adapting the information materials to the needs of the respective vulnerable groups can be achieved.

### **6.3.2. Disaster preparedness education programmes**

The following section is dedicated to the CSOs involvement in disaster preparedness education programmes over the past ten years. Education programmes comprise for example in-class training sessions, practical / realistic exercises simulating certain scenarios, tabletop exercises, group discussions, and online training sessions. Implementing such programmes can support the population to better cope with an emergency situation. Additionally, such exercises / programmes can reveal gaps in the disaster management, which can then be remedied. In this way, first responders can practice their SOPs in exercises and subsequently adapt them if necessary.

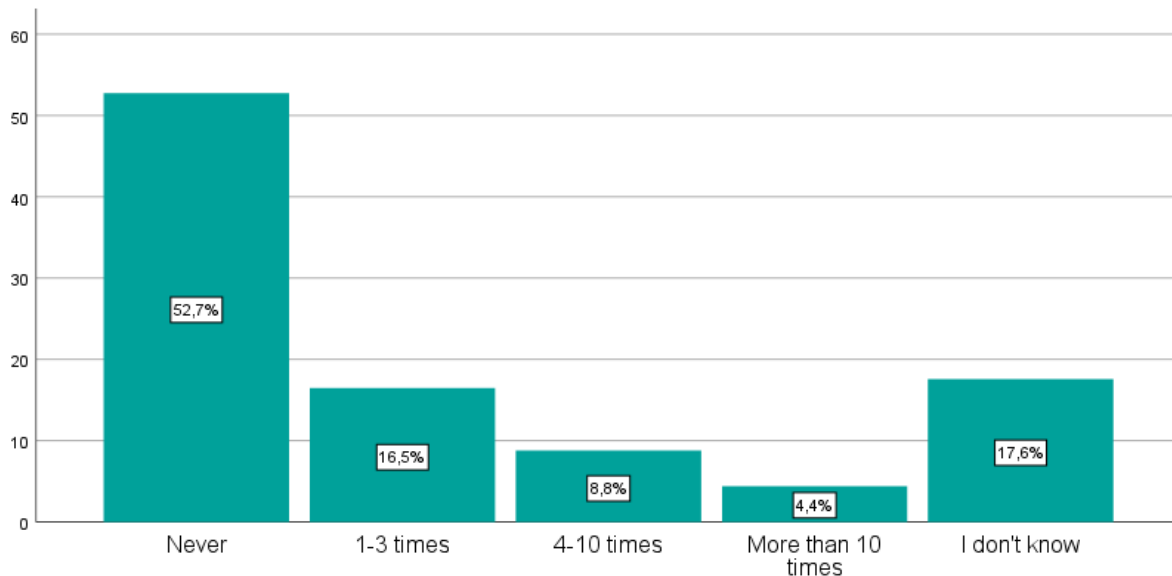
More than half of the CSO respondents (52.7%) indicate that their organisation has never been involved in such programmes in the past ten years (see Figure 21). 16.5% of the survey participants state that their organisation has been involved in education programmes 1-3 times. In addition, 8.8% or 4.4% of respondents indicate a higher rate of organisation involvement (4-10 times or more than 10 times). It should not go unmentioned that approximately one-fifth (17.6%) of the respondents states that they do not know the frequency with which their organisation has been involved in such programmes over the past ten years.

Looking at the content of these programmes, it is noticeable that mainly interaction with first responders (e.g. how to inform them about communication issues like language, sound or vision barriers) was covered in these programmes. 42.3% (n=11) of the respondents (see Figure 22) indicate that communication with first responders was frequently or always covered in the educational programmes in which their organisation has been involved in the last 10 years. In addition, 26.9% (n=7) of the representatives states that this was sometimes the case. Similarly, often (38.4%; n=10; categories frequently and always) the programmes focused on the topic of evacuation<sup>9</sup>, such as in the case of a fire. 23.1% (n=6) of respondents indicate that this subject was sometimes addressed. The topic of medical care / treatment (e.g. execution of an intravenous

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<sup>9</sup> E.g. using official escape routes, following the instructions by authorities.

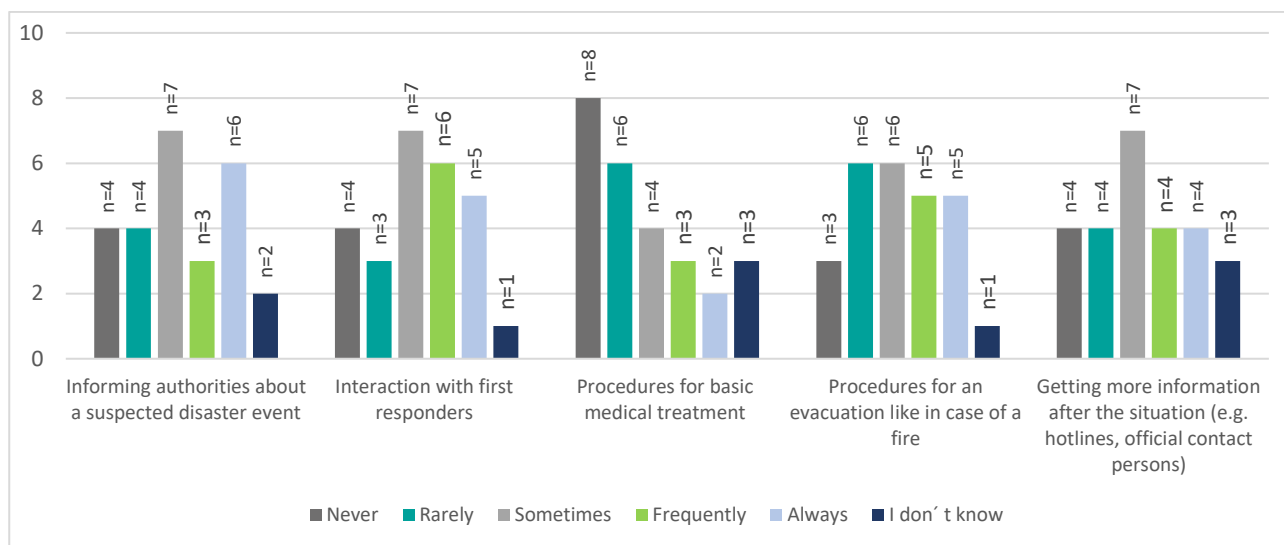
injection, application of an oxygen mask) was the least frequently addressed topic. Only 19.2% (n=5) of the respondents indicate that this topic was frequently or always addressed during the educational programmes. Furthermore, 15.4% (n=4) of the respondents states that this topic was sometimes dealt with.



**Figure 21:** Frequency of organisation's engagement in disaster education programmes in the last ten years (n=91)

In addition to the interaction with first responders during a disaster event, it is also important for those affected to know how they can get more information about the event afterwards. 30.8% (n=8) of the participants indicate that this issue was frequently or always addressed during the respective education programmes and 26.9% (n=7) declared that this was sometimes the case. Another issue before or at the beginning of a disaster event is the issue of informing authorities<sup>10</sup> about a suspected disaster event (e.g. calling the emergency hotline, speaking to officials nearby like police officers or train staff.), for example if someone sees smoke. This issue was also included in the education programmes that the respondents' organisations have participated in over the last 10 years. Thus, 34.6% (n=9) of the respondents states that this area was always or frequently addressed. In addition, more than a quarter (26.9%) (n=7) of the respondents indicate that this issue was sometimes addressed.

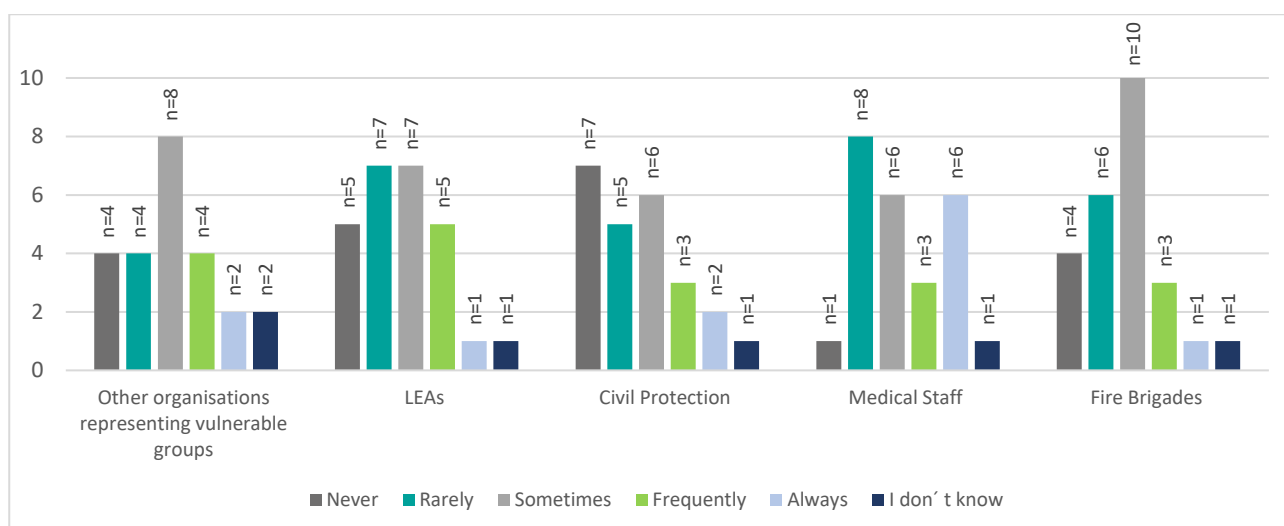
<sup>10</sup> This area also involves interaction with first responders.



**Figure 22:** Frequency in which five aspects of a disaster event are addressed during education programmes (n=26)

Overall, it can be summarized that in the programmes described, emphasis is placed primarily on the topic of interaction with first responders (e.g. how to inform them about communication issues like language, sound or vision barriers). This shows that the organisations representing vulnerable groups attach particular importance to ensuring that the special needs of the group they represent are taken into account by first responders in the event of a disaster.

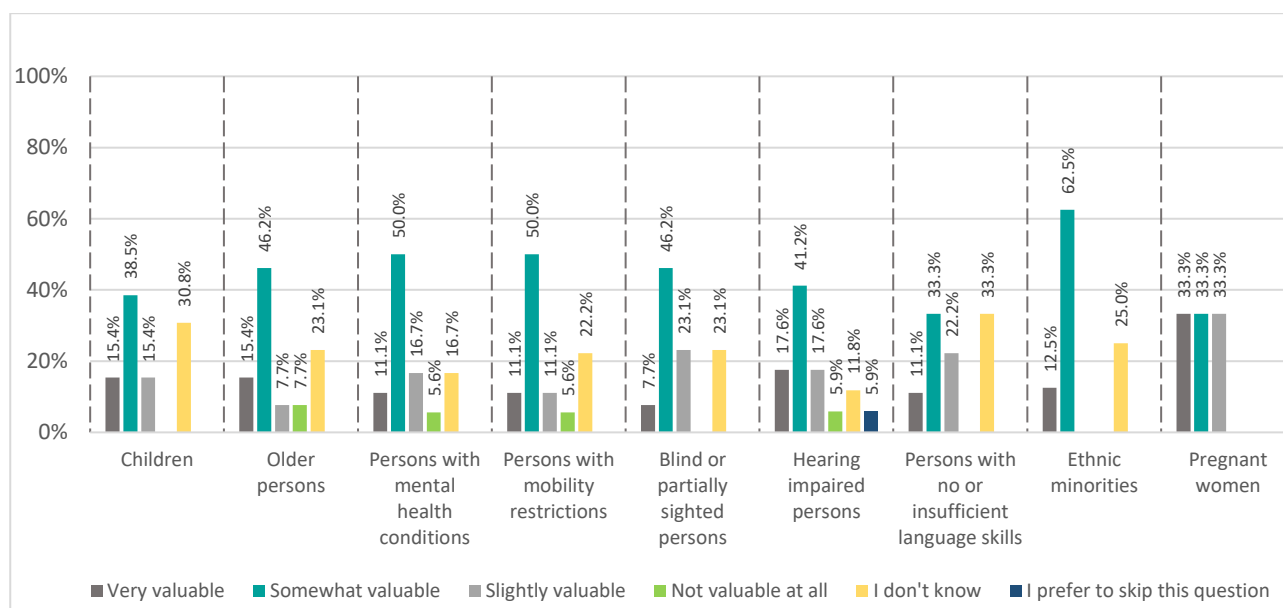
When the results of D2.3 are taken into account, it becomes apparent that the needs of vulnerable groups are seldom taken into account on the part of the emergency services. For example, in CBRNe exercises involving first responder organisations, contact with vulnerable groups was trained in only 8.8% (n=12) of the cases frequently or always (see D2.3). In conclusion, there is a need to further increase awareness on the part of the emergency services of the special needs of vulnerable groups in the event of a CBRNe incident or disaster event.



**Figure 23:** Frequency of organisation's cooperation with other organisations or practitioners to support the education of the represented vulnerable group in the field of disaster events (in order: n=24; n=26; n=24; n=25; n=25)

In addition to the content of the described education programmes, it is also of interest to what extent the respective organisations cooperate with authorities / emergency services - that are responsible

in case of a disaster event - in order to impart knowledge on the topic of disaster events to the groups they represent. 36% (n=9) of the respondents (see Figure 23) indicate that their organisation always or frequently cooperates with medical staff in this regard. In addition, about a quarter (24%) (n=6) of the respondents states that this is sometimes the case. Furthermore, 25% (n=6) of the representatives indicate that their organisation frequently or always cooperates with other organisations representing vulnerable groups in order to prepare the represented vulnerable group for a disaster event. In 33.3% of the cases (n=8) - which is a higher percentage than in the case of the medical staff - it is indicated that this is sometimes the case. Most rarely (16%) (n=4) (Categories frequently and always), representatives state that their organisation cooperates with fire brigades. However, 40% (n=10) of the representatives indicate that their organisation sometimes cooperates with fire brigades in order to educate the represented vulnerable group in the field of disaster events. This is the highest value for the “sometimes” category for all authorities / emergency services surveyed. Slightly higher values (Categories frequently and always) than in the case of fire brigades are found for civil protection authorities. Thus, 20.8% (n=5) of the representatives indicate that their CSO frequently or always cooperates with civil protection authorities to prepare the represented vulnerable group for a disaster event. However, only 25% (n=6) of the representatives declare that this was sometimes true. In the case of LEAs, this is true for 26.9% (n=7) of the representatives. Slightly less of the surveyed representatives (23%) (n=6) declare that their organisation frequently or always cooperates with LEAs to educate those they represent in the field of catastrophic events.



**Figure 24:** Assessment of the value of the organisation's overall education programmes in preparing the represented vulnerable group to cope with a disaster event in the future by vulnerable category represented (Children: n=13; Older persons: n=13; Persons with mental health conditions: n=18; Persons with mobility restrictions: n=18; Blind or partially sighted persons: n=13; Hearing impaired persons: n=17; Persons with no or insufficient language skills: n=9; Ethnic minorities: n=8; Pregnant: n=3)

The above findings indicate that CSOs cooperate to a certain extent with first responder organisations in order to prepare the represented vulnerable group for a disaster event. However, the extent of cooperative relationships still has significant room for improvement. This was also evident in the study with first responders (see D 2.3), which focused only on CBRNe incidents. Only 12.2% of the 222 practitioners, stated that a cooperation exists between their organisation and at least one CSO to address the issue of CBRNe incidents (see D 2.3: 55). Overall, as has been mentioned, there is thus a clear need for expansion of cooperative relationships between first

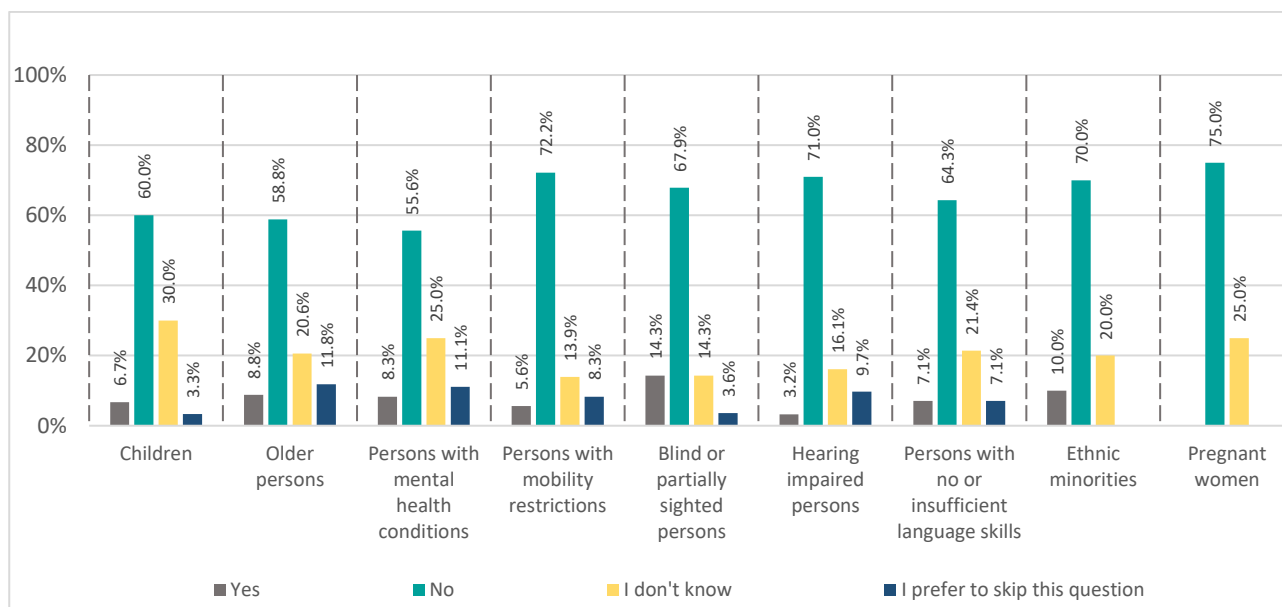
responder organisations and CSOs representing vulnerable groups. In order to achieve the goal of increased exchange between the aforementioned organisations, it is necessary, among other things, as has already been noted, for both sides to take the initiative.

In addition to the question of cooperation partners and the content of the educational programmes described, the benefit for the intended target group is always of interest in such programmes. Fortunately, more than half of the representatives (54.8%) (see attached Figure 45) declare that they think that the programmes are very valuable or somewhat valuable for the represented group, in order to prepare them to cope with a disaster event in the future. Furthermore, in this regard, 11.9% of the representatives indicate that the programmes are slightly valuable and only 4.8% state that the programmes are not at all valuable in preparing the represented vulnerable group to cope with future disaster events. In addition, however, it is important to note that more than a quarter of the representatives (26.2%) could not provide such a classification (I don't know). When looking separately at the organisational representatives by group represented, only slight differences stand out (see Figure 24). 61.6% of the organisational representatives representing older persons rate their organisation's educational programmes as very valuable or somewhat valuable in preparing the vulnerable group represented to deal with a disaster event in the future. In contrast, only 44.4% of the organisational representatives of persons with limited language skills of the respective national language made this classification. Exceptions are shown for the ethnic minority group (75%) and for organisational representatives whose organisation represents pregnant women (66.6%). It must be emphasized, however, that these figures are only comparable to a limited extent due to the low number of cases for these groups. All other groups lie between the first mentioned groups.

Overall, it can be stated that the majority of the respondents think that the programmes are very valuable or somewhat valuable in preparing the represented vulnerable group to cope with a disaster event in the future. This finding should serve as encouragement for those organisations<sup>11</sup> that have not been involved in such educational programmes in the past 10 years to expand their organisational activities in this area. LEAs and first responders should use public relations work to draw the attention of CSOs to the issue of disaster events. However, in addition to raising attention, sufficient financial resources are needed on the side of CSOs to finance activities / operations in the field of disaster events. In the following, attention is therefore paid to the question of whether the annual budget of the organisations represented by the survey participants is considered sufficient to finance the organisation's activities / operations in the field of disaster preparedness / disaster response.

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<sup>11</sup> More than half of the respondents indicate that their organisation has not been involved in such programmes in the past 10 years.



**Figure 25:** Respondents' assessment of sufficiency of the annual budget in the last 5 years for activities / operations related to disaster preparedness and response by vulnerable category represented (Children: n=30; Older persons: n=34; Persons with mental health conditions: n=36; Persons with mobility restrictions: n=36; Blind or partially sighted persons: n=28; Hearing impaired persons: n=31; Persons with no or insufficient language skills: n=14; Ethnic minorities: n=10; Pregnant: n=8)

Nearly 60% of the representatives (59.3%) (see attached Figure 46) indicate that their organisation's annual budget over the past five years has not been sufficient to finance the disaster preparedness / disaster response activities of their organisation. Only about one in ten representatives (9.9%) state that the financial resources were sufficient in this respect. This value is highest for organisational representatives representing blind individuals with 14.3% when survey respondents are considered separately by vulnerable group represented (see Figure 25). Furthermore, it should not go unmentioned that in the overall assessment (see attached Figure 46) 30.8% of the representatives either did not want to answer the question (I prefer to skip this question) or could not make an assessment regarding this question (I don't know).

This result is not surprising, as a majority of the representatives indicate that their organisation is very inexperienced or rather inexperienced with the topic of disaster events. For organisations or organisational representatives, who have hardly any experience with this topic, it might therefore have been rather difficult to answer the question. Nonetheless, it appears that a majority of the respondents rate their organisation's financial resources as insufficient to finance the activities of the respective organisation in the field of disaster preparedness / disaster response in the last five years. One of the demands that could be made is that the financial resources of CSOs organisations should be expanded in order to finance such activities. However, the question from whom the resources should come and whether and, if so, what conditions should be attached to a monetary donation is difficult. It appears to be more appropriate to raise awareness of the importance of the issue in such a way that CSOs use the financial resources at their disposal to ensure that sufficient funds are available for activities in the area of disaster preparedness / disaster response. As has already been mentioned, authorities responsible for dealing with disaster events, among others, can help raise awareness of the importance of the issue on the civil society side through appropriate public relations work.

## **6.4. Needs, expectations and challenges of especially vulnerable groups during a CBRNe incident in regard to scene management, evacuation and recovery procedures**

In a further step of the study, the survey participants were confronted with a CBRNe incident. Most CBRN agents are invisible to the naked eye, odor free and hard to detect by the public. Previous research already provides a picture of different vulnerabilities in relation to evacuation process in general (e.g. Crowder & Charters 2013) and CBRNe incidents in particular (e.g. Eid et al. 2019, Chung et al. 2020, Edkins et al. 2010). The following part complements existing knowledge about the response to vulnerabilities in CBRNe related processes with the new findings of the survey with CSO representatives. Consequently, Chapter 6.4 provides a comprehensive picture of the needs and expectations of particularly vulnerable groups of people in regard to CBRNe incidents.

In general, it has to be emphasized, that a review of 95 guidance documents from 18 different countries (Hall et al. 2020, 11-12) revealed that in regard to evacuation, medical treatment, undressing, decontamination and the subsequent after-care, a range of CBRNe response management strategies exist. Those don't necessarily are consistent, neither within nor between countries. Therefore, the report does not go into country-specific and CBRNe agent-specific particularities or analyses different graduations of the related processes (e.g. issues in regard to wet vs. dry decontamination), but describes basic needs and expectations of vulnerable people based on the most comprehensive decontamination process; the total undressing and the wet decontamination.

### **6.4.1. The evacuation process**

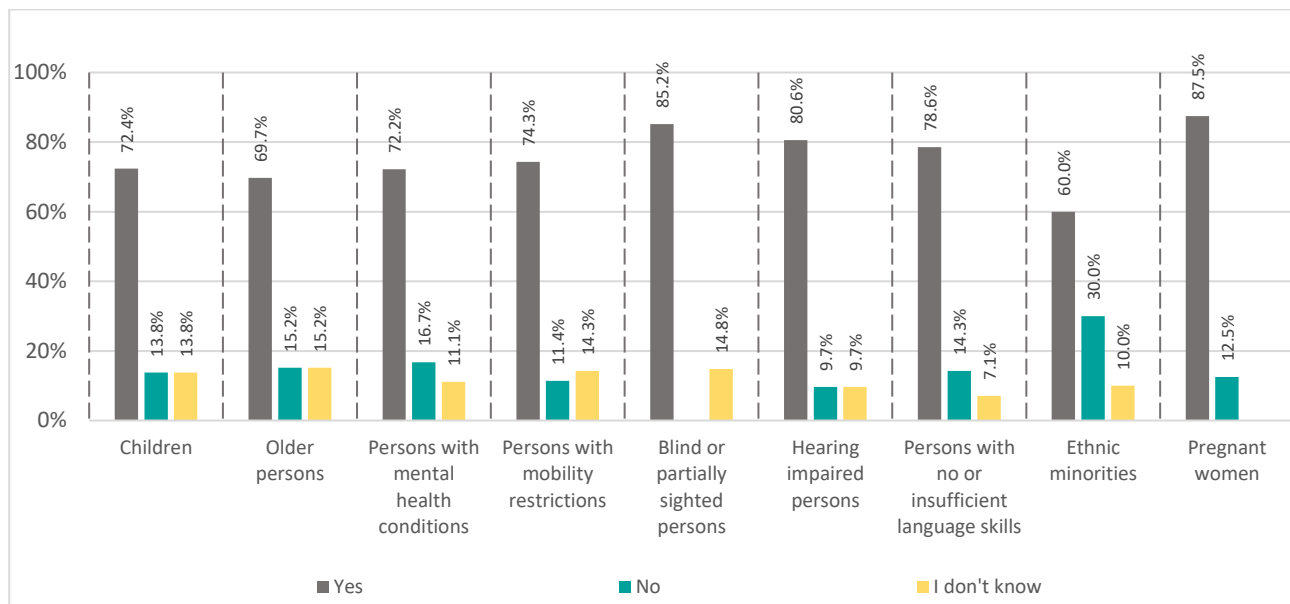
In the event of a CBRNe incident, it is likely that the affected area will have to be evacuated. An evacuation moves people from a defined area. The general public is familiar with escape symbols on doors in public buildings that indicate safe escape routes. Unlike in the event of a fire, CBRNe agents are sometimes not recognisable. Therefore, emergency services must communicate the need for an evacuation. Evacuations ordered by the authorities are obligatory for the affected citizens.

The SOPs of such an evacuation are trained by those responsible for an evacuation. This enables a timely and reliable evacuation process. Crowder & Charters (2013, 16) proved that across most localities, the evacuation flow rate increases as the number of affected people increases. However, such flow calculations must take into account irregular behavioural patterns that could hinder the flow. Such patterns include among others symptoms of fear and anxiety if people don't understand the measures undertaken by CBRNe practitioners. Research implies that increased anxiety among those affected will result in reduced compliance with the given instructions (e.g. Nyaku et al. 2014; Pearce et al. 2013). Besides psychological aspects, an evacuation can result in further considerable challenges, especially for vulnerable groups. As an example, vulnerable persons can only follow the orders if they are able to both understand the given orders (e.g. language barriers) and comply with it (e.g. due to mobility restrictions). In order to ensure a smooth process, it is of interest to know which members of the civil society have difficulties with the measures undertaken by the emergency forces during the evacuation process.

But relevant SOPs of first responders can only address the special needs and expectations of the vulnerable civil society if they are identified prior to an event. An assessment can be made through joint trainings with members of the vulnerable civil society. However, as already noted in Chapter 6.3.2, trainings with vulnerable persons are rarely performed. The following part therefore looks specifically at what assessments the representatives make with regard to a hypothetical evacuation situation in which those they represent could be involved.

The following section clarifies whether in the event of an assumed CBRNe incident, it would be problematic for the represented vulnerable group to leave the immediate hazardous area based on instructions from first responders.

A significant majority of the representatives (70%) indicate that they think it would be problematic for people their organisation represents to leave an area affected by a CBRNe incident based on instructions from first responders. In contrast, only 17.8% of the respondents negate this (see attached Figure 47).



**Figure 26:** During an assumed CBRNe scenario, do you think it would be problematic for those you represent to leave the premises according to instructions from first responders? Respondents' assessment by vulnerable category represented (Children: n=29; Older persons: n=33; Persons with mental health conditions: n=36; Persons with mobility restrictions: n=35; Blind or partially sighted persons: n=27; Hearing impaired persons: n=31; Persons with no or insufficient language skills: n=14; Ethnic minorities: n=10; Pregnant: n=8)

When looking at the organisational representatives separately by vulnerable group represented, it can be seen that the majority always consider the process described to be problematic. Thus, 60% of the representatives representing ethnic minorities state that the described scenario would be problematic for the group they represent. For respondents representing pregnant women, this value is even higher at 87.5%. The values for the other groups lie between the values of the first two groups mentioned (see Figure 26). The data indicate a strong demand for specific measures to address this anticipated problem. First, general challenges are described which are to be expected with regard to all groups. Based on this, specific challenges with regard to the individual groups will be considered.

Asked about the extent to which the situation is problematic for the group their organisation represents, participants assume a general problem with the masks / clothing of the emergency

forces. As part of the evacuation process it should be noted, that individuals affected by the incident will likely be dealing with first responders who will be wearing a full body uniform as well as a respiratory mask that partially or fully (only the eyes are visible) covers the face. The masks will muffle the voices of the first responders. This might affect the communication. Respondents fear communication problems due to the masks as well as anxiety and panic due to the clothing of the first responders. These problems seem to affect the individual groups to slightly different degrees, while the general tendency across groups remains obvious.

Anxiety triggered by first responders' clothing is particularly mentioned in the context of **individuals with mental health conditions**. Depending on vulnerability, different behaviour is to be expected. In connection with anxiety disorders, respondents expect that the PPE can have a negative impact on the evacuation process. For example, anxiety disorders can make affected persons unable to leave their homes. They may also find it difficult to cope with crowds. In the event of an evacuation process, the affected persons may react in a paralyzed manner. Another possible reaction, according to organisational representatives, is panic. Difficulties in understanding the situation and the given orders are furthermore to be expected for people with developmental disabilities. The danger of panic reactions as well as compulsive behaviour (e.g. touching certain objects several times instead of walking on) furthermore exists for people with autism. For them, stressful situations outside the normal routine can be particularly difficult.

