

Opti-Alert

**- Enhancing the efficiency of alerting systems through
personalized, culturally sensitive multi-channel communication -**

Report on Recommendations for Socio-Culturally Sensitive Alerting

- April 2012 -

WORK PACKAGE	WP2: Socio-cultural factors in risk and crisis communication
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Opti-Alert aims to investigate how to improve and enhance the efficiency of alerting systems. The project runs from January 2011 to December 2013, it involves six partners and is coordinated by Fraunhofer Gesellschaft zur Förderung der angewandten Forschung e.V. (FHSS). More information on the project can be found at <http://www.opti-alert.eu/> or by contacting the project manager Dr. Michael Klafft (Michael.Klafft@fokus.fraunhofer.de).

Objectives of Opti-Alert in general and WP 2 in particular

The EU-funded project “Enhancing the Efficiency of Alerting Systems through Personalized, Culturally Sensitive Multi-Channel Communication” (“Opti-Alert” – EC Grant Agreement No 261699) deals with improved regionalization and personalization of warning messages, as well as a closer cooperation and integration of industry-funded alerting systems and state-funded alerting tools.

The deliverable D.2.7 “Report on Recommendations for Socio-Culturally Sensitive Alerting” is the seventh out of seven deliverables within work package (WP) 2: Socio-cultural factors in risk and crisis communication. WP 2 addresses the fundamental question: How are different types of risks (natural as well as man-made) perceived in different socio-cultural and regional contexts, and what is the impact of these perceptions on efficient risk communication? Within this report we will review all research results from this work package with the goal to derive recommendations for the development of the alerting (and simulation) tool suite planned in subsequent work packages.

We have chosen for our study on WP 2 an innovative methodological social scientific approach that combines the information and knowledge gathered by in-depth interviews with experts of crisis management and risk and crisis communication from public authorities responsible for civil protection and the research of official publications, websites, literature, available statistics, etc. with the information, impressions, knowledge, (information) behaviour and information expectations reported by individuals who were actually personally concerned by a previous disaster or are member of “the ordinary public”. The major advantage of this approach is that we will not only (re-)produce an official perspective in regard to the supply of crisis management and crisis communication strategies and methods - of which officials might take for granted that this supply will be used by their target groups as intended by the sender - but we will also gather the perspectives of the users of the official offers - or rather not - and what they actually did and why they did as they did.

Content List

1	Introduction	5
2	Crisis Management.....	7
2.1	Crisis management structures and processes	7
2.2	Attitudes and assessments of the public.....	9
2.3	Shortcomings and possible improvements.....	10
2.4	Conclusions on risk management	12
3	Perceptual Patterns of Disaster.....	13
3.1	Public risk perception and their assessment by authorities.....	13
3.2	Implications for risk and crisis communication.....	16
4	Knowledge Structures on Alerting and Disasters	18
4.1	Knowledge: Assessment by experts and the public	18
4.2	Implications for risk and crisis communication.....	19
5	Crisis Behaviour - Coping Strategies and Compliance.....	21
5.1	Behaviour: Assessment by experts and the public.....	21
5.2	Implications for crisis communication.....	23
6	Information Behaviour & Expectations	25
6.1	Channels & infrastructure for crisis communication and alerting used by authorities	25
	The role of new media: SMS and social networks	27
6.2	Information channels preferred by the public in case of a disaster.....	27
6.3	Implication for Risk and Crisis Communication.....	32
7	Executive Summary	36

1 Introduction

This report is the final and concluding report of WP 2 of Opti-Alert. The “report on recommendations for socio-culturally sensitive alerting” will review all research results from this work package with the goal to derive recommendations for the development of the alerting (and simulation) tool suite planned in subsequent work packages.

