ResiStand

INCREASING DISASTER RESILIENCE BY ESTABLISHING A SUSTAINABLE PROCESS TO SUPPORT STANDARDISATION OF TECHNOLOGIES AND SERVICES

Preliminary Report on End-user Standardisation Demands

ResiStand

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ResiStand Project

Standardisation is a powerful tool to achieve better interoperability. However, it needs to overcome a lack of interest and modest participation from stakeholders. Also, promising research results are not always used as the basis for new standards.

The overall goal of ResiStand is to find new ways to improve the crisis management and disaster resilience capabilities of the European Union and individual Member States through standardisation.

ResiStand contributes to an improved disaster resilience by identifying and analysing the drivers, constraints and expectations of three main stakeholder communities: Standardisation Organisations, End-Users and Suppliers, consisting of researchers, industry and SMEs.

Based on this information, gaps in standardisation are identified and a prioritised roadmap for new initiatives will be created. The roadmap will be complemented by a critical evaluation of standards as a tool to improve disaster resilience.

ResiStand aims at implementing a pre-standardisation process that supports the development of standards. The feasibility of the process will be tested by developing a new work item. The aim is that stakeholders will continuously utilize this “ResiStand Process” in the future, and that the project delivers a better understanding of the potential of standards for contributing to an improved disaster resilience.

ResiStand will support the management of increasing threats to society such as armed conflicts, terrorism, pandemics and natural disasters, which have increasingly cross-border, even global consequences due to the on-going globalisation.

Protection of citizens through anticipation, preparedness, response and adaptation to crisis situations – i.e. maintaining disaster resilience – will be more efficient. Collaboration between national, European and international stakeholders will be improved by unified processes and management systems as well as by technical, procedural, operational and semantic interoperability.

Executive Summary

The disaster management context is a very diverse and complex system of systems, where many different activities need to interlock and stakeholders need to work together. Especially on the European level, standardisation is a powerful tool to solve interoperability issues, to ensure the technical level of equipment made available in a competitive market and thereby decreasing the costs, to allow faster operations, and in the end to improve overall technical and procedural capabilities for each disaster management aspect. In addition, standardisation is a key driver for innovation on a European level as it enables procurement activities and thus the implementation of new solutions i.e. in governmental organisations. A standard in the field of disaster management and resilience can cover not only technological / product solutions, but also procedures, terminology aspects, a service or testing method etc. in all phases of the disaster management cycle and in all related topics, e.g. in command & control, logistics, trainings, crisis communication etc.

In the context of the ResiStand Project, work package WP3 “Identification of standardisation needs and requirements“ thus has the objective to identify and analyse standardisation demands of the end-user community in support of increasing disaster resilience, across all phases and tasks of the disaster management cycle. The analysis is developed from an end-user perspective focusing on real operational needs that can be addressed by standardisation and also tackles related societal requirements and potential constraints for standardisation.

The analysis of end-user standardisation needs has been done in a twofold approach: a consultation of end-users through an online questionnaire and the analysis of former and on-going EU research projects’ results through a desk research.

This document at hand reports the results of Task T3.2 "Initial identification of end-users’ standardisation needs", clustered according to the disaster management phases and their related tasks as defined in the ResiStand framework (D1.1 "ResiStand Handbook – The projects’ conceptual model").

In terms of the overall results, the disaster management phase with the most identified standardisation needs of end-users is the response phase, followed by the preparedness and mitigation phases. The tasks with the most identified standardisation needs were training, information management, warning and crisis communication and response and recovery planning.

The results will be used by T3.3 "Consolidating, analysing, and updating needs of the E-UC" to prepare and conduct four end-user workshops in order to consolidate, amend and validate the needs identified as well as to further discuss potential constraints to the identified standardisation in disaster management to optimise future standardisation activities. In the end, refined end-user needs will be handed over to WP5 "Preparation and road-mapping for standardisation activities" for synthesis, prioritisation and gap analysis.

Table of Contents

List of Figures

List of Abbreviations

C&C	Command and control
CBRN	Chemical, Biological, Radiological, Nuclear
CBRNE	Chemical, Biological, Radiological, Nuclear & Explosive
CI	Critical Infrastructure
CIP	Critical Infrastructure Protection
CLI	Call Level Interface
CM	Crisis Management
CNI	Critical National Infrastructure
CR	Crisis Response
DRM	Disaster Risk Management
EC	European Commission
EU	European Union
ICT	Information and Communication Technologies
LEA	Law Enforcement Agency
IP	Internet protocol
ISO	International Organization for Standardisation
IT	Information Technology
NATO	North Atlantic Treaty Organisation
SME	Small/medium enterprises
SOP	Standard Operating Procedure
UN	United Nations
WHO	World Health Organisation
WMD	Weapons of mass destruction

1 Introduction

The ResiStand Project aims to improve the disaster management and resilience capabilities of the European Union and individual Member States through standardisation. The disaster management context is a very diverse and complex system of systems, where many different activities need to interlock and stakeholders need to work together. Especially on the European level, standardisation is a powerful tool to solve interoperability issues, to ensure the technical level of equipment made available in a competitive market and thereby decreasing the costs, to allow faster operations, and in the end to improve overall technical and procedural capabilities for each disaster management aspect. In addition, standardisation is a key driver for innovation on a European level as it enables procurement activities and thus the implementation of new solutions i.e. in governmental organisations. A standard in the field of disaster management and resilience can cover not only technological/product solutions, but also procedures, terminology aspects, a service or testing method etc. in all phases of the disaster management cycle and in all related topics, e.g. in command & control, logistics, trainings, crisis communication etc.

1.1 Objectives

The main objective of T3.2 is to identify a preliminary set of standardisation needs of end-users. Based on the overall Conceptual Framework for ResiStand as described in D1.1 "ResiStand Handbook – The projects' conceptual model", these needs are clustered according to the four disaster management phases (mitigation, preparedness, response and recovery) and related tasks.

The mitigation phase is based on measures to limit and reduce the impact of crisis/disasters (based on ISO 22300). Disaster management phases related to mitigation are risk identification, risk analysis, risk evaluation, property protection, natural resource protection, public education and awareness raising, trend analysis and monitoring and review.

The preparedness phase's objective is to develop and maintain the organisation structure and the capabilities to carry out response and recovery activities in case of a disaster (based on ISO 22300). Tasks within preparedness are: response and recovery planning, training, preparedness communication, monitoring/detection, personnel management, asset management, (international) cooperation.

The response phase is concerned with saving lives and limiting adverse effects (based on ISO 22300). Related tasks are: warning/crisis communication, disaster cause elimination, rescue, operations, security/law enforcement, evacuation and shelter, emergency health care, disaster area clearance, basic needs supply/restoration, command, control and coordination, situation assessment, information assessment, monitoring/data collection, operations support, logistics.

The objective of the recovery phase is to reconstruct and restore normal life in an efficient way (based on UNISDR 2009). The related tasks are: humanitarian impact recovery, environmental impact recovery, economic impact recovery, re-establishment of infrastructure, establishment of recovery organisation structure, determination and implementation of recovery programme.

For identifying end-user's needs in these areas, results of T3.1 "Identify members and give structure to the End-User Community (E-UC)" are a crucial basis, i.e. a list of end-users in a variety of fields of disaster management.

The output of T3.2 – this deliverable – is intended to be used by T3.3 "Consolidating, analysing and updating needs of the E-UC", which includes workshops with end-users to discuss, adapt, and complement the results as described in this report.

Overall, the output of WP3 is to provide a basis for the identification of standardisation gaps, which is done in WP5, and also for the conclusion of the ResiStand process (WP6). In addition, the consolidation of end-users should contribute to enhance the understanding of end-user requirements related to standardisation activities in general, to optimise standardisation processes in the future, and to overcome the lack of involvement of stakeholders in the fields of crisis management and disaster resilience.

1.2 Approach to identify end-user standardisation needs

To fulfil its objectives, ResiStand T3.2 identified standardisation needs for crisis management and disaster resilience as expressed by end-users (e.g. fire-brigade, dispatch centre, emergency health care, police, etc.). The efforts consisted of two steps: a consultation of end-users through an online questionnaire (see 1.2.1 & Annex 1.2), and analysis of former and on-going EU research project's results through a desk search (see 1.2.2 & Annex 1.3).

The questionnaire was sent to those end-users who had been identified in T3.1[1]. In total, 198 end-users were approached. After collecting the information collected through the questionnaire and the desk research, the results were analysed to provide a preliminary list of standardisation needs. These were then sorted according to the tasks as defined in the ResiStand Conceptual Framework.

Whereas the desk based research allowed for a widespread analysis of current projects involved in disaster management and resilience, the questionnaire predominantly focused directly on the experiences of end-users and their standardisation needs. While the structured elements within the questionnaire are congruent with those used in the desk based research, it is the open questions that may be particularly interesting for ResiStand. The analysis discusses the frequency of identified needs in the different phases of disaster management (mitigation, preparedness, response, and recovery). Then, specific standardisation needs are listed within the different phases. Finally, the research engages with the responses to the open questions within the questionnaire.

1.2.1 Design of the Online Questionnaire

The design of the questionnaire is based on previous work conducted as part of the EC mandate project M/487, which had identified standardisation needs in 2011. A specific emphasis was on understanding the needs of end-users within the fields of crisis management and disaster resilience. Following the ResiStand Conceptual Framework, the end-users were asked to classify their standardisation requirements according to the Disaster Management phases (mitigation, preparedness, response and recovery) and their related tasks. Additionally, the questionnaire collected data about the participation in previous standardisation activities, what type of standard could be useful, reasons why the described problem has not been addressed by standardisation so far, as well as their professional profile.

The link to the online questionnaire as well as an invitation letter to join the End-User Community (E-UC) was sent out to those 198 end-users as identified in D3.1. In order to increase the sample size, recipients were allowed and encouraged to forward the link to the online questionnaire to other relevant end-users as well. Additionally, it was published on various social media networks such as Twitter or LinkedIn. The questionnaire could also be accessed via the ResiStand project website.[2] In addition, and to meet the expected consultative processes in some organisations, the questionnaire was provided for download as word document, which can be found in Annex 1.2, and which also provides an overview and definitions of the disaster management phases and its related tasks.

[1] http://resistand.eu/content/d31-contact-list-end-user-community
[2] http://www.resistand.eu

In total, we received 35 responses from different countries and a variety of organisations, predominantly governmental organisations (see Figures 1 and 2). This spread is hardly surprising given that end-users were the specific focus, which are mostly part of the government in disaster management.

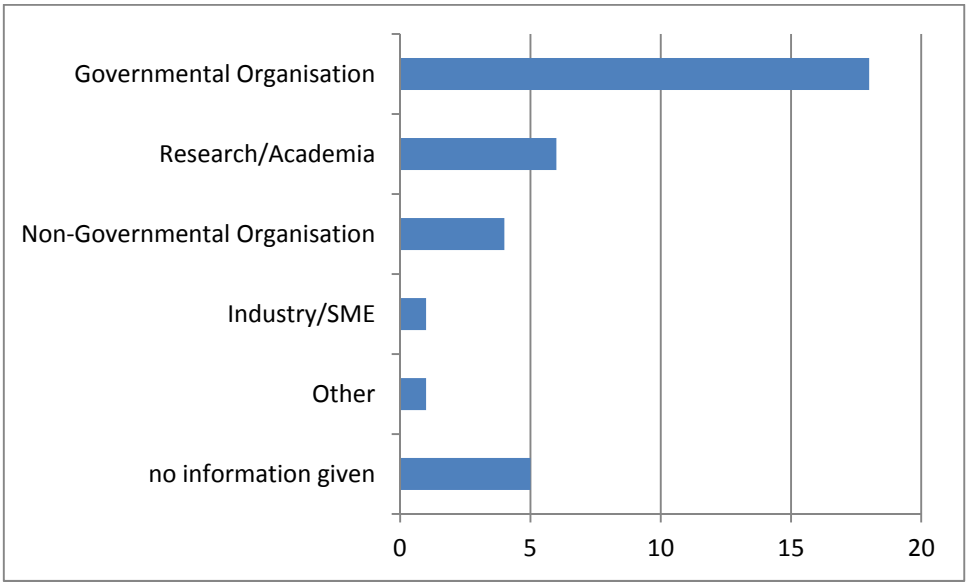

Figure 1 Questionnaire responses sorted by organisation type

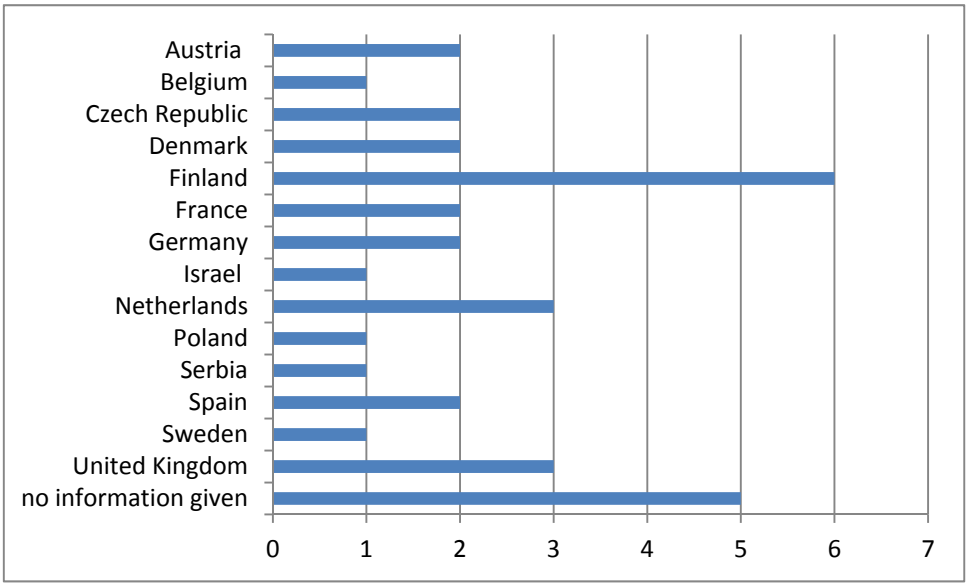

Figure 2: National affiliation of respondents

1.2.2 Design of the Desk Research

A preliminary set of projects, which are related to the ResiStand's objectives, had already been listed in the proposal of the project. This list was expanded by searching the EU CORDIS database[3], here mainly within the subset of the Disaster Risk Management Knowledge Center of the European Commission (approx. 380

