eNOTICE-2

EU Network of Training Centres for preparedness to CBRN Events

Physical and psychological requirements of end-users (people with disabilities) for CBRN decontamination

Scope of this document

CBRN decontamination is uncommon for the **general population, including vulnerable and disabled individuals**. People who are not familiar with it often do not know what to expect and how to handle this situation. This affects all sections of the population. It is a major challenge and a source of stress for everyone involved, both the emergency services and the people affected. This makes it all the more important to understand the needs and requirements of the various stakeholders for decontamination and the process itself. This applies both to the **physical processes and to aspects such as communication,** both aspects are discussed in this document.

Requirements of end-users (vulnerable groups of population – people with disabilities)

eNOTICE-2 project approached patients, patient organisations and associations in Belgium with the aim to collect the user needs and requirements for the methodologies developed by eNOTICE-2. Around 30 interviews have been held in Belgium with a heterogeneous sample of participants connected to the field of handicap, either personally (patient representatives or relatives of persons living with handicap) or professionally (psychosocial manager for emergencies, director of a home for the elderly, nurse in childcare, specialised educators). Age ranged from 20 to 70 years old, participants lived or worked in the Brussels region or in Wallonia. Among the professionals, three of them have experience of collective emergencies as first responders. It is interesting that, among the patient representatives, 2 of them were also active as first responders when their condition still allowed it.

Method

Following the detailed methodology of engaging users and conducting interviews, elaborated in eNOTICE-2 project, the data were collected through semi-structured interviews, supported by an interview guide and analysed based on the transcripts of the interviews.

Interview guide for patient representatives

Questions	Probes
INTRODUCTION	
To begin, I would like you to introduce yourself and explain why you have chosen to take part in this discussion.	What interested you when you first heard about this research? How did you hear about this study? How do the themes of this project concern you?
To what extent have you been personally confronted with an emergency situation?	What happened? If not, in your entourage?
EMERGENCY PREPAREDNESS This section aims at eliciting the degree of emergency preparedness of the participants. Each question corresponds to a preparation stage, leading to possibilities for actions. This is a part that can help for entering into the topic from a more general perspective.	
Does your association help its members about what they should plan for an emergency situation?	Why/why not?
To which extent your association tried to learn or find out more about how to prepare for emergencies?	Where did you find it? Which information?
To which extent your association advise for preparing an emergency kit? Have you collected resources that would be useful to you? Have you thought about how to leave your home in an emergency?	What's in the kit? Why did you do it?
To which extent have you taken actions to develop a plan for the members, their family or their household?	What's the content?
CBRNE	
What does CBRNe mean to you?	Have you ever heard of CBRNe? What do you think these letters stand for? Can you give examples of incidents that you think are CBRNe incidents?
Researcher defines CBRNe for the participants. *CBRN is the abbreviation commonly used to describe the use of Chemical, Biological, Radiological and Nuclear materials or weapons. The malicious use of such materials could cause significant harm or disruption. (from CBRNe glossary of the European Commission)*	
Now that we've explained what CBRNe incidents are, would you like to add anything/complete your answers?	
What does «decontamination » mean to you?	What words come to mind? What do we decontaminate? People, surfaces, objects?
The researcher defines decontamination.	