To deal with an evacuation process can also be particularly difficult for **hearing impaired individuals**. Representatives of hearing impaired individuals describe the problem of not understanding instructions from emergency personnel due to hearing problems. This can also be the case when emergency personnel use loudspeakers, since due to the noisy environment in the case of an evacuation process, instructions may not be understandable to hearing impaired persons. According to their representatives, for totally deaf people, there is a risk of not receiving information in the event of an evacuation, as they are dependent on body language as well as reading the face (lips). When first responders wear masks lip reading is however impossible. For completely deaf people, the need for sign language interpreters<sup>12</sup> at the emergency site is addressed in this context. Furthermore, organisational representatives emphasize the need for visual instructions (e.g., in text form, picture form, video form) for hearing impaired persons as well as deaf people in the event of an evacuation. An additional difficulty that hearing impaired individuals may encounter in the event of an evacuation is that emergency staff may not recognize their disability. In this respect, it is important that hearing impaired persons quickly make the first responders aware of their disability. As shown in Chapter 6.3, programmes that prepare vulnerable groups for a disaster event can be helpful in this regard.

In addition to hearing impaired persons, **visually impaired and blind persons** also require special assistance in the event of an evacuation. Representatives of blind persons, for example, point out that this group has only a limited ability to receive information. In the event of an evacuation, understanding body language is difficult or impossible. Therefore, those affected will need and expect information that is verbally communicated. This group is therefore strongly affected by the

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<sup>12</sup> However, it may be difficult to ensure that appropriately trained personnel are operating at the site. For example, a Romanian respondent addressed the fact that not enough personnel are trained in sign language in Romania.

altered speech quality through the mask. Furthermore, first responders might be confronted with guiding dogs.

Moreover, organisational representatives point out that **deafblind persons** are furthermore unable to hear as well as to visually recognize the instructions of the first responders. In this context, the need for interpreters for deafblind persons is mentioned.

Besides limitations in vision and hearing, **mobility impairments** (e.g., in the case of older persons<sup>13</sup>) can pose special challenges to people in the event of an evacuation. Organisational representatives point out that in the event of an evacuation, people with mobility impairments need time and assistance to follow given instructions. Infrastructural factors can prove problematic in the event of an evacuation, according to one organisational representative. The representative refers to inadequate conditions for people with limited mobility in his city / region (staircase problems / elevators cannot be used in the event of an evacuation<sup>14</sup>). The use of walking aids can also be a problem when evacuating from a train over uneven or slippery terrain. Since these aids represent a form of independence, it can be assumed that affected persons refuse to hand over these objects.

Furthermore, first responders should consider that **children** may react with rigidity or escape tendencies in the event of an evacuation. Research further suggests that children will show separation anxiety if they are separated from their contact persons (see Gurwitch et al. 2004). Furthermore, children are assumed to not follow the instructions of first responders. In this regard, one organisational representative refers to the instruction to children that they should not go with strangers<sup>15</sup>. Basically, pupils in many European countries are prepared for the basic elements of an evacuation process through regularly trained fire alarms at school. In this respect, there are already helpful guidelines for teachers on how to deal with students in such a situation (e.g. DGUV 2019). With regard to infants, it should be taken into account that the person carrying them may not be able to walk rapidly. Especially on rough terrain, a first responder may need to take over the carrying to prevent a fall and allow a rapid evacuation. The same applies to **people with chronic health conditions** who need to carry oxygen with them.

Organisational representatives of **ethnic minorities** point out that many refugees come from areas where disasters are commonplace. In particular, refugees from war and crisis zones are familiar with the dangers posed by nuclear, chemical, or biological (warfare) agents, according to the representatives. Many of these people, their representatives added, are accustomed to following the instructions of (outwardly recognizable) authorities in such cases<sup>16</sup>. Besides, however, there are also groups that do not have this biographical background as well as groups that do not take visible dangers seriously. Furthermore, there are groups that do not follow the instructions of state

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<sup>13</sup> In addition to older people, this can also concern pregnant or postpartum women.

<sup>14</sup> For example, in case of a fire.

<sup>15</sup> Eid et al. (2019, 2) suggest the training of evacuation procedures at school in which teacher are dressed in PPE to demonstrate that people wearing such outfits can be trusted.

<sup>16</sup> However, it could also be that due to traumatic experiences in the past, these individuals may react to another CBRNe incident with rigidity or flight tendencies.

authorities<sup>17</sup>. In addition, in the case of evacuations, it may be difficult for persons with a lack of knowledge of the relevant national language to understand the instructions of the emergency personnel. This circumstance, as well as the further explanations in this paragraph, should be taken into account by emergency forces in the event of an evacuation.

In regard to evacuation process, **tourists** are considered vulnerable as well. Besides insufficient local language skills, the unfamiliar environment and isolation from contact persons might trigger physiological stressors (Eid et al. 2019, 4).

In the context of an evacuation process, Eid et al. (2019, 4) additionally refer to **homeless people**. Previous experiences with representatives of authorities may condition absconding behaviour (e.g. fear of prosecution, missing papers, etc.) that has to be kept in mind by first responders.

It can be summarized that there are expected challenges in regard to all vulnerable groups when it comes to leaving the affected area based on instructions from first responders. Looking at the measures undertaken by first responders, it becomes apparent that there are gaps with regard to the needs mentioned above.

In the context of hearing impaired individuals, it is noted that they need visual instructions (e.g., in text or picture form). To some extent, first responders provide pictorial language. For example, in the study with first responders, about half of the respondents indicated that CBRNe-related information from their organisation is offered in pictorial language (see D 2.3: 69). However, a further expansion of such offers would be desirable, among other things, with regard to hearing impaired persons. Furthermore, in the event of an evacuation, the need for sign language interpreters is raised by organisational representatives. Only rarely, as the study with responders showed, is CBRNe-related information offered in sign language (see D 2.3: 69). Thus, there seems to be a gap between the needs of the affected vulnerable groups and the approaches of the emergency services or their organisations. As already mentioned above, it can be difficult for first responder organisations to take such special needs into account to a sufficient extent, due to heavy time demands. In this context, cooperation's with organisations representing hearing impaired persons are conceivable.

With regard to the problem that people may have to be evacuated at an emergency site who have insufficient language skills or no knowledge of the relevant national language, respondents stress the need for multilingual skills on the part of the emergency response organisations. As was shown in the study with representatives of emergency response organisations, CBRNe-related information is provided in additional languages to a considerable extent (see D 2.3: 68). However, in the event of a CBRNe incident involving individuals with a wide variety of language skills, first responder organisations or their staff cannot be expected to cover the full range of different languages. At this point, cooperation's with organisations representing ethnic minorities could be useful. In the event of a CBRNe incident, staff from those organisations with appropriate language skills could be called to overcome language barriers.

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<sup>17</sup> This could be related to the fact that some refugees have had bad experiences with state authorities in their home countries. Such experiences can contribute to the situation that, in the event of a CBRNe incident, the instructions of emergency forces are not followed.

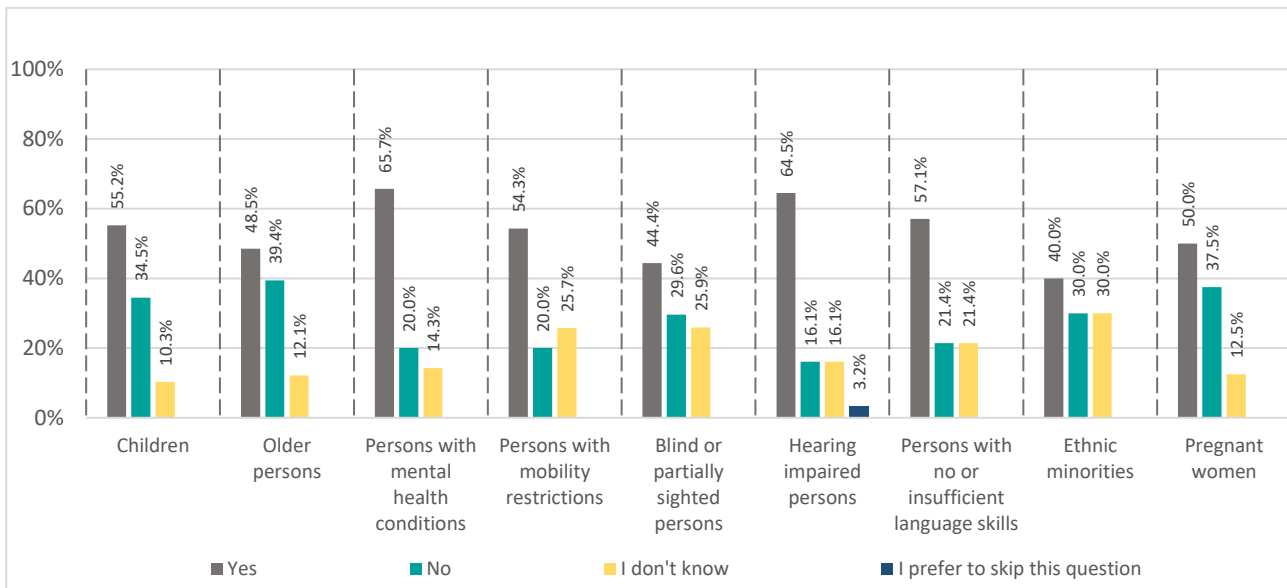
In addition to looking at individual groups, one should generally focus on the way messages are communicated in the event of an evacuation. It appears, that failures in the provision of clear information that corresponds to the special needs of members of the civil society can negatively affect their compliance with evacuation orders (e.g. Campbell et al. 2020b, 14). Organisational representatives make clear that the use of certain expressions and words can lead to confusion and anxiety. Furthermore, in the worst-case scenario, people may act verbally or physically. Organisational representatives express the need for messages that are delivered in a simple way so that they are understood. When including the mentioned study with responders, it can be seen that a large proportion of respondents indicated that their organisation provides CBRNe-related information in plain language (see D 2.3: 69). Thus, it appears that responder organisations are well on their way in this regard.

These gaps also relate to the further interaction with vulnerable persons in CBRNe incidents. After leaving the immediate hazardous area, those affected will have to stay in an assigned location within the hot zone to receive further instructions from first responders before undergoing the decontamination process. The following section clarifies whether in the event of an assumed CBRNe incident, it would be problematic for the represented vulnerable group to stay within the hot zone.

More than half of the surveyed organisational representatives (56.2%, see attached Figure 48) think that this would be problematic for the represented vulnerable group. A quarter of the respondents (25.8%), on the other hand, do not see this as a problem and 16.9% of the respondents states that they cannot make a statement in this regard (I do not know). Also, when examining the organisational representatives by the vulnerable group represented, it can be seen that mostly the majority of the respondents classify the described situation as problematic for the represented group (see Figure 27). Thus, 65.7% of the representatives of persons with mental health conditions classify the situation as problematic for the represented group (this is the highest value for all groups considered). In contrast, only 40% of the representatives of ethnic minorities make this classification (this is the lowest value for all groups considered). However, this does not mean that a majority of these respondents consider the process described to be unproblematic. 30% of these respondents states that they do not know whether the situation would be problematic for the group they represent.

Respondents who indicated that waiting in an assigned area for further instructions from first responders would be problematic for the represented group were further asked to what extent this would be problematic. When looking at the responses, similar patterns can be identified as in the previous section of the chapter.

In general, it is emphasized that such a situation could lead to fear or panic among vulnerable citizens. Uncompliant behaviour and flight tendencies are conceivable. In this context, a need for calming or comfort is highlighted. Organisational representatives emphasize, however, that in emergencies / during situations of chaos, it is very difficult to convince the persons concerned to remain calm and wait for further instructions. In addition, it is emphasized that not everyone will have difficulties with such a situation. However, people may not understand information, the risk or the reason why they need to stay in an assigned place.



**Figure 27:** During an assumed CBRNe scenario, do you think it would be problematic for those you represent to stay in an assigned place within the area of risk until first responders give further instructions? Respondents' assessment by vulnerable category represented (Children: n=29; Older persons: n=33; Persons with mental health conditions: n=35; Persons with mobility restrictions: n=35; Blind or partially sighted persons: n=27; Hearing impaired persons: n=31; Persons with no or insufficient language skills: n=14; Ethnic minorities: n=10; Pregnant: n=8)

The risk that instructions from emergency personnel may not be understood is emphasized in relation to persons with **mental health conditions**. Respondents highlight that autistic individuals may have difficulties with the waiting process. Some autistic persons regularly go for walks and may not understand why they cannot do so in the situation described. Moreover, representatives emphasize that persons with autism need personal space and cannot cope with such a situation for a long time. In this regard, services offered by hospitals are mentioned that organise services in such a way that autistic persons are seen first and do not have to stay in waiting areas for a long time. Similarly, individuals with anxiety disorders may not be able to cope with crowds. In general, organisational representatives emphasize that people with mental health conditions need support and contact persons. Furthermore, they continuously need information that is communicated in a simple format.

The problem of not understanding information is again highlighted specifically for **hearing impaired** individuals. As in the case of leaving an affected area, the need for sign language interpreters as well as visual instructions is emphasized.

Waiting in an assigned area is rated by organisational representatives representing **blind** individuals as presumably not problematic for the represented group. However, it may also be that such a situation (in an unfamiliar area) is very stressful and frightening for blind persons if they cannot see what is going on around them. In addition, according to organisational representatives, such a situation can lead to orientation problems for blind persons. In such cases, they need to rely on the assistance of emergency personnel.

For **children**, organisational representatives point out that such a situation might cause anxiety disorders that could have a strong negative impact on the evacuation process itself and the further interaction. Besides general psychologists, the need for psychologists on site is emphasized who

are specialized in dealing with children. Research further stress the need for a close supervision since children might decompensate or collapse without sufficient warning (see Freyberg 2008, 169).

With regard to **ethnic minorities**, language issues are again highlighted. In addition, it is emphasized that during the waiting process in a designated area - depending on the composition of the groups - group dynamic reactions are possible, which can be hardly controllable due to a wide variety of languages.

All in all, it can be summarized that a majority<sup>18</sup> of respondents think that it would be problematic for the represented vulnerable group to wait in an assigned area for further instructions from the responders during a CBRNe scenario. As in the case of leaving an affected area, similar issues and needs have emerged on the part of vulnerable groups. Based on the results of the previous sections, the need for sufficient psychologically trained personnel on the scene was emphasized once again. In addition to specialist personnel (psychologists), it is also important that the emergency forces on site are able to deal with the affected persons in a psychologically empathetic manner. Thus, organisational representatives have identified a desire on the part of those affected for calming in the situations described. Training / CBRNe exercises can be helpful for appropriate handling of those affected in a CBRNe scenario. Training / exercises can also help to better address the needs of vulnerable groups in a CBRNe scenario<sup>19</sup>. However, the study with responder organisations showed that vulnerable groups are very rarely involved in CBRNe exercises conducted by first responder organisations (see D 2.3: 42f.). In this context, it is difficult for emergency response organisations to include vulnerable groups (outsiders) in such exercises. Legal aspects (closure information, etc.) as well as tactical reasons may speak against the inclusion of outsiders in such exercises. Nevertheless, more exercises involving vulnerable groups should be conducted. The above-mentioned problems can possibly be mitigated by confidentiality obligations in advance of CBRNe exercises. In addition, cooperation's with trustworthy organisations representing vulnerable groups are conceivable. By increasing the involvement of vulnerable groups in CBRNe exercises, the goal of improving the consideration of the needs of vulnerable groups on the part of the emergency response organisations can be achieved.

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<sup>18</sup> However, this majority is not as large as in the case of leaving the scene of the accident.

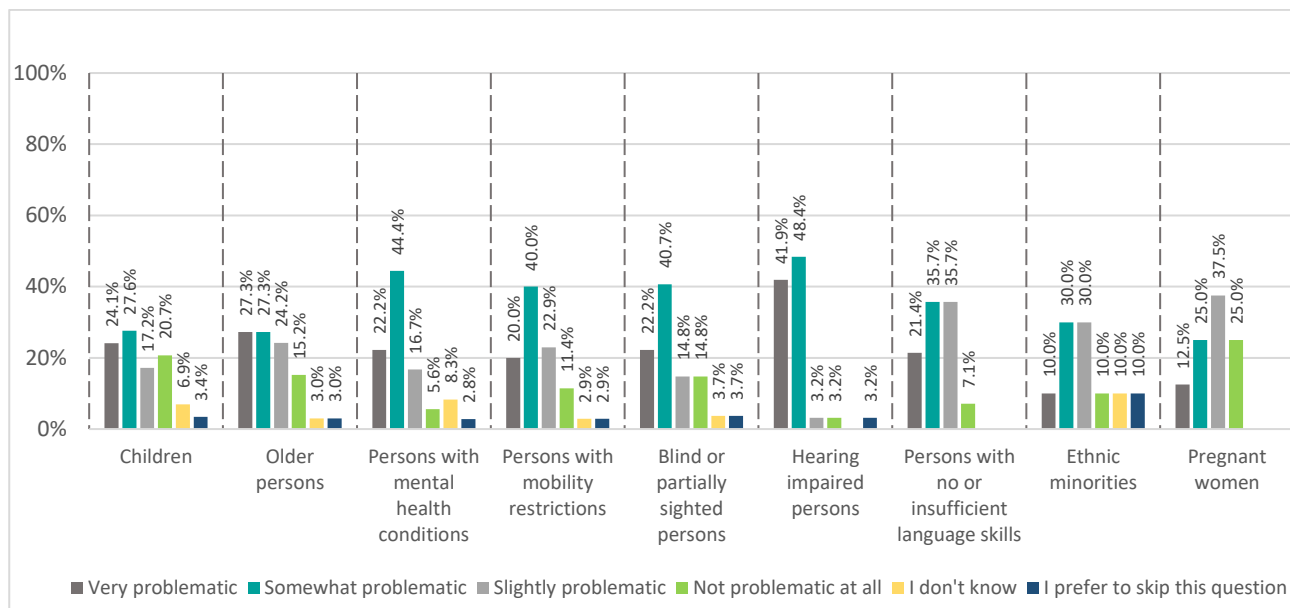
<sup>19</sup> The fact that there is a need for action in this area is shown, among other things, by the statement of a Romanian participant who emphasizes that there is not enough training for emergency personnel in Romania to prepare them for interacting with people with disabilities.

## 6.4.2. The medical triage process

Before undergoing the decontamination, an initial medical assessment is performed. At this stage, it is decided which persons have to go through the further decontamination process more quickly in order to receive further urgently needed medical treatment, and which persons have to remain in the hot zone. It is also decided which persons may be able to take a decontamination shower under supervision and which persons need further support. The prioritizing is based on the vulnerability of those affected and the severity of their medical condition (e.g. Eid et al. 2019, 1). These decisions are not made by choice but are based on a system that determines exactly which patient is placed in which treatment group. It is used when insufficient resources of emergency forces and/or material make it necessary to prioritise medical assistance. In the case of CBRNe, this means that only a limited number of CBRNe-equipped emergency forces can work in the hot zone and only a limited number of affected persons can undergo the complex decontamination process at the same time. The capacity is approx. 6-20 persons per hour, depending on the injury and degree of contamination (see e.g. BBK 2011). Basic aspects of this so-called medical triage have meanwhile also become better known among the public during Covid-19.

The following section clarifies whether in the event of an assumed CBRNe incident, it would be problematic for the represented vulnerable group to undergo the medical triage process in cooperation with first responders.

As can be seen in Figure 49 (see attachment), more than half of the representatives surveyed (60%) state that this initial medical treatment with first responders that still wear heavy protection gear would be very problematic or somewhat problematic for the group they represent. Another 18.9% of the respondents think that conducting such a medical triage would be slightly problematic for the group they represent. In contrast, only 14.4% of the organisational representatives think that the process described would be unproblematic for the represented group. Differences emerge when looking at the representatives separately by vulnerable group represented (see Figure 28). Thus, 10% of the representatives of ethnic minorities state that the described scenario would be very problematic for the group they represent. In contrast, 41.9% of the respondents representing hearing impaired persons make this classification. The values of all other groups considered lie between the two first-mentioned values.



**Figure 28:** During an assumed CBRNe scenario, how problematic do you think it would be for those you represent to undergo a medical triage? Participants' assessment by vulnerable category represented (Children: n=29; Older persons: n=33; Persons with mental health conditions: n=36; Persons with mobility restrictions: n=35; Blind or partially sighted persons: n=27; Hearing impaired persons: n=31; Persons with no or insufficient language skills: n=14; Ethnic minorities: n=10; Pregnant: n=8)

Of the organisational representatives who identified the medical triage process as problematic for their represented group, some highlight that this process could lead to fear (of the unknown), hysteria, stress, and or lack of understanding on the part of the represented group. In addition, it might be that those affected react defensively to the process described. The PPE is still considered a significant trigger of fear or even for panic attacks. However, some CSO representatives emphasize that familiarity with such clothing has been increased by Covid-19.

A consideration of the vulnerable groups described shows that the process can be especially problematic for people with **mental health conditions**. First responders might wrongly assume that the condition is caused by the CBRNe incident. Furthermore, persons might cope with the instructions until a certain trigger causes a change of behaviour. Additionally, persons might be unable to provide relevant personal data, especially regarding their medical history. One respondent further emphasizes that autistic persons may show difficulties in dealing with medical tests.

The muffled voice through the mask worn by first responders might increase communication difficulties and misinformation about the medical background and the current health condition for **hearing impaired persons**. First responders should consider that hearing aids do not guarantee that those affected can understand them. According to organisational representatives, this can lead to a situation in which hearing impaired persons do not develop an understanding of the need and urgency for a medical examination. The need for sign language interpreters is again emphasized for this process.

Besides hearing impaired persons, **visual impaired persons** will rely on guidance and information on what is going to happen. Similar difficulties may arise if blind or visually impaired persons do not understand the instructions of the emergency personnel due to the muffled voice through the PPE.

In the case of **hearing loss in addition to blindness**, the need for deaf-blind interpreters was again emphasized.

The medical triage could be further problematic for people with **mobility impairments**. One organisational representative points out that a medical triage could be problematic if the emergency personnel is not trained to deal with people with limited mobility. Response personnel may not recognize the difference between a disability and a health condition that is caused by the event. According to the representative a medical triage could be further problematic if people with mobility restrictions are asked to perform certain movements such as standing up. Also, some prostheses that cannot go through the decontamination shower without difficulty are not immediately recognisable, so that the person cannot be made aware of the possible need to remove them.

Freyberg et al. (2008, 168) point out, that **children** may be unable to provide relevant personal data, especially regarding their medical history.

Mother and child may be more affected by the CBRNe incident than other groups. According to a representative of an organisation that represents **pregnant women**, a stressful situation, as described above, can negatively affect mother and child. Research suggests, that pregnant women might refuse medical treatment if they perceive a threat for their foetus (e.g. Cono et al. 2006, 1633).

In contrast, an organisational representative whose organisation represents **ethnic minorities** classifies the described scenario as unproblematic for a large part of the represented group. However, the situation would be problematic for those who have been triggered by a trauma and are in a state of mental distress. Problems, according to an organisational representative, could also arise due to **language barriers**. If information is not understood and thus the need for a medical triage is not understood, this can lead to fear on the affected side. In regard to people with no or only limited local language skills, first responders should expect that some people might deny that they did not understand the information. This can cause serious mistreatment.

All in all, it can be summarized that a majority of the representatives (60%) assess the medical triage process as very problematic or somewhat problematic for the represented vulnerable group.

### 6.4.3. The undressing process

Following the evacuation process, individuals affected by a CBRNe incident may need to undergo a decontamination process as a further step if they have come into contact with substances that absolutely must be removed from clothing / skin surfaces. The decontamination process describes the removal of hazardous contaminants. Depending on the substance and the national SOPs, different decontamination procedures will be applied. These range from hand washing to dry decontamination and chemical showers (see Hall et al. 2020, 11). In the survey, special attention was paid to the more extensive decontamination procedure that uses a decontamination tent system for wet decontamination. In preparation for a decontamination process, it is possible that affected persons will be asked to partially or completely undress themselves (see Hall et al. 2020, 11). They will probably only wear a tag or wristband. These were distributed as part of the previous medical triage and usually indicate the classification in the respective treatment category as well as the medical measures carried out and the urgently needed further treatment. The process can be particularly problematic for vulnerable groups. Due to self-protection, the emergency forces will still wear heavy protective equipment in this situation.

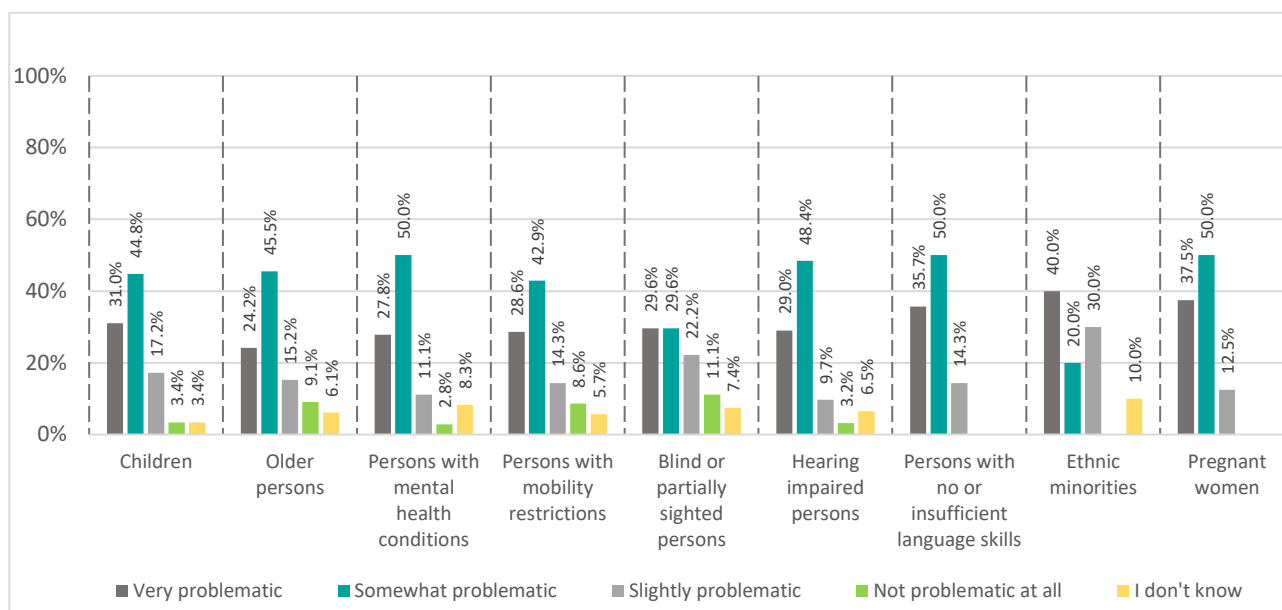
In order to clarify whether and if so to what extent this process is problematic for vulnerable groups, the organisational representatives were asked whether they think it would be problematic for the group they represent to undress for the further decontamination process. The following section describes the representatives' assessment in regard to the undressing process.

A large majority of the organisational representatives (83.3%, see attached Figure 50) think that this process would be to some extent problematic for the vulnerable group they represent. In this regard, a quarter (24.4%) of the respondents think that this process would be very problematic and 41.1% of the surveyed organisational representatives indicate that undressing would be somewhat problematic for the group they represent. In addition, 17.8% of the respondents rate this process as slightly problematic and only 8.9% indicate that they think this process would not be problematic at all for the vulnerable group they represent. A look at the individual groups shows that especially the representatives of ethnic minorities think that the described scenario would be very problematic for the group they represent (40%)<sup>20</sup>. On the other hand, only 24.2% of the representatives of organisations representing older people make this assessment (see Figure 29).

Except for the respondents who indicated "not problematic at all," "I don't know," or "I prefer to skip this question," all respondents were asked about the extent to which undressing would be problematic for the vulnerable group represented by their organisation. In general, it can be stated that some organisational representatives think that it would be problematic for the group or parts of the group they represent to understand the necessity of the measure. In this context, it is emphasized that if there is no clear information why the undressing is necessary, the situation would be difficult. Furthermore, it is mentioned that anxiety and fear can contribute to the fact that the instructions of the emergency services are not followed. In addition, the clothing itself can be a problem.

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<sup>20</sup> The reasons for this are discussed below.



**Figure 29:** During an assumed CBRNe scenario, how problematic do you think it would be for those you represent to undress themselves (to undergo the further decontamination process)? Participants' assessment by vulnerable category represented (Children: n=29; Older persons: n=33; Persons with mental health conditions: n=36; Persons with mobility restrictions: n=35; Blind or partially sighted persons: n=27; Hearing impaired persons: n=31; Persons with no or insufficient language skills: n=14; Ethnic minorities: n=10; Pregnant: n=8)

The danger that the necessity of the measure is not understood is mentioned, among other things, in relation to **people with mental health conditions**. However, it may also be, according to an organisational representative, that the persons concerned do not understand the instructions. With regard to mentally ill / mentally disabled persons, the need for assistance in the situation described is further formulated. However, this does not concern all persons of this group. One respondent emphasizes that whether people with mental health conditions have a problem with the situation described or not depends strongly on the respective disorder and the current condition.

For **hearing impaired** persons, the process is also not considered problematic if they receive the necessary information for this purpose. However, it is possible that due to hearing problems, instructions may not be understood. As with the other situations described, the need for sign language interpreters is mentioned.

In contrast, a representative of an organisation for the blind points out that the undressing process would not be a major problem for **blind and visually impaired** persons, if no additional disability is present. However, it could be difficult to understand verbal instructions from emergency personnel with masks.

Especially in relation to **older people**, it is emphasized that some may be reluctant to part with their belongings including their walking and hearing aids and glasses. With regard to **older persons** respondents indicate that they may be particularly dependent on assistance during the undressing process.

**Persons with mobility restrictions** may also require assistance. People with mobility impairments may not be able to undress without assistance. Taking off prostheses and transferring from wheelchairs can also take time. However, problems may also arise when these individuals are assisted. One organisational representative stress out that difficulties could arise with undressing if this is done by non-qualified staff.

With regard to **children**, it is emphasized that they may not understand or be able to implement instructions on their own. In addition, the risk is described that children may not understand the danger that a contamination possesses. It should also be taken into account that behaviour will vary greatly depending on age. Especially small children can refuse such measures without reason. Undressing in front of strangers can also be problematic if children refuse to follow the instructions. Studies suggest that the proportion of children who refuse can be very high (see Fertel et al. 2009). **Infants** represent a special case. They have to be undressed. Freyberg et al. (2008, 169) point out that this can be a problem if the immediate caregiver is injured or alone. Another critical point, mentioned in relevant publications with regard to children in the undressing process, is the danger of hypothermia due to the distribution of fat in the body (e.g. Eid et al. 2019, 2).

Problems with undressing, can also face **pregnant women**. Organisational representatives emphasize that for pregnant women, taking off shoes and socks can be problematic in a physical sense and that they may need a chair. In addition, the sense of balance could be impaired, so that pregnant women may have problems standing on one leg as well as taking off pants.