[3] http://cordis.europa.eu

projects)[4], which was screened for relevant completed as well as currently on-going projects using relevant key words such as "standard", "best practice". Once a project was identified, the project deliverables were scanned to identify if an end-user needs assessment with respect to standardisation had been conducted, and/or the project coordinators were asked if such an activity had taken place in their project. This information was collated in a database, structured according to the questionnaire; i.e. it contained the same information about disaster management phases and related tasks. This enabled a joint discussion on results (see also Annex 1.3 for the design of the used excel-file).

Both the questionnaire and the database for results of the desk research allowed for a short description of the needed standard, which was filled in by the end-user or the desk researchers, respectively. Given the open nature of this field, the collected data is very heterogeneous, which complicated comparison. The collected standardisation needs were filled into an excel sheet that was constructed similarly to the questionnaire with respect to the phase and task they belong to by the T3.2 task partners. As a next step a re-evaluation of the assignments to the different tasks was applied to guarantee consistency within the categorisation into disaster management phases and tasks.

The questionnaire was filled out by 35 end-users. The desk research analysed 101 EU-projects (for the list see Annex 1.1).

These two activities yielded a total of 192 standardisation needs. The results of their review will be used to help in the preparation of several end-user workshops, which are intended to further discuss and validate needs in the four disaster management phases. Eventually, the goal of this WP is to enable WP5 (identification of standardisation gaps) to develop a weighted list of standards and to further enhance the understanding of end-user requirements related to standardisation processes to optimise future activities.

1.3 Limitations of the study

Response rate

Although the questionnaire was sent out directly to 198 end-users, and in addition was published through different channels, and could be accessed very easily, only 35 end-user standardisation needs were identified through the questionnaire. Most of the collected data came from the desk research and not directly from end-users. However, this result matches and supports the objective of the project to overcome the lack of involvement of stakeholders.

End-user selection

While the snowball approach of asking individual end-user and then having them forward the questionnaire to other end-users has been beneficial in creating a larger response size, this approach is also prone to potential bias towards certain types of end-users. End-users are more likely to forward questionnaire to end-users within the same field of work. Thus, instead of generating responses from end-users in a wide field of work areas, it may have produced pockets of responders in a smaller number of work areas. However, the original basis of end-user contacts was well-balanced (cf. D3.1 "Contact list of the End-User Community"), plus, given that the overall number of responses from the questionnaires is a lot smaller than those from the desktop research, this potential bias is negligible when discussing the combined results from both sources.

Type of standard

One of the variables that were included in the questionnaires and the desktop research was the identification of the "type" of the requested standard (basic standard, terminology standard, testing standard, product standard, process standard and service standard). While from the outset this categorisation appeared unproblematic, the data analysis revealed that end-users had difficulties in identifying those. For example,

[4] http://drmkc.jrc.ec.europa.eu/knowledge/Scientific-Results

some standardisation needs were concerned with defining and using the same terminology, yet these needs were not always categorised as terminology standard as would be expected, but some of them were categorised as process standard, as basic standard or product standard). In a similar vein, even among the desktop researchers the selection was quite subjective. Given these impediments, the gathered information is listed in the results section, but it has not been further processed and analysed.

Qualitative analysis

A qualitative analysis may have been a beneficial addition for the questionnaire and the desk research, especially in view of deriving possible societal requirements for developing and implementing a respective standard. Unfortunately, the data defied this type of analysis due to several reasons. The main source for any qualitative analysis was the open question about what sort of problem the standard is supposed to solve. As it turned out, the answers to this question were highly divergent. They ranged from very specific requests, e.g. about a very detailed problem with nanotechnology, to very general concerns, e.g. establishment of an early warning system at EU level. Even the attempt to develop larger thematic areas (in addition to the categorisation of phases and tasks) turned out to be not useful due to the data divergence. Eventually, the most useful alternative, as can be seen in the analysis chapters further below, was to retain the separation into the phases and tasks that constitute the ResiStand framework and then list the standard requirements that have been put forward within these individual phases and their tasks. These difficulties also appeared when trying to analyse answers to the question "From your knowledge or experience: why hasn't this problem been addressed so far?", and thus prevented the development of a structured and detailed presentation of societal requirements. However, first hints on standardisation restraints to be further analysed can be identified from the answers to this question.

1.4 Structure of this report

Deliverable 3.2 details the purpose, process and results of identifying standardisation needs of end-users in the afore-mentioned two-fold approach. The presentation of the identified standardisation needs is divided into the disaster management phases. First, the results of the questionnaire are presented (chapter 2), then the ones of the desk research (chapter 3). Finally, a synthesis of the results is presented in chapter 4, and recommendations for the preparation of the following workshops are derived in chapter 5.

2 Results of questionnaire

Whereas the desk based research allowed for a widespread analysis of current projects involved in crisis management and disaster resilience, the questionnaire focused directly on the experiences of end-users and their standardisation needs. While the structured elements within the questionnaire are the same as those used to conduct the desk based research, it is the open questions that may be particularly interesting for ResiStand. The analysis will first engage with the data with regard to the different phases of disaster management (mitigation, preparedness, response, and recovery) before discussing the open responses to the question about standardisation needs.

The results of the questionnaire clearly show that end-users expressed an interest in a lot of standards in the preparedness (n=14) and response (n=14) phases. While a need for standards was expressed a few times in the mitigation phase (n=5), it was nearly absent in the recovery phase (n=2). Future work in T3.3 has to focus on elucidating the reasons behind this limited interest in these phases.

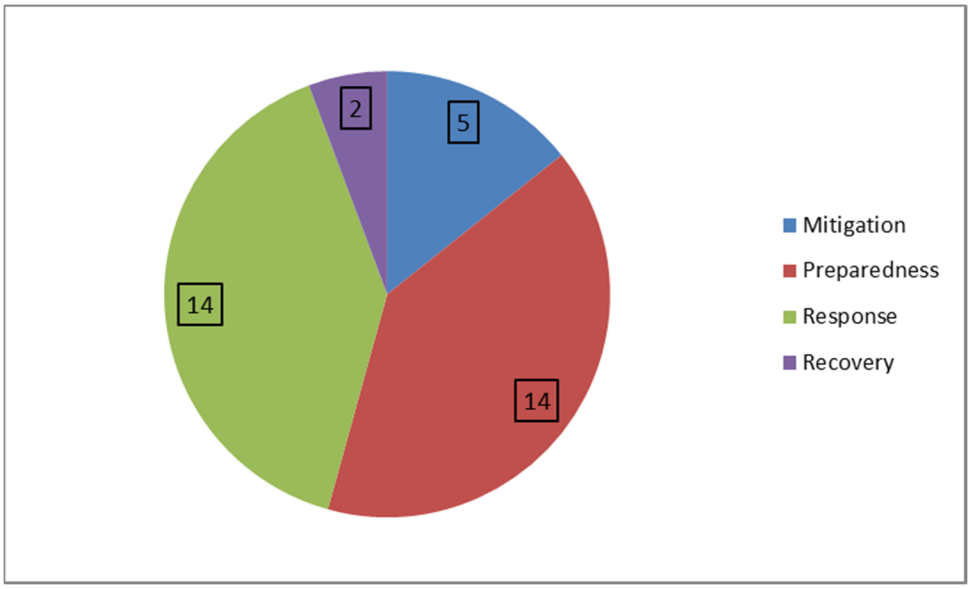

Figure 3 Standardisation needs in the different disaster management phases

2.1 Mitigation

In total, the questionnaire identified a total of five needs in the mitigation phase. Given that there were nine subcategories, there were of course some categories not mentioned at all. Public education and awareness raising was cited twice. Risk evaluation, risk analysis and risk identification were each mentioned once.

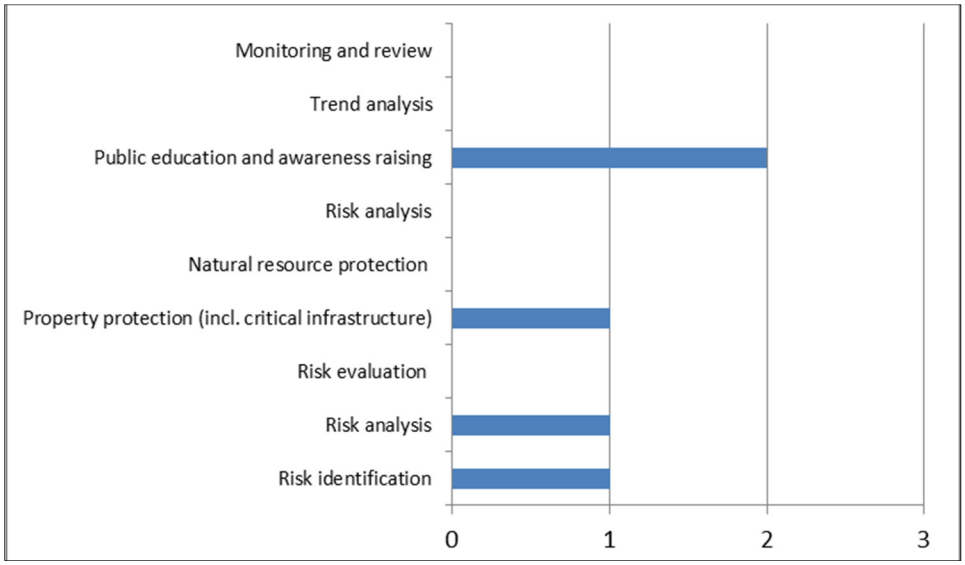

Figure 4: Overview of standardisation needs in the mitigation phase

To give an overview on the specific mentioned standardisation needs within the mitigation phase, each one of them is individually and literally featured in the following section – divided into the related tasks.

Public education and awareness raising:

1. *"Mitigation and preparedness procedures"*
2. *"Instructions on public behaviour during an emergency (especially an earthquake) are not standardized"*

Property protection:

1. *"At present, Critical National Infrastructure (CNI) protection varies significantly across CNI sectors as well as across EU nations. While there are already some EU directives in place which ensure standardisation across some CNI (though often more in the safety than security space, e.g. The Seveso Directive), more could be done to understand, share or even standardise the way in which EU nations manage CNI security, particularly in relation to those sectors where the loss of an asset will have an impact across national boundaries. Equally, there will be some assets in some EU states which are relied upon by other states for day to day critical activity. It may therefore be helpful to have a standard EU procedure for engaging with member states about cross-border CNI, as well as a process for managing these assets once they have been identified. While there is already a process in place to protect EU CNI, such as the Galileo programme, it may be helpful to share the standards relating to this more widely."*

Risk analysis:

1. *"Standardisation might make benchmarking the National Risk Assessment easier."*

Risk identification:

1. *"We need a common approach to identify risks in order to compare the different risk levels across borders."*

2.2 Preparedness

Overall, 14 needs were described by the end-users. Even though there were seven subcategories in total, the end-users only perceived a lack of standardisation needs in these three subcategories (response and

recovery planning, (international) cooperation establishment and training), all of which were mentioned quite often. Especially training appears to warrant further standardisation efforts.