The basis of this qualitative study has been a comparative study on crisis management, crisis communication, individual behavior reported by those who survived a disaster and information behavior and expectations of “ordinary” members of the public of seven countries: Austria, France, Germany, Italy, Hungary, the Netherlands, and Sweden. The study was performed by the sine-Institut, based in Munich, a social scientific research institute. The research was only possible through strong cooperation with the partners of the Opti-Alert consortium: they suggested potential experts from their respective country for the interviews as well as individuals who had survived disasters; partners recruited people and provided room for the focus groups in their premises. Most of all, partners contributed to WP 2 via intensive discussion of the design of the respective work packages as well as discussion of the results at various stages and internal project meetings.

Specifically, this report encompasses an overall view of findings pertaining to the following elements:

1. The design of the interviews, as laid out in D 2.1: *Conceptual interview design report*, was the basis for the analysis of the results with experts and survivors, and is therefore implicit to all results presented here.
2. The seven country reports with experts from risk and crisis management and communication, including its comparative analysis as laid out in D 2.2: *Reports on semi-structured interviews with risk-communication experts*.
3. The comparative analysis of the in-depth interviews with people in the seven examined countries who were personally affected by a natural or man-made disaster as displayed in D 2.3: *Reports on individuals previously affected by crises*.
4. Research for all seven countries on socio-cultural diversity in crisis communication that includes statistics on risk perception, trust in authorities, media usage and questions of social integration reported within D 2.4: *Report on socio-cultural clusters in the participating countries*. Within this report subjective and objective factors were identified that are fundamental elements for a model of socio-cultural clustering.
5. A selection of these factors (age, sex, migration background, different risk areas, different living areas) were agreed by the consortium as basis for the recruitment plan of the focus group interviews that were conducted and analysed in six out of the seven countries (with the exception of the Netherlands). Results of the analysis were given in D 2.5: *Report on focus-group interviews*.

The following report is divided into five main chapters: In chapter 2 risk and crisis management and alerting structure principles of the examined countries will be reported, including the assessment thereof by the respective public. Chapter 3 is devoted to perceptual patterns of disasters. It will be addressed, in particular, how perceptual patterns of disaster of

authorities are distinguished from those of the public. In chapter 4 the knowledge structures on alerting will be analysed with a particular focus on the interface between the government and the public: what knowledge on alerting, crisis management and disasters do authorities expect the population to have – and how well informed do people feel and report to be in reality? The way people behave and cope with disasters is dependent on knowledge. Chapter 5 analyzes coping strategies and compliance, again in a comparative perspective: what differences do we find between what authorities assume about public response compared to what was reported or assumed by the public themselves? Finally Chapter 6 is a comprehensive analysis of information behavior and information expectations in case of a disaster: Which channels for risk and crisis communication are used by authorities to inform the public and which channels are considered useful, suitable and, in particular, trustworthy, by the public? The potential role of new channels for alerting (social media, SMS, etc.) will be addressed here, too. Each of these chapters end with recommendations that follow from the results: implications for risk and crisis communication. The executive summary at the end of the reports highlights the most important findings of this work package.

2 Crisis Management

In this section the crisis management structures and processes of the seven countries will be summarized and analysed in regard to shortcomings and promising improvements. For that purpose, suggestions from experts interviewed in this project will be reviewed and compared to criticism expressed by attendees of focus group and biographic interviews. In this context, special attention will be given to the crisis management capabilities of authorities as well as to the general attitude these actors are met with by the public.

2.1 Crisis management structures and processes

Crisis management deals with exceptional events that threaten the functioning of a society in several vital aspects. The design of political and administrative structures meant to deal with and overcome such events is therefore a critical task for each country and requires thorough planning, extensive information, skilled personnel and substantial amounts of resources.

Given these preconditions, all of the countries examined in this project have basically decided on the same fundamental structure, which is – regardless of the actual legal system of distribution of competencies – shaped by the principle of subsidiarity. According to this, the key position is with local and regional authorities: Mayors and heads of regional bodies are the first political decision makers to be informed of a crisis, who then in turn activate the relevant administrative and political structures and coordinate the rescue services¹. If the crisis exceeds local or regional capacities the next higher administrative level will be engaged, a step which can be decided top-down as well as initiated by the mayor him/herself. In very severe cases – usually labelled as ‘national crisis’ – national authorities will take the lead, which usually means the involvement of special national-level bodies and the national government itself.