The process is further described as problematic for **victims of abuse** and members of **ethnic minorities**. One organisational representative points out that undressing in front of other people can lead to a re-traumatisation for abuse victims. With regard to ethnic minorities, organisational representatives emphasize that undressing on the open street can be problematic for parts of the group represented due to religious and cultural reasons. In this context, the veiling requirement for women in Islam is mentioned. In addition, it is emphasized that the process can also be problematic for men due to religiously based shame. Furthermore, it is possible that personal shame is felt due to physical disfigurements (torture marks, scars, burns, etc.).

Overall, it can be summarized that most of the organisational representatives think that it would be problematic to some degree for the group they represent to undress for the further decontamination process. Undressing for parts of the group they represent was rated as particularly problematic by respondents from organisations representing ethnic minorities (religious shame, etc.). To accommodate groups / individuals who have a major problem with a public undressing process<sup>21</sup> despite a hazardous situation, responders (if their resources allow it) should create screened areas where those individuals can undress. However, it should be clearly communicated that these areas are only available to individuals who have a major problem with the undressing process. Otherwise, there would be a risk that everyone would want to take advantage of this.

In order to relieve the emergency services, it is conceivable that accompanying persons (parents, guardian, caregivers, etc.) - if available - take over the undressing process. However, the accompanying persons need clear instructions from the emergency personnel on what has to be done. Clear information is also essential in the general communication process between responders and those affected by a CBRNe incident. If there is no clear information, according to an organisational representative, as to why the disrobing process is necessary, this process will prove to be difficult. To prevent this, emergency forces should make clear why disrobing is imperative (health hazard due to contaminated clothing, etc.). Research confirms that the provision of concrete information highly affects the compliance during a CBRNe incident (e.g. Hall et al. 2020, 17).

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<sup>21</sup> As has been shown, this could also be particularly true for victims of abuse.

#### **6.4.4. The decontamination process**

Following the undressing process, a decontamination shower may be required to clean affected skin areas. The whole process is supervised by emergency personnel who control the decontamination and provide support if necessary. If there is no restriction, this process can be undertaken independently. However, if affected individuals are unable to stand without assistance they may need to lie on a stretcher to go through the decontamination process. During the process described, affected individuals will be completely naked. Upon completion of the decontamination process, they will receive fresh clothing and further medical treatment if needed. Especially for vulnerable groups, the process described can be challenging.

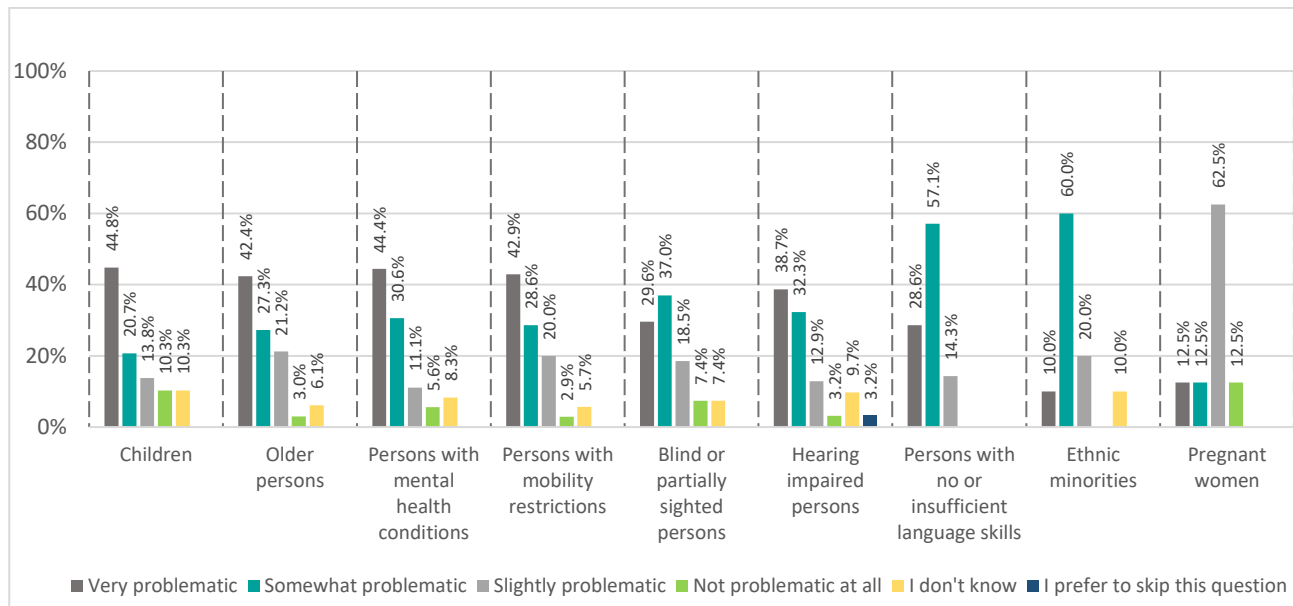
In order to find out whether and to what extent the process is problematic for vulnerable groups, the organisational representatives were asked how problematic they think the decontamination shower would be for the vulnerable group represented.

Exactly one-third of the organisational representatives (see attached Figure 51) state that they think that the process would be very problematic for the represented group. This is the highest value in the "very problematic" category when comparing the value with the previously described scenarios. This clearly shows that decontamination in particular is a very sensitive process for vulnerable groups. Therefore, emergency response organisations should primarily address problematic issues for vulnerable groups that arise during the decontamination process. In addition to the organisational representatives who view a decontamination shower as very problematic for the vulnerable group represented, there is another third (32.2%) who rate this process as somewhat problematic for the group their organisation represents. Moreover, 17.8% of the representatives surveyed think that this process would be slightly problematic and 7.8% of the respondents do not consider the described situation to be problematic at all for the represented group.

Differences have again emerged when taking a separate look at the organisational representatives by vulnerable group represented (see Figure 30). 44.8% of respondents whose organisations represent children state that the described scenario would be very problematic for their represented group. In contrast, only 10% of ethnic minority representatives rate this process as very problematic for their group. This result is somewhat surprising. It would have been expected, that due to religious and cultural factors among some ethnic minorities, the described scenario would be rated as very problematic by more than 10% of the corresponding organisational representatives. However, it must be added restrictively that 60% of the representatives of ethnic minorities consider the execution of a decontamination shower as somewhat problematic for the represented group. This is the highest value in the category "somewhat problematic" for all examined groups. In the category "very problematic" the values for the other groups surveyed are between the values for the ethnic minority and children group.

As was mentioned earlier, the decontamination process can lead to anxiety on the affected side. Moreover, organisational representatives who have found the situation problematic emphasize a development of shame towards strangers. Fear, as well as shame can lead to behaviours that are difficult to manage in regard to all civilians affected.

Regardless of the vulnerability, it cannot be assumed that all civilians will decontaminate equally thoroughly. Therefore, basic assistance and control is important.



**Figure 30:** During an assumed CBRNe scenario, how problematic do you think it would be for those you represent to undergo a decontamination shower? Respondents' assessment by vulnerable category represented (Children: n=29; Older persons: n=33; Persons with mental health conditions: n=36; Persons with mobility restrictions: n=35; Blind or partially sighted persons: n=27; Hearing impaired persons: n=31; Persons with no or insufficient language skills: n=14; Ethnic minorities: n=10; Pregnant: n=8)

Looking closer at the individual difficulties that arise for especially vulnerable civilians in a decontamination process, it appears, that with respect to **persons with mental health conditions**, it is emphasized that anxiety disorders can lead to a refuse of the decontamination shower. In this context, persons with eating disorders are mentioned. However, restrictively, it is emphasized that those problems will not apply to all affected people. Whether the described process would be problematic depends very much on the respective disturbance pattern as well as the current condition, according to an organisational representative. The described scenario could especially be problematic for **autistic persons**. Thus, it is emphasized that autistic persons might be confused about taking a shower in a place that is not their home. In addition, according to organisational representatives, for individuals with autism or intellectual disabilities with certain support needs, hanging the tag around their neck or not removing the tag may be problematic. In the worst case, the high stress level could make it impossible to perform a decontamination. However, in cases where a decontamination is possible, autistic individuals require assistance. Moreover, it is emphasized that they cannot follow instructions simultaneously with "normal" adults and children.

The process is considered as unproblematic for **hearing impaired persons** if they perceive the necessary information for the process. However, for previous reasons, information may not be perceived or may be misinterpreted. Possible consequences are disorientation as well as no understanding of the need for a decontamination shower. In addition, the removal of hearing aids or speech processors for the decontamination shower can lead to complete deafness on the part of affected individuals.

It is highlighted that **blind and visually impaired persons** might find it difficult or impossible to orient themselves in a decontamination tent if they are not guided by a sighted person. It must also be noted that further instruction may not be heard or seen through the shower.

Similar to **older persons**, **persons with mobility restrictions** are in need for assistance to undergo the decontamination process. If they can't stand on their own, they may have to be showered while

laying on a stretcher that is pushed through the tent via a kind of conveyor belt. Therefore, seating options such as a plastic chair are needed for this group.

In addition, the decontamination process can also be problematic for **children**. Thus, it is emphasized that the described process is hardly feasible for children without a caregiver. Research suggests, that younger children show signs of frolic or panic during the shower (Freyberg et al. 2008, 168). This may delay others affected to undergo the decontamination and thus hinders the overall process. Furthermore, children will perceive the heat and pressure of the shower different compared to adults. Freyberg et al. (2008, 169) stress the need for “kid-friendly” shower adapter, that lower the pressure to approximately 60psi (413.7 kPa) as well as temperatures of no less than 98°F (36.7°C). This need should be considered especially with regard to possible hypothermia and further injuries to the skin. With regard to the latter point, the study also recommends avoiding alcohol- and bleach-based disinfectant solutions wherever possible. Similar to the previous findings in regard to the handling of **infants**, they might need to be carried by first responders, if their immediate caregiver can’t perform this task due to injuries. This also applies in view of the slippery floor. Freyberg et al. (2008, 169) suggest placing infants on a stretcher to decrease the risk of being dropped. Furthermore, the breathing of infants needs to be secured to prevent aspiration by placing the infants on a side and not face up.

With regard to **pregnant women**, organisational representatives point out that stress caused by the decontamination process can have a negative impact on mother and child. Also, being naked in public can be more problematic than usual for pregnant or postpartum women, as the pregnancy process changes the body and the body image. Similar to the findings in regard to the undressing process, depending on their constitution, they might need assistance to perform the shower routine thoroughly.

As partially problematic, the decontamination process is classified by a respondent whose organisation represents **ethnic minorities**. Thus, it is emphasized that it would be problematic for a part of the represented group to take a shower with others due to religious and cultural reasons. However, it is also stressed that same-sex showering would be okay for the majority if the emergency personnel overseeing the process are also of the same gender. According to the respondents, the process could also be problematic for people with a lack of knowledge of the respective national language.

Problems could arise for **people with chronic mental health conditions** for example if they have to go through the routine without necessary supplies (e.g. oxygen, insulin). In case they can’t perform the shower routine by themselves, they might rely on assistance and the stretcher.

In summary, it can be stated that a majority of the respondents consider the execution of a decontamination shower to be problematic for the group they represent. Thus, two thirds of the respondents rate this process as very problematic or somewhat problematic for the represented group.

## 6.5. Approaches to close gaps between the needs and expectations of especially vulnerable groups and the measures of CBRNe practitioners

To facilitate the interaction between the vulnerable civil society and first responders prior, during and after a CBRNe incident, respondents indicate several measures that should be implemented in SOPs of CBRNe management. These were collected through the open questions included in the survey.

### 6.5.1. Measures CSOs consider to facilitate the interaction between the vulnerable civil society and first responders during a CBRNe incident

#### Assessment of vulnerability

As a basic suggestion for vulnerable groups in a CBRNe environment, one representative recommends short personal consultations with those affected about the special needs for his or her sense of security. This can only be implemented to a limited extent in the event of an emergency, especially in regard to critical time management. A short checklist as part of the medical triage prior to the decontamination could be considered. Such a checklist could include the most important restrictions and needs to be considered. Looking at the restrictions and needs of the individual vulnerable groups, overlaps can be found. The list should therefore not include many individual items, but those that are most likely to facilitate cooperation (e.g. unaccompanied, (sign) interpreter needed, immobile etc.). In the best-case scenario, this facilitates the work of the further decontamination and after-care emergency services as well. For this purpose, the existing lists of medical triages should be revised and if possible a small dedicated section should be included.

Especially in regard to the vulnerability of **pregnant women** in a CBRNe environment, women of childbearing age should be asked about a possible pregnancy. This influences the classification of decontamination urgency in the medical triage process.

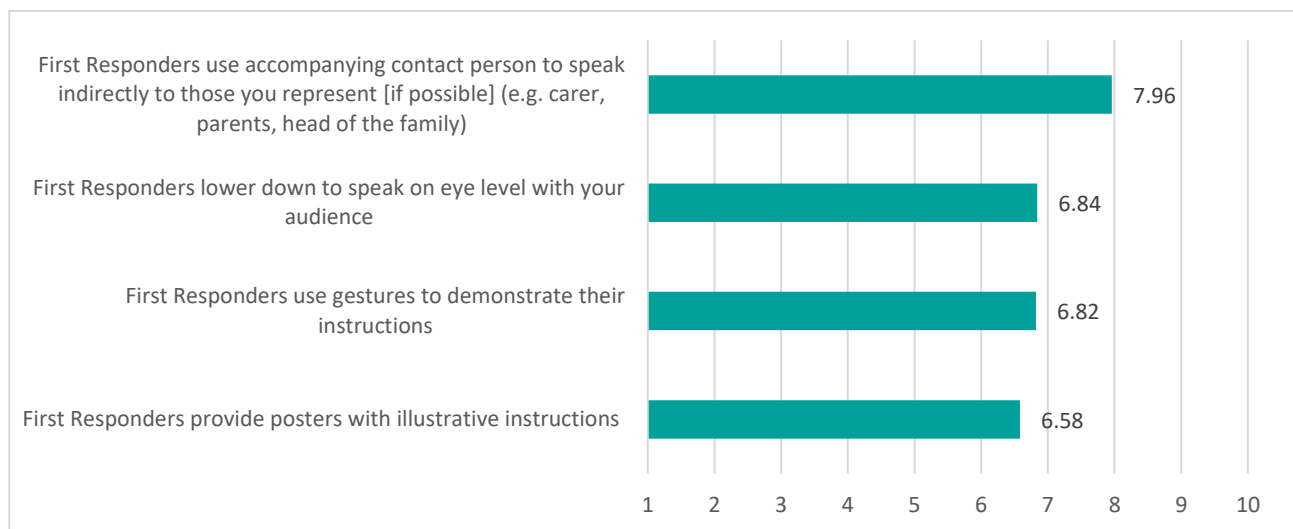
Additionally, to support **people with chronic medical conditions**, first responders should ask for necessary medication. These supplies must be left behind during the decontamination process and should therefore be kept available by responders outside the hot zone.

#### Separation and integration

As a basic rule, attention should be paid to not separating significant others from each other. Representatives confirm, that the involvement of accompanying contact persons should be sought if possible. The majority of representatives that further explain the use of attachment figures imply, that this measure will reduce anxiety. Similar suggestions can be found in previous researches on vulnerable people in emergency situations (e.g. Campbell et al. 2020b, 15). In doing so, the compliance of those represented to cope with instructions given by first responders during a CBRNe situation is expected to considerably increase. The mean value is 7.96 with 10 being the highest value (see Figure 31). First responders are not familiar with the respective individual and usually have only very limited experience in dealing with the respective vulnerable group. Contact persons include among others carer of health restricted persons, relatives and teachers that are familiar with the needs of their protégé. Research suggests that those contacts “who interact with them on a

regular basis will know how to achieve an efficient evacuation without causing undue distress to individuals” (Crowder & Charters 2013, 2). Therefore, they are a valuable resource for first responders, in terms of the communication process, the psychological treatment and the consultation of the medical background. Where direct communication is limited or not possible, these contact persons can “translate” the information to individual vulnerable people.

One participant of a CSO that represents a diverse portfolio of vulnerable people argues that the combination of relatives and first responders as information providers would be the most suitable way to engage with members of the vulnerable civil society. Another representative further argues, that if first responders train such scenarios, caregivers such as parents, teachers and nurses should be included in order to learn from each other and create a basic routine.



**Figure 31:** Aspects that might increase the compliance of those represented to cope with instructions given by first responders during a CBRNe situation; mean value based on a rating scale from 1 = no increase at all to 10 = high increase (in order: n=89, n=88, n=88, n=90)

A considerable number of representatives of people with **mental disabilities** explain that working with carers strongly facilitates the communication process with those they represent. People with **dementia** would need a personal companion during the entire intervention who can patiently explain and support them. Ideally this attachment figure is a trusted relative or carer. Otherwise a first responder who is experienced in dealing with people with dementia would be helpful. This support would be most conducive to a calm and successful process. The same statements are made for individuals with **autism spectrum disorder**. In this case, the degree of facilitation is considered to be very strong when involving an attachment figure.

With regard to severely **visually impaired** people, it is noted that constant contact with one or two attachment figures should be secured to reduce anxiety. First responders should give them some physical guidance in the hot zone and allow them to hold their arm or those of a relative for orientation. In the event that no attachment figure can be found, this task should either be taken over by a first responder or another person affected should be involved. However, two participants representing blind persons point out that unlike in the case of persons who have a recognisable caregiver through whom communication can be handled, in the case of visually impaired persons, an attempt should be made to speak directly to them and/or include their relatives.

For children, psychological support should be ensured during and after the process. First responders should undertake measures that mitigate separation anxiety (see Gurwitch et al. 2004). An important attachment figure are the parents. Furthermore, a representative further argues that a separation from peers should also be avoided as far as possible. In regard to an accident in a train that includes a class of students, the children should be allowed to stay together. If this is not possible to a certain extent, children of the same sex should be grouped to reduce the class. For children, it would be beneficial to be accompanied by a caregiver or supported by one designated caregiver when carrying out the undressing and decontamination process. Another suggestion for very young and unaccompanied children is the use of so-called transitional objects. This was illustrated with the example of a teddy bear. If the Teddy takes the decontamination shower as well, the overall psychological stress can be reduced and the child more likely follows the given orders. In regard to **infants**, the immediate caregiver should be included in all measures (if possible). Furthermore, a first responder should assist in the evacuation, undressing and decontamination process due to unsafe ground conditions and the safe handling by two people. If the immediate caregiver is unable to perform the procedures, first responders should perform this task. Thereby, the posture and breathing of the child should be secured. Because of the heavy protective clothing, safe handling has to be practised by first responders prior to a CBRNe incident.

No representative of **ethnic minorities** gives a more detailed statement on grouping, so it is unclear to what extent the consideration of certain family structures has a positive impact on the engagement with first responders. Overall, consideration should be given to group members of the same sex to undergo the undressing and decontamination process.

For **people with no or only limited language proficiency**, Taylor et al. (2008, 11) suggest to group people that share a language. Alternatively, individuals should be paired with other people with sufficient language proficiency. This “buddy system” is also indicated in regard to unaccompanied **children**.

With regard to service animals, Edkins et al. (2010, 39) recommend that they should not be separated from their owner during the decontamination process where possible. If this is not feasible (e.g. the owner might need urgent medical treatment), a first responder has to prevent the animal from leaving the hot zone and take charge of it. Therefore, basic self-protection behaviour should be trained by the emergency services (e.g. adequate hand position on the belt, etc.).

## Emotional responsiveness

In addition to the involvement of attachment figures, emotional responsiveness to the persons is perceived as a helpful method. As an example, first responders should lower down to speak on eye level (mean value 6.84; see Figure 31). It should be further understood that individuals have different emotional capacities. A representative describes in more detail that if a person does not understand the instructions immediately, yelling should be avoided. The reasons for this misunderstanding can be of various nature (e.g. fear of the unknown situation, physical or mental barriers, the distorted voice of the first responder through the mask, etc.). Especially representatives of vulnerable **people with mental disabilities** stress the importance to remain calm and, if necessary, to explain the instruction again or rephrase it.

To facilitate the interaction with members of the vulnerable civil society, first responders should promote a sense of trust and confidence (see Edkins 2010, 57). This is mentioned with regard to all

groups. Especially cooperation with ethnic minorities seems to benefit greatly from such emotional responsiveness. Respondents indicate the use of trained mediators. Unlike interpreters, these mediators are trained to explain the seriousness of the situation, while at the same time communicating it in a way that is appropriate to the situation. Through their way of speaking, they have a calming effect on those affected. This can be trained and therefore also be learned by first responders. In part, the basics of such training can already be found in the basic training of various emergency forces. One representative explains more concretely that the use of such mediators could also counteract group-dynamic reactions at an early stage (e.g. speculation about the nature of the danger and possible consequences), as they understand the reactions and conversations and can react immediately by providing clarification. In addition, it facilitates the recognition of persons who are in a psychological (or psychosomatic) state of emergency. This enhances a targeted intervention (e.g. organise a comprehensive crisis intervention outside the hot zone. Following the rating of Figure 31, the intervention was rated with a facilitation of 10 across representatives of all groups. Therefore, CBRNe practitioners operating in the hot zone should undergo such training as far as possible, as it seems to greatly facilitate the engagement with those affected. In addition, as described, the protective equipment of the first responders can lead to fear or, in the worst case, even to panic states on the affected side<sup>22</sup>. To address this issue, responders could attach a photo of themselves to their protective gear that shows their faces. In the event of a CBRNe incident, this could somewhat humanize the exchange process between responders and those affected. During Covid-19, health care professionals in different countries have used this method and report positive results (e.g. BBC News Mundo 2020).

## Communication design

Based on the further advices of the representatives, a few basic elements should be taken into account in the communication with members of the (vulnerable) civil society, especially within the hot zone<sup>23</sup>. There is a broad range of scientific research that provide an overview of such elements (e.g. CDC 2015, 13; ISO 22395 2018, Chapter 5.2). Other studies provide an overview of relevant recommendations in regard to vulnerable groups (e.g. Campbell et al. 2020a and 2020b). How effective communication should be designed has also been addressed in detail by Hall et al. (2020).

As a first important step, first responders should always announce their presence verbally. This is especially important with regard to **visually impaired people**. It is also noted that they should be approached from the front if possible. The person should notice the presence of the first responder before performing actions on them. They should also be asked if they need assistance before respective actions are performed. First responders should not assume that the help offered will always be effective. In fact, it can slow down the process (see Taylor 2008, 13). This also appears to be important with regard to **children** and **autistic people**. Taylor et al. (2008, 14) point out, that

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<sup>22</sup> However, it has been shown that in the context of the Covid-19 pandemic, the familiarity with the protective equipment described has increased.

<sup>23</sup> Chapter 6.2.1, 6.2.2 and 6.2.3 already presented the needs, expectations and challenges of especially vulnerable members of the civil society in regard to communication process. The findings are now specifically applied to a CBRNe incident, whereby the communication relates to the persons within the danger and decontamination zone.

first responders should treat all affected individuals as experts on their own abilities and needs. They will communicate what kind of assistance will be the most effective ones.

When talking to vulnerable people, only one first responder should communicate at a time. Respondents indicate that different communication partners might increase confusion. In general, simple vocabulary should be emphasised with regard to all groups of people. Technical words or abstract ideas should be avoided whereas an attention should be paid to the simplification of essential content. First responders should speak slowly and discuss one point at a time. As far as possible, those affected should not be interrupted in their answers and given the opportunity to ask questions. Depending on the individual, the attention span may be shorter regardless of any impairments. One representative suggests, to let those affected repeat what has been ordered. Additionally, first responders should repeat instructions.

Representatives of all vulnerable groups state that the information should be emphasised through body language. The use of gestures to demonstrate their instructions facilitate the interaction with first responders by an average of 6.82 (see Figure 31). This seems to be very helpful especially for **mentally and hearing impaired people**. In the specific case of **autistic persons**, an authoritative voice and finger pointing should be avoided. Autistic people may interpret this as a sign of anger. Instead, eye contact should be made if possible. With regard to persons with **dementia**, it is explained in more detail that instructions should be practically demonstrated so that people with dementia can imitate them. The degree of facilitation here was assessed as 8.

Besides the use of gestures that can be used for the majority of groups, knowledge of sign language and the ability to communicate basic messages in sign language are found very helpful for **hearing impaired people** (also see Chapter 6.2.4). In this context, almost all representatives of this group indicate the necessity for sign language interpreters in the hot zone as critical in regard to the compliance of those they represent. One representative further notes that if first responders are interested, they could contact relevant CSOs in the region or country to arrange courses so that first responders can learn how to communicate basic but important messages in sign language<sup>24</sup>.

The general use of visual signs in the hot zone is rated 10 on average, as they structure the activities. Those might include short explanatory videos showing a decontamination process in front of the decontamination tent, written instructions on walls, colour signs on the floor, etc. The visual content should be designed in such a way that it is accessible to a wide range of people regardless of sensory impairments, language barriers and comprehension difficulties. This is also important with regard to illiterates, who may belong to the group of ethnic minorities (e.g. refugees) as well as to persons whose alphabet greatly differs from the national alphabet (e.g. Roman alphabet vs. Chinese characters). Freyberg et al. (2008, 168) suggest short cartoon videos or simple posters that visualize the required decontamination actions. Thereby, all information within the hot zone has to be presented in a large format and positioned in easy visible locations, preferably in the waiting area prior to the decontamination tent (see Edkins et al. 2010, 40). With regard to children, the positioned height should be taken into account. Additionally, the colour contrast should be legible for visually impaired people (e.g. colour blindness or deficiency).

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<sup>24</sup> Collaboration approaches will be further examined in Chapter 6.5.3.

On average, the use of illustrative instructions by all groups represented is rated 6.58 in regard to the facilitation of engagement with vulnerable groups during a CBRNe incident (see Figure 31). In contrast, according to representatives of **visual impaired** people, it will greatly improve the compliance of blind and visually impaired people of all ages if the first respondents ensure that all information and instructions are provided in an audible format. In this case, the use of gestures can't facilitate the engagement and terms such as "there" and "on the blue line" should be reconsidered. The visual description of the situation can be trained during exercises.

A representative of **hearing impaired** and older people suggests the use of microphones. This is considered to support this group to understand the information. Nevertheless, this might cause additional stress for those who react negatively to loud impressions (e.g. children, people with mental impairments, etc.). Instead, other representatives of hearing impaired people imply that visual instructions are sufficient. SOPs should be revised to see if the visual communication is considered within the hot zone. Further detailed information about the CBRNe incident can be provided outside the zone after the decontamination process.

## Examination and handling

An examination of decontamination guidance documents for CBRNe practitioners found out, that only little information is given to address the particularities of mobility issues that may require additional support during the decontamination process (Hall et al. 2020, 19). Freyberg et al. (2008, 169) point out that during the decontamination process children should be examined for injuries, as they sometimes do not recognise them themselves. Respondents indicate, that this also applies to people with visual impairment and mental impairment. Furthermore, some stress that besides the handling of infants, first responders should be trained to handle certain physical conditions (e.g. removal of prostheses, positioning of pregnant women, pain-reduced movement of paralysed persons, transfer of wheelchair, etc.). Taylor et al. (2008, 3) recommend including physical therapists in the decontamination team. In addition, the showering conditions for children should be considered in the SOPs in regard to temperature and water pressure. The different handlings should be further educated and trained periodically since technology develops overtime (e.g. the design and handling of prostheses is changing).

## Secure areas

If possible, a 'secure' and quiet area should be created where communication about what to do next takes place. Although people must remain in the hot zone before the decontamination, representatives argue, that an area should be created where neither the dead are visible, nor should there be much passage by the emergency services, nor should the press be able to see in from the outside. One representative further adds that people who suffer from **chronic fatigue syndrome**, for example, suffer from the many impressions and must be given the opportunity to rest if necessary. Respondents indicate that seating possibilities (chairs, etc.) should be offered if possible. It has been shown, for example, that seating options could be advantageous for **pregnant women** during the undressing process. Furthermore, this could also be advantageous for older people in particular. Such an approach would also be desirable for the shower process to protect people with unsteady footing on the wet floor.

In regard to the undressing and decontamination process, respondents suggest that emergency forces should - if possible - create shielded areas in which those already undressed can wait.

Following the suggestions in regard to measures of separation, those areas should be divided into male and female if possible. Furthermore, only people of the same sex should shower with each other. This is also recommended explicitly with regard to children by Freyberg et al. (2008, 169). It would be additionally advantageous if the emergency personnel who control the process are also of the same gender. These measures can minimize the shame factor in such a situation. However, as described, it may be impossible for some individuals (e.g. people with autism) to take a shower with others. In these cases, first responders should ensure<sup>25</sup> that the persons concerned can shower alone. Overall, respondents recommend, that it should be ensured that as few people as possible should perform the undressing and decontamination shower together at a time.

In order to reach this area, another suggestion, especially for **visual impaired and older people**, is the use of clear instructions. Instead of “go that way”, first responders should say “Go to the left”. Additionally, landmarks in the area, e.g. a tree or a flashing light, can be useful. Another suggestion in regard to bigger hot zones is the creation of orientation paths along which those affected can safely walk to such a collection point. Those can be built with a hose line or ropes that are already used in CBRNe management.

### **6.5.2. Measures CSOs consider to facilitate the interaction between the vulnerable civil society and first responders after a CBRNe incident**

#### **Secure areas**

According to representatives of all CSOs, providing a closed off area for those affected to compose themselves and address questions in a perceived safe environment is estimated to significantly increase the degree of compliance even after the decontamination process. On average, the increase in compliance is rated 8.44 (see Figure 32). Additionally, both in the hot zone and afterwards, first responders should take care to protect those affected against the weather. This appears to be particularly considerable in view of the danger of hypothermia. Therefore, first responders should always ensure, that children are dry wrapped and shielded against the cold (e.g. towels, blankets, heater, etc.) (see Freyberg 2008, 169). The same applies especially to older persons that can't sufficiently regulate their body temperature. In addition, sufficient water supplies should be provided in hot weather conditions.