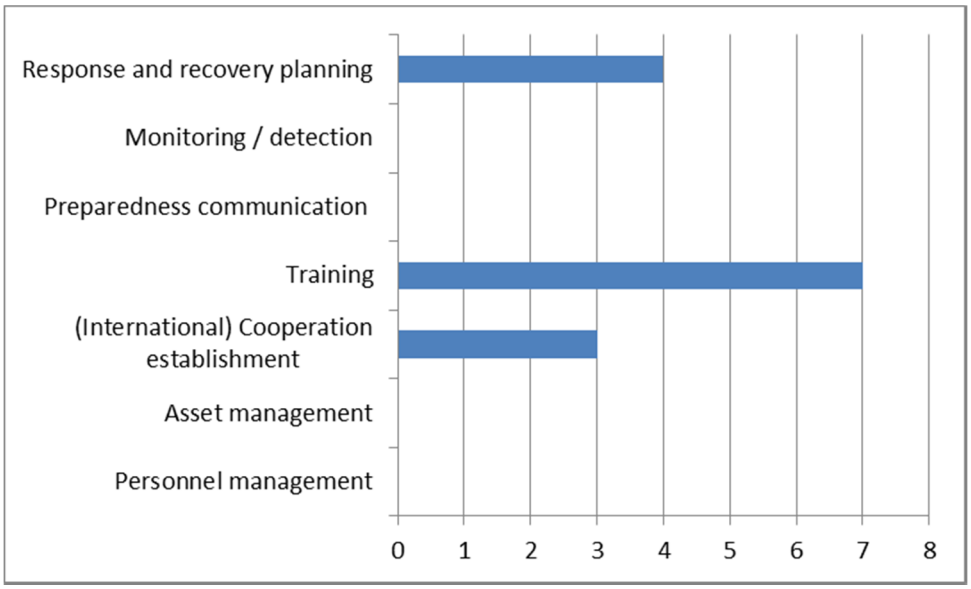

Figure 5: Overview of standardisation needs in the preparedness phase

To give an overview on the specific mentioned standardisation needs within the preparedness phase, each one of them is individually mentioned in the following section – divided into the corresponding tasks.

<u>(International) cooperation establishment:</u>

1. *"Crisis management terminology at the international (EU) level is not standardized and there is no "dictionary" that could explain possible differences. Often some words or phrases can have different meaning (e.g. term "crisis management" in Czech republic means the same as "emergency management", while in other countries it means "emergency management on top/political level") which can be a cause of confusion or misunderstanding during exercises, preparations, presentations and meetings or other international events. It would be beneficial to make a dictionary/list of basic CM terms including critical infrastructure, population protection, and others, possibly with "warning" that a specific term is used differently in certain member states and update it on a regular basis."*
2. *"As far as I am aware, each country in Europe has its own approach to the Crisis Management and disaster resilience. To understand each other correctly, even though using the same language, there is a need for definition of basic terms."*
3. *"Attempting to develop a working inter-agency protocol for emergency services to work together on a cross border basis between neighbouring international jurisdictions to deal with a major emergency incident that would require the initiation of the Civil Protection Mechanism"*

<u>Response and recovery planning:</u>

1. *"In the Netherlands we have sheets containing all the information, tasks, responsibilities of all kind of organisations with - possible - tasks and duties in emergency management. It seems us that it would be useful to have something like this international on standardized forms"*
2. *"Defining the most important concepts. Different terms are used in different member states and even within a member state. International co-operation shapes the terms and not always to the best possible result."*
3. *"Concept of planning should be same to all participants"*

4. *"How to handle situations involving high risk pathogens in surface mass transport and at airports. This includes several aspects like protection of staff and passengers, guidelines, operational procedures, and cleaning and decontamination, and training"*

Training:

1. *"Standard training for first responders would ensure right response and would enable and ease coordination between different responders, even in case more than 1 country is involved"*
2. *"There is an absence of common certification systems for training in crisis management (generally) and protection against CBRN (specifically). Beside this, there is no mechanism of mutual recognition of certificates across the EU countries. As a first step, to overcome this gap, Standards for different level of preparedness should be developed."*
3. *"organize of terms of crisis management and collaboration services, develop guidelines for further risk management (in his opinion), how to understand resistance (elements of resistance)"*
4. *"In my personal perception, there is a strong need to standardize a truly European approach in field of training for crisis management operations. Namely for such activities as Virtual/ Table-Top-Exercise or with small field component. Is should include issues like using modern ICT for early warning and data assessment for contingency planning."*
5. *"issue: heterogeneous levels of education, training and skills evaluation at the European level"*
6. *"Cross-border exercises have a long history and a common understanding has been developed how international exercises shall be carried out. There are several guiding documents and manuals for exercises and a large volume of lessons learned documents has been produced. ISO has published a standard for exercises and testing. Nevertheless there is no common European standard for European exercises like those exercises which are carried out under the EU civil protection mechanism. A European exercise standard which describes the elements and requirements of large scale cross-border exercises and the procedures how to plan, implement and evaluate them could facilitate the tendering of exercises as well as exercises planning, implementation and evaluation."*
7. *"Standards to make training more simple"*

2.3 Response

While a need for a standard was expressed for half of the subcategories in the response phase, command, control and coordination (n=5) received the most mentions. Only security/law enforcement (n=3) as well as warning/crisis communication (n=2) received more than one mention as well.

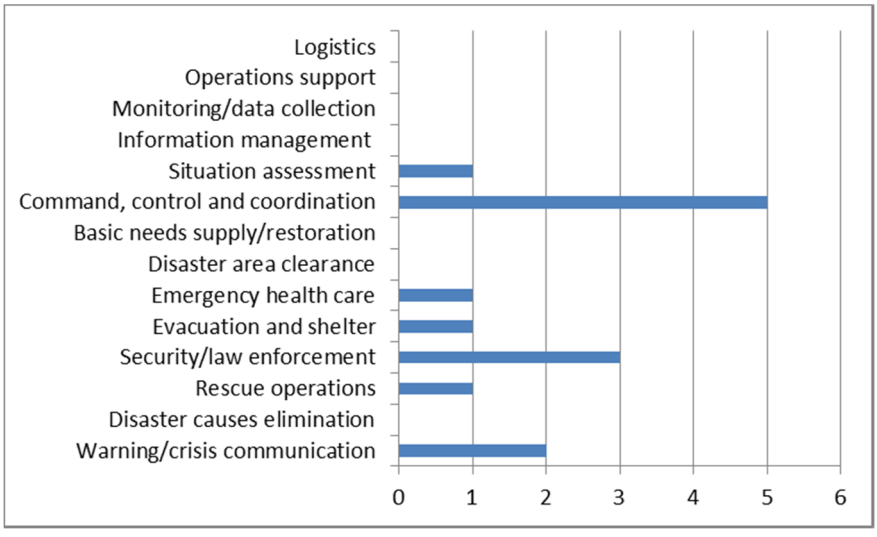

Figure 6: Overview of standardisation needs in the response phase

To give an overview on the specific mentioned standardisation needs within the response phase, each one of them is individually mentioned in the following section – divided into the corresponding tasks.

Warning/crisis communication

1. *"How to organize operational networks on rapid change situation by information and communication?"*
2. *"Multilingual standardised Public warning for citizens"*

Situation assessment

1. *"Use of unmanned aerial systems for supporting situational awareness operations. Standardised data collection from these new tools would enable sharing of the collected data across crisis managers."*

Command, control and coordination:

1. *"EU PC Mechanism aims to organize a coordination based on a modular approach of emergency response in the Union. Nowadays, a real Incident command system, operable at top level (interagency and for cross border incidents), could give an harmonization of command practices, in order to have a better interoperability in case of major incidents; and on another hand being fully connectable to others command systems in the word, e. g. US IC system and UN practices (closed to previous one)."*
2. *"Topic is related to Information Management. It would be helpful to get standards for IT-based support for command & control. It begins with the command & control center of a city/region and ends with the local command & control unit on location. All systems should work electronically hand in hand. The on scene commander should have a actual overview about all units on location without having to type everything in an own C&C system. All date should be transmitted automatically. In the end the units should get orders electronically on e. g. a tablet computer in the car/unit."*
3. *"There can be a problem of radio communications. Every emergency service is using digital, analog systems that cannot connect each other."*
4. *"interoperability and comparability of command and control structures among organizations as well as nations/regions"*
5. *"common terminology during command and control of an operation"*

Emergency health care:

1. *"If a response is requested thru various mechanism it is not a surprise what at the end will arrive on the spot"*

Evacuation and shelter:

1. *"The organization of shelter supplies as well as the development of a safe return plan has been described in ISO 22315 "Societal security — Mass evacuation Guidelines for planning" briefly. A following Standard deepening these issues could be helpful."*

Security/law enforcement:

1. *"In my opinion CBRN-E training for law enforcement first responders should be harmonized on EU level. LEA's of the member states have different levels of training and the response procedures are not consistent either. That makes cross-border cooperation on CBRN-E challenging. A lexicon on CBRN-E related definitions would also be required to facilitate communication between law enforcement, scientific support and legislative authorities."*

2. *"Exchange of information between law enforcement authorities. Registers, their content and availability"*
3. *"Quick reaction, on - time intervention, SOP in evidence gathering, securing crime scene maintaining public order"*

Rescue operations

1. *"How can we support the incident command through "big data" and geo data?"*

2.4 Recovery

While standardisation needs in the mitigation phase already received very limited attention, the recovery phase was even less often mentioned. Only twice did end-users cite a need for standards in the recovery phase, which were both on re-establishing infrastructure.

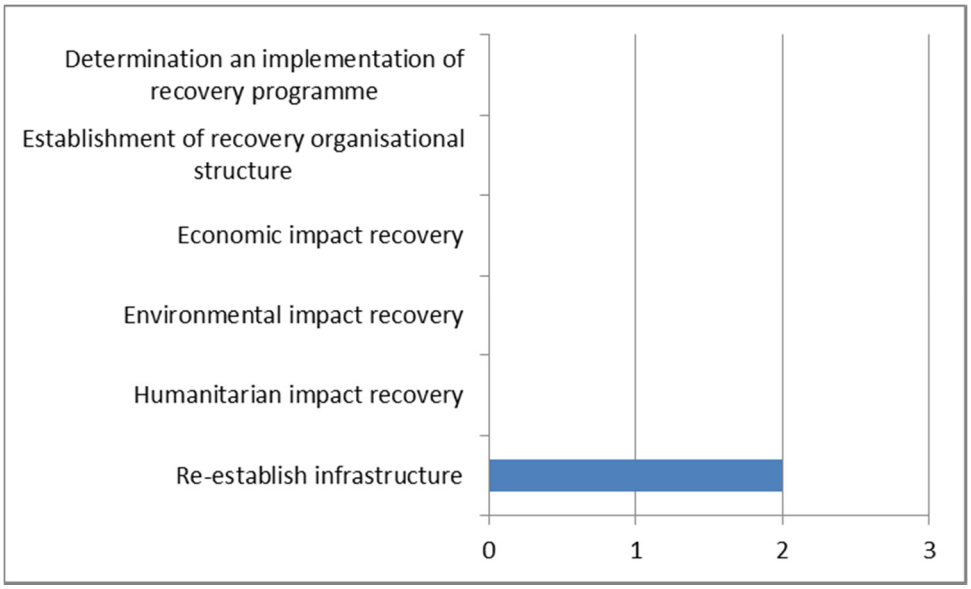

Figure 7: Overview of standardisation needs in the recovery phase

To give an overview on the specific mentioned standardisation needs within the recovery phase, each one of them is individually mentioned in the following section – divided into the corresponding tasks.

Re-establish infrastructure:

1. *"When restoring physical infrastructure (roads and rail lines) a very wide range of methods are used for building the specification for the infrastructure being rebuilt. This often leads to the use of previous specification losing the opportunity to build back better."*
2. *"The use of recycled debris in the reconstruction and rehabilitation of infrastructure"*

2.5 Further questions in the questionnaire

Considering the limitations regarding further analysis, the results of additional questions from the questionnaire are listed below.

"What type of standard could solve the problem?"