This process as well as several other aspects linked to the management of a disaster is predefined in all countries by the according plans. While in some countries like Austria, Germany and the Netherlands these plans exist at national or regional level, in other countries like France, Hungary or Italy each community is obliged to have prepared such a plan, at least if it is situated in a risk area.

Beyond these rather general similarities each country has its specificities regarding how crisis management is organized. In **Austria** structures and processes are quite different from those of most other countries insofar as the highest authorities can be found at the level of the Bundesländer (states) instead of the national level, which reflects the federalist composition of the state. This means that, except for nuclear crises and pandemic diseases, national level authorities will be involved only after receiving requests from the states or other subordinate bodies.

A similar model can be found in **Germany**, which is a federal state as well. Despite an extensive administrative crisis management structure at federal level – the Federal Office of Civil Protection and Disaster Assistance BBK, the German Emergency-Precaution-Information-System deNIS, the Joint Information and Situation Centre GMLZ, a federal ad-hoc crisis committee and the Federal Disaster Relief Forces THW – the main responsibility in crisis management is formally with the states. Their willingness to transfer decision-making

¹ The actual coordination of rescue services like fire department, medical services etc. is often transferred to a trained specialist, though.

power to the national government and its institutions can be expected to depend mainly on their need for additional resources, be it in terms of coordination capacity or information.

France can be perceived as the other extreme in regard to the degree of (de-)centralization. The connection of the French crisis management with the military sector is still very pronounced. While in all other countries the civil protection has clearly evolved away from this sphere after the end of the Cold War, in the French institutions personnel with military background are still present. Therefore it is not surprising that a clear chain of command and a strong hierarchy are considered essential for effective crisis management in this country. This is also reflected in the existence of so called *zones of defence*, which overlay the civil administrative structure of departments and form – next to the national government – an additional layer of control over regional and local activities in this context. Another French particularity is the existence of an extensive system of disaster management plans: These not only exist at all administrative levels but are also differentiated according to the type of event (natural or man-made) and other criteria like responsibilities (plans for rescue operators and plans for medical facilities).

In contrast to the French approach, crisis management experts from **Italy** strongly emphasized that the autonomy of regional and especially local authorities is crucial for successfully handling a crisis. Though, like in France, superior institutions can take over the responsibility from mayors and regional actors and certainly will do so during large disasters, the autonomy of these subordinate bodies will usually be respected as, for example, mayors of course have a better knowledge of their territory and will thus be able to make more appropriate decisions than the national government. A second characteristic of the Italian model can be found in separate crisis management institutions, which are labelled the civil protection system, a name still bearing reference to the military origin. While in most of the other countries crisis management is a task performed by the common authorities, in Italy there are special civil protection bodies at each level adding to this structure.

Among the countries examined in this project only **Hungary** exhibits a similar organisation. Like in Italy the former purpose of this civil protection system was to protect civilians in the case of (nuclear) war and was transformed after 1990 to be focussed on natural- and man-made disasters. However, together with the end of the military threat from the Cold War context the budget of these bodies decreased, which is why today they can mostly be found in high risk areas only and are often understaffed even there.

Like in France we find special administrative regions for crisis management in **the Netherlands**, the so called *safety zones*. In contrast to France these zones do not aggregate several departments but form an administrative structure independent of the Dutch provinces. In fact they are arranged according to the existing police structures and form the middle layer of the crisis management system. Another point which is quite unique in the Netherlands is the political arrangement at the top: While in all other countries reviewed here there is a clear leadership either in the form of a leading ministry or the head of state, in the Netherlands such a supreme command is missing. As none of the heads of the ministries have the power to overrule the other even in a disaster, coordination and compromise features very prominently in the Dutch system.

Finally, **Sweden** does not feature any major variation from the general model outlined above: The chain of command reaches from the mayors up to the national government with the Swedish Civil Contingencies Agency (MSB) as a specialized crisis management institution. In a disaster situation, the usual administrative entities from all effected levels serve as crisis management bodies, coordinating the disaster relief forces and other necessary resources.