The removal or reduction of hazardous materials from the undesirable place (contamination) to lower the risk of further harm and/or cross contamination. *Dry decontamination: the use of techniques without water or liquids to decontaminate people or property.* *Wet decontamination: the application of water (or other liquids) to decontaminate people, property or infrastructures.* *Mass decontamination: the physical process of rapidly removing contaminants from a large number of people in the shortest possible time lapse, in potentially life-threatening situations to lower the risk of further harm and/or cross contamination.* *(from CBRNe glossary of the European Commission)*	
Now that we've explained what decontamination involves, would you like to add anything / complete your answers?	
In your opinion, if the professionals have to decontaminate you, what will they ask you to do?	How do you think this will work? Does it have to be dressed? Do I need to take medication?
The researcher explains the procedures of decontamination AND/OR present videos *The person needs to take a shower and brush himself/herself very carefully, every inch of the body, to remove any possible contaminant. Special attention - to the hair, hair absorbs a lot, so washing the hair (and beards for men!) is essential. If the person is wounded, injured or handicapped - cannot take the shower him/herself, then the firemen - first responders- do it for the person. The person is brought inside the decontamination tent on a stretcher, the clothes is cut off, removed and placed in the plastic bag and the person is put in the shower and treated with water and brushes.* *https://www.facebook.com/watch/?v=422692475036473* *https://www.youtube.com/watch?v=-50bBNTRcrk&t=629s*	
What do you expect from professionals **before** decontamination?	What is the information? What are the attitudes? What should they say? What should they do? What should they never say? What should they never do?
What do you expect from professionals **during** decontamination?	What is the information? What are the attitudes? What should they say? What should they do? What should they never say? What should they never do?
What do you expect from professionals **after** decontamination?	What is the information? What are the attitudes? What should they say? What should they do? What should they never say? What should they never do?
TRANSITION *As we explained earlier, decontamination is essentially based on "wet" techniques. This means that it will not be possible to decontaminate certain objects and aids to daily living without delay.*	
MANAGEMENT OF ASSSTIVE DEVICES AND HANDICAP	

In your opinion, what should be planned **BEFORE** decontamination / an incident to ensure that decontamination goes smoothly for these people? [Repeat according to the different assistive devices]	What should you have ready in case a CBRNe incident occurs?
Who should have this responsibility? Why is this important?	Who should organise the preparation?
In your opinion, what should be planned DURING decontamination to ensure that decontamination goes smoothly for these people? [Repeat according to the different assistive devices]	What resources are needed during the incident?
Who should have this responsibility? Why is this important?	Who should organise the response during the incident?
In your opinion, what should be planned AFTER decontamination / an incident to ensure that decontamination goes smoothly for these people? [Repeat according to the different assistive devices]	What resources are needed after the incident?
Who should have this responsibility? Why is this important?	Who should organise the post-incident response?
CLOSING	
What would you recommend for professionals who deal with people with disabilities during emergencies?	
We've come to the end of this interview. Would you like to add anything or complete any of your answers?	

Physical requirements

Participants firstly emphasised that handicap is a personal situation: each person has an individualised experience of the handicap, with heterogeneous needs and resources. Moreover, they also insisted that the persons with the more complex needs are likely to experience several handicaps (e.g. those with extreme mobility problems can also have respiratory problems, cognitive problems or sensorial limitations). They also stressed the need for considering invisible handicaps, that are not directly visible by first responders: this was, e.g., mentioned for persons living with Ehler-Danlos syndrome or those with Multiple Sclerosis. Several participants even stressed that those patients with cognitive problems or mental health problems are even more complex to manage as their reactions are difficult to predict and anticipate, leading to an individualised response for each person. From the interviews, it appears to be particularly the case for children or adults with autistic problems as their reactions could be violent or confronting for first responders. It was also mentioned by the professionals that – in general – first responders have few experiences with persons living with disabilities and that it could lead to inappropriate reactions (infantilisation, speaking too loud, impatience, etc.). Consequently, several participants feared that these persons are at risk of being excluded from proper care during an emergency. Some even feared that the first responders end up using force, violence or contention to force them to undergo decontamination. A participant therefore suggested that giving an anxiolytic could help those who are too stressed.

When it comes to physical requirements during the CBRN incident response and decontamination process, participants suggested to distinguish assistive devices whose removal is not harmful or life-threatening (e.g. audio prothesis, wheelchair) from devices that cannot be removed or should be replaced within minutes (e.g. respiratory assistance). Devices whose removal is life-threatening should be replaced in a minute of time while, for some devices, participants estimated that they can wait if support is offered providing a mechanic wheelchair, organising the possibility of staying in a health care facility instead of going back home without assistive devices, helping for quickly receiving a substitute. Some participants stressed that priority should be saving the life and preserving life. If a device is removed, other participants insisted that the priority should be helping patients regaining the autonomy as quickly as possible.

Some also distinguished devices that are tailor-made for the persons from devices that are more generic (without specific programming of the devices for the need of the persons). In the second case, it was perceived easier to provide a replacement.