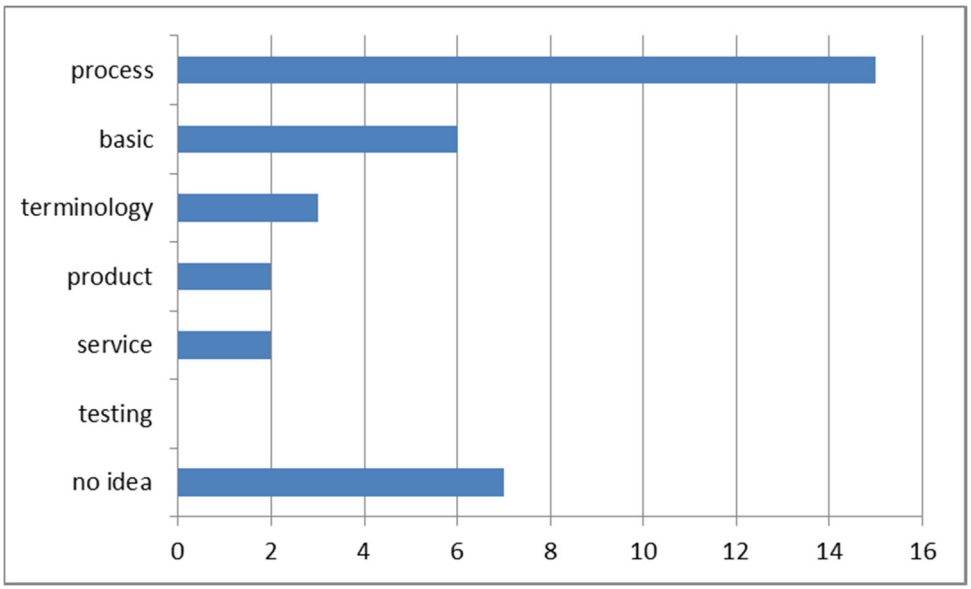

Figure 8: Frequencies of types of standardisation

The most frequent indicated types of standard within the questionnaire were process standards, followed by basic standards and terminology standards.

"From your knowledge or experience: why hasn't this problem been addressed so far?"

This question has been implemented, to a) gather information on why a specific standard has not been implemented so far, e.g. due to legal, ethical or societal constraints and b) to also gain further understanding, how to optimize standardisation processes in general.

Legal regulations and different national laws seem to play an important role within the named reason why the mentioned problems have not been addressed so far. To give an unfiltered view of these open questions, the literal answers within the questionnaire are listed below:

1. *"Societal Security technical committees fail to produce results"*
2. *"I think CNI security is a complex area which is managed within states through complex and variable legislative criteria. There may also be different risk tolerances across different EU nations, as well as understanding of what type of infrastructure counts as CNI, and how critical these types of infrastructure are."*
3. *"NRA is a nationally developed system."*
4. *"I'm sure there have been efforts to address this issue, but the results are either not known to me or it hasn't been finished for some reason. This problem often appears as one of the goals of some exercises or events, but not EU-wide."*
5. *"The globalization did not required international approach in the given field in the past."*
6. *"No experience of activating the Civil Protection Mechanism. Other countries may not have been asked to share such a protocol with their colleagues in Europe. There may be an unwillingness to share such information. There are many international networks of practitioners dealing with emergency management in existence throughout Europe and there has been little communication between them, this could be addressed by way of a suitable forum or Community of Users such as this"*
7. *"Different legislation and different ways of organizing preparedness. Preparedness is steered by local laws"*
8. *"National ways for conducting processes have been too kindly appreciated. The way to act in crisis should be same regardless of the target area: inside or outside EU"*

9. *"complex and new issues, not foreseen earlier, slowness of creating standards"*
10. *"Crises management is a national responsibility. The problem is extremely large with different possible approaches. There was no (or very little) effort in the past to establish a unified system acceptable by different nations."*
11. *"different understanding of the same concepts by people from different parts of Europe"*
12. *"insufficient collaborations between training and education centres at the European level"*
13. *"Not enough need nor consolidated experience however the benefits are high from a cost, timeliness and environmental positive impacts were we able to prepare and agree upon a single standard for adoption in the recovery phase. These benefits highlighted and documented in post-disaster and post-conflict scenarios of non-EU countries."*
14. *"Because it wasn't time to harmonize IC systems rather than coordinate them."*
15. *"Too many individual/local procedures/workflows. Too many independent suppliers. Wish to have a "perfect" local solution because standardisation mostly leads to a less "perfect" solution from the local point of view."*
16. *"legal regulations, no binding obligation to take part in the standardization process"*
17. *"Lack of unified legislative efforts, security issues, national security issues, lack of community legislative on common security problems"*
18. *"Different operating cultures and legislation"*
19. *"The problem has been addressed so far in ISO 22315, but only short and briefly."*
20. *"Acquisition process is mostly nationally steered leading to the purchase of different commercial systems in different countries providing also different kinds of data, which hinders international collaboration."*
21. *"Owing to the complex nature of the subject matter, the standardization of CBRN-E is quite challenging"*
22. *"because it is national responsibility how to organise command and control"*
23. *"Wide and versatile area"*
24. *"Making decision over own organization's boundary function prove lack of in common processes. In many organizations, there are not opened processes properly."*

"Have you already participated in any standardisation activity/ies?"

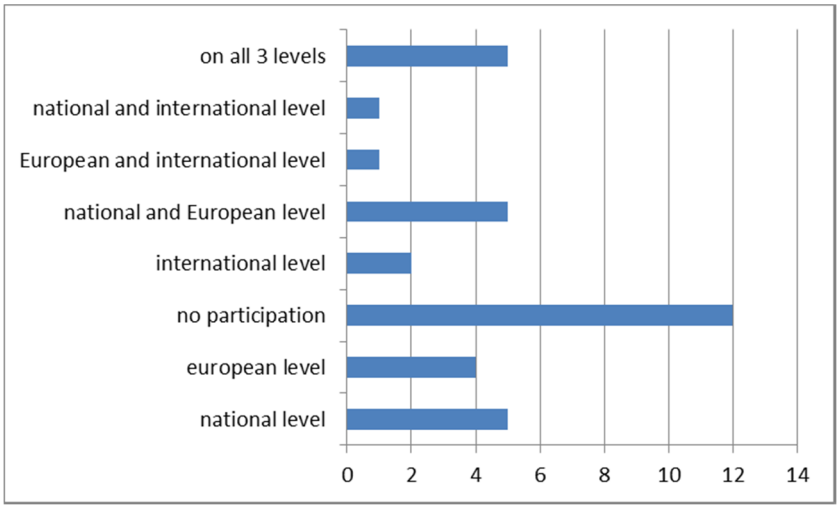

Figure 9: Participation in standardisation activities

The majority of the end-users who filled out the questionnaire have already participated in standardisation activities across national borders.

3 Results of the desk research

Within the Desk Research 157 standardisation needs of 101 EU-Projects were identified and categorized according to the disaster management phases and tasks based on the defined framework of ResiStand (D1.1). 62 standardisation needs were on such a broad level of detail that they were not analysed as specific standardisation needs but instead taken into account as general remarks on the needs of standardisation that were evaluated in the different EU-Projects.

Standardisation needs were most often expressed in the response phase (n=51), followed by the preparedness phase (n=23), the mitigation phase (n=19) and the recovery phase (n=2).

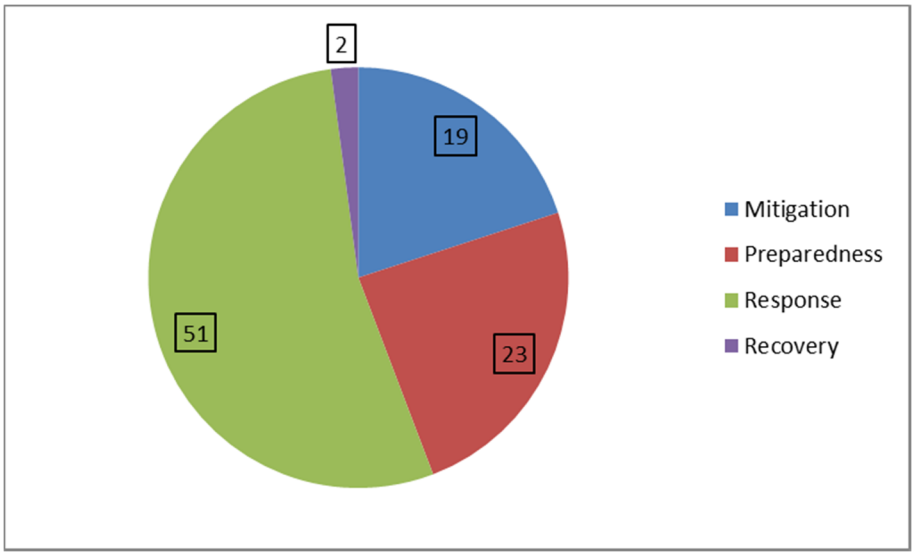

Figure 10: Standardisation needs in the different disaster management phases

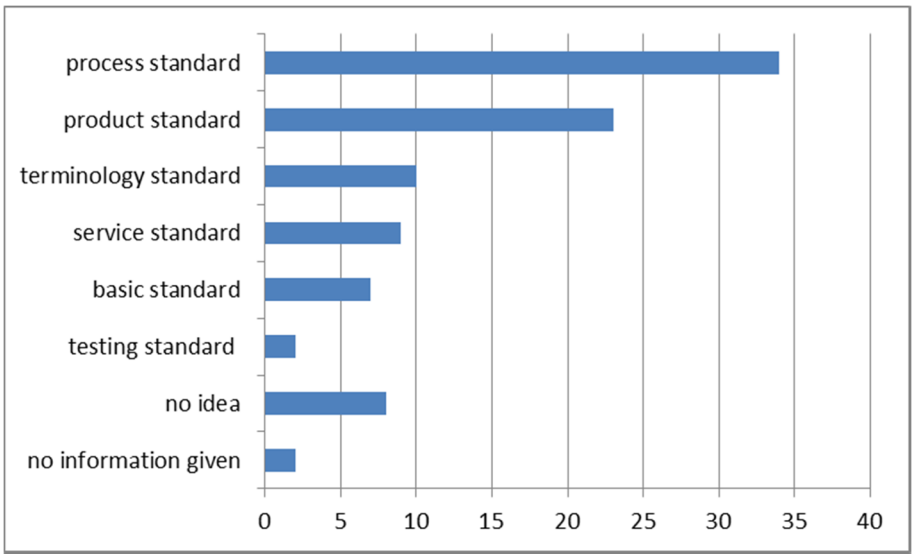

Figure 11: Frequencies of types of standardisation

3.1 Mitigation

In total, the desk research identified a total of 19 needs in the mitigation phase. Five of them were concerned with the task of risk analysis, four of them with the task of monitoring and review as well as with property protection, three with risk identification, two with public education and one with risk evaluation. None of them covered the tasks trend analysis and natural resource protection.

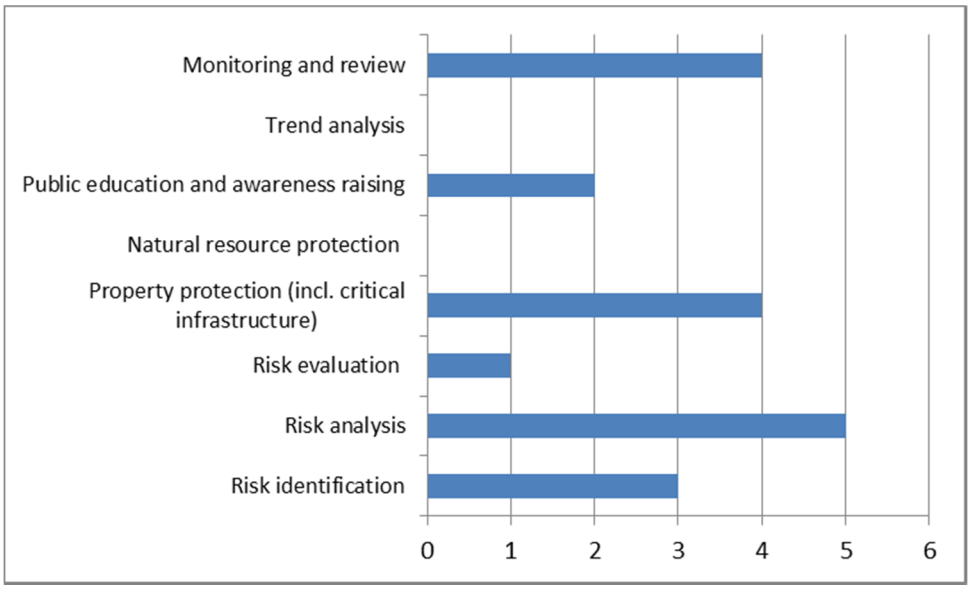

Figure 12: Overview of standardisation needs in the mitigation phase

To give an overview on the specific mentioned standardisation needs within the mitigation phase, each one of them is individually and literally featured in the following section – divided into the corresponding tasks:

Monitoring and review:

1. *"In the context of fire related emergency, a stakeholder says "A lesson learned becomes so after that a relevant number of people certified the importance of the arguments. I think that after this step it is necessary to standardize the lessons learned so that a large numbers of organizations can use it, and secondly it is necessary to inform all the stakeholders involved in the same process"*
2. *"NO standard on how to conduct a lessons learned process, including data collection and evaluation and implementation of improved practices"*
3. *"Plan debrief procedures beforehand. One should have a standardized debrief plan before the event occurs. Several experts noted that debriefs after an operation is often lacking. This must be conducted more systematically in order to improve the implementation of lessons learned. After a crisis one should revise the risk analysis"*
4. *"For the lesson learning tool (Training tool), a standard reporting system is the most important need to be addressed"*

Property protection:

1. *"For the lesson learning tool (Training tool), a standard reporting system is the most important need to be addressed."*
2. *"Understanding the link between Climate Change (through changing Extreme Weather Events) and subsequent Risk towards Critical Infrastructures"*
3. *"Different CI owners/operators/policy makers make use of different applications for doing Risk Assessment: because of this difference in applications, it is difficult to share/compare lessons learned on e.g. mitigation measures."*

4. *"Standardized methodologies for quantification of resilience measures in the context of CIP"*
5. *"Standard risk assessment approach for cross-border strategic infrastructures"*

Public education and awareness raising:

1. *"long-term learning framework for improving community preparedness to a wide range of hazards"*
2. *"Reinforce citizen and local territorial community awareness and involvement, with increased knowledge of risks and available channels for information and advice for appropriate actions (before, during and after the incident)"*

Risk analysis:

1. *"Information in EUROCODE EN 1991-1-7 is not detailed enough to enable the reader to execute comparable risk analyses for building structures. (source: ELASSTIC D 4.6)"*
2. *"The problem is: The existence of various (different, non-standardized) methods of measuring the risks of nanotechnologies."*
3. *"Cyberattack vulnerability metrics are not defined as standard"*
4. *"Many classifications related to hazards and meteorological conditions are available throughout the community of practitioners, but none of them is internationally adopted. Nevertheless, they show the real need for a comprehensive taxonomy, making the efforts of the EPISECC project relevant and interesting for the above-mentioned Standardisation Organisations: a taxonomy that would expand the coverage in depth (detail of classification) and width (number of classified concept) would definitely represent a valid proposal for an improvement to existing standards and a robust basis for a number of new tools for information exchange between IT multilingual system making use of the Common Information Space. EPISECC plans therefore to establish links to ISO, ETSI and OASIS aiming at presenting the developed taxonomy and initiating a process for improving the quality of the current standards for structuring the information for an effective situational awareness."*
5. *"To define standardised sets of meta-data for risk descriptions including co-ordinates, probability, severity, nature of the risk and possible triggers."*

Risk evaluation:

1. *"Methodology standardisation of cost-benefit quantification to Security measures."*

Risk identification:

1. *"Common understanding/definition of (what is) Critical Infrastructure, (what is) Resilience, (what is) Risk, and (what is) Extreme Weather;"*
2. *"there is not a widely-adopted security standard in the IoT world (such as the ISO 27000 for the traditional IT network)"*
3. *"Flooding – Communication: Regarding scientific details concerning the floods one should standardize data bases containing relevant information which can be available for the internal and external network for the scientific community and the crisis management community."*

3.2 Preparedness

23 standardisation needs belonged to the preparedness phase: 15 concerned response and recovery planning, each of the tasks monitoring/detection and asset management had three standardisation needs and two addressed training. No needs pertained to preparedness communication, (international) cooperation establishment or personnel management.

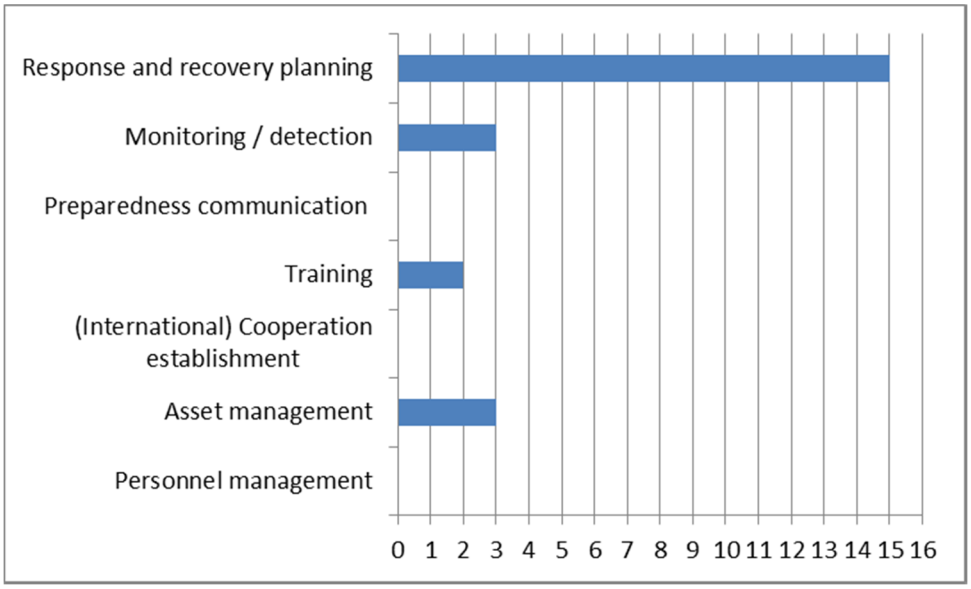

Figure 13: Overview of standardisation needs in the preparedness phase

To give an overview on the specific mentioned standardisation needs within the preparedness phase, each one of them is individually and literally featured in the following section – divided into the corresponding tasks:

Asset management:

1. *"Tested and reliable first responder work-suits that provide sufficient protection to escape the contaminated area, and that are standardized to the greatest extent possible (to simplify cross-sector and cross-border efforts"*
2. *"Lack of standards on experimental setup (includes scenario design, data analysis and assessment, logistical experiment design procedures, data collection, societal and ethical aspects) to practice CM and to test new CM solutions"*
3. *"Harmonisation in capacity building and mapping: A standard way of assessing capacity is essential in order to build trust and understanding among organisations, which is the first step towards cooperation, sharing resources and jointly plan capacity."*

Monitoring/detection:

1. *"common technical and interoperability standards for identity and borders systems, as well as standards for biometric identifier"*
2. *"Air, water and ground sampling kits, accompanied by set guidelines and EU-standards for content, application and approaches for use. - Strategies for safe and efficient sampling while keeping an adequate "chain of custody",,*
3. *"Need for a standardised approach to perform a fast analysis at incident response."*

Response and recovery planning:

1. *"self-rescue advice (such as exit-signs, illuminated trails, …) in traffic infrastructure"*
2. *"From a perspective of the SAVE ME system [detects disaster events in public transport terminals/vehicles and critical infrastructures], I imagine that we would need a European standard on how indoor maps of critical traffic infrastructure are made, so they could easily be imported into the SAVE ME" system (or similar commercial systems based on this technology)."*
3. *"Establish a common geospatial basic information system (including for underground facilities and buildings), based on Geographic Information Systems (GIS) standards, to be used by organizations before and during crisis situations"*

4. *"Logistic: There should be prior formulation of a list of goods and a standard format for shipments and orders for smooth and seamless activation of the disaster response"*
5. *"Currently no standardized curriculum exists for disaster preparedness for healthcare practitioners"*
6. *"Need for Emergency Action Plan to identify emergencies and describing measures to minimize impacts and ensure public security – specifically focused on mass gatherings and/or riots"*
7. *"Operational standards and doctrines for use in search and rescue should be reviewed by relevant authorities and updated to incorporate use of unmanned vehicles (e.g. drones)"*
8. *"Common CBRN symbology standard needed. PRACTICE points on the iconography and the possibility to establish a common approach in designing codes and symbols easy to understand by both security specialists and by the public. Despite the challenges to carry out such exercise, more needs to be done to easily communicate during crisis. Several research initiatives are taking place to harmonize the symbols: INDIGO- FP 7 research project D-BOX and IFREACT. Apart from those, NATO, UN agencies developed some guidance documents on this topic. Standardisation might be the platform for coordination among these initiatives, towards the development and adoption of common symbols adapted to different categories of public and to security specialists. (Source: PRACTICE D9-9)"*
9. *"Although several products exist and all the basic functionalities of a GIS system are available in CRs, still shortcomings have been identified in the graphical representation of objects and concepts, potentially leading to misunderstandings or slow reactions. Moreover, there are significant discrepancies in the available base maps, in terms of quality, details and richness: the quality and quantity of information are defined locally and there is no standard available across Europe"*
10. *"The EC should, at earliest opportunity, mandate the Standardisation Development Organisations to provide an approved standard for NG112 implementation."*
11. *"Results of comparable research projects must be monitored to ensure standardized interoperability of projects' results"*
12. *"Exchange of information concerning needs, resources, capacities and activities is difficult within and between professional and civilian communities because of different terms and interpretations of terms. This is an important cause of collaboration gaps between communities."*
13. *""How clean is clean" standards, including common hazard/damage/risk assessment standards for CBRNe, Decontamination – to us the main issue is that at the moment there are no agreed "how clean is clean" standards (especially for WMD agents). We will need to set them up in the project (using experts). Only after we have the standard we can go to the technological partners and ask for the tests and devices to verify that we are below the threshold."*
14. *"We need a standard about resilience with good practices and concept for crisis management based on agility more than on planning. It should concern development of good practices, not requirements for certification. Such an approach is complementary to ISO 22301 (Business continuity management systems – Requirements). It concerns both agility during response phase and preparation for agility. It assumes a good understanding of the context (organization and capabilities)."*
15. *"Develop a standardized electronic triage system to improve the logistics and the situation awareness."*

<u>Training:</u>

1. *"Need for standardisation to train the use of social media in emergency situations"*
2. *"Standardisation of objects models (digital re-usable assets) for modelling and simulation environment (application for cross-boundary training)."*

3.3 Response

Most of the specific identified needs were categorized into the response phase (n=51). 13 of them are concerned with information management, eleven of them with warning/crisis Communication, nine with command, control and coordination, seven with rescue operations, five each with emergency health care and situation assessment and one with monitoring/data Collection. None of them were categorized into the following phases: logistics, operations support, basic need supply/restoration, disaster area clearance, evacuation and shelter, security/law enforcement or disaster causes elimination.

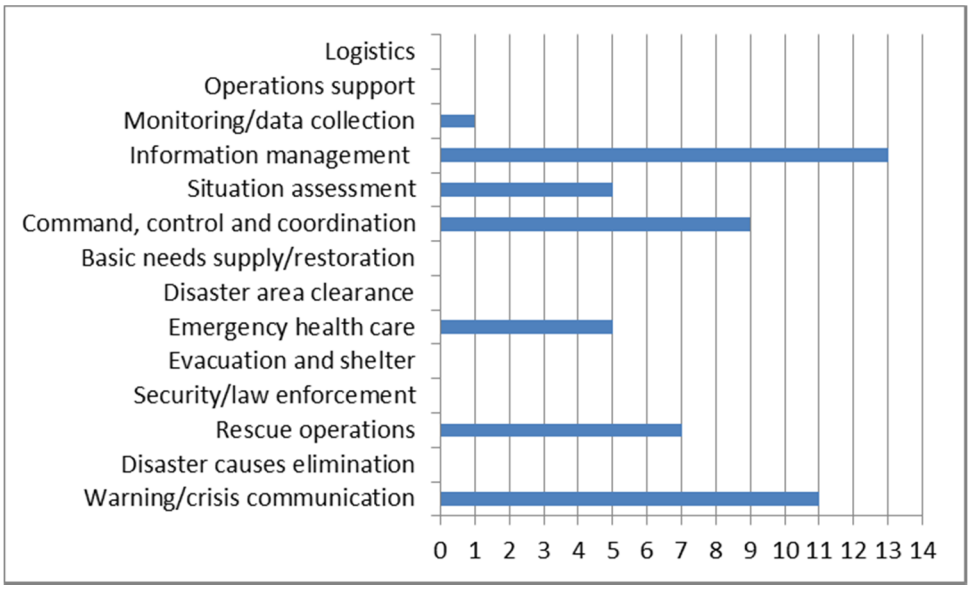

Figure 14: Overview of standardisation needs in the response phase

To give an overview on the specific mentioned standardisation needs within the response phase, each one of them is individually and literally featured in the following section – divided into the corresponding tasks:

<u>Command, control and coordination:</u>

1. *"Establish a standard operational procedure (SOP) for intervention rules and coordination mechanisms ("command & control") with respect to the interaction between the health and psychosocial services as well as with other responders, ESF and relevant stakeholders;"*
2. *"The process to define the "limited key information" to share (pre, during, post incident) to improve preparedness, coordination and debriefing (between different actors and different hierarchical levels) must be standardized."*
3. *"Semantic interoperability is needed to make communication possible between users of different Emergency Management Systems, by providing mapping among different classifications at both national and international levels for some commonly used map objects (icons and terms)"*
4. *"Semantic interoperability is needed for basic concepts (e.g. risk manager, crisis, resilience). The objective is not so much to make new definitions, but to match existing ones to make sure people understand each other, even if they are using different languages."*
5. *"The PEACE project will investigate the provisioning of day-to-day emergency communication in next generation All-IP networks. Due to the different structure of IP and PSTN networks it is not possible to simply reuse current standards and solutions forr ealizing such communication in IP networks. This involves location management and identification solutions as well as providing reliable VoIP service infrastructure. To be able to support emergency services over an all-IP infrastructure further work is required in the area of highly reliable IP."*
6. *"The European Council has been stressing the need for interoperability among technologies used for Public Protection and Disaster Relief (PPDR) communications across Europe for a long time.*

Nevertheless, while the introduction of TETRA and TETRAPOL technologies in the last two decades has increased the possibility to talk cross agency internally in a country, cross border communication for the public safety forces is not well solved as of today."