#### **Communication design**

Outside the hot zone, not all civilians will receive the same treatment. Following the initial medical triage prior to the decontamination, some affected persons will immediately be transferred to the hospital to undergo necessary further medical treatment. Others will have to wait for further instructions that include e.g. the recording of personal data and witness statements, subsequent medical treatment and the transfer from the location. The first important step mentioned by two participants in regard to all affected people leaving the decontamination is to check whether they can perceive that they are out of the hot zone. This should be communicated as clearly as possible. This

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<sup>25</sup> If resources allow it.

communication should include reassurance and aspects of physiological first aid. Furthermore, respondents stress the need for transparency of the (temporal) process. One participant who represents different groups of vulnerable people states, that ideally, information should come from people they already trust. Consequently, carers and relatives that are already reliable attachment figures should continuously be involved in the communication process even after leaving the hot zone. In contrast, it is considered inappropriate to use first responders who are indistinguishable from those who have accompanied them in the hot zone to communicate safety. Although the PPE of first responders in this area differs from that within the hot zone, they might still be related to the situation experienced within. On average, representatives therefore indicate an increase in cooperation of 8.33 (see Figure 32) when providing professionals with specific communication training with the different vulnerable groups. A special after-care right after the decontamination can include among others interpreter and psychologists. Those specialists are usually not trained in PPE, and are therefore not allowed to enter the hot zone. With regard to the immediate aftercare of **people with mental or developmental health conditions**, two representatives state that good communication in such a situation helps to avoid the risk of developing Post Traumatic Stress Disorder and other mental health problems. Therefore, professionals specialised in the care of these groups of people should be employed, as their needs may be more complex. In this regard, people with **developmental disabilities** are considered to be at much greater risk of developing mental health issues than the general population. In addition, this group should be thoroughly monitored for late physical injuries that occur after such disasters, as many of them can only make limited statements about pain and discomfort. This can also be investigated in cooperation with such trained experts. Following the statements of the representatives, the psychological treatment should be a significant component of the aftercare. In Austria and Germany, there are already emergency service teams trained in crisis intervention who are usually alerted via the rescue coordination centre. Since representatives of all vulnerable groups stress the need of such a service, those systems should be implemented nationwide, including a diverse portfolio of specialists. For **hearing impaired people**, representatives stress the need for sign language interpreters. CBRNe-related information should be provided in sign language on a larger scale. Sufficient sign language interpreters for hearing impaired individuals could be made available on-site through cooperation with CSOs.

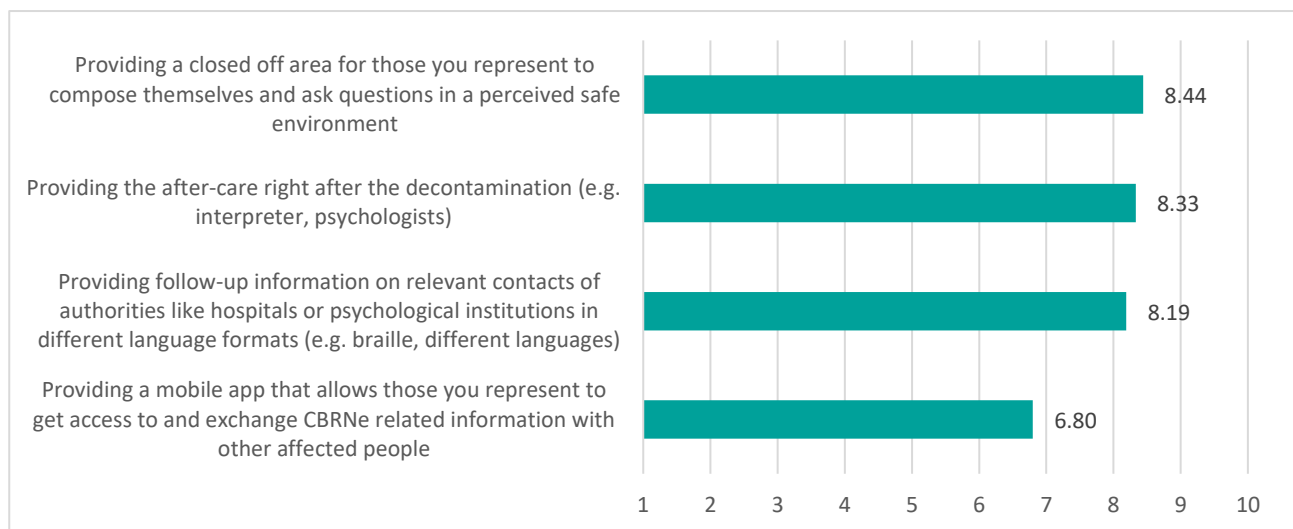
One participant representing **people with no or only limited language skills** points out that in view of the large number of different languages to be expected, a translator would not be necessary for all of them on site. Rather, the use of video interpreter would be helpful. In this respect, contacts with relevant CSOs or translation companies should be established, who can engage in the situation via video.

## Information content

It can be assumed that there is a high demand for information among all groups. Representatives of various CSOs emphasise the increase in the sense of security by improving knowledge about what is happening. After the CBRN decontamination, those affected usually no longer have phones and devices to inform themselves. They are therefore dependent on the first responders and experts. Initially, all those affected will have a strong wish to know how their relatives involved are doing and where they may be receiving further medical care. Hall et al. (2020, 16) found, that ensuring the safety of loved ones (including involved pets), has a strong impact on the level of compliance. Furthermore, communication should take place on expected next steps (e.g. registration, medical check-ups, etc.) and where further information can be obtained if needed. The use of flyers is

indicated that provide important information. Follow-up information should provide information about relevant contacts of authorities like hospitals or psychological institutions as well as possible emotions and reactions they might face after the event. Respondents consider an increase in the compliance if those information are provided in different language formats such as braille and foreign languages. On average, this is rated 8.19 (see Figure 32). Although sign language interpreters are considered helpful, two representatives argue that **hearing impaired** people should be offered written information in any case, since they do not automatically know sign language. The need for written information is indicated in regard to **older people** as well. With regard to **persons with developmental disabilities**, it is emphasised that all information should have cognitively accessible versions. Especially with regard to persons with **autism spectrum disorder**, the procedure should be explained afterwards and an explanation of the reasons for the procedure and possible consequences should be given. For **pregnant women** SOPs should implement recommendations about the communication with pregnant women infected with emerging and bioterrorism pathogens. “In an emergency response setting, pregnant women should be encouraged to consider their own health and safety and the effect of potential ill health on their pregnancy, should be offered prenatal evaluation for fetal abnormalities if desired, and should be encouraged to enroll in pregnancy registries when applicable.” (Cono et al. 2006, 1635) An information paper could include relevant information about recommended next steps (e.g. providing contact details of medical specialists, exchange information with the birth clinic/midwife, etc.).

Similar comments are made with regard to almost all the groups represented. With regard to **children**, the suggestion is made to provide materials suitable for children, which take up the decontamination process in a playful-pedagogical way, such as a children's book or the like. This is rated 9. Furthermore, in reward of their cooperation some form of appreciation can be provided (e.g. medal, certificate or toy). This was rated 8. These materials could be created in advance and provided if necessary.



**Figure 32:** Aspects that might increase the compliance of those represented to cope with instructions given by first Responders after leaving the area of risk; mean value based on a rating scale from 1 = no increase at all to 10 = high increase (in order: n=90, n=89, n=89, n=89)

## Communication as team work

The representative of a CSO that represents various groups of vulnerable people recommends creating a specialised communication team that can forward necessary information in the needed format. Such an approach is also found in guidance documents for first responders (e.g. CDC 2015, 13). Information material could be prepared in advance in different language formats (see Chapter 6.2.4) and forwarded to those affected in the respective format after leaving the decontamination tent. Such a team could consist of members of the emergency response units as well as of members of CSOs including specialists such as sign language interpreters and psychologists. This is expected to strongly facilitate the engagement among the civilians and the first responders. Following the rating in Figure 32, this is rated with 10 among representatives of different CSOs. The crisis intervention teams are usually not trained for linguistic diversity. However, those teams could serve as a model. Taking up the idea of a medical triage section, which records key points of vulnerability, a colour navigation system could be introduced to guide those affected to a specific after-care area. Such an approach facilitates a more targeted record of personal data and witness statements as well as the medical and psychological treatment. People with certain vulnerabilities could be sent straight to the appropriate contact person who is able to communicate in an appropriate manner. In this regard members of the police can be joined with different interpreters, psychologists, child service workers and other specialists. People who do not or only understand visual instructions to a limited extent should be accompanied by their attachment figure. To set up such a system, cooperation with the relevant specialists are necessary. These are discussed in more detail in the following chapter.

## Restoring independence

After leaving the decontamination shower, if **blind and visually impaired people** need to move to a new and unfamiliar area, they will most likely still need orientation assistance. If they had to leave / lost their assistive devices in the hot zone, they may need to be equipped with new assistive devices such as canes, magnifying glasses, glasses / sunglasses, etc.<sup>26</sup> But also for **people with chronic medical conditions** necessary medications (e.g. oxygen, insulin, asthma inhaler) and objects (e.g. prostheses, wheelchair, etc.), which could not be taken through the decontamination process, should be provided whenever possible. Furthermore, consideration should also be given to the custody within the hot zone, the decontamination and the transfer of decontaminated service animals that can't be decontaminated with their owner. First Responders should have access to storage boxes if needed.

## Leaving the scene

With regard to the end of such a decontamination procedure, a representative of visually impaired persons strongly emphasizes that it should be avoided to let them leave the scene on their own. Blind people are usually helpless in unfamiliar surroundings. Therefore, support should be offered. If necessary, a contact person should be informed, or the transport should be organised.

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<sup>26</sup> Taylor et al. (2008, 6) indicate that this does not generally apply to all assistive devices. Devices of non-absorbent material can be decontaminated while devices of absorbent materials (e.g., canes with soft handles, wheelchair cushions) have to be withheld by the first responders.

Providing a mobile app that allows those affected to get access and exchange information with other affected people afterwards is also considered to increase the compliance (see Figure 32). A representative of **deaf people** confirms the utility of apps and websites where deaf people can find follow-up information in sign language. Besides a continuing provision of follow-up information, a continuing psychological support after the CBRNe incident was rated 9. One representative emphasizes that not every (triggered) trauma leads to immediate reactions (panic, flight reflex), but can initially only have an internal effect without anyone noticing. The typical trauma reactions often only occur with a time delay (insomnia, nightmares, sweating, shortness of breath, sociophobia/retreat tendencies/isolation, depression, listlessness, pain, etc.). In this context, several representatives mention the offer of individual and group meetings.

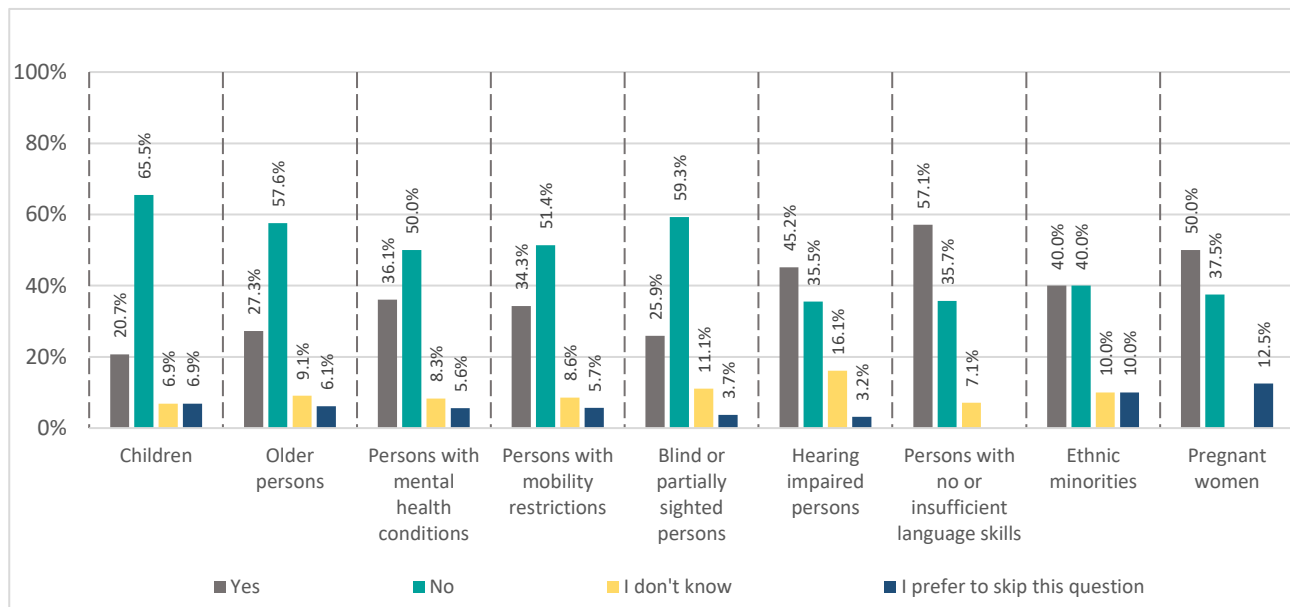
### 6.5.3. Measures CSOs consider facilitating collaboration approaches between CSOs and first responders

In summary, the study revealed certain areas in which collaboration should be implemented:

- Collaboration with CSOs should be sought to raise awareness of existing CBRNe related information material. Already designed leaflets, brochures and briefing notes should be forwarded via the e-mail distribution and newsletter lists of CSOs to reach out to a broader public.
- In addition, collaborations with CSOs should help to increase the involvement of vulnerable groups in CBRNe exercises.
- Furthermore, the collaboration approach should aim to improve the accessibility of related information material. CSOs should teach LEAs and first responders how CBRNe related information should be adapted to the respective special needs. If possible, the “translation” should be performed as a joint task in order to relieve the emergency forces and, on the other hand, to ensure success. Thereby, the design of (translated) messages should be developed in collaboration with relevant CSOs to avoid misunderstandings and ensure cultural appropriate content.
- Collaboration should further help to reach members of the public if they cannot be informed by LEAs and first responders (e.g. limited accessibility, limited communication with untrained persons, etc.).
- Additionally, CSOs should demonstrate and promote the benefits of relevant warning apps to increase their target audience. At the same time, LEAs and first responders should ensure the accessibility of such tools by learning more about e-accessibility from relevant CSOs.
- Collaboration should further aim to connect LEAs and first responders with relevant experts (e.g. child psychologists, physical therapists, etc.) and interpreters to facilitate the interaction with members of the vulnerable civil society during and after a CBRNe incident on site. In regard to interpreters, a dedicated communication team should be set up to coordinate the collaboration in this respect during and after a CBRNe incident.

The general willingness to cooperate with other institutions and organisations has already been investigated in the previous chapters (e.g. Chapter 6: cooperation with other organisations in general; Chapter 6.3.2: joint activities in disaster education). A collaboration approach is marked by

a shared objective between both partners. In regard to CBRNe incidents, collaboration between responders and representatives of vulnerable populations should aim to facilitate the engagement with these groups before, during and after an incident in a continuous and targeted way. The following part examines collaboration approaches between CSOs and first responders and their potential in regard to CBRNe incidents.



**Figure 33:** Indication of collaborations from CSOs with first responders by vulnerable category represented (Children: n=29; Older persons: n=33; Persons with mental health conditions: n=36; Persons with mobility restrictions: n=35; Blind or partially sighted persons: n=27; Hearing impaired persons: n=31; Persons with no or insufficient language skills: n=14; Ethnic minorities: n=10; Pregnant: n=8)

30.0% of the representatives indicate specific collaborations with first responder organisations. In contrast, 54.4% negate such efforts and additional 12.2% are unaware of any collaboration with first responders (see attached Figure 52). Looking further at the different vulnerable groups represented, it appears, that not all groups have equally high or low collaboration numbers. In fact, in more than half of the cases, representatives of persons with no or insufficient language skills confirmed such collaborations whereas this is only the case for 27.3% of the representatives of older persons (see Figure 33). Even more rarely than CSOs representing old people, collaborations are indicated by representatives of children (20.7%) and of blind or partially sighted persons (25.9%). The differences can partly be explained by the different distribution of the samples in the different groups. However, efforts for such a collaboration should be made across all groups.

One participant explains that in order to get to know each other, regular meetings with representatives of police and fire brigade are implemented within the CSO. Getting to know each other is a fundamental step in developing a mutual understanding of what both sides can contribute to the success of the common objective.

Looking back at Chapter 6.1, challenges and limits appear, which define the collaboration and should be considered from early on. These include the time available for joint activities on both sides (keyword volunteer staff), as well as the financial possibilities (keyword annual budget). During such meetings it should also be evaluated at which level such an exchange should take place: On the management level with the representatives on both sides or with individuals (vulnerable civilians and relief workers). Furthermore, the shared objective should be defined in more detail and adequate joint strategies should be developed to reach certain milestones. The measures and tools for this

should also be identified. Some measures that might facilitate the interaction with first responders in regard to CBRNe incidents have already been presented on part of the CSOs. The measures are aimed at different first responder categories. The collaboration partners should find out which measures are used by the respective first responders in the respective country or region and how the suggestions of the CSOs can be integrated into the respective SOPs. This can only be decided on an individual basis between the participating collaboration partners (e.g. different responsibilities in the countries, regional CSOs available, structure of the SOPs, etc.).

As an example of such a collaboration, one representative refers to emergency plans that have been created with relevant local practitioners (mostly Red Cross and police) that are aimed for refugee facilities. The plans reflect the respective needs and expectations of certain groups of residents. Complementing this, a continuous and targeted exchange between first responders and residents is established. Additionally, information channels are communicated where further knowledge can be obtained and exchanged. However, the representative stresses, that the success of such a collaboration varies from place to place. Accordingly, there is not one template that can be used to ensure a successful collaboration between CSOs and first responders for every location and country.

Moreover, the discussions will reveal which partner in which way can contribute to a successful harmonization of the SOPs and to what extent (e.g. support for translations by CSOs, greater involvement in exercises by first responders, etc.). Since such a collaboration approach is not a short-term event, but a long-term process, the measures and tools should be continuously assessed for their usefulness and adjusted if necessary.

Of those representatives that indicate collaboration approaches with first responders, 59.3% consider those approaches as successful in including the needs of those represented (see attached Figure 53). Taking up the above example of collaboration in disaster education trainings, one interviewee confirms that on the one hand, these joint activities does not only aim to increasingly train the local first responders on the needs of the represented group. But in addition, the CSO is able to train people with intellectual disabilities in emergency situations like evacuations in collaboration with these services to improve the overall process. Representatives recount that especially up-to-date and reliable information increases the competences on both sides and facilitate the coordination of joint activities. It is also noted that such efforts have helped to train the police on issues such as dementia. Also mentioned as a positive example was the cooperation with national crisis centres, which in times of Covid-19 often implemented the comments and advice of CSOs regarding the special needs of certain vulnerable groups in regard to press conferences, etc. In one case, the necessary contacts for this quick exchange of suggestions had already been developed since 2016. Accordingly, it takes time to build up efficient collaborations, but in the long run it is possible to implement helpful suggestions more quickly and effectively in the event of an emergency.

Only 11.1% of respondents indicate that the collaboration appears to be unsuccessful (see attached Figure 53). Further 22.2% explain, that they cannot assess the success. Some respondents state that the success of individual collaborations is difficult to assess as they are still developing. In this context, one respondent referred to a new emergency number for deaf and deafblind people as part of an interpreter service working with emergency services. Similar positive improvements are reported by other representatives. Two representatives hope that the slow achievements of the collaboration approach ultimately leads to a 112 service within the EU that offers video conversation, medical information, etc. hopefully within a decade. One participant further notes that even if a single measure in the longer term turns out to be unsuccessful, in the end, it is still a step in the right direction.

## 7. LIMITATIONS AND FUTURE CONSIDERATIONS

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Over the course of the research period, the survey has revealed some limitations but also ideas for future research.

As also stated in Chapter 3.2, the present study was limited to surveying organisational representatives who can represent vulnerable groups. A direct survey of vulnerable persons may appear to be the first choice. However, as has been pointed out, a number of methodological problems and challenges arise in the context of multinational surveys among vulnerable groups (see Chapter 3.2). To circumvent these challenges and problems and in line with the Task 3.4 description, the approach with organisational representatives was selected. Such an approach is also recommended in other studies (e.g. CDC 2015, 11). In addition, it can be assumed that some of the participants in the study themselves fall into one or even more of the described categories of vulnerable groups. Thus, needs and expectations of vulnerable persons in case of a CBRNe incident could be directly communicated in the study. If this was not the case, needs and expectations could be communicated indirectly as described. It can be assumed that organisational representatives who are intensively involved with the vulnerable group represented will be able to express the needs and expectations of this group in the event of a CBRNe incident almost 1:1.

As shown in Chapter 6.1.1, there were some overlaps in the evaluation of the results by vulnerable group represented. However, this circumstance could not be prevented, as some organisation representatives stated that they represent more than one of the described vulnerable groups.

Considering the current sample size of participants who completed the survey (n=91), a larger sample would have been desirable. The survey was offered in English plus 9 other languages to increase the number of participants. In addition, care was taken to allow access to the survey by persons with certain limitations (e.g., blind and visually impaired persons). Furthermore, numerous channels were used to promote the survey. Moreover, several reminder phases were carried out to draw attention to the survey (direct email communication, promotion of the survey via the CSAB and other networks, promotion of the survey via EU partner projects, promotion of the survey on Twitter / Facebook / LinkedIn pages, etc.). For more details on the efforts described, see chapters 3.3.2, 4.1 and Appendix D. Despite all these efforts to reach a larger sample, it is obvious that the topic of CBRNe is a niche topic. As shown in chapter 6.2.5, there is little experience on the civil society side (CSOs) regarding the topic of disaster events. The topic of CBRNe and in particular the topic of CBRNe terrorist attacks are even more specific. In this respect, it can be assumed that many potential participants did not take part in the survey or did not finalise it because there are no points of contact at all with the topic described. Furthermore, it can be assumed that the number of participants was influenced by the Covid-19 pandemic. Special challenges have arisen as a result of the pandemic (high mortality among older persons, increase / intensification of mental health conditions, school closures, etc.), which may also affect representatives of CSOs in particular. In this context, the additional workload that can result from the described challenges has impacted the number of participants in the study. Furthermore, it is also possible that differences in the number of participants by country (see chapter 6.1) can be explained by the situation described. Countries that were considerably impacted by the virus had to reorganise their work tasks. Thus, the number of participants likely differs significantly, depending on the countries' epidemiological situation at the time of the survey. However, the described differences in the number of participants by country are not critical, since the present study did not aim to compare countries. Given that similar patterns

have emerged across countries in the needs and expectations of vulnerable groups in the event of a CBRNe incident, it can be assumed that a more balanced country distribution would have led to relatively similar results.

It can be emphasized that the study results provide a good basis for further research in the area of "Needs of vulnerable groups in CBRNe situations". This study has provided a foundation of recommendations for CBRNe responders and CSOs across Europe that focus on the needs of vulnerable groups before, during, and after a CBRNe incident. These recommendations can now be adapted by responders to the contextual conditions in their respective countries. Or in other words, these recommendations can now be translated into concrete SOPs, etc. Further studies could also examine for individual countries how SOPs could be redesigned in order to be optimally integrated into the contextual conditions (distribution of tasks in the event of a disaster, regional, local responsibilities, etc.) of the respective countries.

As shown in this chapter, some limitations have emerged in the context of the study. Nevertheless, the research objectives and research questions stated in Chapter 3.1 were comprehensively answered. The needs and expectations of particularly vulnerable groups (before, during and after a CBRNe incident) were identified. In addition, gaps between these needs and approaches of responders in CBRNe incidents were illustrated. Ultimately, recommendations were developed to address these gaps. The following conclusion describes these recommendations in detail.

## 8. CONCLUSION AND RECOMMENDATIONS

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In this section, the key results of the research will be summarized with an eye towards the special needs and expectations of vulnerable citizens in regard to CBRNe situations. The multinational survey with representatives of organisations that represent specific vulnerable groups, aimed to identify perceived gaps across Europe between the needs of the vulnerable civil society on the one hand and the approaches of CBRNe practitioners to prepare for and respond to a CBRNe incident on the other hand. The results led to the identification of approaches across Europe to close those gaps.

In the following, special attention is paid to the research questions formulated in Chapter 3.1. Based on the results, this chapter also features recommendations for practitioners to close the identified gaps.

**Research question 1:** *What are the (perceived) needs of vulnerable citizens regarding information in the preparedness stage?*

The question refers to the findings from chapters 6.2.1 to 6.2.4. The results are based on the responses of the representatives of CSOs as well as the outcomes of the survey with CBRNe practitioners and the interview study with LEAs. The lessons learned from a webinar on e-Accessibility (e.g. Accessibility of webpages and apps) were also incorporated to complement the findings.

In regard to the needs among members of different vulnerable groups in terms of ways to communicate, no major differences can be found.

For **all vulnerable groups**, a strong wish for face-to-face and telephone communication was indicated, as well as digital media, followed by print media. Through these communication channels especially, the vulnerable civil society will apparently reach out to providers of CBRNe related information. On the other hand, these channels also seem to be the most suitable ones for contacting members of the vulnerable civil society in this respect. Additionally, the postal service seems to be a highly preferred medium of choice on part of the vulnerable civil society to get in touch with their representatives.

With regard to digital media, it should be noted that the study results indicate that the focus for **all vulnerable groups** is primarily on e-mail communication. As in the case of postal communication, practitioners should distribute their existing CBRNe materials (brochures, leaflets, etc.) more through this communication channel. In cooperation with CSOs, CBRNe-related information can also be distributed through their e-mail distribution lists and newsletters. In addition to email communication, the study results indicate that all vulnerable groups rely heavily on organisational websites and social media in their digital media use to connect with their organisational representatives. Regarding social media this is often also the case the other way around. In this respect, it should be taken into account that not all information is currently designed barrier-free (e.g. webpages, mobile apps, etc.). It can be assumed that media that are accessible will be used by a broader public.

A closer look at social media revealed that Facebook in particular, followed by Instagram, is used by **all vulnerable groups** to contact their representatives. Compared to Facebook and Instagram, this study showed that traditional blogs seem to be very rarely used by vulnerable groups to communicate with their representatives. Thus, compared to other social media, traditional blogs do not seem to be a suitable medium to distribute CBRNe-related information to a large part of the vulnerable population.

A comparison of **children** with other vulnerable groups showed that social media are not used more frequently as a means of communication to get in contact with their organisation representatives. However, **older people** tend to rely less frequently on social media.

In addition to communication channels, the language formats in which they receive information are particularly important for vulnerable groups. The research highlighted that LEAs and first responders should always provide information in written form, as it appears that this format is the most important when communicating with **the majority of vulnerable groups**.

Especially with regard to **blind persons and visually impaired persons** as well as with regard to **ethnic minorities**, it has furthermore been shown that information in audible formats are important to communicate with these groups. LEAs and first responders should increase CBRNe related information material that is accessible in an audio format.

Furthermore, especially for **children, ethnic minorities and persons with limited knowledge of the respective national language**, information in simple language are of great importance. Moreover, it has also been shown that pictorial language plays an important role for these groups. In addition to the aforementioned groups, this also applies to **older persons and people with insufficient language skills including foreigners and illiterate persons**.

**Blind persons and visually impaired persons** rely to a large extent on information in Braille. The same is true about sign language for **hearing-impaired or deaf persons**.

With regard to the group of **people with limited knowledge of the respective national language**, it should also be noted that information materials in additional languages are particularly important. As shown in the study, information materials in English seem to be of particular importance. The language composition of the respective society should be taken into account. Thereby, LEAs and first responders should adapt their CBRNe-related information materials to the relevant contextual conditions (language composition in society, etc.) in their country.

In conclusion, it can be summarized that the study has shown that CSOs representing vulnerable groups use a variety of communication channels and media to get in touch with the group they represent in the best possible way. LEAs and first responders should take this as a model to meet the information needs of the vulnerable civil society prior to a CBRNe incident. If they cannot directly contact the vulnerable population themselves, it would be advisable to communicate the information in close cooperation with CSOs. Furthermore, vulnerable groups as a whole depend on diverse language formats to receive information. LEAs and first responders should therefore ensure that pre-incident information for a CBRNe incident is provided in as many language formats as possible to cover the needs of vulnerable groups.

**Research question 2:** *What are the (perceived) needs of vulnerable citizens with regard to information in a situation of response to an imminent CBRNe threat situation?*

The second research question refers to the findings from chapters 6.2, 6.4 and 6.5.1 and 6.5.2. The results are mainly based on the responses of the representatives of CSOs. Various related findings in scientific research were used to complement the responses. Furthermore, the findings from previous PROACTIVE deliverables such as D2.3, D1.2 (Davidson et al. 2019) and D1.3 (Hall et al. 2020) are also taken into account.

Communication with the public outside the hot zone and through the media greatly differs from the communication with those affected within the expected hot zone (see Davidson et al. 2019, 25). This stems from the immediate and direct communication process, the different time management, the PPE and the absence of interpreters within certain at-risk areas.

In regard to the provision of information to the general public, the findings for research question 1 indicate suitable communication channels, media and formats of pre-incident information for the general public. Those findings further apply to the provision of information during and after a confirmed CBRNe incident. Overall, it can be assumed that social media are a suitable instrument for LEAs and first responders to distribute CBRNe-related information during the imminent CBRNe threat situation phase.

In regard to the hot zone, especially **blind and visually impaired people, deaf and hearing impaired people, older persons** and **children** have additional special needs. First of all, they need to be approached from the front and informed about the presence of the first responders where possible. Since some vulnerabilities are not immediately recognised or are only recognised in the further course of the interaction, this point refers in fact to all vulnerable groups. In direct contact, for **all vulnerable groups**, information should be given by only one first responder at a time. A need for as simple information as possible was emphasized for all vulnerable groups. Except for blind people, all information should be highlighted by gestures and communicated at eye level. As this group is sometimes accompanied, such gesture language is also important for the accompanying person. It is also true for all vulnerable groups that information should be provided slowly and calmly, and repeated if possible. Parts of the vulnerable civil society will take longer to understand information than others. This includes **visually, aurally and linguistically impaired people**, as well as **children** and **people with mental impairments** such as dementia. Therefore, LEAs and first responders should refrain from shouting and pushing.

Sometimes vulnerable people need the help of caregivers such as parents or teachers to understand the information about the imminent threat situation. This is especially the case for **children, people with mental health conditions** and people who do not understand the given information due to barriers as in the case of **deaf and hearing impaired people** and **people with insufficient language skills**.

Regarding the content, **all vulnerable groups** need clear instructions. Especially **blind and visually impaired people** need clear information to understand the visual conditions of the expected hot zone (e.g. "Go to your right until you come across a door ten metres ahead of you. This is open. Leave the building via this path. Outside you will receive further information").

At some point, **all vulnerable groups** need information about the expected further next steps such as the decontamination routine. If possible, this information should be given before rather than during the process, so that they can prepare themselves and ask questions if necessary. Additionally, information is needed in regard to the safety of their current location and their partially separated relatives. Furthermore, **pregnant women** will have a great need for information on the impact of a possible CBRNe incident on their unborn child.