They suggest keeping the devices as long as possible with the persons: when removed, the device should be clearly identified before being decontaminated. As these technologies are user-tailored, i.e. adjusted to the needs and physical features of every particular person, participants favour the option of decontaminating the individual device of the person as quickly (and safely) as possible. Some suggested having a “material decontamination chain” in parallel to the “human decontamination chain”.

For those with mobility problems, **attention should be paid to the assisting a person with a disability**. As the victims may suffer from a neuromuscular disease, they won’t be able to help (e.g. for some, even lifting the head is not possible). If the time lapse allows it, it can be useful to have patient lift in the “dirty zone” for helping to the transfer. Patients can remain lying: it is maybe not relevant to have a wheelchair for each person. However, some patients cumulating a respiratory problem with a neuromuscular problem must be half-sitting. It should then be possible to have stretcher with lift-up backrest. Some persons with disabilities have also a certain degree of autonomy, meaning that being put on a stretcher may be not adapted. It was suggested to use “**shower plastic wheelchair**” for the decontamination, so that the person can preserve its autonomy and spare the professional resources.

While waiting for the decontamination or if the victims must travel to the decontamination tent, attention should be paid that not all persons that appear to be valid are able to walk the distance or to wait standing. Chairs for the waiting zone, wheelchairs for the small noria are then needed. After the decontamination, ensuring that persons can – comfortably- lie down, especially those with muscular problems, was pointed as important.

Moreover, some participants stressed that not all devices can be seen directly such as urinary catheters, stomas or parenteral probes. Participants were wondering how this can be managed by FR, as – in their view - this kind of material is not part of the standard equipment of an ambulance. Also, a participant recalled that some victims could have incontinence problems (it will be particularly the case if the incident takes place close to a nursing home or a home for the elderly or an institution for persons with polyhandicaps). After the decontamination shower, when dressed, it will be necessary to put on protections.

Additional devices were mentioned as important to consider as it is perceived by the participants difficult to replace and not suitable for an intensive washing: compression garments, orthopaedic insoles, adapted shoes, compression splints and cuddly toys.

Through the interviews, a particular category of devices also emerged: **the tablets and smartphones** that some persons will sensorial and/or cognitive problems use to communicate. For example, some persons with severe hearing loss have specific applications on their phone to communicate, same for persons with autistic disorders. Without these devices, there won’t be any form of communication possible: for some participants, it is not possible to envision removing these devices for more than the time of the decontamination. It was also pointed that diabetics use their cell phone (or similar device) to control their insulin pump and they need to monitor their glycemia.

Table 1 summarises the key ideas extracted from the questionnaires regarding physical requirements.

Table 1. Emergency Considerations for Vulnerable Groups: Physical Needs

Vulnerable groups: Physical requirements	
Individualised experiences	Participants highlighted that disabilities are unique to each person, requiring tailored approaches.
Cumulative handicaps and complex needs	Complex needs often involve multiple disabilities (e.g., mobility, respiratory, cognitive); patients with cognitive or mental health problems are challenging to manage due to unpredictable reactions.
Invisible disabilities	Invisible disabilities (e.g., Ehler-Danlos syndrome, Multiple Sclerosis) are not directly visible to first responders and need consideration during emergency responses.
First responder challenges	First responders may lack experience with disabilities, risking inappropriate reactions or exclusion from care; the fear of being excluded from care is real.
Decontamination of assistive devices	Decontamination processes should start with tracking and tracing the device, differentiating between devices that can wait and those that require immediate replacement, and preserving autonomy during decontamination of the devices.
	Critical assistive devices : Assistive devices differ in their removal needs; some are non-critical, while others must be replaced immediately (e.g. respiratory assistance).
	Invisible devices and stomas : risk assessment should be conducted for medical or feeding probes, catheters, pacemakers and stomas
	Tailor-made devices : They should be distinguished from generic devices, which are easier to replace.
Assisting a person with a severe disability	In case of mobility or respiratory needs: considering using a stretcher with a lift-up backrest to allow them to be half-seated or provide a chair in the shower. Comfortable lying positions should be ensured post-decontamination, particularly for those with neuromuscular problems.