7. *"semantic interpretation of the exchanged data"*
8. *"Reinforce communication interoperability between command and control (C&C) systems. Communication interoperability could be improved by a better definition of needs and the use of minimum common terms/formats, information objects and minimum set of requirements."*
9. *"To prevent IP communication solutions for Emergency Services being unevenly available across Member States, there is a need for a harmonised strategy and standardisation at EC level."*

Emergency health care:

1. *"From WHO (Regional office in Europe): inadequacies at Emergency Medical Services in Europe due to a lack of standardisation; minimal standards are required. Minimum standards Equipment for in-hospital and out-of-hospital emergency services"*
2. *"From WHO (Regional office in Europe): inadequacies at Emergency Medical Services in Europe due to a lack of standardisation; minimal standards are required. Minimum standards for Education of EMS professionals"*
3. *"From WHO (Regional office in Europe): inadequacies at Emergency Medical Services in Europe due to a lack of standardisation; minimal standards are required. Minimum standards for inter-connectivity between dispatch centres across borders"*
4. *"New standard to record and report Health impact parameters"*
5. *"Standards on patient-management in mass casualty incidents (e.g. minimal data-set for patient-management in mass casualty incidents, management of data of affected persons in mass casualties, which shall duly take into account privacy issues and personal data equipment) to close the gap in (inter)national pre-hospital patient-management with differing national standards."*

Information management:

1. *"Standardized interfaces for communication and data exchange with actual common data exchange platforms such as GDACS and VirtualOSOCC"*
2. *"Standardized interfaces for communication and data exchange with local damage assessment systems such as HAZUS"*
3. *"TETRA- and TETRAPOL-terminals (hand-held and mobile) are not interoperable (cross-border). An Inter System Interface (ISI) is still missing even when the same technology solution is used in neighbour countries. There are some projects dealing with the interoperability of TETRA and TETRAPOL trying to solve these issues. It is discussed whether Gateways or Inter System Interfaces (ISI) will be the most costeffective solution.Standardisation on EC level is required to define various interoperable levels of talk-groups based on the results of on going projects, e.g. the Norwegian-Swedish ISI project"*
4. *"Real time text is a communication method that uses "full duplex" communication, thus implementing a flow of two-way communication. Although various text services are available, most of them rely on a smartphone environment or a PC base. With these "services" being separated from standard phone functionality as CLI, Location etc. it is difficult to get this kind of service compliant with all emergency service-related legislation. There are standards available in Europe but despite this, there are still different solutions which are offered for people that need text as a way of communication. In this situation, interoperability between the services, but especially with the emergency services, is not arranged for."*
5. *"Standardisation on EC level is required in order to come to an agreement about automatic registration of location, availability, status and type of emergency response units entering the emergency services' communication network of another country."*

6. *"Technology-wise, video streams require the definition and implementation of common standards in all Member States, because the service should be carrier and device-independent."*
7. *"The European Commission should launch Research and Development projects aimed at defining user interfaces (e.g. graphical functions, icons, colours etc.) standardised across member states and regions, thus improving the understanding of the emergency situations. The example of the current geographic information system used by border control (EUROSUR) and its evaluation could lead to the next steps. This must be accompanied with the definition of common cartographic projections, descriptive tags and icons, labelling, others. Moreover, since many different proprietary systems exist, the sharing of information requires the definition of data models."*
8. *"Automatic sharing of data and information across borders"*
9. *"A standard is needed on formats and protocols for more efficient information sharing (Reachback after radiological/nuclear incident)."*
10. *"With respect to big data standardisation of nomenclature for data sharing is needed"*
11. *"Improve standardisation in Ontology acquisition for Social media information"*
12. *"Development of standards on information needed regarding the geo-location of an individual, a post, or a tweet (e.g., how the location is represented, location of topic versus location of individual, how to manage retweets)"*
13. *"A need for interoperability of social media data, including data standards and content categories to support information sharing among multiple stakeholders"*

Monitoring/collecting data:

1. *"Need for a standardised approach for post incident monitoring/to support mass screening in case of a CBRN attack"*

Rescue operations:

1. *"Emergency call line standards/guidelines which tell staff how to react when several/more people call in with the same symptoms"*
2. *"Lack of general knowledge regarding available methodology and lack of standardised approaches to measure residual risks of secondary exposure and to set allowable levels of contamination.. "Best practice" should be set as benchmark for assessment for secondary exposure and allowable contamination levels"*
3. *"Increased use of various types of unmanned assets outputting various types of data creates problems for multi-national deployments due to the integration of these tools in the standard operating procedures of international teams and for data sharing"*
4. *"Standardisation of detection equipment for search and rescue (to facilitate international missions)."*
5. *"Facilitate interoperability of unmanned search and rescue equipment."*
6. *"Geo-localization (GIS) standards for use in buildings and underground systems to facilitate First Responders intervention. It concerns two standards (how to implement technology, such as the use of radio wireless communication protocols, and how to acquire the geo-localization information)."*
7. *"Scoring systems for injuries already in place and implemented are not totally standardised."*

Situation assessment:

1. *"it is unknown wheter time-temperature-curves for fires in buildings initiated by an impact of a plane, a truck or a car are covered in the current standards"*
2. *"Methodology for sourcing information (social media, tweets, crowd source information) to assess impact of wide scale disaster and identify public needs"*
3. *"Early detection through weak signals using social media"*

4. *"Standardize the way of acquiring digital information from victims/public and sending it to the whole command & control system (it may include developing a common „victim ticket", to be filled in by victims using smart phone emergency applications)."*
5. *"Improve decision support system and situation awareness by information filtering & delivery for top level organizations"*

Warning/crisis communication:

1. *"Warning (alert and notification) dissemination understanding. Develop alert libraries that are applicable in all European countries. Define common European messages schemes for fire and evacuation systems. Capitalize on existing ISO/DIS 22322 on public warning process and ISO/DIS 22324 on colour coded alert."*
2. *"Develop a common language for warning (alert and notification): Develop alert libraries that are applicable in all European countries (going beyond ISO/DIS 22324 on colour coded alert and ISO/DIS 22322 on public warning systems)."*
3. *"Develop a common language for warning (alert and notification): Develop a communication protocol that allows lightweight transmission of alert messages and supports light encoding of the alert libraries; with possible use of wireless media (suggest more specific use of the Common Alerting Protocol (CAP), based on alert libraries, to allow interoperability)."*
4. *"How to communicate with the public in transnational emergencies?"*
5. *"Develop a common and standardized procedure in order to let citizens actively bring in their resources into the relieve effort (e.g. a „resource ticket" available on mobile phones and the web)."*
6. *"Standardisation for providing dynamic information during an emergency (i.e. evacuation information in real time, location, infrastructure availability, exit routes availability)."*
7. *"Public authorities are dependent on industry and SME's to build solutions to respond properly to the social media community. There is a need for new ways to obtain and analyze (social media) data, but the European market is extremely fragmented. There is no one single app in the EU that informs all citizens about potential ongoing crisis."*
8. *"While discussing the use of social media for informing citizens during an emergency, the experts found the following topic as in need for careful consideration: Depending on the amount of details the alert will include requirements standardisation has to be set and agreed."*
9. *"Need for standard messaging to assist digital volunteers"*
10. *"Need for standards for level of service w.r.t. social media use by response organisations, including methods of coordination"*
11. *"Clear and effective communication with the population with all means, including pre-developed standard messages (preferably agent/scenario specific communication strategies)"*

3.4 Recovery

Only two of the identified standardisation needs were categorized into the recovery phase. Those were concerned with the tasks humanitarian impact recovery and re-establish infrastructure. None of the specified needs were related to the tasks environmental impact recovery, economic impact recovery, establishment of recovery organization structure or determination and implementation of recovery programme.

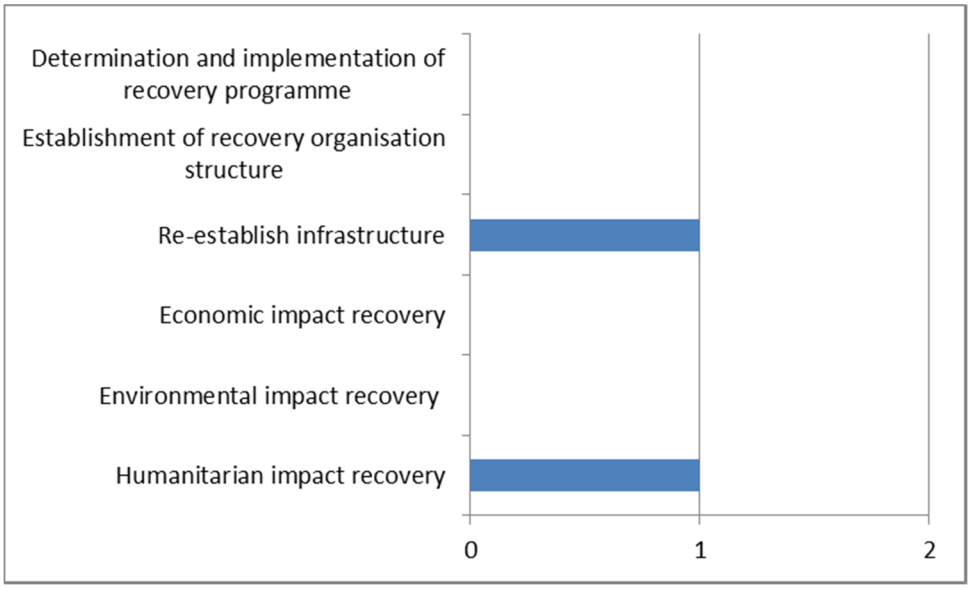

Figure 15: Overview of standardisation needs in the recovery phase

To give an overview on the specific mentioned standardisation needs within the recovery phase, each one of them is individually and literally featured in the following section – divided into the corresponding tasks:

Humanitarian impact recovery:

1. *"Structured best practices in psychosocial support after disasters. Readily available all over Europe, easy to apply and implement (high end expertise on psychosocial support/ procedures is not necessary, support level of excellent standards accommodated)."*

Re-establish infrastructure:

1. *"Need for pre-standardisation efforts to harmonize assessment of complex indoor infrastructures for CBRN contamination and decontamination re-occupancy decision. It was noted that dispersion of CBRN agents in a complex building is heterogeneous. In a PRACTICE workshop it suggested that it would be useful to establish a strategy/standard operating procedures for modeling the CBRN agents in such context. In the same workshop it was suggested that remote techniques are available in other fields but for the time being, they cannot be a good solution for predicting the future incidents. In addition, the participants emphasized the importance of being involved in the design, development, technical documentation and validation of the model. (source: PRACTICE D9-9)"*

4 Synthesis of results

The disaster management phase with the most identified standardisation needs of end-users is the response-phase (n=65), followed by the preparedness (n= 37) and mitigation phase (n=24). Only four standardisation needs were identified for the recovery phase.

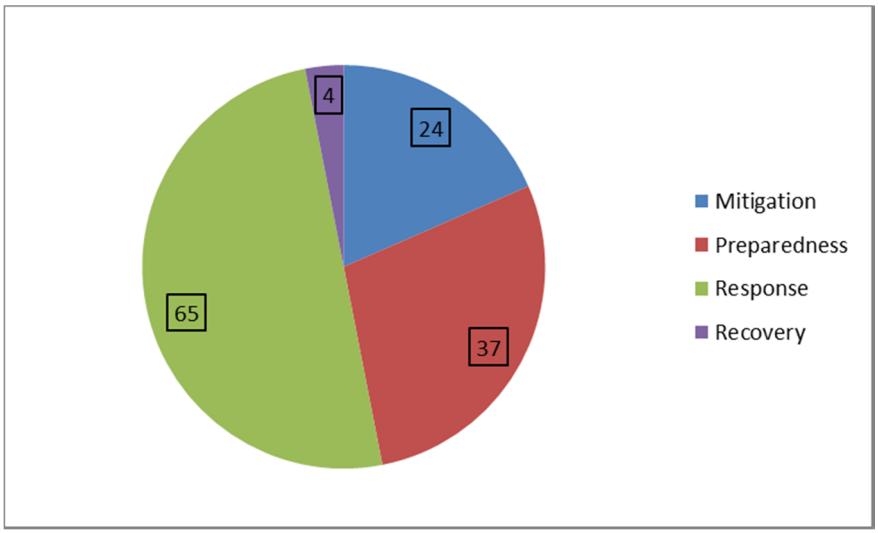

Figure 16: Frequency of disaster-management phases

Within the mitigation phase the most identified needs belong to the tasks of risk identification, public education and awareness raising as well as property protection and risk analysis and risk evaluation. None were concerned with trend analysis and natural resource protection in the questionnaire or in the desk research.