**Research question 3:** *What are the (perceived) needs of vulnerable citizens with regard to scene management, evacuation, etc.?*

The question refers to the findings from chapter 6.4.1-6.4.4 that analysed the (perceived) needs and expectations of the vulnerable civil society during a CBRNe incident and chapter 6.5.1 and 6.5.2 that provided measures representatives of CSOs consider to facilitate the respective CBRNe management. The answer to the research question is mainly based on the statements of the representatives of CSOs interviewed, as well as on supplementary findings from relevant research literature and former deliverables such as D2.3, D1.2 and D1.3.

In general, it can be noted that vulnerable groups rely on a variety of support services in the event of a CBRNe incident in regard to all management phases.

In this respect, across **all vulnerable groups**, the need for caregivers in the situation described is evident. Reference persons of vulnerable persons can be, for example, guardians, parents, other relatives, friends, etc., who are familiar with the specific needs of the respective person.

Furthermore, during a CBRNe incident, the need for a safe and quiet place where affected individuals can ask questions about how to proceed was **generally** emphasized. The need of affected individuals for calming and comfort should also be seen in this context.

Furthermore, a need for clear information on why certain processes (undressing, decontamination shower, etc.) will become necessary during a CBRNe incident was highlighted for **all vulnerable groups**. The same applies to the need for clear instructions. For **deaf and hearing impaired people, people with mental health conditions, children, ethnic minorities and people with insufficient language skills including illiterate persons**, information should be provided in simple, easy to read and sufficiently large illustrations.

For **deaf persons or persons with hearing impairments**, the need for sign language interpreters was highlighted in regard to all CBRNe related processes. It may otherwise be impossible for completely deaf individuals to understand instructions from first responders. Furthermore, a need for visual instructions (text form, image form, video form, etc.) was identified through which information from first responders can become accessible to the aforementioned group. In this context, the importance of gestures was also emphasized. Apps that translate what is spoken into speech were identified as another way to obtain information in the situation described.

With regard to **blind persons or visually impaired persons**, it was emphasized that they may have orientation problems in the situation described (evacuation route, orientation in the decontamination shower, etc.). In this respect, a need for guidance by emergency personnel or other sighted persons

was identified. This need can be satisfied, for example, by holding another person's arm. Furthermore, they may need a further description of their surroundings (e.g. "the round shower button in front of you at shoulder height", "Keep care, at your feet there is a small step five metres in front of you", etc.). Other support services that are conceivable include assistance with the undressing process for the further decontamination.

For **deaf-blind individuals**, the need for deaf-blind interpreters in the described situation was further emphasized.

**Persons with mobility impairments** may also require assistance. For example, in relation to the evacuation process, it was highlighted that people with mobility impairments need time and support to follow instructions issued by emergency services. In the event of an evacuation, individuals with mobility impairments may also rely on means of support (e.g. elevators) that are not available in the event of a CBRNe incident (e.g. due to fire). Emergency responders should take this circumstance into account. In addition, individuals with mobility impairments may require assistance with the undressing process for the further decontamination as well as assistance with the decontamination shower. This assistance may be provided either by first responders or by other affected individuals at the scene. In this context, it can be advantageous for persons with mobility impairments to receive help from caregivers (if possible and available), since a trust relationship exists with them. At this point, however, it must be emphasized that this can also be advantageous for the other vulnerable groups described.

In addition to the already described groups, the decontamination process can also be difficult for **pregnant women**. When undressing for the further decontamination process, they may have problems with removing shoes and socks. In this context, the need for seating possibilities was highlighted to facilitate the undressing process. Beyond pregnant women, this can also be particularly beneficial for **older people**.

Special needs may also arise in the event of a CBRNe incident with respect to **ethnic minorities or persons with a lack of language skills of the respective national language**. Religious and cultural factors may make it especially difficult for some individuals to undress in public in front of others<sup>27</sup>. In this respect, conducting a decontamination shower is also problematic, as in this case showering (completely naked) with other people is intended. Some individuals will expect to be allowed to undergo the undressing and decontamination process alone or at least shielded as much as possible. People with a lack of knowledge of the relevant national language need information in additional languages.

Furthermore, the need for sufficient psychological support in the described situation was identified for **all vulnerable groups**. Especially for **people with mental health conditions** (anxiety disorders, compulsive disorders, etc.), an evacuation as well as a decontamination process can be problematic. For autistic persons it was especially emphasized that they need personal space. Furthermore, it was emphasized that particularly autistic persons could have problems with waiting processes (waiting for the evacuation, waiting for the decontamination, etc.) in the described situation. For some

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<sup>27</sup> This process can also be particularly problematic for individuals with physical disfigurements (scars, burn marks, torture marks, etc.) and for anorexic individuals. In addition, the process can also be very problematic for pregnant women due to an altered body image.

persons with autism it may also be impossible to shower with others. In this case, there is also a need to shower alone. They might also need help to identify their physical condition during the medical triage.

In addition to general psychological support, a need for psychologists specialized in children was identified. **Children** may also be particularly in need of support during the record of medical history/current injuries, the undressing for the further decontamination process as well as during the decontamination shower. Support from caregivers (e.g. parents, siblings, etc.) can be beneficial in this context, as there is a close relationship of trust with them.

**People with chronic health conditions** will need information on their necessary assistant devices and service animals (e.g. return, replacement, handling of oxygen, etc.) during and after the event.

**Research question 4:** *What are the (perceived) needs of vulnerable citizens in a recovery situation after a CBRNe incident?*

The fourth research question mainly refers to the findings from chapter 6.5.2 which are complemented with the findings from the previous chapters. In terms of content, the research question predominantly relates to the approaches of CSOs, relevant supporting research literature and former deliverables such as D2.3, D1.2 and D1.3.

In connection with leaving the hot zone, a need was identified on the part of **all vulnerable groups** to receive confirmation that they are now in a safe environment. Furthermore, a need for reassurance was generally emphasized. Overall, a need was also identified to receive information on how to proceed or where to obtain further information, if needed. Moreover, after decontamination affected persons are usually without devices (mobile phones, etc.) via which they can obtain information about the situation. In this respect, they are dependent on first responders and experts for information.

Furthermore, a need for psychological support was mentioned. However, this need was not only identified after leaving the hot zone immediately, but also far beyond the end of the CBRNe incident. Thus, it was emphasized that not all trauma leads to immediate reactions. The typical trauma reactions (shortness of breath, nightmares, etc.) often occur with a time delay. In this context, the need for individual and group meetings to process what has been experienced was emphasized.

In addition, with regard to different vulnerable groups, the need for information on how to proceed in appropriate language formats (simple language, Braille, etc.) or in languages other than the national language was highlighted. Those correspond to the findings in regard to the first research question. In the context of the recovery situation, a need for sign language interpreters was highlighted for **hearing impaired persons** to receive information. However, it was also emphasized that written information are necessary because not all hearing impaired persons understand sign language.

Especially in relation to **autistic** individuals, a need for explanation of the procedures performed (decontamination shower, etc.) was highlighted. This includes the reasons for the procedures performed, as well as the potential impact of a CBRNe situation afterwards.

For **pregnant women**, a strong need was identified to receive information on how substances they had been exposed to might affect their pregnancy and what steps they should take further in this regard (contact with appropriate physicians, exchange with the maternity clinic, etc.). Obtaining information about how CBRNe substances can affect their health was also identified as an immediate need for **all other vulnerable groups**.

For **blind or visually impaired persons** as well as **people with mobility restrictions**, a need for assistance in leaving the site of a CBRNe incident was highlighted. Especially blind persons may be helpless in unfamiliar environments. In this case, they are dependent on help from contact persons or on help from strangers when leaving the place of action. Furthermore, it is possible that blind or visually impaired persons are dependent on support objects (cane for the blind, magnifying glasses, etc.) after leaving the hot zone, which they have lost / had to leave behind during the decontamination. In this respect, there is a need to obtain appropriate support objects again as quickly as possible. This also applies to **persons with mobility impairments, hearing impaired people** and **people with chronic health conditions** who are dependent on wheelchairs, prostheses or hearing aids and medication. In relation to persons with mental health conditions, there may be a need for appropriate medication after leaving the hot zone.

**Research question 5 & 6:** *What are perceived gaps across Europe between the (perceived) needs of the vulnerable civil society on the one hand and the approaches of CBRNe practitioners to prepare for and respond to a CBRNe incident on the other hand? And which approaches can be identified to close those gaps?*

Research question 5 and 6 combine the findings of all chapters. Based on identified gaps between the (perceived) needs of the vulnerable civil society and the approaches of CBRNe practitioners, the report presents concrete recommendations. The gaps result from the direct comparison between the measures of CBRNe practitioners and the special needs of vulnerable persons. Additionally, gaps were identified based on the participants' assessment regarding considerable problems during the (hypothetical) CBRNe incident. These gaps are complemented by corresponding findings, which are emphasised in relevant research literature. The recommendations comprise all recommended actions in regard to the identified gaps. Besides, findings of the survey with CSOs, the survey and study with CBRNe practitioners and relevant scientific literature, the recommended actions are complemented by the previous deliverables D1.2 and D1.3. and the insights of the webinar on e-accessibility. In addition to the actions to mitigate or clear the identified gaps, the necessary responsible stakeholders are identified, which play a crucial role for the implementation of these recommendations. These include CBRNe practitioners as well as relevant and interested CSOs and experts. Thereby, the following recommendations comprise the key elements 'why' the recommendations should be implemented (identified gap), 'how' the implementation should take place (recommended actions) and 'who' should implement the recommendation (responsible stakeholder). Additionally, some recommendations indicate necessary 'conditions for implementing the proposed actions' and points 'to be considered' (aspects including expected consequences) when implementing the recommendations.

The recommendations refer to the previous recommendations from D2.3, which gave general recommendations for action for CBRNe practitioners. Some of these recommendations already addressed the consideration of vulnerable persons in CBRNe incidents and are now being specified in more detail. The recommendations of this report should enable stakeholders to purposefully address the identified gaps. For this purpose, the individual recommendations were designed in such a way that they are inherently consistent and can be copied individually from the document. References within individual recommendations to others facilitate stakeholders to address corresponding gaps.

Certain gaps in relation to vulnerable persons in CBRNe incidents can be identified. Prior to a CBRNe incident, there are certain ways in which CBRNe practitioners can be prepared to adequately interact with members of the civil society prior, during and after an event. The following recommendations arise:

The following recommendation refers primarily to the first recommendation of D2.3. In addition, in some sections the report emphasized the need to include certain aspects in SOPs of CBRNe practitioners. These are also included in this recommendation.

**Recommendation 1:** *The needs, expectations and challenges, especially in regard to vulnerable members of the civil society should be considered more extensively in CBRNe related SOPs. (see also D2.3: Recommendation 1)*

<b>Identified gap</b>	The measures of response undertaken by LEAs and first responders do not always correspond with the needs, expectations and challenges regarding the vulnerable members of civil society (e.g. communication strategy, offered information material, etc.).
<b>Recommended actions</b>	<ul style="list-style-type: none"> <li>• LEAs and first responders should <b>identify</b> vulnerable groups that are insufficiently considered in certain response measures or SOPs.</li> <li>• LEAs, first responders and CSOs should exchange knowledge about the needs, expectations and challenges in regard to certain vulnerable groups to adapt the SOPs accordingly (e.g. conferences, group meetings, etc.).</li> <li>• SOPs should implement recommendations about the <b>communication with pregnant women</b> infected with emerging and bioterrorism pathogens. <b>(see Recommendation 15)</b></li> <li>• LEAs and first responders should exchange respective knowledge, “lessons learned” and “best practice” with practitioners (from <b>other countries</b>) (including blue light organisations, municipal authorities, security companies, etc.) via conferences, seminars, joint trainings, projects, the PROACTIVE App, etc.</li> <li>• Efforts to include vulnerable groups in SOPs should be <b>promoted via social media</b> channels/networks, the PROACTIVE App (improving perceptions and setting a good example).</li> </ul>
<b>Responsible stakeholder</b>	All LEA and first responder organisations involved in CBRNe management and relevant CSOs.

The next recommendation refers primarily to the second recommendation of D2.3. This recommendation is supplemented by the findings from the Chapters 6.2 and 6.3.

**Recommendation 2:** *Emergency response organisations should increasingly reach out to CSOs to raise awareness for major emergencies in general, particularly CBRNe incidents involving the public. (see also D2.3: Recommendation 2)*

<b>Identified gap</b>	Only 16.5% of the participants stated that they are familiar with the topic of major emergencies. The general public is not expected to be regularly informed about this topic either. In order to increase the awareness for CBRNe incidents among the public, LEAs and first responders need to communicate this topic more strongly (e.g. through information material, through involvement in exercises, etc.) <sup>28</sup> .
<b>Recommended actions</b>	<ul style="list-style-type: none"> <li>• LEAs and first responders should raise awareness for CBRNe related emergencies in regard to different locations in which a CBRNe incidents can occur and that influence the related CBRNe management (e.g. evacuation in railway facilities, airports, schools, etc.)</li> <li>• CSOs should act as interfaces with the group of vulnerable citizens they are representing, reach out to members of the public especially when direct communication from LEAs and first responders is more difficult (e.g. due to limited accessibility, limited communication with untrained persons, etc.).</li> <li>• LEAs and first responders should involve CSOs to <b>distribute relevant information</b> material via their newsletters.</li> <li>• CSOs should support first responders to promote helpful information channels such as relevant webpages and mobile apps, in particular the PROACTIVE App.</li> <li>• If possible, comprehensive (social media) <b>information campaigns</b> (e.g. posters, TV spots, etc.) to raise awareness for this topic (e.g. Remove campaign in the UK) should be carried out. In these information campaigns, indications can be given to further publically available information. If feasible, such campaigns should be conducted in close cooperation with relevant CSOs to maximise the reach to relevant audiences. <b>(see Recommendation 3)</b></li> <li>• LEAs and first responders should raise overall awareness of CBRNe related topics via social media channels/networks (giving impulses and setting a good example).</li> </ul>
<b>Responsible stakeholder</b>	All LEA and first responder organisations involved in CBRNe management, relevant CSOs and practitioners engaged in critical infrastructures such as the railway and airport.

<sup>28</sup> The approaches described in the following can be beneficial to first responder organisations, although they are time-consuming. A heightened awareness / increased knowledge on the part of the civil society regarding the topic of disaster events can have a relieving effect on emergency response organisations in the event of a disaster (CBRNe incident). This also applies to vulnerable groups.

A need for certain cooperation and collaboration approaches were mentioned in numerous sections throughout the report. The results are summarised in Chapter 6.5.3. Furthermore, the recommendation complements the ninth recommendation from D2.3.

**Recommendation 3:** *Emergency response organisations and CSOs should cooperate to a greater extent in order to better address the specific needs of vulnerable groups in the event of a disaster / CBRNe incident. (see also D2.3: Recommendation 9)*

<b>Identified gap</b>	More than half of the respondents of the D2.3 study report having no cooperation agreement with CSOs representing members of the vulnerable civil society. Furthermore, vulnerable persons are insufficiently involved in relevant exercises. As a result, first responders lack the knowledge to adequately address the needs of vulnerable civilians in CBRNe operations. This creates an urgent need for CBRNe practitioners to implement cooperation agreements with CSOs. Especially with regard to CBRNe response, there is an insufficient inclusion of translators, psychologists and psychiatrists in LEA and first responder networks.
<b>Recommended actions</b>	<ul style="list-style-type: none"> <li>• LEAs and first responders should use cooperation to raise awareness for the needs of vulnerable groups in CBRNe incidents on the one hand and for CBRNe related measures on the other hand. <b>(see Recommendation 2)</b></li> <li>• LEAs, first responders and CSOs should exchange knowledge about the specific needs of vulnerable groups to adequately adapt CBRNe related exercises, SOPs and information material. <b>(see Recommendation 1, 5, 6)</b></li> <li>• CSOs should reach out to members of the public if they can't be informed by LEAs and first responders (e.g. limited accessibility, limited communication with untrained persons, etc.). <b>(see Recommendation 6)</b></li> <li>• LEAs, first responders, other relevant practitioners (e.g. railway security) and CSOs should (more regularly) conduct <b>joint exercises</b> in general and particularly regarding CBRNe. <b>(see Recommendation 5)</b></li> <li>• CSOs should offer a network of potential candidates for trainings. <b>(see Recommendation 5)</b></li> <li>• LEAs and first responders should reach out to relevant <b>translators, psychologists and psychiatrists</b> to facilitate the engagement with certain members of the vulnerable civil society during and after a CBRNe incident.</li> <li>• If possible, a dedicated communication team should be set up to coordinate the adequate communication during and after a CBRNe incident. <b>(see Recommendation 6)</b></li> <li>• CSOs should offer courses to teach LEAs and first responders about communication specifics and the handling of certain vulnerable groups. <b>(see Recommendation 5)</b></li> <li>• If possible, LEAs, first responders and CSOs should implement cooperation agreements to implement a firm partnership.</li> <li>• LEAs and first responders should exchange respective knowledge, "lessons learned" and "best practice" with practitioners (from other countries) via conferences, seminars, joint-trainings, projects, etc.</li> <li>• LEAs and first responders should raise overall awareness of their efforts to cooperate with CSOs via social media channels (improving perspective and setting a good example).</li> </ul>
<b>Conditions for implementing the proposed actions</b>	However, a prerequisite for implementing the recommendation is sufficient time and financial resources at both ends of the collaborative relationship. As the study has shown sufficient financial resources can be difficult to obtain, especially for CSOs. When initiating a cooperation, it should be clarified at which level the cooperation should be established (management level, etc.). In addition, a clear cooperation goal should be formulated, as well as approaches for achieving this goal. Furthermore, evaluation mechanisms seem to be useful in order to check the effectiveness of the approaches.
<b>Responsible stakeholder</b>	All LEA and first responder organisations involved in CBRNe management, other practitioners engaged in critical infrastructures such as the railway and airport, relevant CSOs and individual experts representing vulnerable groups.

The recommendation is influenced by the sixth, seventh and eighth recommendations of D2.3. It uses the findings of the Chapters 6.2.1-6.2.4 and 6.3.1 to identify concrete approaches for action. The recommendation primarily refers to the public rather than those affected within the hot zone.

**Recommendation 4:** *Emergency response organisations should increase the availability of CBRNe-related information prior, during, and after a CBRNe incident in specific language formats (audio language, Braille, sign language, simple language, and pictorial language<sup>29</sup>). In addition, information materials should be offered in languages other than the local language. (see also D2.3: Recommendation 6, 7 & 8)*

<b>Identified gap</b>	The special needs of vulnerable persons are not always sufficiently taken into account in CBRNe related information material. This concerns both the content and the format of the communication. Also, the way of how communication is handled does not always meet the needs of the vulnerable civil society (e.g. insufficient emotional responsiveness).
<b>Recommended actions</b>	<ul style="list-style-type: none"> <li>• LEAs and first responders should revise their existing CBRNe related information material to identify gaps in which the special needs of vulnerable citizens are insufficiently considered.</li> <li>• LEAs and first responders should strongly implement and increase the amount of information available in <b>additional language formats</b>: <ul style="list-style-type: none"> <li>○ General use of simple written language.</li> <li>○ Different languages (at least English and commonly spoken languages<sup>30</sup>).</li> <li>○ Braille.</li> <li>○ Sign language (in regard to videos and press conferences, etc.).</li> <li>○ Sufficiently large and high-contrast illustrations/videos.</li> </ul> </li> <li>• LEAs and first responders should <b>expand the used communication channels</b>: <ul style="list-style-type: none"> <li>○ Leaflets and brochures should be shared via e-mail newsletters.</li> <li>○ Relevant information material should be accessible on the relevant websites of LEAs and first responders Links should refer to further relevant partnering websites including the PROACTIVE App.</li> <li>○ Multiple social media channels should be taken into account. Especially Facebook and the PROACTIVE App should be used to spread material.</li> </ul> </li> <li>• LEAs and first responders should <b>mitigate existing accessibility restrictions</b> in publicly available information (e.g. e-accessibility of mobile apps and webpages).</li> <li>• Furthermore, dedicated information material for certain vulnerable groups should be offered. <b>(see Recommendation 15)</b></li> <li>• LEAs and first responders should involve CSOs to provide information material in an adequate format. <b>(see Recommendation 3)</b></li> <li>• LEAs and first responders should exchange respective knowledge, “lessons learned” and “best practice” with practitioners (from other countries) via conferences, seminars, joint trainings, projects, etc.</li> </ul>
<b>Responsible stakeholder</b>	All LEA and first responder organisations involved in CBRNe management.

<sup>29</sup> For example, short explanatory videos in front of a decontamination tent describing the decontamination process are conceivable.

<sup>30</sup> The language composition of the respective society should be taken into account. If one takes the examples of Germany and France, for example, it is conceivable, also in view of the ethnic composition of the societies, that information materials could also be offered in Turkish and Arabic. Numerous other examples could be mentioned at this point, but since this study does not claim to make recommendations for individual countries (such an approach would have been far beyond the resources of this study), no more details will be given here. In general, it should be clear that first responder organisations should adapt their CBRNe-related information materials to the relevant contextual conditions (language composition in society, etc.) in their country.

The following recommendation elaborates on the recommendations 4, 5 and 6 from D2.3. Chapter 6.3.2 of this report in particular provides important insights in regard to vulnerable groups in CBRNe exercises. In addition, the usefulness of exercises was noted at relevant points throughout the report.

**Recommendation 5:** *In CBRNe exercises of LEAs and first responders, vulnerable groups should be increasingly included so that their specific needs can be better taken into account in an emergency. In addition to vulnerable persons, their caregivers / companions should also be included, as they can be an important source of information for the respective vulnerable person as well as for the emergency responders. (see also D2.3: Recommendation 4, 5 & 6)*

<b>Identified gap</b>	Vulnerable people are too rarely involved in exercises to identify unforeseen challenges in the interaction with LEAs and first responders. An increased participation of vulnerable groups in CBRNe exercises is urgently needed to adequately adapt CBRNe related SOPs.
<b>Recommended actions</b>	<ul style="list-style-type: none"> <li>• LEAs and first responders should more regularly involve members of the vulnerable civil society and other relevant practitioners like the railway security in training exercises.</li> <li>• If possible, some exercises should include caregivers (e.g. teacher, physical therapists, midwives, etc.) and service animals.</li> <li>• There is a strong need to train certain aspects (<b>see Recommendation 8, 11, 12, 13</b>) <ul style="list-style-type: none"> <li>◦ Communication procedures (e.g. involvement of caregivers, acoustic guidance, etc.).</li> <li>◦ Assistance (e.g. pain reduced mobilisation, the handling of infants and prostheses, etc.).</li> <li>◦ Identification, handling and decontamination of assistant devices and service animals.</li> </ul> </li> <li>• LEAs and first responders should involve representatives of CSOs more regularly in the design and supervision of exercises. (<b>see Recommendation 3</b>)</li> <li>• CSOs should offer courses to teach LEAs and first responders about communication specifics and the handling of certain vulnerable groups (<b>see Recommendation 3, 6, 8, 11, 12, 13</b>): <ul style="list-style-type: none"> <li>◦ Adequate contact approaches.</li> <li>◦ Basics of sign language.</li> <li>◦ Mobilisation of infants and people with mobility restrictions.</li> <li>◦ (Oral) guidance of visual impaired persons.</li> </ul> </li> <li>• If possible, basic self-protection rules in handling assistant animals.</li> <li>• LEAs and first responders should continuously adapt their SOPs based on the learning outcomes of the exercises. (<b>see Recommendation 1</b>)</li> <li>• LEAs and first responders should exchange respective knowledge, “lessons learned” and “best practice” with practitioners (from other countries) via conferences, seminars, joint trainings, projects, the PROACTIVE App, etc.: <ul style="list-style-type: none"> <li>◦ Templates for confidentiality agreements.</li> <li>◦ Checklists of points to be considered when involving vulnerable people.</li> <li>◦ Guidelines for exemplary exercises that address tactical issues.</li> <li>◦ Helpful contact points for recruiting volunteers.</li> </ul> </li> <li>• CSOs should support LEAs and first responders to recruit volunteers. (<b>see Recommendation 3</b>)</li> </ul>
<b>Conditions for implementing the proposed actions</b>	<p>The following points should be discussed prior to joint trainings:</p> <ul style="list-style-type: none"> <li>• Recruitment issues.</li> <li>• Legal/Confidential obligations in including external people.</li> <li>• Logistical/tactical issues to be considered.</li> <li>• Ethical obligations in including vulnerable people.</li> </ul>
<b>Responsible stakeholder</b>	All LEA and first responder organisations involved in CBRNe management especially those that are active within the hot zone, other practitioners engaged in critical infrastructures such as the railway and airport, relevant CSOs and individual experts representing vulnerable groups.

The overall communication and interaction with vulnerable individuals during a CBRNe incident and within the hot zone can facilitate the interaction with LEAs and first responders during and directly after such an event. In this regard, the following recommendations are suggested:

The first recommendation directly refers to the eighth recommendation of D2.3. The Chapters 6.4.1-6.4.4 and 6.5.1-6.5.2 provide valuable insights to concretise this recommendation.

**Recommendation 6:** *In communication with vulnerable persons, increased attention should be paid to these groups' specific needs during a CBRNe incident. (see also D2.3: Recommendation 8)*

<b>Identified gap</b>	The special communication needs of vulnerable persons are not always sufficiently taken into account in CBRNe response. This concerns both the content and the format of the communication. Also, the way how communication is performed does not always meet the needs of the vulnerable civil society (e.g. insufficient emotional responsiveness).
<b>Recommended actions</b>	<ul style="list-style-type: none"> <li>• In the event of a CBRNe incident, LEAs and first responders should consider the following communication rules when interacting with affected individuals: <ul style="list-style-type: none"> <li>○ Those affected should be approached from the front.</li> <li>○ LEAs and first responders should always announce their presence verbally.</li> <li>○ Only one LEA or first responder should communicate at a time.</li> <li>○ Communication at eye level is desirable.</li> <li>○ Gestures should be used to clarify instructions.</li> <li>○ LEAs and first responders should communicate calmly and slowly.</li> <li>○ Instructions should be repeated.</li> </ul> </li> <li>• First responders in PPE who come into direct contact with those affected should pin photos of themselves to their uniforms. <b>(see Recommendation 9)</b></li> <li>• In order to find an appropriate way of communication, LEAs and first responders should exchange knowledge with CSOs and relevant experts. <b>(see Recommendation 3)</b></li> <li>• If possible, CSOs should offer communication seminars. <b>(see Recommendation 3)</b></li> <li>• These communication practices should be trained during joint exercises. <b>(see Recommendation 5)</b></li> <li>• LEAs and first responders should exchange respective knowledge, "lessons learned" and "best practice" with practitioners (from other countries) via conferences, seminars, joint trainings, projects, etc.</li> </ul>
<b>Responsible stakeholder</b>	All LEA and first responder organisations involved in CBRNe management, especially those that communicate with those affected within the hot zone, relevant CSOs and individual experts representing vulnerable groups.

Basically, the first indications for the following recommendation can be seen in all parts of Chapter 6.4. In concrete terms, attention was drawn to this in the Chapter 6.5.1. Chapter 6.5.2. also underlined the relevance of the following recommendation.

**Recommendation 7:** *Significant others should not be separated from each other and/or replacement significant others should be provided as a temporary measure. If possible, caregivers (e.g., parents, guardians, etc.) of vulnerable persons should not be separated from the vulnerable person.*

<b>Identified gap</b>	It turns out that certain (vulnerable) people should not be separated from each other in order to generate a higher level of compliance, to reduce symptoms of fear and anxiety and to facilitate the overall CBRNe response. It cannot be assumed that this is currently sufficiently taken into account.
<b>Recommended actions</b>	<ul style="list-style-type: none"> <li>• LEAs and first responders should aim not to separate significant others from each other in all processes of CBRNe response. The same applies to service animals.</li> <li>• If people need to be separated (also from their service animals), information about their whereabouts and condition should be provided in a timely manner.</li> <li>• If no significant other can be found, first responders should group or pair people ("buddy system").</li> <li>• If people have to be separated, smaller same sex-groups should be formed (especially with regard to children and ethnic minorities).</li> <li>• If possible, families should stay together. Accordingly, children should not be separated from their parents. The same applies to caregivers such as nurses and those in need of care.</li> <li>• People who speak the same language should be grouped to reduce isolation and enhance possible translations among the group within the hot zone.</li> <li>• A first responder should be provided for (unaccompanied) people who display severe anxiety within the hot zone. Relevant experts (e.g. translators, psychologists, etc.) should be involved outside the hot zone if necessary. <b>(see Recommendation 3, 6)</b></li> <li>• If necessary, responders should use transitional objects (e.g. blanket, stuffed animal, etc.) for individual children.</li> <li>• LEAs and first responders should exchange knowledge about group behaviour and symptoms of anxiety to adequately group people.</li> <li>• If necessary, relevant guidance should be incorporated in SOPs. <b>(see Recommendation 1)</b></li> <li>• LEAs and first responders should exchange respective knowledge, "lessons learned" and "best practice" with practitioners (from other countries) via conferences, seminars, joint trainings, projects, etc.</li> </ul>
<b>Responsible stakeholder</b>	All LEA and first responder organisations involved in CBRNe management, especially those that are active within the hot zone and relevant CSOs.

As for recommendation 7, the Chapters 6.4.1-6.4.4 implied a certain need. The following recommendation was especially emphasized in Chapter 6.5.1 and additionally referred to in chapter 6.5.2.