Psychological requirements

Whatever the nature of the impairment or of the disability, all participants insisted on the need for a **clear, continuous and calm communication**. As expressed by a participant, if there is a permanent communication, it will be easier to remove the assisting devices as the victims are reassured. Some participants also stressed that they understand that the situation requires rapid actions and that it is not a moment when one can start an in-depth dialogue. Consequently, these participants suggested to communicate more regularly in "normal" situations to help persons to prepare themselves.

The choice of the words used is important during the emergency situations such as saying disabled persons or just "disabled".

Verbal communication is important, but also **additional communication strategies** as pictograms for the deaf and hearing-impaired persons are needed, and these recommendations were confirmed also by the findings of H2020 PROACTIVE project[1]. As the masks worn by the first responders can prevent the visual contact, some also suggested to have transparent masks, allowing for lip-reading. Several participants also suggested having interpreters in sign language during and after the decontamination process although they also acknowledged that not all persons master this language. Colour codes, pictograms, videos were also mentioned during the interviews as helpful supporting materials.

Ensuring a permanent presence, never letting the persons alone was also mentioned as key during the interviews. This can be a FR or another person. Especially for persons having cognitive problems, a physical presence can be important. Also, an interviewee, based on his experience of evacuating nursing homes, explained that for those with cognitive problems, they may not realise what is happening. Some participants wondered if the **families could stay together** during the decontamination.

Alongside the presence, several participants also pointed the physical environment: when there are too many sensorial stimulations, particularly the noise and the light, it could be contributing to the anxiety and stress. Among other examples, persons with hearing loss have troubles to distinguish the sounds and too many of it can overwhelm them, leading to a rupture of communication. A participant suggested to reduce the light of the headlamp. Participants suggested then to **pay attention to the physical environment of the waiting area before the decontamination and after the decontamination**: reduced light, reduced noise, possibility of being "isolated", social distancing rules. For persons with behavioural problems, the specialised educators suggested to have "something" to occupy them to help them to wait.

The director of the elderly home also suggested to involve as soon as possible the **usual professionals** in the management of the situation. For example, if the residents of the elderly home must be decontaminated, once the process is over, the nurses of the elderly home can take over. Similarly, for persons with disability living in an institution, being as quickly as possible surrounded by familiar faces, without masks or PPE can help to reduce the anxiety and the stress. A participant suggested that usual professionals can remain "dirty" longer to help with the decontamination of the patients, meaning that they might not be decontaminated directly as "valid" persons in the first priority, but having to wait until the last patient needing assistance for the decontamination is cleaned. Therefore, as pointed by the participant, not all professionals can be ready to accept such a non-priority role and should never be forced to do it. Another

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[1] https://proactive-h2020.eu/wp-content/uploads/2021/03/PROACTIVE_20210226_D3.4_V5_DHPol_Common-approaches-civil-society.pdf

interviewee suggested that the professionals used to accompany the persons should be decontaminated, equipped as the FR and be present during the decontamination process.

Some participants also raised the question of consent: during emergencies, they fear that they will be likely to be asked to comply with orders although this can be perceived as disrespectful, rude or abusive (e.g. having to be naked in front of male FR). These participants suggested then to have a possibility for debriefing the incident, to voice their discomfort. But, other participants also pointed out that for those with cognitive and behavioural problems, even touching them could be a source of distress and anxiety. Again, working with a referent person (from the family or the professional entourage) was perceived as a solution to facilitate the process.

Building on the experiences during COVID, a participant discussed the triage. Victims need to assure that **if there is a triage, it is not because of their handicap** but because of clinical criteria like other victims, e.g. based on a T1/T2/T3 triage groups classification, the vital prognosis, the consciousness. This participant explained that, during COVID, a young girl with autistic problems was refused to intensive care because she was perceived as a disabled person. He also had several testimonies of persons severely disabled for whom the health care professionals wrongly projected that they have a poor quality of life and should not be resuscitated although the persons themselves have a strong craving for life. In that sense, he advised that more exchanges between FR and persons with severe disabilities may help them to better understand what it does mean “quality of life” when the person lives with numerous limitations. **Involving patient associations in training and education of FR** was mentioned by several participants as an asset for better knowing and understanding life with disabilities.