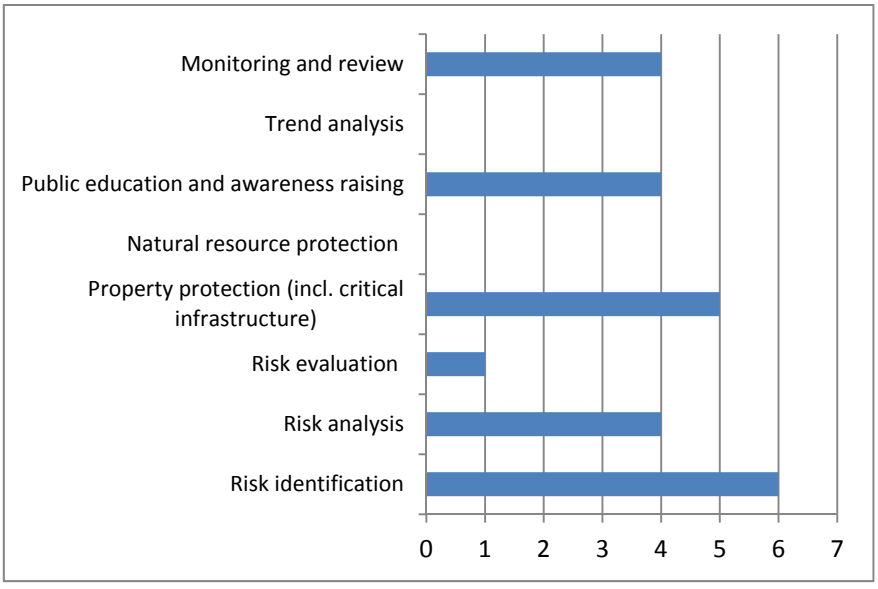

Figure 17: Tasks in mitigation phase

The task that most identified standardisation needs were assigned to within the preparedness phase was response and recovery planning, followed by training. A few standardisation needs were also allocated to monitoring/detection, (international) cooperation establishment and asset management.

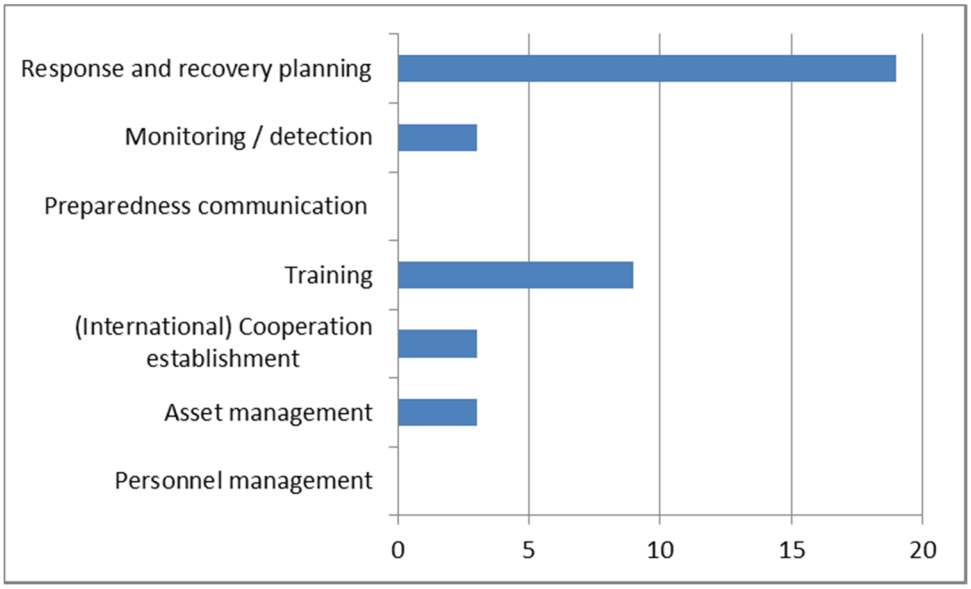

Figure 18: Tasks in preparedness phase

Within the questionnaire and the desk research the highest number of standardisation needs was assigned to the response phase. Three tasks were mentioned most frequently: information management; command, control and coordination as well as warning/crisis communication. Rescue operations and situation assessment as well as emergency health care were also phases where a need for more standardisation was expressed.

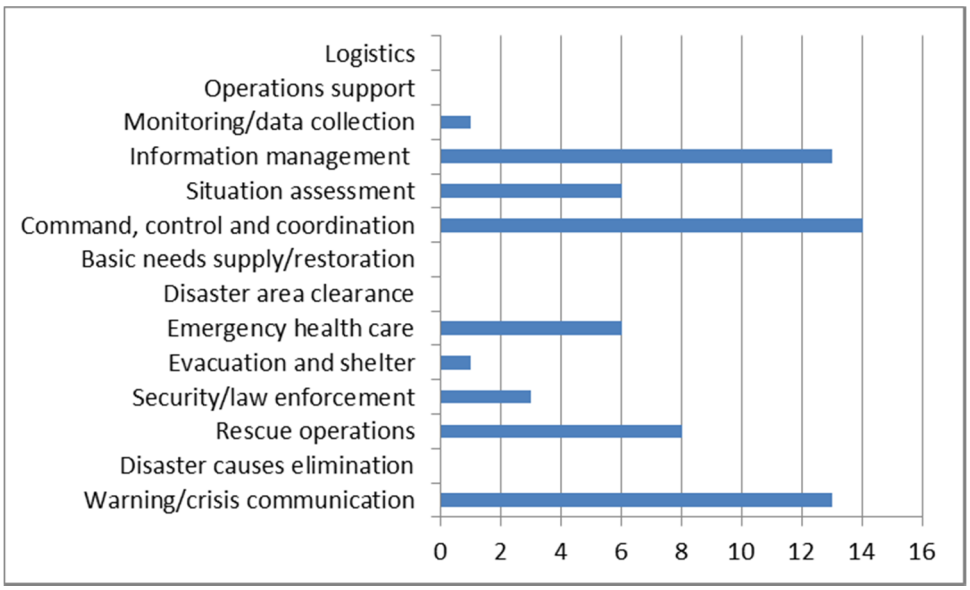

Figure 19: Tasks in response phase

Only four needs for standardisation were indicated in the recovery phase, three of them were concerned with the task of re-Establishing infrastructure and one with humanitarian impact recovery.

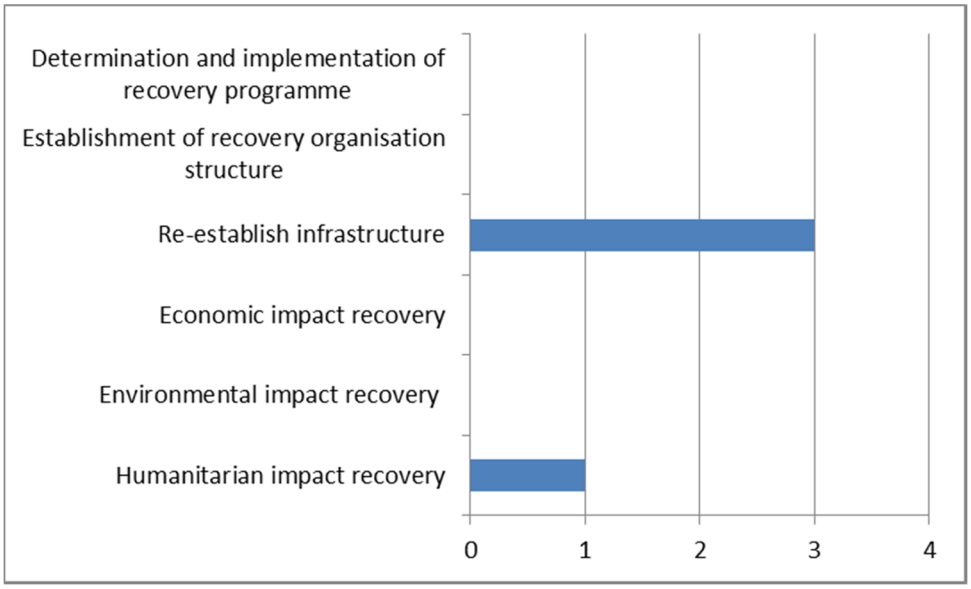

Figure 20: Tasks in recovery phase

While results with regard to the specific subcategories were quite heterogeneous, several subcategories received an unusually large number of standard needs (Figure 17). Given the predominance of needs in the response and recovery phase, it is unsurprising that three subcategories came from the response phase (information management; command, control and coordination; warning/crisis communication) and the remaining two, including the most often cited need are in the recovery phase (response and recovery planning; training). It might be useful for the workshops to follow up on this finding and further discuss why so many standardisation needs have been requested within these tasks.

Figure 21: Top five standardisation needs by subcategories.

5 Recommendations for the workshops (T3.3)

Several results of this analysis have implications for the development of the workshops. First, the large number of standardisation needs in the response phase requires a preliminary selection of thematic foci for the workshop. Second, the limited needs expressed particularly in the recovery phase poses the question as to why it has received so little attention. Are standards in fact abundant in the mitigation phase or have end-users not yet reflected on the need for standards in this phase? Resilience may have simply not yet caught the attention of those end-users who are engaged in mitigation work. Another explanation why recovery and mitigation have been rather abundant in needs could be due to the large number of EU-projects that have been surveyed. Possibly, the EU has focused their attention on these phases instead of funding projects in mitigation and recovery, which could have produced these skewed results. Another possible explanation is that standardisation needs appear to be more necessary if the pressure to react quickly is high. This pressure to react quickly is more prevalent in the preparedness and response phases.

To further discuss and validate the gathered needs within the individual phases they should be prioritised by end-users for the workshops.

As mentioned in the questionnaire the different national legislative systems seem to be the main reason why some problems have not been solved by implementing standards so far. A common European legal system would be beneficial for standardisation activities in the area of disaster management and resilience. As this seems to be unrealistic in the near future, other solutions shall be discussed.

Annex 1 List of the projects covered in the desk research

ACRIMAS	DOGANA	IMPACT	PULSE
AF3	DRIVER	IMPRESS	Reaching OUT
ANYWHERE	ECOSSIAN	IMPROVER	RECONASS
ATHENA	EDA T&E BioDIM	INACHUS	REDIRNET
BRIDGIT	EDEN	INTACT	RESCCUE
BRIGAID	EDUCEN	I-REACT	RESCUER
BROADMAP	ELASSTIC	ISIS	RESIN
C2-SENSE	ELITE	ISITEP	RESOLUTE
CAERUS	EMERGENT	M/487	SAFECITI
CAPER	EMYNOS	MEDIA4SEC	SAFEWATER
CARISMAND	EPISECC	nanoSTAIR	SALUS
CAST	ERNCIP CBRNE STDS 16	NEXES	SAVE ME
COBACORE	ESENET	OPERAMAR	SAWSOC
CONCORDE	ESPRESSO	OPSIC	SECINCORE
CONSORTIS	EU-CIRCLE	PANDEM	SECTOR
CRISP	EVACUATE	PANDHUB	SECUREPART
CRISYS	EWISA	PEACE	S-HELP
CUIDAR	FASTPASS	PERSEUS	SHERPA
DARIUS	FORTRESS	Pop-Alert	SLAM
DARWIN	GIFT	PRACTICE	SLANDAIL
DESTRIERO	HARMONISE	PREDICT	SMARTPRO
DISASTER	HECTOS	PROGRESS	SmartResilience
DITAC	ICARUS	PSYCRIS	SMR
SNOWBALL	SOTERIA	SPARTACUS	SPEEDKITS
STACCATO	SUPER	TACTIC	TAWARA_RTM
VALUESEC			

Annex 2 Online questionnaire

Introduction

ResiStand is a Horizon 2020 project which aims to find new ways to foster the crisis management and disaster resilience capabilities of the European Union and its Member States through improved standardisation activities.

As described by CEN/CENELEC, "a standard is a document that sets out requirements for a specific item, material, component, system or service, or describes in detail a particular method or procedure." Standards thus ensure "that materials, products, processes and services are fit for their purpose" (ISO), enabling harmonisation on national, European or international level.

The project ResiStand contributes to enhanced disaster resilience capabilities by identifying and analysing the drivers, constraints and expectations towards standardisation of **three main stakeholder communities: Standardisation Organisations**, **end-users / Practitioners** in crisis management and disaster resilience, and **Suppliers**, consisting of researchers, industry and SMEs.