**Recommendation 8:** *If possible, responders should actively involve caregivers (e.g. parents, friends, guardians, nurses, teachers, etc.) of vulnerable persons in the evacuation, the medical triage, the undressing and the decontamination process to ensure appropriate support for vulnerable persons. If this is not possible, responders should involve other affected persons or step in themselves where necessary.*

<b>Identified gap</b>	First responders often know nothing or not enough about how to deal with vulnerable persons in general and with those affected in particular. They are also impaired by their heavy protective gear (e.g. mask, gloves). Respondents indicate a strong benefit for the overall CBRNe response when first responders actively involve assistant persons in their procedures (e.g. communication, assistance, etc.). Such an involvement can relieve the on-site emergency personnel in their tasks. In addition, such an approach can increase the likelihood that vulnerable persons will comply with the given instructions.
<b>Recommended actions</b>	<ul style="list-style-type: none"> <li>• Assistant persons should be used as an information resource during the medical triage. This applies especially to children and people with mental health conditions such as dementia. The guardianship should also be clarified for the further (medical) treatment.</li> <li>• Assistant persons should be involved in the communication process during the whole CBRNe incident. <b>(see Recommendation 6)</b></li> <li>• Assistant persons should support first responders in assistant tasks (e.g. acoustic guidance, undressing, etc.). <b>(see Recommendation 11, 12, 13)</b></li> <li>• Caregivers and relatives should be involved in (CBRNe) exercises to create a routine. <b>(see Recommendation 5)</b></li> <li>• LEAs and first responders have to give clear instructions on what they expect from assistant persons in any CBRNe related process. Furthermore, first responders should ask how to assist before intervening in the already established interaction between caregiver and affected person.</li> <li>• Only if no assistant person can be found or paired with a vulnerable person, first responders should assign their own forces. However, those are then bound.</li> <li>• If necessary, relevant guidance should be incorporated in SOPs. <b>(see Recommendation 1)</b></li> <li>• LEAs, first responders and CSOs should exchange knowledge about the involvement of caregivers. <b>(see Recommendation 3)</b></li> <li>• LEAs and first responders should exchange respective knowledge, “lessons learned” and “best practice” with practitioners (from other countries) via conferences, seminars, joint trainings, projects, etc.</li> </ul>
<b>Responsible stakeholder</b>	All LEA and first responder organisations involved in CBRNe management, especially those that communicate with those affected within the hot zone and relevant CSOs.

The following recommendation refers directly to a finding from Chapter 6.5.1. This takes up a current "best practice" method in connection with Covid-19, which has already been implemented all over the world.

**Recommendation 9:** *When first responders are wearing protective equipment during a CBRNe incident, they are likely to create fear and anxiety among the affected persons. Therefore they should attach a photo to their clothing that shows them without the protective gear.*

<b>Identified gap</b>	Respondents expect behaviour such as fear and anxiety by parts of the vulnerable civil society in view of the PPE worn by first responders in the hot zone. PPE worn by first responders can be impressive for a 'lay' person and can 'dehumanize' the look of the first responder who is wearing it. It cannot be assumed that this is currently sufficiently taken into account.
<b>Recommended actions</b>	<ul style="list-style-type: none"> <li>• First responders who come into direct contact with those affected should pin photos of themselves to their uniforms. An appropriate photo allows affected persons to see that a 'normal' person is underneath the protective equipment. <b>(see Recommendation 6)</b></li> <li>• When possible, first responders should use PPE which allows a larger part of the face to be visible, allowing people to see the eyes of the first responder.</li> <li>• First responders, should work out how this idea can be implemented (e.g. decontamination capability of the photos, ways of attaching the photo to the uniform, compliance of their emergency forces, etc.).</li> <li>• LEAs and first responders should exchange respective knowledge, "lessons learned" and "best practice" with practitioners (from other countries) via conferences, seminars, joint trainings, projects, etc.</li> </ul>
<b>Responsible stakeholder</b>	All LEA and first responder organisations involved in CBRNe management, especially those that communicate with those affected within the hot zone.

The engagement with those affected within the hot zone during the different stages of a CBRNe incident plays an important role in the respective compliance with first responders. In this study, it was shown that besides evacuation from an assumed dangerous area, subsequent medical triage, undressing and decontamination can be especially problematic for vulnerable individuals. This leads to the following recommendations for first responders which may not only be helpful for vulnerable individuals, but also to anyone else affected by a CBRNe incident:

Based on Chapter 6.4.2, the following coping methods emerged for the following recommendation in Chapter 6.5.1.

**Recommendation 10:** *First responder organisations should develop a brief medical triage checklist that can be used to identify potential vulnerabilities among those affected by a CBRNe incident. Such a list should include the major vulnerabilities that may concern those affected by a CBRNe incident. In addition, the list should identify the specific needs that arise from the corresponding vulnerabilities.*

<b>Identified gap</b>	Respondents indicate that in some cases vulnerabilities are not immediately recognised or are only identified in the further course of the interaction. Furthermore, some pre-conditions might be mistakenly assumed to be caused by the CBRNe incident. This may result in incorrect treatments and in delays in the overall process.
<b>Recommended actions</b>	<ul style="list-style-type: none"> <li>• First responders should always ask for vulnerabilities and necessary assistant devices/medications. Furthermore, all women of childbearing age should be asked about a possible pregnancy. This influences the classification of decontamination urgency in the medical triage process. The PROACTIVE App could be used to gather this information.</li> <li>• First responders should revise their medical triage documents to identify insufficiently noted vulnerabilities to facilitate the interaction with vulnerable groups.</li> <li>• If adaptable, in cooperation with CSOs, first responders should develop and incorporate such a checklist in their SOPs. <b>(see Recommendation 1, 3)</b></li> <li>• Additionally, to support people with chronic medical conditions, first responders should ask for necessary medication. These supplies must be left behind during the decontamination process and should therefore be kept available by responders outside the hot zone. If necessary, caregivers should be involved in the medical triage. <b>(see Recommendation 8)</b></li> <li>• LEAs and first responders should exchange their approaches to include vulnerabilities to the medical triage documents (“lessons learned” and “best practice”) with practitioners (from other countries) via conferences, seminars, joint trainings, projects, the PROACTIVE App, etc.</li> </ul>
<b>To be considered</b>	<ul style="list-style-type: none"> <li>• Some people might be reluctant to indicate certain vulnerabilities (e.g. people with certain mental health conditions, etc.).</li> <li>• Furthermore, such an approach might take a few more minutes for each affected person.</li> </ul>
<b>Responsible stakeholder</b>	All LEA and first responder organisations involved in CBRNe management, especially medical responders, paramedics and those that communicate with those affected within the hot zone, relevant CSOs and individual experts representing vulnerable groups.

The following recommendation reflects the findings of Chapter 6.4.3 which were reviewed in Chapter 6.5.1.

**Recommendation 11:** *Several strategies should be used as part of the undressing process to address the special needs of the vulnerable civil society and to increase compliance with the given instructions.*

<b>Identified gap</b>	Respondents indicate certain problems in regard to members of the vulnerable civil society in view of the undressing procedure. It cannot be assumed that this is currently sufficiently taken into account.
<b>Recommended actions</b>	<ul style="list-style-type: none"> <li>• If possible, responders should establish secure areas for individuals who have a major problem to undress in public (especially in regard to autistic persons, certain ethnic minorities, pregnant women and people with anorexic conditions). However, such an offer has the potential that too many will demand this option and discussions will tend to hinder the process.</li> <li>• If possible, only people of the same sex should undress next to each other.</li> <li>• If possible, first responders should provide seating areas for the undressing process. This can be beneficial for people with mobility limitations (e.g. pregnant women and older persons).</li> <li>• If needed, first responders should assist in the undressing process. <ul style="list-style-type: none"> <li>○ <b>Unaccompanied children:</b> They need clear instructions and might need help to undress.</li> <li>○ <b>Infants:</b> First responders should support the caregivers/take over the process if no caregiver is available.</li> <li>○ <b>Pregnant women and older people:</b> Might need help to undress.</li> <li>○ <b>People with mobility impairments:</b> Might need help to undress and to remove assistant devices (e.g. wheelchair, prosthesis, etc.). First responders should be trained in pain-reduced mobilisation.</li> <li>○ <b>People with visual impairments:</b> They need clear acoustic instructions and guidance.</li> <li>○ <b>People with hearing impairments:</b> They need clear visual instructions.</li> <li>○ <b>People with no or insufficient language skills:</b> If necessary, affected people who understand instructions should be used to show the process.</li> </ul> </li> <li>• As few first responders and other affected persons as possible should be directly involved in the undressing process at a time.</li> <li>• If possible, the personnel supervising the process should also be of the same gender (this is even more important for some religious groups where women can only be attended by women and men by men).</li> <li>• LEAs, first responders and CSOs should exchange knowledge about the special needs of vulnerable people in the undressing process. <b>(see Recommendation 3)</b></li> <li>• LEAs and first responders should continuously adapt their SOPs accordingly. <b>(see Recommendation 1)</b></li> <li>• LEAs and first responders should exchange respective knowledge, “lessons learned” and “best practice” with practitioners (from other countries) via conferences, seminars, joint trainings, projects, the PROACTIVE App, etc.</li> </ul>
<b>Responsible stakeholder</b>	All LEA and first responder organisations involved in CBRNe management, especially those that communicate with those affected within the hot zone, relevant and individual experts representing vulnerable groups.

Similar to the previous recommendation, the findings of Chapter 6.4.4 were reviewed in Chapter 6.5.1 to provide a cohesive overview over the needs and expectations of vulnerable citizens in a decontamination process and adequate measures to respond to those needs.

**Recommendation 12:** *Several strategies should be used as part of the decontamination shower routine to address the special needs of the vulnerable civil society and to increase compliance with the given instruction.*

<b>Identified gap</b>	Respondents indicate certain problems in regard to members of the vulnerable civil society in view of the decontamination shower routine. It cannot be assumed that this is currently sufficiently taken into account.
<b>Recommended actions</b>	<ul style="list-style-type: none"> <li>• First responders should illustrate the decontamination process prior to the shower routine (e.g. posters in front of the tent, information on the PROACTIVE App, etc.).</li> <li>• If people refuse to shower together with other people, first responders should offer the opportunity to shower alone (especially in regard to autistic persons, certain ethnic minorities, pregnant women and people with anorexic conditions). However, such an offer has the potential that too many will demand this option and discussions will tend to hinder the process.</li> <li>• If possible, only people of the same sex should shower at the same time.</li> <li>• If possible, first responders should provide seating areas. This can be beneficial for people with mobility limitations (e.g. pregnant women and older persons), visual limitations and people with certain chronic health conditions.</li> <li>• First responders should monitor the effectiveness of the shower routine.</li> <li>• If possible, the personnel supervising the process should also be of the same gender as those affected (this is even more important for some religious groups where women can only be attended by women and men by men).</li> <li>• If needed, first responders should assist in the shower routine: <ul style="list-style-type: none"> <li>○ <b>Unaccompanied children:</b> They need clear instructions and might need help to shower. If necessary, transition objects such as teddy bears should be used that also go through the decontamination process. The temperature and water pressure should be adapted (<math>\geq 98^{\circ}\text{F}/36.7^{\circ}\text{C}</math> and <math>\leq 60\text{psi}/413.7\text{kPa}</math>). If possible, a dedicated kid-friendly shower should be installed. Alcohol- and bleach-based disinfectant solutions should be avoided.</li> <li>○ <b>Infants:</b> They should never be carried by a single adult in view of the danger of dropping the infant due to the wet floor. If possible, infants should be placed on a stretcher and showered by first responders. The adequate position should be trained to secure breathing and avoid aspiration. An adequate temperature and water pressure should be secured. Alcohol- and bleach-based disinfectant solutions should be avoided.</li> <li>○ <b>Pregnant women, older people and people with mobility impairments:</b> They might need help to shower. First responders should be trained in pain reduced mobilisation.</li> <li>○ <b>People with visual impairments:</b> They need clear acoustic instructions and guidance.</li> <li>○ <b>People with hearing impairments:</b> They need clear visual instructions.</li> <li>○ <b>People with no or insufficient language skills:</b> If necessary, affected people who understand instructions should be used to show the process.</li> </ul> </li> <li>• As few first responders and other affected persons as possible should be directly involved in the decontamination shower at a time.</li> <li>• LEAs, first responders and CSOs should exchange knowledge about the special needs of vulnerable people in the undressing process and how to adequately illustrate and communicate the shower routine. <b>(see Recommendation 3)</b></li> <li>• CSOs should teach first responders to adequately assist (e.g. ensuring the breathing of infants, showering service animals, etc.). <b>(see Recommendation 3, 4)</b></li> <li>• LEAs and first responders should continuously adapt their SOPs accordingly. <b>(see Recommendation 1)</b></li> <li>• LEAs and first responders should exchange respective knowledge, “lessons learned” and “best practice” with practitioners (from other countries) via conferences, seminars, joint trainings, projects, the PROACTIVE App, etc.</li> </ul>
<b>Responsible stakeholder</b>	All LEA and first responder organisations involved in CBRNe management, especially those that communicate with those affected within the hot zone, relevant CSOs and individual experts representing vulnerable groups

After focusing on the acute phase of a CBRNe incident in the previous recommendations, the last section of recommendations addresses the leaving of the hot zone and the subsequent aftercare following a CBRNe incident. As in the case of the previous recommendations, several approaches are conceivable to make it easier for vulnerable persons, but also for all other affected persons:

**Recommendation 13:** *When / after leaving the hot zone, several strategies should be used by first responders to facilitate the interaction with vulnerable individuals during the after-care phase.*

<b>Identified gap</b>	Respondents indicate certain problems in regard to members of the vulnerable civil society in view of the after-care procedure.
<b>Recommended actions</b>	<ul style="list-style-type: none"> <li>• After leaving the hot zone, emergency personnel should clearly communicate to those affected that they are now in a safe environment. If possible, information should be communicated by a trusted source such as first responders.</li> <li>• If possible, a quiet and safe place should be created for those affected where they can calm down and ask questions about how to proceed. <ul style="list-style-type: none"> <li>○ This place should not be accessible for members of the press.</li> <li>○ There should be sufficient distance from the hot zone (sense of security, no view of dead bodies, etc.).</li> <li>○ The place should be designed to meet the respective weather conditions (e.g. heating options to avoid hypothermia especially in regard to children and older persons; shade and drinking options against heat).</li> <li>○ Seating and lying options should be offered for pregnant women, persons with mobility and visual impairments and certain groups with chronic health conditions (e.g. chronic fatigue syndrome, persons with respiratory conditions such as COPD, etc.).</li> </ul> </li> <li>• Fresh clothes should be available. If possible, people should remain separated by gender until they are dressed. Therefore, two separate passage areas would be appropriate immediately following the decontamination shower.</li> <li>• Subsequently, LEAs and first responders should provide appropriate information material that explains the CBRNe incident and provides follow-up information. (<b>see Recommendation 15</b>)</li> <li>• Further medical treatment and psychological care should be offered.</li> <li>• The coordinator of the operation should carefully organise the after-care procedure to order necessary experts (e.g. translators, psychologists, etc.).</li> <li>• Cooperation with CSOs representing vulnerable groups is conceivable to recruit experts in time. (<b>see Recommendation 3</b>)</li> <li>• If possible, a dedicated communication team should be set up to coordinate the adequate communication during and after a CBRNe incident. (<b>see Recommendation 6</b>)</li> <li>• If possible, those affected should be directed to the appropriate experts to ensure help tailored to their needs (area with child psychologists, area with sign language interpreters, area for people who do not speak the relevant national language, etc.).</li> <li>• A colour navigation system could be introduced to facilitate the assignment to certain experts (etc. yellow to sign interpreters, green to translators, etc.).</li> <li>• The experts should assist during the registration and initial witness' statements.</li> <li>• Significant others should be involved in the communication process. (<b>see Recommendation 8</b>)</li> <li>• LEAs and first responders should continue to take into account special needs in regard to leaving the scene (e.g. guidance, visual instructions, etc.).</li> <li>• LEAs and first responders should exchange respective knowledge, "lessons learned" and "best practice" with practitioners (from other countries) via conferences, seminars, joint trainings, projects, the PROACTIVE App, etc.</li> </ul>
<b>Responsible stakeholder</b>	All LEA and first responder organisations involved in CBRNe management, especially those that communicate with those affected outside the hot zone, relevant CSOs and individual experts representing vulnerable groups

The last recommendations refer to the findings of Chapter 6.5.2 which was dedicated to the after-care-process.

**Recommendation 14:** *The independence of vulnerable persons should be restored as early as possible and as far as possible.*

<b>Identified gap</b>	It is to be expected that some people will show reluctance to comply with measures if they have to give up their independence. In this regard, assistant devices such as oxygen, wheelchairs, glasses, hearing devices, prosthetics, mobile phones, etc. are necessary for some vulnerable groups. Respondents assume that these needs for independence are not yet sufficiently taken into account by LEAs and first responders.
<b>Recommended actions</b>	<ul style="list-style-type: none"> <li>• First responders in the hot zone should identify necessary assistant devices.</li> <li>• If possible, first responders should note those devices on the medical triage sheet to inform first responders in the decontamination area and outside the hot zone.</li> <li>• If the material can be decontaminated, the assistant devices should be taken through the decontamination process. <ul style="list-style-type: none"> <li>◦ <b>Blind and visually impaired people:</b> They need to receive orientation assistance, their decontaminated assistive devices (e.g. glasses, magnifying glasses, sunglasses, canes, etc.) or adequate substitutes.</li> <li>◦ <b>Service animals:</b> If they can't be decontaminated with their owner, storage boxes are needed plus basic knowledge of the adequate handling.</li> <li>◦ <b>Deaf and hearing impaired people:</b> They need to receive visual/written instructions, their decontaminated assistive devices (e.g. hearing aids, etc.) or adequate substitutes.</li> <li>◦ <b>People with chronic medical conditions:</b> In some cases, they rely on medications (e.g. oxygen, insulin, asthma inhaler, etc.) that cannot be decontaminated. Adequate substitutes must be provided.</li> <li>◦ <b>People with mobility restrictions:</b> They need adequate seating options or alternative assistance devices, unless their own can be decontaminated (e.g. prostheses, wheelchair, etc.).</li> </ul> </li> <li>• First responders should be trained to identify and decontaminate eligible assistant devices. <b>(see Recommendation 5)</b></li> <li>• The handling of assistant devices should be included in relevant SOPs. <b>(see Recommendation 1)</b></li> <li>• CSOs should educate interested first responders about the handling of the assistant devices. <b>(see Recommendation 3, 5)</b></li> <li>• LEAs and first responders should exchange respective knowledge, "lessons learned" and "best practice" with practitioners (from other countries) via conferences, seminars, joint trainings, projects, etc.</li> </ul>
<b>Responsible stakeholder</b>	All LEA and first responders involved in CBRNe management, especially those that communicate with those affected outside the hot zone, relevant CSOs and experts.

Besides the findings of Chapter 6.5.2, the following recommendation further addresses the results of Chapter 6.3.1 and 6.3.2.

**Recommendation 15:** *Follow-up information material should be provided that addresses the different information needs of certain vulnerable groups. (see also D2.3: Recommendation 8)*

<b>Identified gap</b>	Not all members of the vulnerable civil society will have the same information demand. This applies not only to the content but also to the design of the messages to be communicated. It has become apparent that these needs are sometimes not sufficiently taken into account.
<b>Recommended actions</b>	<ul style="list-style-type: none"> <li>• LEAs and first responders should revise their existing information material to identify insufficiently covered content.</li> <li>• LEAs, first responders and CSOs should prepare adequate information material prior to a CBRNe incident. <b>(see Recommendation 3, 4)</b></li> <li>• LEAs and first responders should include relevant translators, psychologists and psychiatrists into their networks to enhance the formulation and design of the provided information. <b>(see Recommendation 3)</b></li> <li>• In general, the material should inform about relevant contacts of authorities like hospitals or psychological institutions as well as possible emotions and reactions they might face after the event. <ul style="list-style-type: none"> <li>○ <b>Children:</b> If possible, materials suitable for children that illustrate the decontamination process in a playful-pedagogical way should be provided.</li> <li>○ <b>Pregnant women:</b> Potential consequences on the pregnancy should be explained. Prenatal evaluation should be offered. Information material should focus on recommended next steps (e.g. providing contact details of medical specialists, exchange information with the birth clinic/midwife, etc.).</li> <li>○ <b>Persons with no or limited language skills:</b> If needed, relevant translators should be included to identify remaining ambiguities.</li> </ul> </li> <li>• LEAs, first responders and CSOs should cooperate in the after-care information process to identify the adequate information material for the respective vulnerable groups. <b>(see Recommendation 3)</b></li> <li>• LEAs and first responders should exchange knowledge with relevant involved practitioners to create a joint information strategy. <b>(see D2.3: Recommendation 3)</b></li> <li>• LEAs and first responders should exchange respective knowledge, “lessons learned” and “best practice” with practitioners (from other countries) via conferences, seminars, joint trainings, projects, etc.</li> </ul>
<b>Responsible stakeholder</b>	All LEA and first responder organisations involved in CBRNe management, especially those that communicate with those affected outside the hot zone, relevant CSOs and individual experts representing vulnerable groups

Within this chapter, **15 recommendations** for CBRNe practitioners and relevant CSOs were presented that covered the different phases of CBRNe management. Following these recommendations can help to achieve the goal of better addressing the specific needs of vulnerable groups in the event of a CBRNe incident. In conclusion, this study can thus make a modest contribution to the visibility of vulnerable groups in the event of a CBRNe incident.

## 9. SYNERGIES WITH OTHER WPS AND TASKS

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The report was drawn up in close cooperation with the PROACTIVE partners. Within this framework, a large number of synergies with other WPs and tasks have emerged. Moreover, some of the recommendations of this deliverable were already taken into account in the design of the study, the execution, the evaluation and the subsequent publication.

**WP1:** The findings of D1.2 and D1.3 provided valuable insight into the consideration of vulnerable people in guidance documents of CBRNe practitioners across Europe.

**WP2:** Selected members of the PSAB supported the development of the questionnaire in regard to the description of CBRNe management (e.g. scene management, decontamination). Members of the PSAB were further involved in the final review of D3.4. Along additional European first responders and LEAs that took part in the survey and study of D2.3, the PSAB strongly contributed to the findings and recommendations in D2.3. Those results were used to compare the needs and expectations of the vulnerable civil society with the approaches of first responders and LEAs across Europe in this report.

**WP3:** Selected members of the CSAB supported the development of the questionnaire and the design of the online webpage (see Chapter 3.3.2). (*see Recommendation 3*) The CSAB WS was further used as an opportunity to promote the survey (see Chapter 4.1). (*see Recommendation 2*)

**WP4:** Documents and findings found for the management of vulnerable citizens in emergency situations in general and especially in CBRNe incidents will be included in the PROACTIVE App and web platform for CBRNe practitioners. The recommendations of D3.4 will be further shared via those platforms (*see Recommendation 2*).

**WP5:** Documents and findings found in regard to emergency situations in general and especially in regard to CBRNe incidents will be included in the PROACTIVE App for citizens. As part of this, the recommendations of D3.4 will be uploaded. Furthermore, the development of the App will consider the findings of needed language formats and e-accessibility (*see Recommendation 2, 4, 15*). Valuable points in CBRNe management were also identified where an app would be beneficial for both, affected members of the vulnerable civil society and CBRNe practitioners. Difficulties in the dissemination of new apps due to a rather low preference for this medium on the part of the vulnerable public and their CSOs have also become apparent. This provides important advice on how the PROACTIVE app should be communicated, namely in close cooperation with CSOs.

**WP6:** The usefulness of the recommendations to close the gaps between the needs and expectations of especially vulnerable citizens and the measures undertaken by first responders will be considered and evaluated as much as possible during the three exercises. The findings of D3.4 will be considered in the scenario development of the exercises. For the scenario development, Recommendation 5 emphasizes several points which should increasingly be trained during (joint) CBRNe exercises. Moreover, Recommendation 5 indicated certain steps that PROACTIVE has to consider prior to the exercises. As part of the evaluation process of the three field exercises, the recommendations will eventually flow into the final recommendations deliverable (D6.6).

**WP7:** During the design of the online survey and the evaluation of the findings, DHPol participated in a web seminar on e-accessibility. Furthermore, DHPol organised an introduction seminar on e-accessibility with an organisation from Switzerland (Access-for-all) that included partners from UIC and Rinisoft. In this context, besides valuable input for WP5, more accessibility features on the PROACTIVE project website are being considered (**see Recommendation 4**). Additionally, the recommendations of D3.4 will be part of the exploitation plan in D7.5.

**WP8:** The research was conducted in close cooperation with the partners in WP8 to ensure data security and ethics standards (see Chapter 5).

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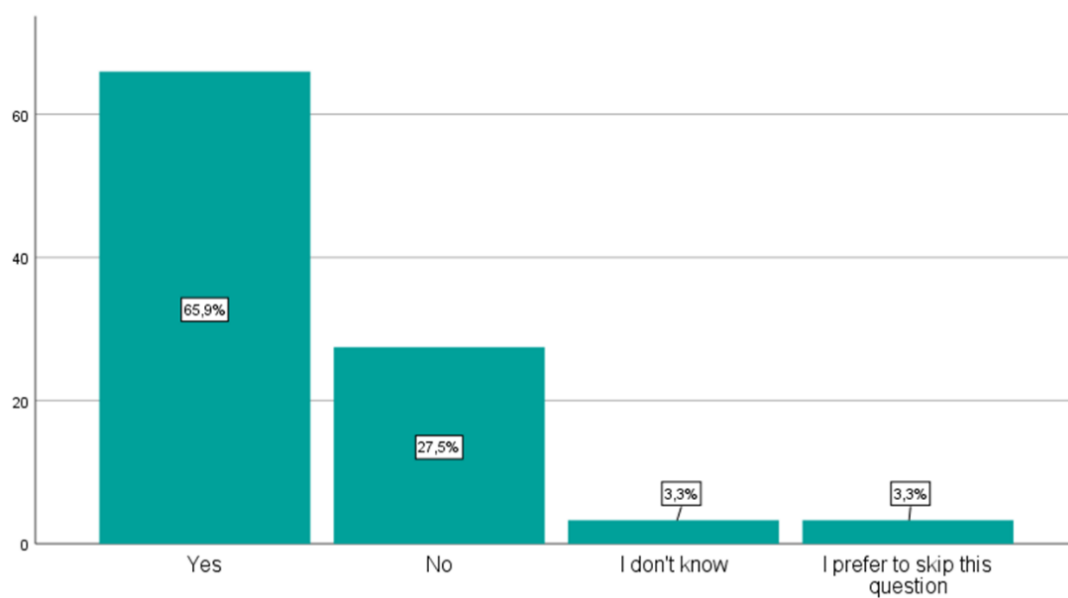
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## 11. APPENDIX A – FIGURES

### Figures

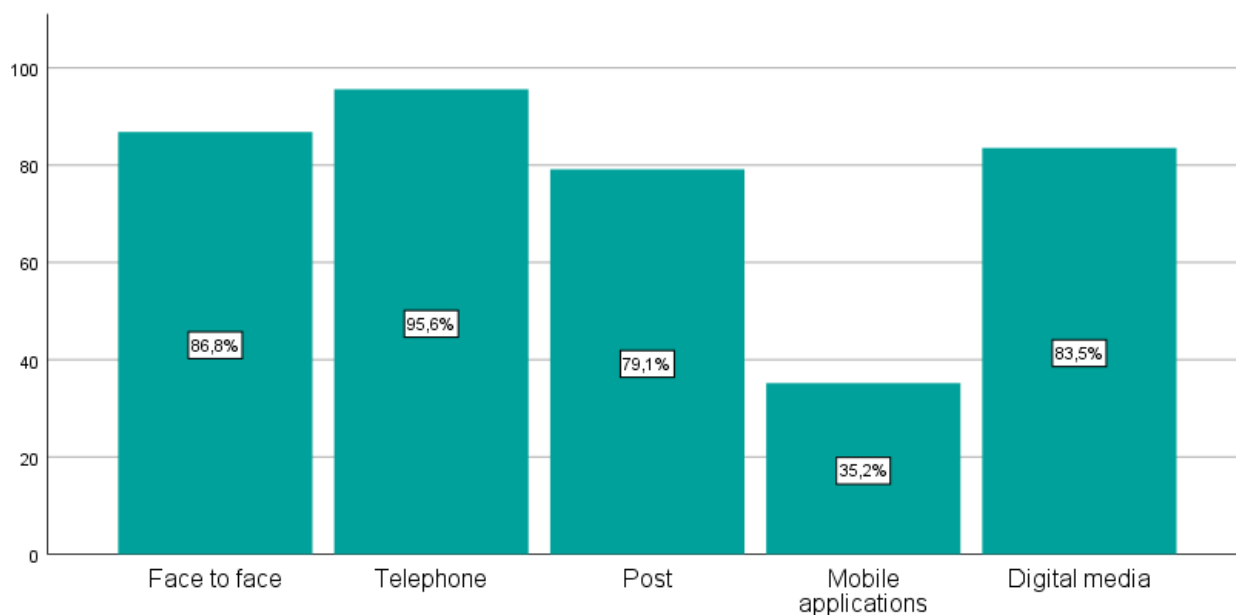
### APPENDIX A

#### Figures of Chapter 6.1

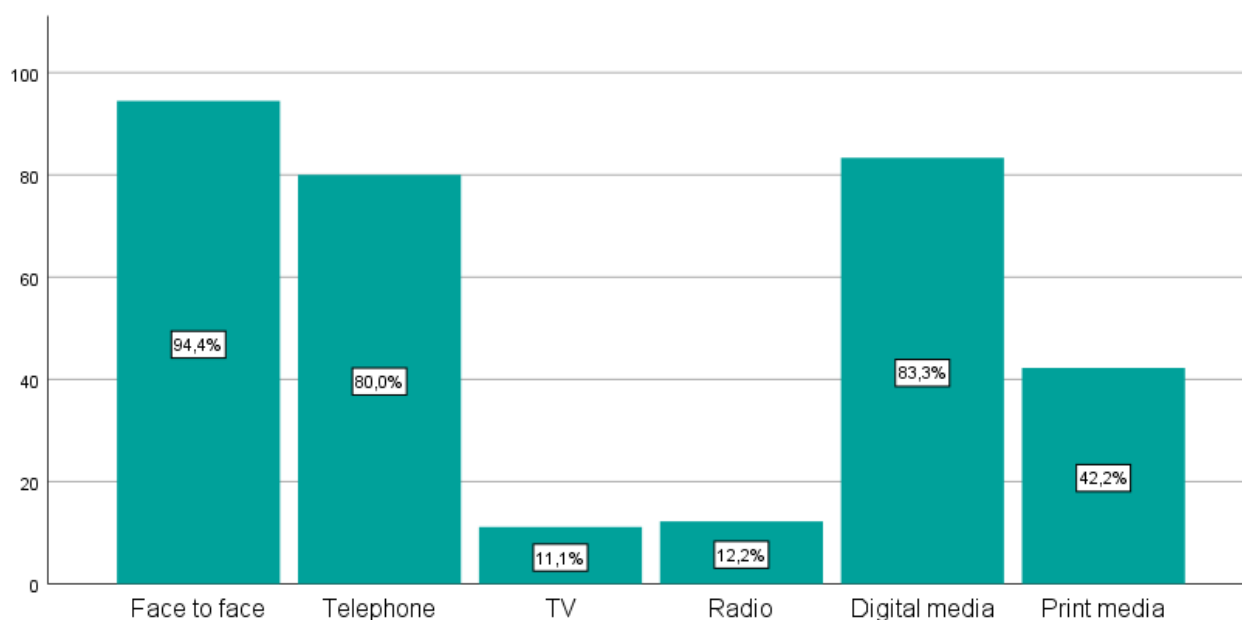


**Figure 34:** Affiliation with other organisations/interest groups (n=91)

## Figures of Chapter 6.2.1

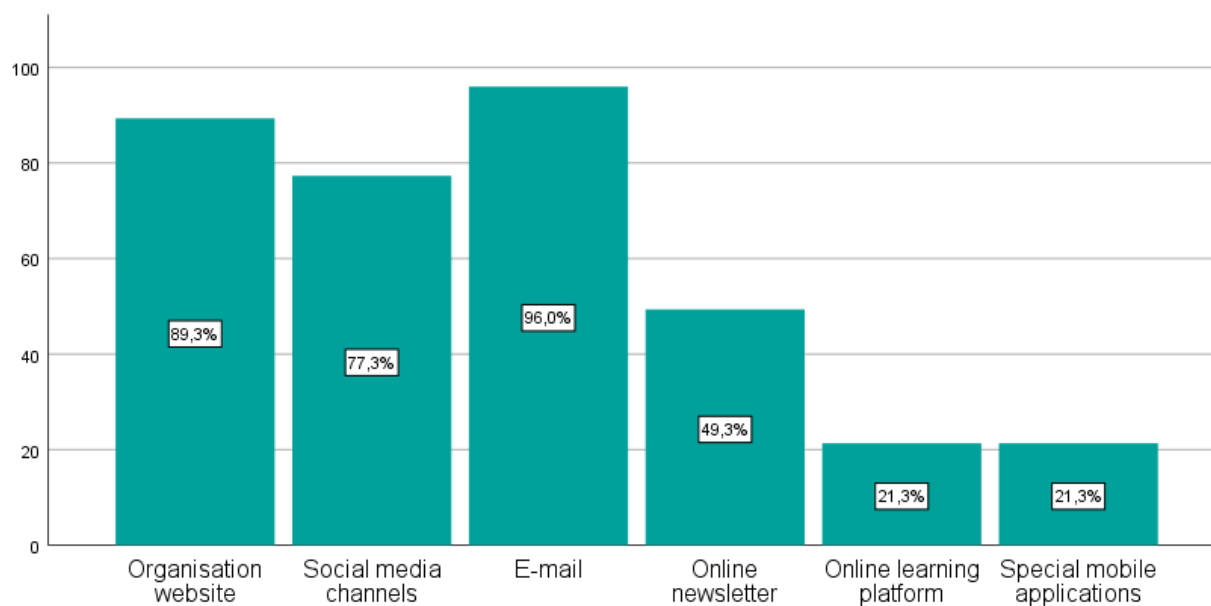


**Figure 35:** Vulnerable citizen's use of certain communication channels to get in touch with their CSOs; multiple selection option (n=91)