2.2 Attitudes and assessments of the public

Successful crisis management strongly depends on the cooperation of the population it seeks to protect. This is apparent regarding compliance with public crisis communication (i.e. evacuation orders) but also relevant for other aspects of a functioning management process (i.e. acceptance of the priority of rescue services in traffic). It therefore matters with which attitude the public meets such actors, whether they trust their decisions in such critical and often life-threatening situations or not and also how they judge their skills and capacities.

Generally speaking, the reputation varies substantially between the countries and sometimes also between different actors within them, especially between politicians and non-political actors like (governmental) experts or disaster relief forces. With **Austria** we find a country where politicians and disaster-related professionals enjoy a very high level of confidence in regard to their credibility as well as their skills needed for crisis management. Especially fire brigades and medical services are perceived as well-trained and professional. Though no one expects them to reduce the risks associated with a major disaster to zero, their capabilities and the official regulations in the field of man-made and natural risks add to the high feeling of safety that distinguishes Austrians from most other countries in question here. The only exception to this concerns a nuclear crisis, as people remember the Chernobyl accident where authorities were both overwhelmed and quite restrictive in their information policy, though people expressed their understanding of this attitude.

In **France**, the general attitude is rather negative, especially concerning politicians. As these are often regarded to skew the truth in everyday political matters no less is expected in serious crises, though people assume that this would belong to the category “for their own good”. This already indicates that though people may judge general politics not to follow their interests, during a crisis the basic commitment to the common good in terms of safety is by and large unchallenged. This finds its expression also in the fact that all French would turn without hesitation to their municipality and the rescue services in a crisis situation, irrespective of some doubts of whether their capacities will be sufficient.

Looking at **Germany**, we find a picture quite similar to Austria, though the trust in politicians is somewhat less pronounced. On the other hand, disaster relief forces such as fire fighters and medical rescue services have a very positive reputation among the public that increases when people have already had disaster experiences (something which is not natural as we will see with some other countries). Capabilities in terms of resources and management skills are judged to be sufficient for most cases except for a nuclear accident, an event which is expected by many to result in chaos, especially at local levels.

Hungary presents a very mixed picture, with areas where a rather high level of confidence in authorities and rescue services prevails (urban area) and others where people doubt whether these forces will be able to protect them in light of little training and a lack of financial resources. Besides that, we find a similar situation like in France with a generally low trust in politicians but where people would turn to their municipality and other authorities in a crisis situation nonetheless.

Among the seven countries analysed in Opti-Alert, **Italy** is clearly the one where politicians have the worst reputations. Particularly younger people, but also Italians who have already experienced a disaster, often have a devastating picture of each elected person involved in disaster-related processes. Many reported feeling very unsafe even in their homes or public buildings like schools due to poor safety regulations. Those who live in a high risk area not only feel uninformed but partially misinformed. Others stated that even in cases of repeated disasters the performance of the mayor and his staff did not improve but remained chaotic. Only the civil protection bodies and fire brigades are rated as competent and helpful.

As for **the Netherlands**, results are rather mixed. On the one hand, the public is ascribed a rather critical attitude towards authorities by experts. People do not simply comply with their

advice or orders but often ask for reasons and backgrounds before doing so. On the other hand, there is no such mistrust like we have seen in France and especially Italy – comparative Eurobarometer-data show that trust in authorities is comparatively high. Regarding the special topic of crisis management, the judgement seems to strongly depend on previous disaster experiences: while some have experienced very professional management and thus judge the municipality and fire brigades accordingly, others have less positive memories, i.e. in terms of a municipality not giving out any information during a highly critical industrial accident or public health institutions downplaying the related risks in the aftermath.

Sweden again resembles Austria in many respects: General trust in authorities is very high, which applies to their sincerity as well as to their disaster management skills. Like in the “Alpenrepublik” this results in a very strong feeling of safety, even if some people do recognize that resources will probably be insufficient during a major crisis, i.e. in terms of the number of ambulances. Others who experienced the performance of crisis management actors as poor – one person remembers an industrial accident without receiving any information from the municipality or the operator, just like in the Netherlands – even speak of an “overconfidence” in authorities, which nevertheless once more underlines the general pattern of very high trust.