One should not neglect that **some persons living with disability may already consider themselves with less chances of survival from the beginning**. It was mentioned by some persons with mobility problems. If an incident happens, they will need to be evacuated, they cannot do it by themselves and some reported that they are aware that they may be dead before the FR reach them or that they won’t be considered as priority.

Finally, an important part of the psychological dimension concerns **the relation that the persons living with an assistive device has with this device**. Although some devices can be removed without endangering the life of the person, the removal of the devices can trigger a whole range of reactions (anxiety, panic attack, verbal or physical violence, withdrawal, refusal, opposition…). It implies, from the responders, a careful appraisal of the removal of the device, even a simple pair of glasses or an audio prothesis, and, again, working whenever possible with a referent person to help reassuring the patients.

Table 2 summarises the key ideas extracted from the questionnaires regarding psychological requirements.

Table 2. Emergency Considerations for Vulnerable Groups: Psychological Needs

Vulnerable groups: Psychological requirements	
Communication with a person with hearing or visual disabilities	Clear, continuous communication is essential during emergencies to reassure and guide people with disabilities; Specialised communication strategies (e.g., pictograms, sign language, transparent mask for lip-reading, video) should be used to aid those with sensory impairments.
Environmental considerations	Reducing sensory stimulation (e.g., noise, light), ensuring a permanent presence, and provide distractions to help them wait in waiting areas can help reduce stress and anxiety for people with disabilities waiting for decontamination.
Involvement of usual professionals	Involving familiar caregivers or family members from the start can reduce anxiety and improve cooperation during decontamination, particularly for those with cognitive or behavioural problems.
Consent and sensitivity	Emergency protocols should consider consent and respect (using the term "disabled person" is respectful whereas "disabled" alone is not; Forced actions (e.g., undressing) can be distressing.
Triage and fair treatment	Ensuring fair treatment during triage is crucial; decisions should be based on clinical criteria, not disability status.
Perceived survival chances	Some people with disabilities may feel they have reduced chances of survival; responders should be aware of this mindset and be trained accordingly, ideally with the involvement of disabled people's associations.
Emotional attachment to devices	The psychological attachment to assistive devices means removing them can cause anxiety or distress, requiring careful handling.
Post-decontamination debriefing	Stress and discomfort can be significantly reduced if a debriefing session is organized after the decontamination. During this time, additional details about the fate of personal assistive devices can be provided.

Summary and next steps

Decontaminating sensitive assistive devices in various environments in emergency, military and industrial response is essential and requires reliable solutions. This document focuses on both general procedures and special considerations for people with disabilities. Key issues were identified, highlighting the need for first responders to be familiar with the challenges and equipped with appropriate tools. By following the cleaning guidelines and understanding the materials and types of different supporting devices, users might be able to recuperate their devices and continue to use them after the decontamination process.

The knowledge gained from the exercise hosted by Fire Department of Dortmund in April 2024 gave valuable insights for improving the decontamination standards processes and led to formulation of specific recommendations, such as:

1. Cleaning guidelines of assistive devices:
    - Implement the guidelines and procedures for cleaning the supporting devices.
    - Test, compare and validate the procedures for efficiency, safety for humans, animals and environment, time, cost
2. Communication with people with disabilities:
    - Provide different communications strategies during the decontamination procedure.
    - Have a small briefing session with the vulnerable groups before the procedure.
3. Education and training of first responders:
    - Regular training programmes to keep first responders up to date with the latest decontamination techniques and procedures.

By implementing these recommendations learned from the exercise, first responders can be better prepared for emergencies, increase the safety and efficiency of decontamination processes and ensure the long-term usability of supporting devices. This will help to strengthen the resilience of communities to CBRN threats and ensure the protection of people, the environment and property.

The results of the exercise can be used as a basis for further research in order to further improve the standard of decontamination in CBRN situations. The aim is to identify gaps and in particular, to find improvements in procedures, equipment and communication with the affected population.