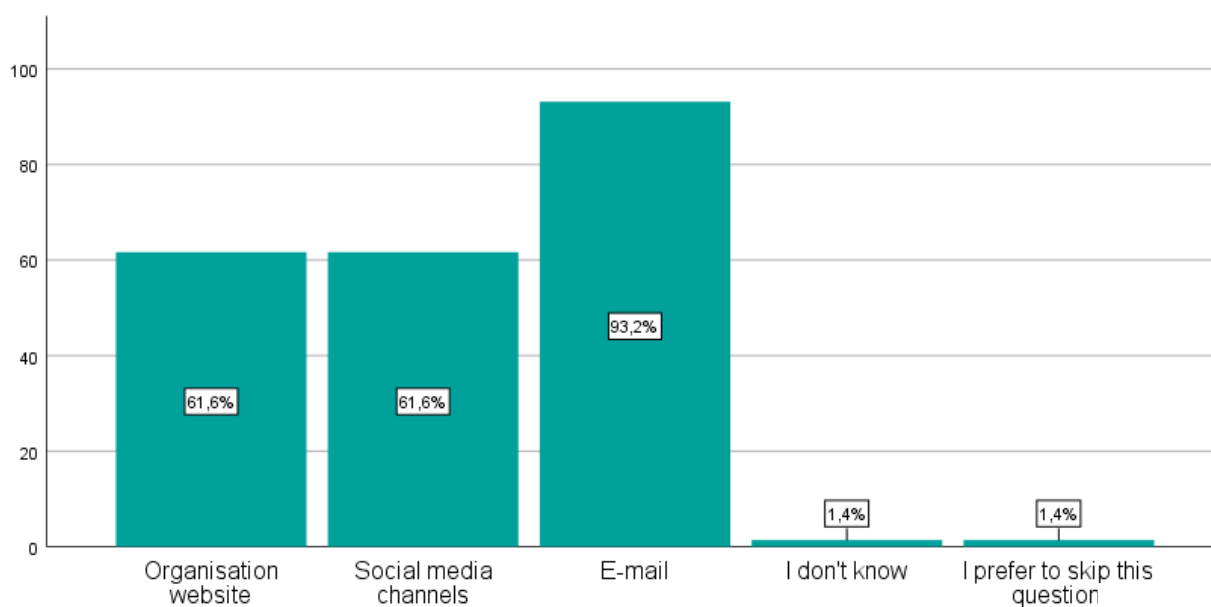


**Figure 36:** CSO's use of certain communication channels to get in touch with those they represent; multiple selection option (n=90)

## Figures of Chapter 6.2.2

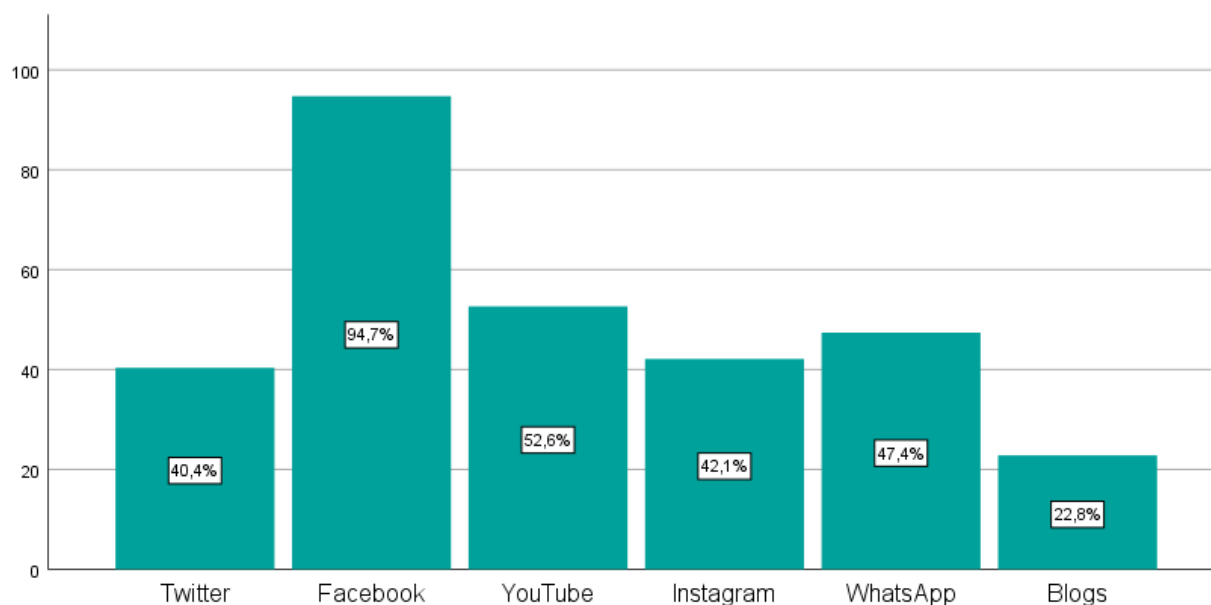


**Figure 37:** CSO's use of certain digital media to get in touch with those they represent (n=75)

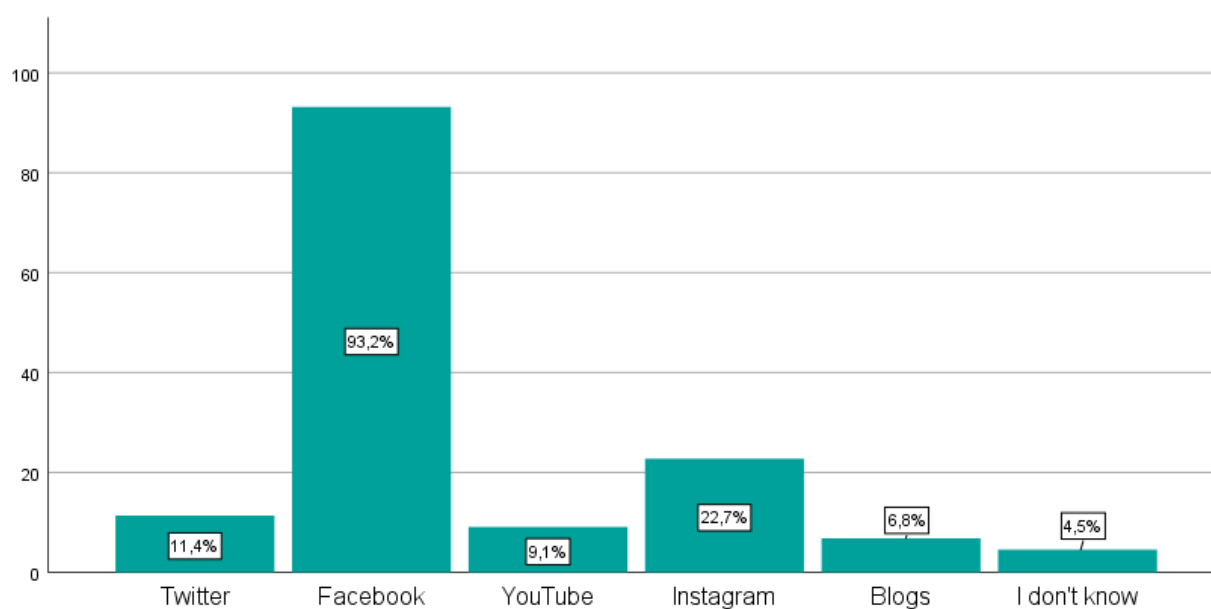


**Figure 38:** Vulnerable citizen's use of certain digital media to get in touch with their CSO; multiple selection option (n=73)

## Figures of Chapter 6.2.3

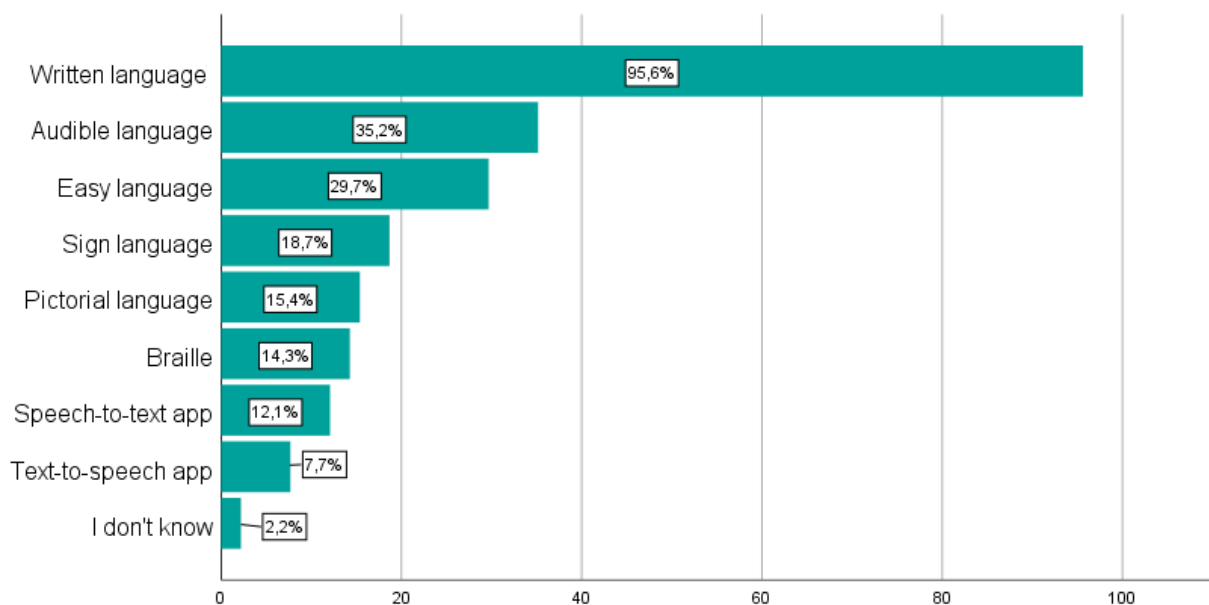


**Figure 39:** CSO's use of certain social media channels to get in touch with those they represent; multiple selection option (n=57)

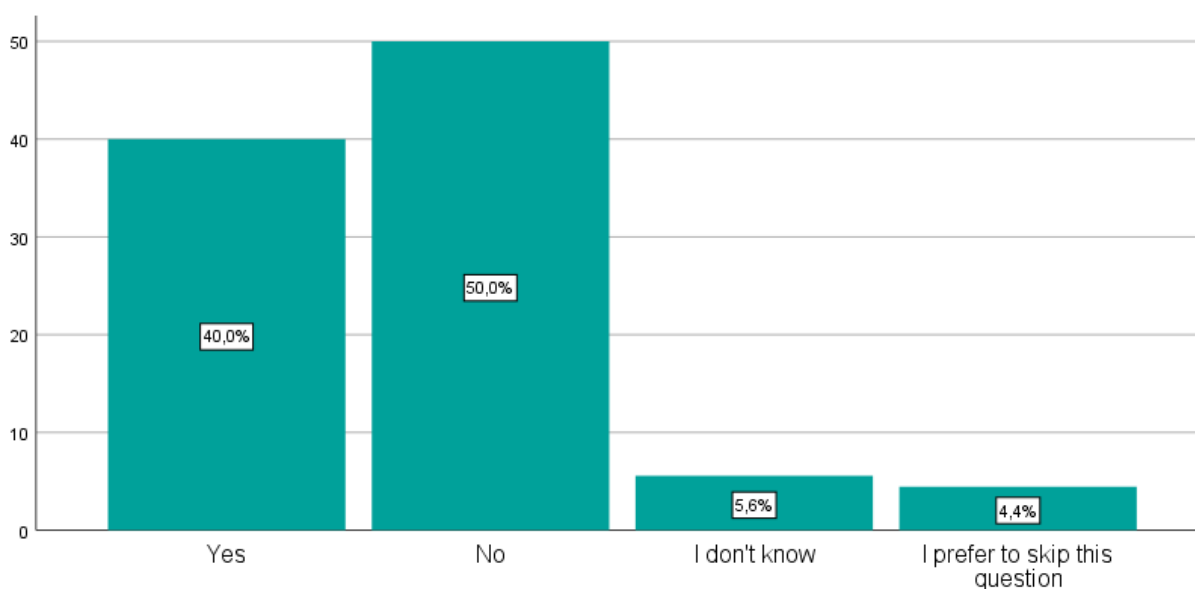


**Figure 40:** Vulnerable citizen's use of certain social media channels to get in touch with their CSOs; multiple selection option (n=44)

## Figures of Chapter 6.2.4

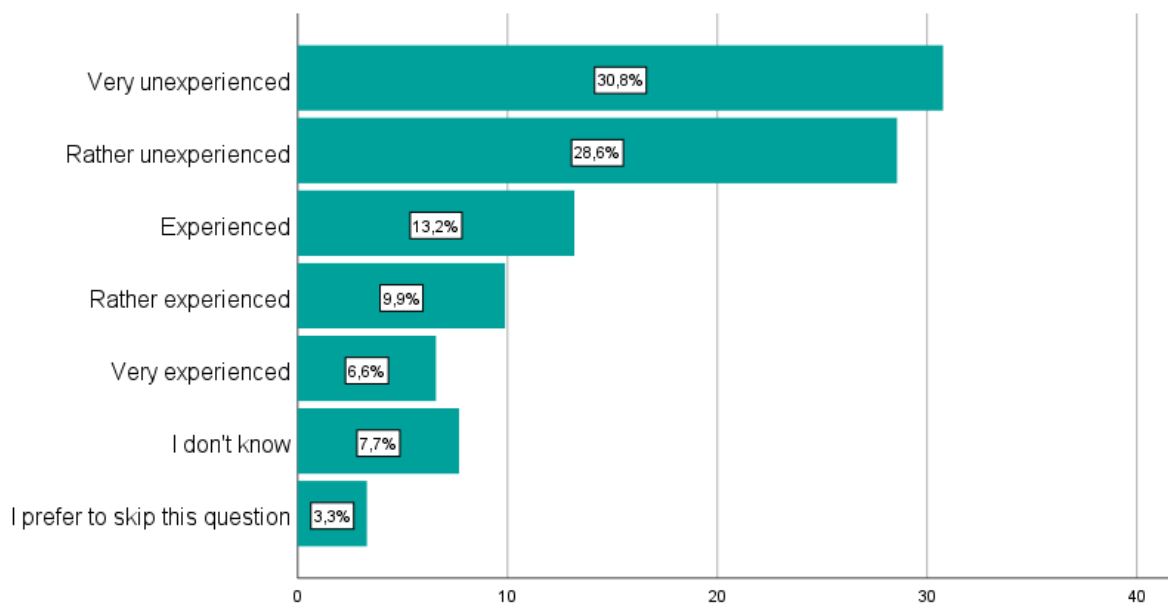


**Figure 41:** CSO's provision of certain language formats; multiple selection option (n=91)

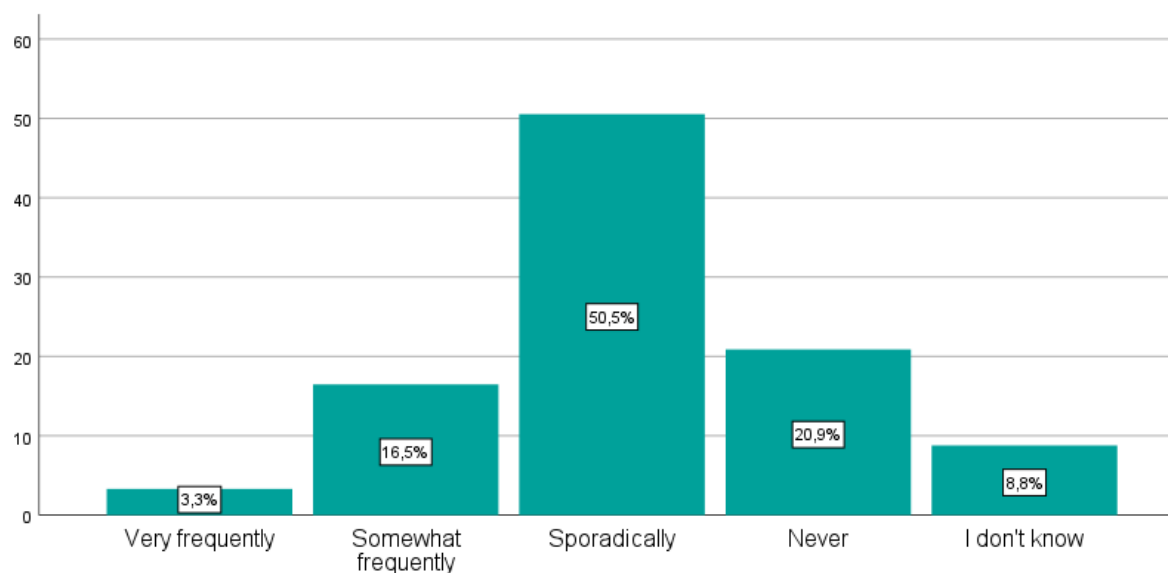


**Figure 42:** CSO's provision of information in additional language(s), including written, oral or sign language in other language(s) (n=90)

### Figures of Chapter 6.3.1

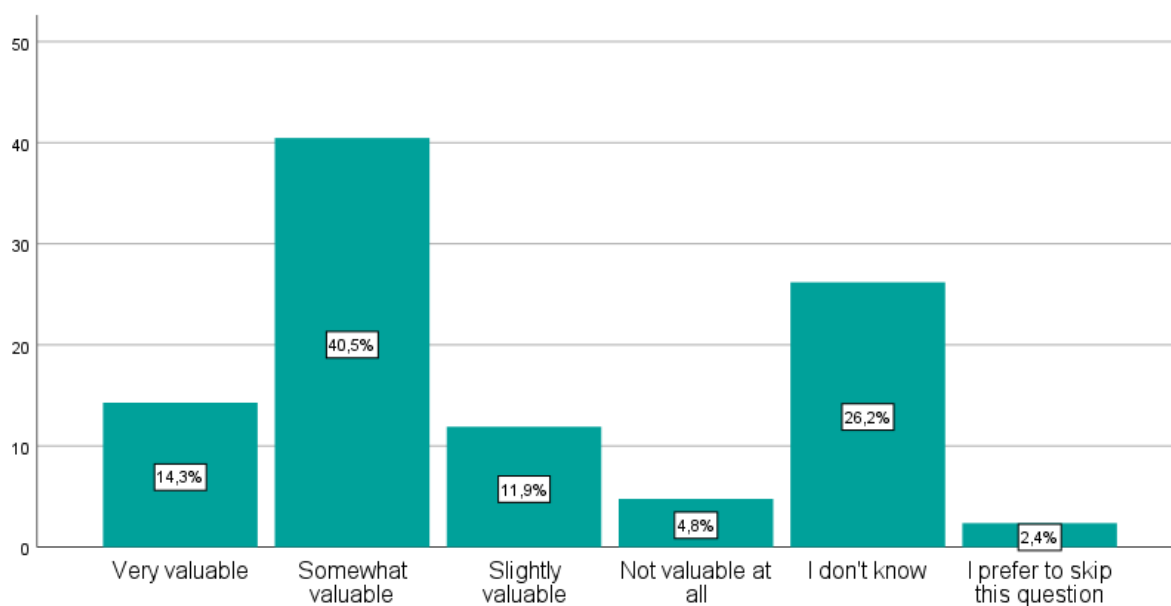


**Figure 43:** Responders' assessment of the general organisational experience with the topic of disaster events (n = 91)

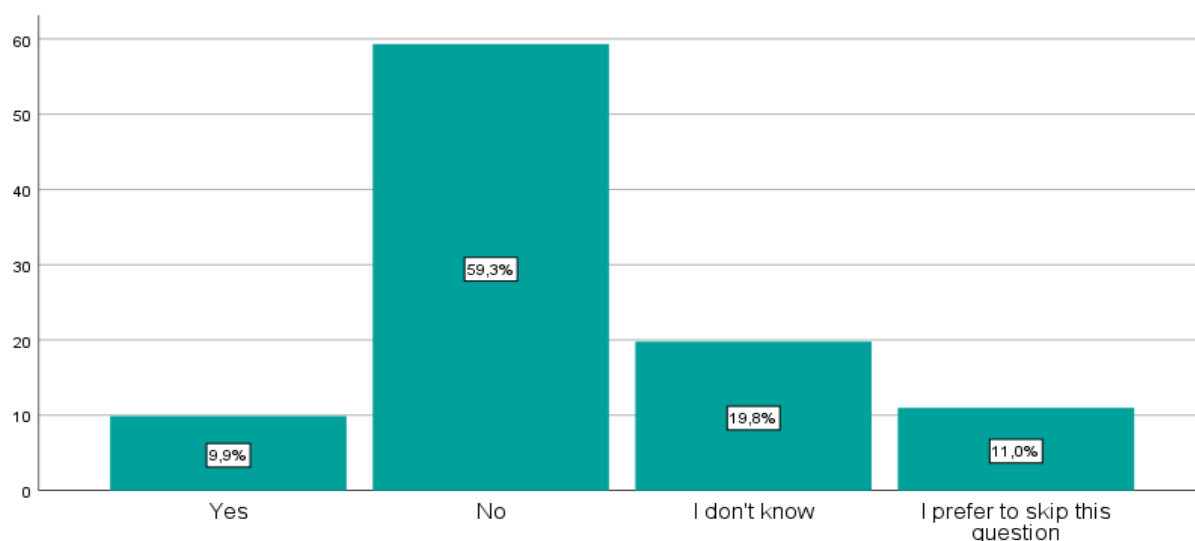


**Figure 44:** Responders' assessment of the frequency with which they came across publicly available information materials they thought are adequate in preparing those they represent for a disaster event (n = 91)

## Figures of Chapter 6.3.2

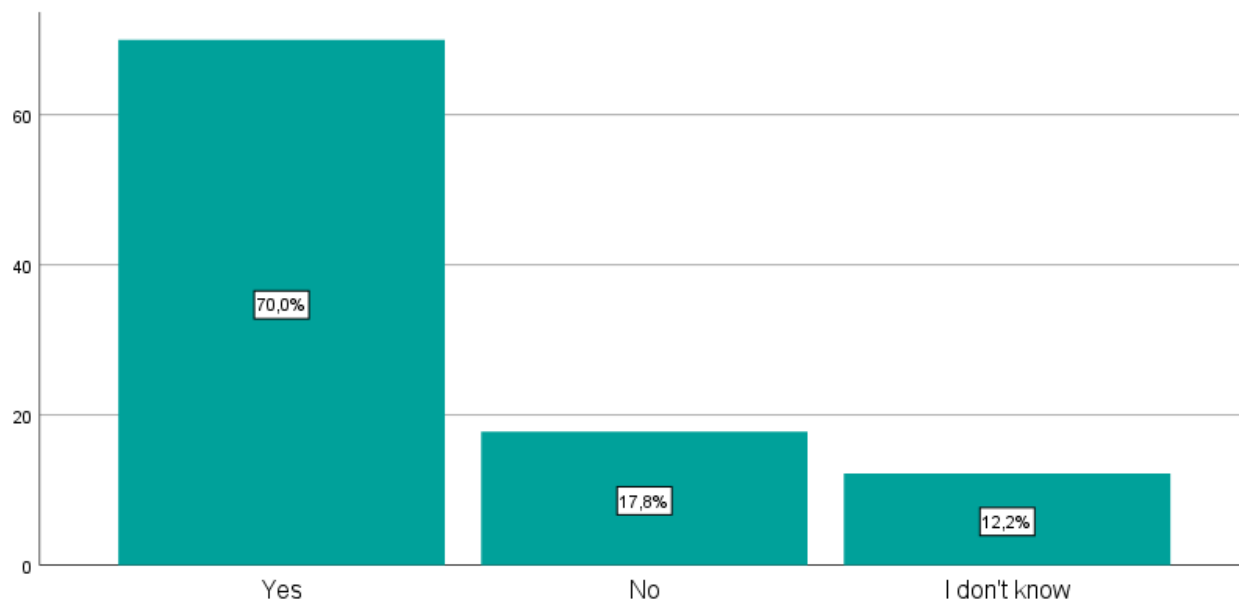


**Figure 45:** Assessment of the value of the organisation's overall education programmes in preparing the represented vulnerable group to cope with a disaster event in the future (n = 42)

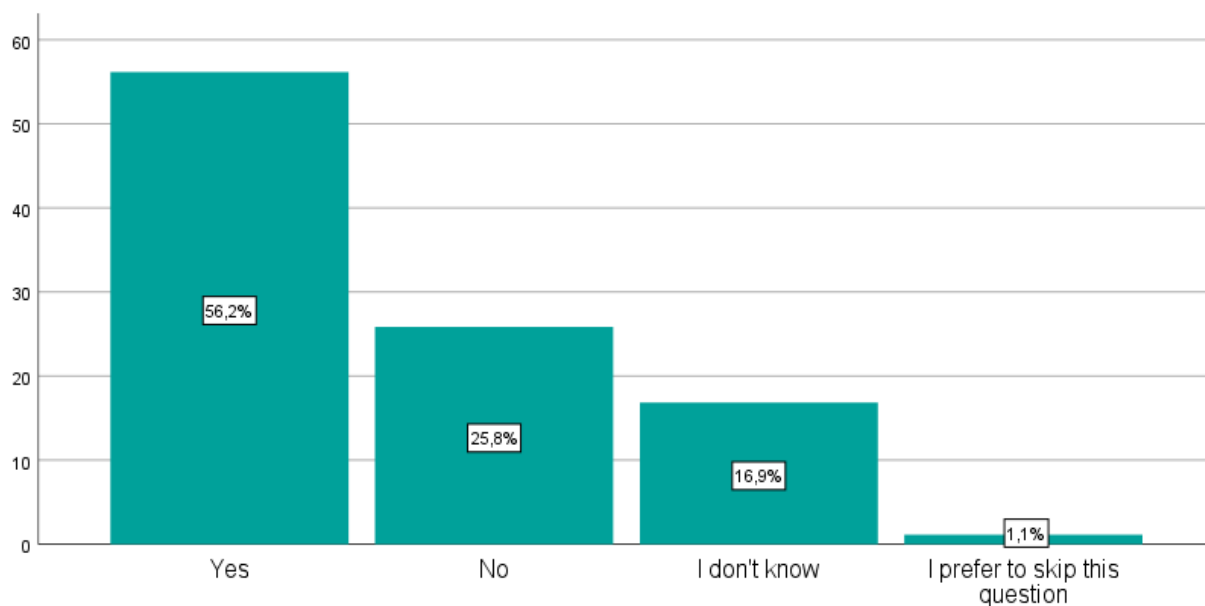


**Figure 46:** Sufficiency of annual budget in the last 5 years for activities / operations related to disaster preparedness and response (n = 91)

## Figures of Chapter 6.4.1

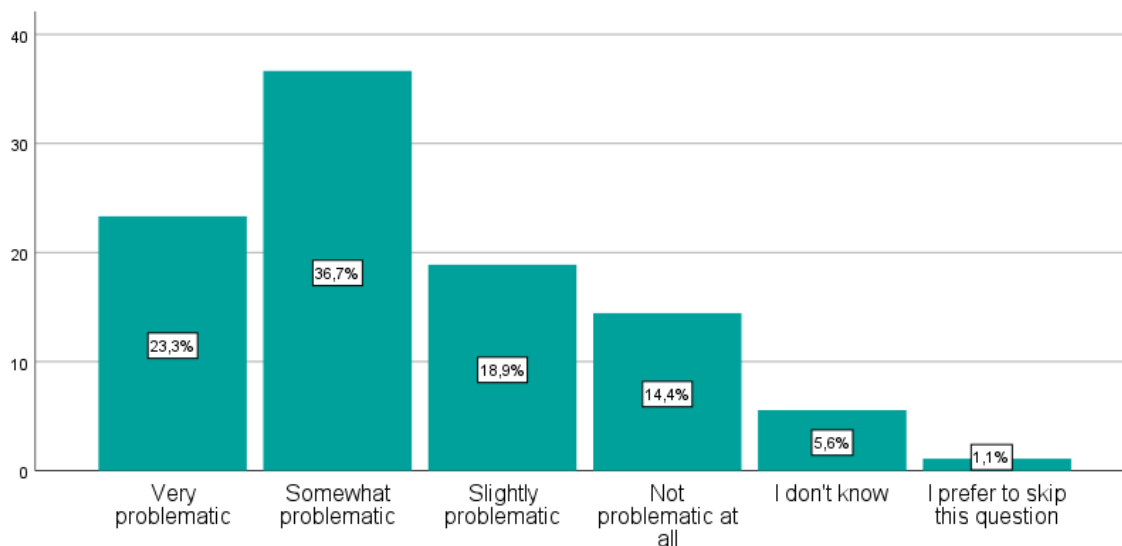


**Figure 47:** During an assumed CBRNe scenario, do you think it would be problematic for those you represent to leave the premises according to instructions from first responders? (n =90)