To fulfil its objectives, ResiStand starts with identifying current problems in the area of crisis management and disaster resilience that might be solved or improved by standardisation at the European level. Thus, **this questionnaire addresses end-users / practitioners working in the area of crisis management and disaster resilience, to identify problems in their daily operations for which standardisation / harmonisation at the European level might be a potential solution.**

The questionnaire will take 10-15 minutes to complete and comprises six questions plus information related to your professional profile. It is open to all end-users/ practitioners in the field of crisis management and disaster resilience. You are thus welcome to forward the link to the questionnaire to any person you consider is suitable.

ResiStand's partners also kindly invite you to join the ResiStand end-user Community (E-UC), in case you haven"t registered yet. You may do so at the end of this questionnaire.

For further information on the EU project ResiStand, please visit http://resistand.eu/ or contact info@resistand.eu. If you have any questions regarding this questionnaire, please contact Ms Isabelle Linde-Frech (isabelle.linde-frech@int.fraunhofer.de).

PLEASE SEND YOUR COMPLETED QUESTIONNAIRE(S) TO MS ISABELLE LINDE-FRECH

UNTIL FRIDAY, SEPTEMBER 23 17:00.

By proceeding, you confirm to have read and understood this information sheet[5] and to consent the following:
My participation in this survey is voluntary, I understand that I will not be paid for my participation, but I understand that my consent does not take away any legal rights in the case of negligence or other legal fault of anyone who is involved in this study. I further understand that nothing in this consent is intended to replace any applicable EU, state, or local laws.

[5] Please find the information sheet linked on the starting page of the online questionnaire.

The following questions will give you the opportunity to describe an issue or a problem (at a regional, national or European level), which might be solved or improved by standardisation / harmonisation at a European level. This issue might relate to a certain process or could be of a technical, operational, procedural, linguistic or semantic nature. It will be possible to complete and submit the questionnaire several times and thus address as many problems as you wish.

Please think of a problem that possibly could be solved by standardisation. In which phase of disaster management is it located?

Disaster or crisis management can be divided into four phases, following the definitions by ISO 22320[6] and UNISDR[7]. Please choose from the list below, the respective (most suitable) phase related to the problem you want to describe:

☐	**Mitigation** ISO 22320 Definition: Measures taken to prevent, limit and reduce impact of the negative consequences of incidents, emergencies and disasters.
☐	**Preparedness** ISO 22320 Definition: Activities taken in order to prepare incident (disaster) response.
☐	**Response** ISO 22320 Definition: Actions taken in order to stop the causes for the imminent hazard and to mitigate the consequences of potentially destabilizing or disruptive events and to recover to a normal situation.
☒	**Recovery** UNISDR Definition: Restoration and improvement, where appropriate, facilities, livelihoods and living conditions of disaster-affected communities, including efforts to reduce risk factors.

What is the related task in the indicated disaster management phase?

Disaster management phases can be associated with specific fields of work/ tasks. Please choose from the four tables below **the table related to the previously specified phase** and **indicate the (most suitable) field of work/ task**, the problem you want to describe is related to **(only one answer)**:

TASKS RELATED TO MITIGATION

☐	**Risk identification** Process of finding, recognizing and describing risk. (ISO 31000)
☐	**Risk analysis** Process to comprehend the nature of risk and to determine the level of risk. (ISO 31000)

[6] International Organisation for Standardisation (ISO) 22320:2011 Societal security -- Emergency management - Requirements for incident response https://www.iso.org/obp/ui/#iso:std:iso:22320:ed-1:v1:en

[7] 2009 The United Nations Office for Disaster Risk Reduction (UNISDR) terminology on disaster risk reduction http://www.unisdr.org/we/inform/publications/7817

☐	**Risk evaluation** Process of comparing the results of risk analysis with risk criteria to determine whether the risk and/or its magnitude is acceptable or tolerable. (ISO 31000)
☐	**Property protection (incl. critical infrastructure)** Actions that involve the modification of existing buildings or structures to protect them from a hazard, or removal from the hazard area.
☐	**Natural resource protection** Actions that, in addition to minimizing hazard losses also preserve or restore the functions of natural systems. (FEMA)
☐	**Risk analysis** ISO 31000 Definition: Process to comprehend the nature of risk and to determine the level of risk.
☐	**Public education and awareness raising** Actions to inform and educate citizens, elected officials, and property owners about the hazards and potential ways to mitigate them. (FEMA)
☐	**Trend analysis** Investigation of the evolution of risks. (in line with ISO 17666)
☐	**Monitoring and review** Ensuring controls are effective and efficient, obtaining further information to improve risk assessment, analysing lessons learned, detect changes in internal and external context, identify emerging risks. (ISO 31000)

TASKS RELATED TO PREPAREDNESS

☐	**Personnel management** Activities to provide enough and skilled personnel that is required to carry out certain response and recovery tasks: Establish workforce and education of knowledge and skills to perform certain response or recovery tasks.
☐	**Asset management** Activities to provide equipment, tools, ICT and other assets that are required to enable to respond to and recover from disasters: Procurement of infrastructure, equipment, (ICT) tools and supplies that are needed to respond/recover as well as maintenance of the infrastructure, equipment and (ICT) tools, and warehousing of relief goods.
☐	**(International) Cooperation establishment** - between emergency services and with third parties: Process of working or acting together for common interests and values based on agreement. Note: The organisations agree by contract or by other arrangements to contribute with their resources to the incident (disaster) response but keep independence concerning their own hierarchical structure. (ISO/PAS 22399)
☐	**Training** Activities designed to facilitate the learning and development of knowledge, skills, and

	abilities, and to improve the performance of specific tasks or roles (in disaster response and/or recovery). (ISO 22300)
☐	**Preparedness communication** Communicating, consulting and/or instructing the pubic how to be well-prepared for a crisis/disasters and how to behave when a crisis/disaster event occurs.
☐	**Monitoring / detection** Determine the status of an environment to alert personnel (i.e. emergency services) to the presence of an incident and to allow control (response) actions to be initiated. (based on ISO 14004 and ISO 10418)
☐	**Response and recovery planning** Develop, compile and maintain procedures and information in readiness for use in an incident (response and recovery). (ISO 28002)

TASKS RELATED TO RESPONSE

☐	**Warning/crisis communication** Providing information on the threat or disaster, including realistic guidelines on which safety measures one should take, and – with respect to volunteer management – how one could assist in disaster response.
☐	**Disaster causes elimination** On-site activities to stop or to contain the cause of the disaster; depending on the disaster it might be firefighting, flood control, stop spill of hazardous materials, and containment of hazardous materials.
☐	**Rescue operations** On-site activities to save lives; it concerns: search and rescue (SAR), triage of victims, decontamination of persons, stabilisation (first treatment), and ambulance transport to safe areas or (field-) hospitals.
☐	**Security/law enforcement** Securing areas/persons, identification of persons, forensics, maintain public order, and traffic management (both in-going and out-going the affected area).
☐	**Evacuation and shelter** This concerns (a controlled) evacuation of persons and animals from a certain area or building, and the provision of shelter to the evacuees, including provision of nutrition and sanitation to evacuees and reunification of evacuees with their relatives.
☐	**Emergency health care** Off-site activities to save lives; it concerns: Health service in regular hospitals, health service in field hospitals, quarantine and isolation, mass prophylaxis/vaccination, and psychological care.
☐	**Disaster area clearance** This concerns debris clearance, decontamination of objects (contaminated area, infrastructure and/or vehicles), water management (draining and pumping), and animal destruction of (potentially) infected animals.

☐	**Basic needs supply/restoration** This category of tasks concerns the supply and/or restoration of basic products and services, or alternatives, which are of vital importance to survive: Provision of drinking water and sanitation, provision of food, provision of energy, and provision of ICT/Telecom.
☐	**Command, control and coordination** Decision-making, planning and tasking activities at the various coordination and command levels that are involved in managing a certain disaster event (including volunteer management and collaboration with third parties while responding to the disaster situation).
☐	**Situation assessment** Development of operational information through enrichment of collected data, including the development of a common operational picture (COP) and threat assessment.
☐	**Information management** Storing (log-keeping) and sharing of information such as collected data, assessments made and decisions taken.
☐	**Monitoring/data collection** Collection of data by physical monitoring (surveillance) and data-mining.
☐	**Operations support** Supply of basic services to first responders on-site or nearby the location of the incident to enable their response activities. It concerns provision of communication/ICT to first responders, provision of energy to first responders, and guarantee safety and security to first responders.
☐	**Logistics** Transport of personnel and materiel, including supply of relief goods (vaccines, food, tents, etc.) fuel and spare parts, to support sustained disaster response operations.

TASKS RELATED TO RECOVERY

☐	**Humanitarian impact recovery** Provision of public health and safety services and provision of food and shelter for those displaced. This covers for example physical impacts (including individuals' health, housing and financial needs), psychological impacts, and deaths.
☐	**Environmental impact recovery** Clearance of pollution and decontamination, dealing with waste and restoration of natural resources and habitats.
☐	**Economic impact recovery** Economic and business recovery and recovery from financial impact on authorities.
☐	**Re-establish infrastructure** Re-establishment of transport routes and restoration of interrupted utilities and other essential services.

☐	**Establishment of recovery organisation structure** One or more recovery organisation structure(s) has/have to be established both on the short-term as well as on the long-term. Recovery structures and processes have to be established, based on the general organisation structures that are developed in the preparedness phase.
☐	**Determination and implementation of recovery programme** Based on an impact assessment a recovery programme has to be established on policy level, and has to be implemented in accordance to policy-decisions.

What is the problem you want to solve by standardisation at a European level?

Please provide a description of the problem/ issue, for which you consider that standardisation / harmonisation at a European level might have the potential to improve the situation. This issue might relate to a certain process or e.g. be of a technical, operational, procedural, linguistic or semantic nature.

What type of standard could solve the problem?

The given types of standard follow the definition by ISO/IEC Guide 2:2004.

☐	**No idea**
☐	**Basic standard –** Wide-ranging coverage or contains general provisions for one particular field
☐	**Terminology standard** – Concerned with terms, accompanied by their definitions etc.
☐	**Testing standard –** Concerned with test methods, sometimes supplemented with other provisions related to testing
☐	**Product standard –** Specifies requirements to be fulfilled by product or group of products, to establish its fitness of purpose
☐	**Process standard –** Specifies requirements to be fulfilled by a process, to establish its fitness of purpose
☐	**Service standard –** Specifies requirements to be fulfilled by a service, to establish its fitness of purpose

You might leave an additional comment/ explanation here:

From your knowledge or experience: why hasn't this problem been addressed by standardisation so far?

☐	**No idea**
☐	**Please leave your comments here:**

Have you already participated in any standardisation activity/ies?

(multiple choice possible)

☐	**No**
☐	Yes, at **national** level
☐	Yes, at **European** level
☐	Yes, at **international** level

Please **give an additional short description/ explanation**, of the type of involvement and if the participation was successful or why you haven't been involved so far:

Do you want to sign up for the ResiStand's end-user Community (E-UC)?

To stay updated about project outcomes, to ensure that you don#"t miss opportunities to participate in events, and to get involved in improving standardisation processes in the area of crisis management and disaster resilience you should join the ResiStand end-user community (E-UC). As a member of the E-UC you will contribute to increased interoperability and compatibility between systems, services, and authorities, i.e. across borders. Once signed up, you will also be invited to end-user workshops scheduled between January and March 2017 with the possibility to have your travel costs reimbursed (only for a limited number of members of the E-UC):

☐	No, I don"t want to sign up
☐	I" m already a member of the E-UC

☐	Yes, I"d like to sign up, please send me future information via e-mail in **html** format
☐	Yes, I"d like to sign up, please send me future information via e-mail in **text** format

Please indicate your professional profile

TYPE OF ORGANISATION:	
☐	Governmental organization
☐	Non-governmental Organization
☐	Research / Academia
☐	Industry / SME
☐	Other:
COUNTRY:	
NAME OF YOUR ORGANISATION:	
YOUR POSITION:	
YOUR LAST NAME:	
YOUR FIRST NAME	
YOUR E-MAIL ADDRESS:	

Please send your completed questionnaire(s) to
Ms Isabelle Linde-Frech (isabelle.linde-frech@int.fraunhofer.de) **until September 23, 2016, 17:00.**
You may send as many completed questionnaires as you wish – please number them accordingly.

THANK YOU VERY MUCH FOR YOUR CONTRIBUTION!

Annex 3 Excel-File for desk research

As provided to the T3.2 partners to collect and cluster the information out of the identified research projects. Drop downs were implemented for the project names as well as for answering questions 1+2+4, which followed the definitions from the project handbook (D1.1.), to enable fast and comparable completion of the table.

Questions 1-4 are the same ones that have been raised

Add standardisation need

Project	Q1: DM phase	Q2: DM task related to				Q3: Description of the	Q4: What type of standard	additional comments
		Mitigation	Prepardness	Response	Recovery			
DRIVER	Mitigation	Public education and awareness raising				evacuation training of the public	Service standard	INVENTED/FANTASY EXAMPLE