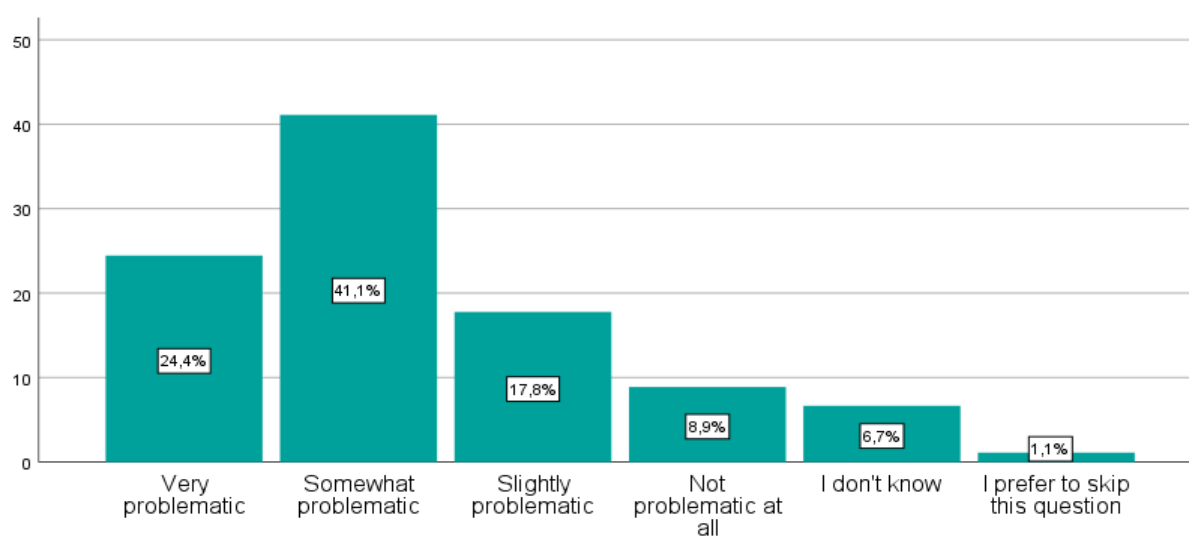
**Figure 48:** During an assumed CBRNe scenario, do you think it would be problematic for those you represent to stay in an assigned place within the area of risk until first responders give further instructions? (n = 89)

## Figures of Chapter 6.4.2



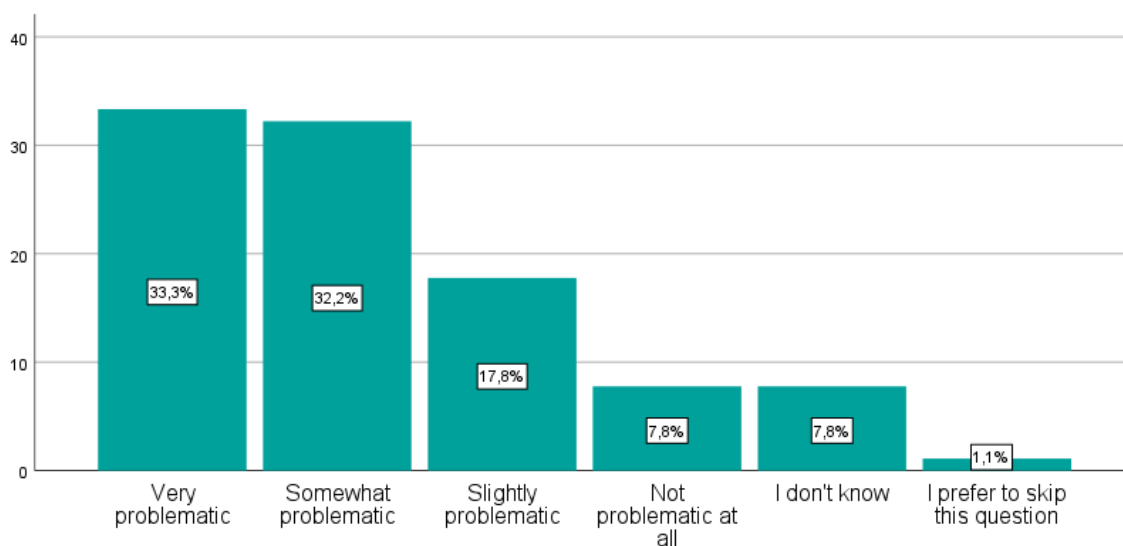
**Figure 49:** During an assumed CBRNe scenario, how problematic do you think it would be for those you represent to undergo a medical triage? (n = 90)

## Figures of Chapter 6.4.3



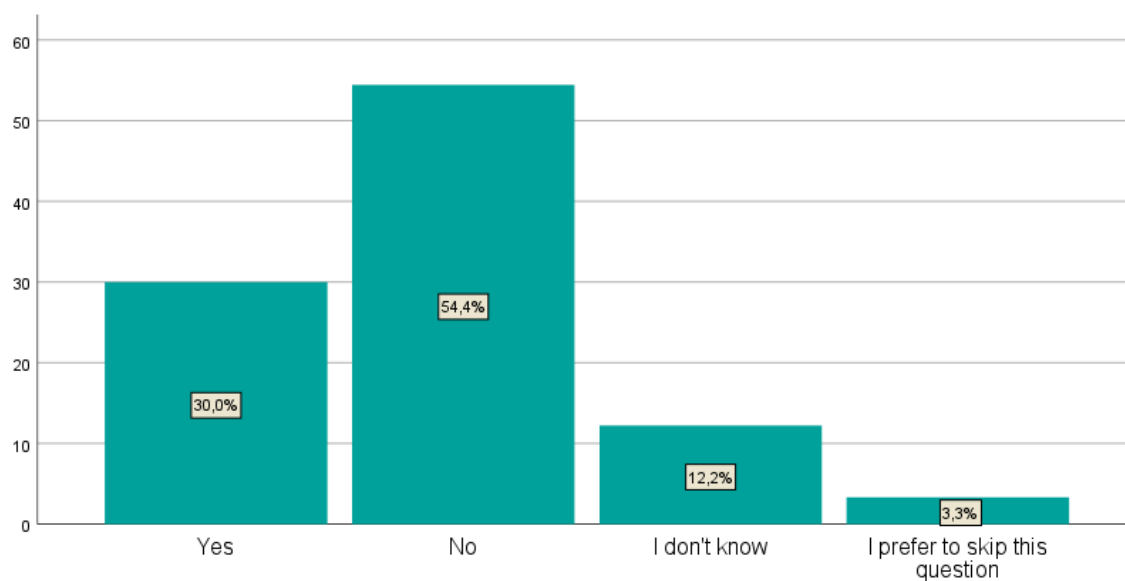
**Figure 50:** During an assumed CBRNe scenario, how problematic do you think it would be for those you represent to undress themselves (to undergo the further decontamination process)? (n = 90)

## Figures of Chapter 6.4.4

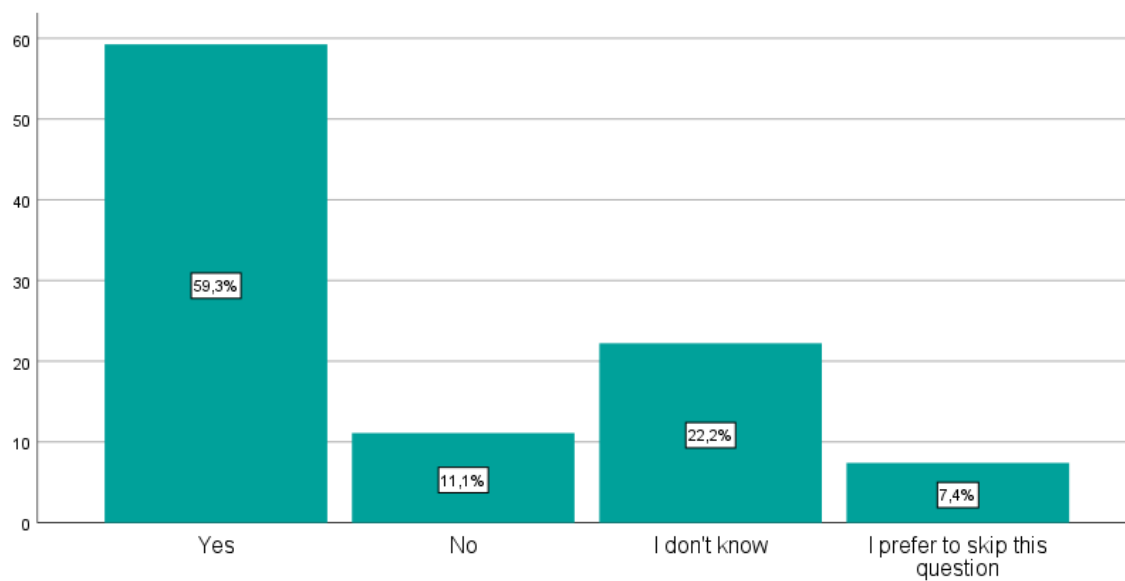


**Figure 51:** During an assumed CBRNe scenario, how problematic do you think it would be for those you represent to undergo a decontamination shower? (n = 90)

## Figures of Chapter 6.5.3



**Figure 52:** Indication of collaborations from CSOs with first responders (n=90)



**Figure 53:** Do you think those collaborations have been successful in including the needs of those you represent regarding their interaction with first responders? (n=27)

## 12. APPENDIX B – INVITATION LETTER OF QUANTITATIVE SURVEY

### Invitation letter of quantitative survey

### APPENDIX B



Dear Sir or Madam,

As a partner of the EU funded project **PROACTIVE**, **German Police University (DHPol)** would be very grateful if you could help us by answering a few questions about the specific needs and requirements of particularly vulnerable groups (e.g. children, persons with limited mobility, blind or visually impaired persons, persons with mental health conditions) with regard to CBRNe situations. The term CBRNe refers to chemical, biological, radioactive, nuclear and explosive agents that require the intervention of Law Enforcement Agencies (LEAs) and First Responders. **Participation in the survey does not require expertise on this topic on your side. Your views and experiences will be of utmost interest to us.** Special emphasis will be put on the (perceived) needs of specific groups of persons during a CBRNe incident. Your participation helps to identify gaps between LEAs' / First Responders' approaches across Europe and the needs of the group you represent.

The European research project **PROACTIVE** (*PREparedness against CBRNE threats through cOMmon Approaches between security praCTitioners and the Vulnerable civil society*) aims to increase practitioner effectiveness in managing large and diverse groups of people in a CBRNe environment. CBRNe incidents, whether accidental or terrorist-based, can have a high impact on society. Therefore, the project will provide in-depth research to facilitate the interaction between European Law Enforcement Agencies (LEAs) as well as First Responders and the vulnerable civil society.

Attached we provide you with a detailed information sheet regarding your participation in the survey. Your responses to the questionnaire are strictly confidential and handled in line with the GDPR.

This survey will only take up to 15 minutes to complete. Please click on the link below to start the survey:

<https://proactive.limequery.com/725689?newtest=Y&lang=en>

The survey is available in 9 languages and you can select the language on the start page. The deadline for participating in the survey is **November 13, 2020**.

Please feel free to circulate the mail to your colleagues and other potentially interested contacts in your network. If you would like to discuss the research with someone beforehand (or if you have questions afterwards), please contact:

Danielle Carbon and Andreas Arnold

[PROACTIVE\\_study@dhpol.de](mailto:PROACTIVE_study@dhpol.de)  
German Police University  
Zum Roten Berge 18-24, 48165 Münster, Germany

Best regards and stay healthy!

**Project PROACTIVE's Civil Society Advisory Board (CSAB)** is continuously recruiting new members, and you are invited to join. To learn more, please contact us through the email below. Also be sure to follow us on our social media accounts. For more information, please visit us on:



## 13. APPENDIX C – QUESTIONNAIRE

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### Questionnaire

### APPENDIX C

#### General Questions

1. Please state the name of your organisation and [if applicable] its acronym (e.g. The German Federation of the Deaf [DGB]):  
\_\_\_\_\_
  
2. Which of the following vulnerable groups does your organisation represent? You can choose more than one answer. Please check all that apply.
  - ☐ Children
  - ☐ Older persons
  - ☐ Persons with mental health issues
  - ☐ Persons with mobility restrictions
  - ☐ Blind or partially sighted persons
  - ☐ Hearing impaired persons
  - ☐ Persons with no or insufficient language skills of the national language
  - ☐ Ethnic minorities
  - ☐ Pregnant women
  - ☐ Other (please specify): \_\_\_\_\_
  - ☐ I prefer to skip this question
  
3. How long has your organisation existed? Please indicate in years: \_\_\_\_\_
  
4. In which country/countries is your organisation active? \_\_\_\_\_
  
5. At what level does your organisation operate? You can choose more than one answer. Please check all that apply.
  - ☐ International level
  - ☐ National level
  - ☐ Regional level
  - ☐ Local level
  - ☐ I prefer to skip this question
  
6. Is your organisation affiliated with other organisations/interest groups? Please select one of the following options.
  - ☐ Yes  
If yes: Please describe: \_\_\_\_\_
  - ☐ No
  - ☐ I don't know
  - ☐ I prefer to skip this question
  
7. Please indicate the approx. staff size of your organisation?  
\_\_\_\_\_
  - ☐ I don't know
  - ☐ I prefer to skip this question
  
8. Which best describes your staff? Please select one of the following options.
  - ☐ Only professional staff
  - ☐ Mainly professional staff
  - ☐ Half professional and half volunteer staff
  - ☐ Mainly volunteer staff
  - ☐ Only volunteer staff
  - ☐ Other (please specify): \_\_\_\_\_
  - ☐ I don't know
  - ☐ I prefer to skip this question

9. Which best describes your organisation? Please select one of the following options.

- ☐ Privately sponsored
- ☐ Community sponsored
- ☐ Government sponsored
- ☐ Other (please specify): \_\_\_\_\_
- ☐ I prefer to skip this question

### **Communication**

*In the following section you will be asked questions about your organisation's preferred methods of communicating with those you represent.*

10. How do you get in touch with those you represent? You can choose more than one answer. Please check all that apply.

- ☐ Face to face
- ☐ Telephone
- ☐ TV
- ☐ Radio
- ☐ Digital media (If yes: Question 11)
- ☐ Print media
- ☐ Other (please specify): \_\_\_\_\_
- ☐ I don't know
- ☐ I prefer to skip this question

11. Which digital media do you use to get in touch with those you represent? You can choose more than one answer. Please check all that apply.

- ☐ Organisation website
- ☐ Social media channels (If yes: Question 12)
- ☐ E-mail
- ☐ Online newsletter
- ☐ Online learning platforms
- ☐ Special mobile applications
- ☐ Other (please specify): \_\_\_\_\_
- ☐ I don't know
- ☐ I prefer to skip this question

12. Which social media channels do you use to get in touch with those you represent? You can choose more than one answer. Please check all that apply.

- ☐ Twitter
- ☐ Facebook
- ☐ YouTube
- ☐ Instagram
- ☐ WhatsApp
- ☐ Blogs
- ☐ Other (please specify): \_\_\_\_\_
- ☐ I don't know
- ☐ I prefer to skip this question

13. How can those you represent get in touch with your organisation? You can choose more than one answer. Please check all that apply.

- ☐ Face to face
- ☐ Telephone
- ☐ Post
- ☐ Mobile applications
- ☐ Digital media (If yes: Question 14)
- ☐ Other (please specify): \_\_\_\_\_
- ☐ I don't know
- ☐ I prefer to skip this question

14. Which online media do they prefer to get in touch with your organisation? You can choose more than one answer. Please check all that apply.

- ☐ Organisation website
- ☐ Social media channels (If yes: Question 15)
- ☐ E-mail
- ☐ Other (please specify): \_\_\_\_\_
- ☐ I don't know
- ☐ I prefer to skip this question

15. Which social media channels do they prefer to get in touch with your organisation? You can choose more than one answer. Please check all that apply.

- ☐ Twitter
- ☐ Facebook
- ☐ YouTube
- ☐ Instagram
- ☐ Blogs
- ☐ Other (please specify): \_\_\_\_\_
- ☐ I don't know
- ☐ I prefer to skip this question

16. In which of the following formats does your organisation provide information resources? You can choose more than one answer. Please check all that apply.

- ☐ Written language
- ☐ Speech-to-text app
- ☐ Text-to-speech app
- ☐ Audible language
- ☐ Sign language
- ☐ Pictorial language
- ☐ Easy language
- ☐ Braille
- ☐ Other (please specify): \_\_\_\_\_
- ☐ None
- ☐ I don't know
- ☐ I prefer to skip this question

17. Regarding non-native speakers, tourists and foreigners: Besides your national language(s), does your organisation provide information resources in additional written, oral and sign languages? Please select one of the following options.

- ☐ Yes  
If yes, which languages? : \_\_\_\_\_
- ☐ No
- ☐ I don't know
- ☐ I prefer to skip this question

### **Disaster management**

*In the following section you will be asked questions that are concerned with your organisation's experience regarding the needs of those you represent in disaster events.*

18. How experienced is your organisation in general with the topic of disaster events? This includes events such as fires, floods, earthquakes, epidemics, terrorist attacks etc. Please select one of the following options.

- ☐ Very experienced
- ☐ Rather experienced
- ☐ Experienced
- ☐ Rather unexperienced
- ☐ Very unexperienced
- ☐ I don't know
- ☐ I prefer to skip this question

19. How frequently have you come across publically available information materials that you thought did an adequate job in preparing the population you represent for a disaster event? (e.g. official websites of emergency agencies, information campaigns, etc.) Please select one of the following options.

- ☐ Very frequently
- ☐ Somewhat frequently
- ☐ Sporadically
- ☐ Never
- ☐ I don't know
- ☐ I prefer to skip this question

*When you know better you do better.*

*In the following section you will be asked questions regarding how your organisation educates those you represent to cope with disaster events.*

*Education programmes comprise for example in-class training sessions, practical/realistic exercises simulating certain scenarios, table top exercises, group discussions, and online training sessions. The questions refer to activities that are organized by your organisation as well as other organisations, for example the local Fire Brigade.*

20. To what extent does your organisation provide information for those you represent on how to behave during such a disaster event? Please select one of the following options.

- ☐ To a great extent
- ☐ Somewhat
- ☐ Very little
- ☐ Not at all
- ☐ I don't know
- ☐ I prefer to skip this question

21. How frequently has your organisation been engaged in some kind of disaster education program in the last ten years? Please select one of the following options.

- ☐ Never (Filter: question 25)
- ☐ 1-3 times
- ☐ 4-10 times
- ☐ More than 10 times
- ☐ I don't know (Filter, question 24)
- ☐ I prefer to skip this question (Filter, question 24)

22. How frequently were the following aspects of a disaster event discussed during these education programmes?

[Frequency: Never – Rarely - Sometimes - Frequently – Always - I don't know]

- ☐ Informing authorities about a suspected disaster event, e.g. if someone sees smoke or a person has symptoms of a heart attack (e.g. calling the emergency hotline, speaking to officials nearby like police officers or train staff)
- ☐ Interaction with first responders like medical responders, fire fighters (e.g. how to inform them about communication issues like language, sound or vision barriers)
- ☐ Procedures of basic medical treatment (e.g. execution of an intravenous infusion, application of an oxygen mask)
- ☐ Procedures of an evacuation like in case of a fire (e.g. using official escape routes, following the instructions by authorities)
- ☐ Getting more information after the situation (e.g. hotlines, official contact persons)
- ☐ Other (please specify): \_\_\_\_\_

23. How frequently has your organisation cooperated with the following organisations to support the education of those you represent? (e.g. joint seminars, participation in training exercises, common information campaigns)

[Frequency: Never – Rarely - Sometimes - Frequently – Always - I don't know]

- Fire Brigades
- Medical Staff
- Civil Protection
- Law Enforcement Agencies
- Other organisations representing vulnerable groups
- Other (please specify): \_\_\_\_\_

24. How valuable do you think your overall education programmes have been in preparing those you represent to cope with a disaster event in the future? Please select one of the following options.

- ☐ Very valuable
- ☐ Somewhat valuable
- ☐ Slightly valuable
- ☐ Not valuable at all
- ☐ I don't know
- ☐ I prefer to skip this question

25. In the last 5 years, has your annual budget been sufficient to finance your activities/operations related to disaster preparedness /response?

- ☐ Yes
- ☐ No
- ☐ I don't know
- ☐ I prefer to skip this question

### **What to expect in a CBRNe scenario**

*Most CBRN agents are invisible to the naked eye, odor free and hard to detect by the public.*

*The following two pictures illustrate self-protected first responders in a CBRNe scenario. The protection gear includes a full body uniform and a respiratory protection mask that partially or completely covers the face. Usually, the lower part of the mask consists of a filter against CBRNe agents in the air or alternatively a connection to an oxygen cylinder at the back. Please note, the mask muffles the voices of the first responder. Only the eyes of the first responder are visible. Please note, facial expressions are therefore not recognizable. Lip reading is impossible.*



***The next questions will guide you through the event of a CBRNe scenario.***

*First of all, the affected area will likely be evacuated and closed off.*

*The following picture presents a crowd of civilians in a CBRNe scenario. These may include both old and very young people. They can behave very differently, e.g. they can be afraid. The civilians might have to stay in a certain area until decontamination is over.*



26. During an assumed CBRNe scenario, do you think it would be problematic for those you represent to leave the premises according to instructions from first responders? The question refers to physical and mental abilities as well as any other circumstances affecting compliance. Please select one of the following options.

- ☐ Yes
- If yes, why: \_\_\_\_\_
- ☐ No
- ☐ I don't know
- ☐ I prefer to skip this question

27. During an assumed CBRNe scenario, do you think it would be problematic for those you represent to stay in an assigned place within the area of risk until first responders give further instructions? The question refers to physical and mental abilities as well as any other circumstances affecting compliance. Please select one of the following options.

- ☐ Yes  
If yes, why: \_\_\_\_\_
- ☐ No
- ☐ I don't know
- ☐ I prefer to skip this question

*The following two pictures show some civilians in a CBRNe scenario after the evacuation process. Affected individuals will likely need to undergo a decontamination process, where clothing needs to be removed. They might have to undress themselves completely. The contaminated clothing is transferred into bags.*



28. During an assumed CBRNe scenario, how problematic do you think it would be for those you represent to undress themselves (to undergo the further decontamination process)? The question refers to physical and mental abilities as well as any other circumstances affecting compliance. Please select one of the following options.

- ☐ Very problematic  
If problematic, why: \_\_\_\_\_
- ☐ Somewhat problematic  
If problematic, why: \_\_\_\_\_
- ☐ Slightly problematic  
If problematic, why: \_\_\_\_\_
- ☐ Not problematic at all
- ☐ I don't know
- ☐ I prefer to skip this question

*Affected individuals will likely need to undergo medical triage, where the first responders will also wear protective gear. The following picture shows two first responders in a decontamination tent. The protective gear now consists of a one-piece full body suit. The face is fully visible through a thin protective screen. Please note, the voice is still muffled. The tent is high enough to stand inside.*

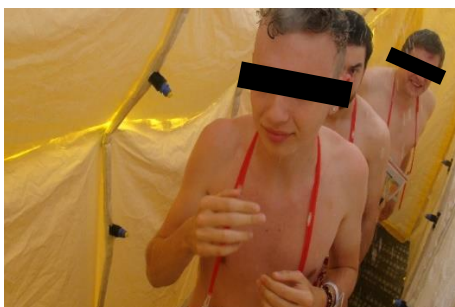


29. During an assumed CBRNe scenario, how problematic do you think it would be for those you represent to undergo medical triage performed by personnel in protective suits and facemasks? The question refers to physical and mental abilities as well as any other circumstances affecting compliance. Please select one of the following options.

- ☐ Very problematic  
If problematic, why: \_\_\_\_\_
- ☐ Somewhat problematic  
If problematic, why: \_\_\_\_\_
- ☐ Slightly problematic  
If problematic, why: \_\_\_\_\_
- ☐ Not problematic at all
- ☐ I don't know
- ☐ I prefer to skip this question

Furthermore, those you represent might have to take a shower by themselves or by laying on a conveyor belt.

The following picture shows three male civilians undertaking a shower by themselves in a decontamination tent. They only wear a tag on a long band around their neck, on which the patient's data is noted. They will get fresh clothes after decontamination.



30. During an assumed CBRNe scenario, how problematic do you think it would be for those you represent to undergo a decontamination shower? The question refers to physical and mental abilities as well as any other circumstances affecting compliance. Please select one of the following options.

- ☐ Very problematic  
If problematic, why: \_\_\_\_\_
- ☐ Somewhat problematic  
If problematic, why: \_\_\_\_\_
- ☐ Slightly problematic  
If problematic, why: \_\_\_\_\_
- ☐ Not problematic at all
- ☐ I don't know
- ☐ I prefer to skip this question

The following questions refer to suggestions to facilitate the interaction between the first responders and those you represent.

31. Which of the following aspects might increase the compliance of those you represent with instructions given by first responders during a CBRNe situation?

Please rate the level of increase on a scale from 1 = no increase at all to 10 = high increase.

[1 \_\_\_\_\_ 0 \_\_\_\_\_ 10]

- ☐ First responders use gestures to demonstrate their instructions
- ☐ First responders provide posters with illustrative instructions
- ☐ First responders lower down to speak on eye level with your audience
- ☐ First responders use accompanying contact person to speak indirectly to those you represent [if possible] (e.g. carer, parents, head of the family)
- ☐ Other recommendations (please specify): \_\_\_\_\_
- ☐ I don't know
- ☐ I prefer to skip this question

32. Which of the following aspects might help those you represent to cope after leaving the area of risk? Please rate the level of increase on a scale from 1 = no increase at all to 10 = high increase.

[1 \_\_\_\_\_ 0 \_\_\_\_\_ 10]

- ☐ Providing the after-care right after the decontamination (e.g. interpreter, psychologists)
- ☐ Providing follow-up information on relevant contacts of authorities like hospitals or psychological institutions in different language formats (e.g. braille, different languages)
- ☐ Providing a closed off area for those you represent to calm down and ask questions in a perceived safe environment
- ☐ Providing a mobile app that allows those you represent to get access to and exchange CBRNe related information with other affected people
- ☐ Other recommendations (please specify): \_\_\_\_\_
- ☐ I don't know
- ☐ I prefer to skip this question

33. Has your organisation established any form of institutional collaboration with First Responding organisations? Please select one of the following options.

- ☐ Yes (Filter, question 34)
- ☐ No (Filter, End of questionnaire)
- ☐ I don't know (Filter, End of questionnaire)
- ☐ I prefer to skip this question (Filter, End of questionnaire)

34. Do you think those collaborations have been successful in including the needs of those you represent regarding their interaction with first responders? Please select one of the following options.

☐ Yes

If yes, why: \_\_\_\_\_

☐ No

☐ I don't know

☐ I prefer to skip this question

**Thank you very much for your participation. If you have any questions, please do not hesitate to contact us.**

**Contact:**

Andreas Arnold and Danielle Carbon

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German Police University

Zum Roten Berge 18-24, 48165 Münster, Germany

All pictures used in the questionnaire have been provided by the PROACTIVE partner West Midlands Police/UK in compliance with the GDPR guideline.

## 14. APPENDIX D – CONTACTED PARTICIPANTS ACROSS EUROPE

### Contacted participants across Europe

### APPENDIX D

Country	Contacted candidates	Medium	Reminders	Responsible partner
Albania	1	Mail	3	DHPol
Armenia	1	Mail	3	DHPol
Austria	22	Mail	3	DHPol
Azerbaijan	1	Mail	3	DHPol
Belarus	1	Mail	3	DHPol
Belgium	39	Mail	3	UIC/DHPol
Bosnia Herzegovina	1	Mail	3	DHPol
Bulgaria	3	Mail	3	DHPol
Bulgaria	4	Mail	2	Rinisoft
Croatia	4	Mail	3	DHPol
Cyprus	2	Mail	3	DHPol
Czech Republic	19	Mail	3	UIC/DHPol
Czech Republic	11	Mail	3	PPI
Denmark	4	Mail	3	DHPol
Estonia	3	Mail	3	DHPol
Finland	5	Mail	3	DHPol
France	70	Mail	3	UIC/DHPol
Germany	241	Mail	3	DHPol
Greece	10	Mail	3	DHPol
Hungary	3	Mail	3	DHPol
Iceland	4	Mail	3	DHPol
Ireland	6	Mail	3	DHPol
Italy	3	Mail	3	DHPol
Latvia	3	Mail	3	DHPol
Lithuania	3	Mail	3	DHPol
Luxemburg	2	Mail	3	DHPol
Malta	2	Mail	3	DHPol
Netherlands	5	Mail	3	DHPol
North Macedonia	2	Mail	3	DHPol
Norway	4	Mail	3	DHPol
Norway	22	Mail	2	FFI
Poland	101	Mail	3	UIC/DHPol
Portugal	3	Mail	3	DHPol
Republic of Moldova	11	Mail	3	UIC/DHPol

Country	Contacted candidates	Medium	Reminders	Responsible partner
Romania	42	Mail	3	UIC/DHPol
Romania	13	Mail	2	CBRNE
Russia	1	Mail	3	DHPol
Serbia	2	Mail	3	DHPol
Slovakia	4	Mail	3	DHPol
Slovenia	4	Mail	3	DHPol
Spain	27	Mail	3	ETICAS/DHPol
Sweden	47	Mail	3	UMU
Switzerland	18	Mail	3	DHPol
Turkey	2	Mail	3	DHPol
Ukraine	3	Mail	3	DHPol
United Kingdom	7	Mail	3	DHPol
United Kingdom	73	Mail	3	CBRNE