2.3 Shortcomings and possible improvements

As the previous passages already indicate, public crisis management is often far from perfect. In this section shortcomings as identified by experts but also by the public will be presented and – if possible – compared. On this basis, recommendations for improvements can be made that consider both perspectives.

Starting again with **Austria**, we have already seen that the public is quite satisfied with the current state of the crisis management system. Those who have already experienced a disaster received quick and comprehensive help from local authorities, while others expect no less. By contrast, political actors especially at the federal level do indeed see room for improvement. An official publication on the national crisis management system from 2009² clearly stated that the cooperation between the states and the federal level is rather weak and should be improved. However, like in many other policy areas the states are reluctant regarding such proposals for fear of losing still more competencies to the federal state, which is why the cooperation is still based on informal contacts in many parts. As this could prove disastrous in a major crisis situation, when routines and proven information channels are important, a political solution has to be found soon.

Like in Austria, in **France** most people affected by a disaster were mainly content with the way authorities handled the event. However, there have also been reports by victims who encountered very poorly equipped disaster relief forces or who did not receive any support even after several hours. Though it is in the nature of a disaster to overwhelm a society, there are references from both sides – the public and experts – that several such shortcomings can be traced back to the centralistic structure of the French crisis management system. This can be illustrated by the tragic events during storm Xynthia 2010 in La-Faute-sur-Mer, a small community on the Atlantic coast: After having complied with the general alert which was issued for large parts of France and advised to close the doors, windows and electric shutters, many residents were surprised by a massive flooding from the ocean and died of hypothermia, being trapped in their flooded houses without electricity. A more localized assessment of the approaching risk could have revealed such shortcomings and therefore led to a strategy more

Bundesministerium für Inneres, 2009: SKKM. Strategie 2020; http://www.sicherheit.ktn.gv.at/171192_DE-.pdf (last retrieved 27.04.2012).

suited for this special situation. According to public crisis management experts, the current revision of the system will consider this problem and assign more autonomy to the mayors and other local actors during a crisis.

The situation in **Germany** again resembles the picture in Austria in many ways. Neither in the interviews with people effected by disasters nor in the focus group discussions was there any criticism against the current shape of public crisis management. This perception is shared by crisis management experts, who emphasize that, in terms of financial resources and manpower, the German system is superior to most others in Europe. What is more, via regular extensive trainings involving crisis managers from the states as well as from the federal level, most internal shortcomings have already been identified and removed. Only a decade ago the situation was still quite different, when the coordination between the states and federal institutions turned out to be chaotic and resulted in massive losses of efficiency.

In terms of shortcomings, **Hungary** stands out most in this analysis. The experts interviewed identified several severe problems, starting with the disregard of crisis regulations during operations and inadequate crisis management plans in many communities, two critical issues which have not been mentioned in any of the other countries. Furthermore, with the civil protection bodies there are separate crisis management structures these are usually led by non-professional political actors lacking expertise in this regard. What is more, due to the lack of financial resources all crisis management institutions are regarded as insufficiently prepared for almost anything beyond ordinary fires. This situation is of course recognized by the public, especially in the urban context where attendees of the focus group criticized the lack of financial resources and lack of professional, well-trained staff. As already mentioned, the assessment was different in other areas which may reflect regional differences. Nevertheless, people who did not have substantial information on the condition of crisis management generally tended to doubt the competency and preparedness of these actors, simply because they have not been seen publicly demonstrating their readiness (“if they were [prepared] they would communicate it”). The starting points for improvements therefore not only include the obvious necessity of increasing funding and training but also a revised PR-strategy that communicates preparedness to the public.

As we have seen, the situation in **Italy** is not far better, at least in terms of the shortcomings as perceived by the population. Chaotic crisis management on site has been mentioned as only one of several problems, which is why the list of problems made out by experts – lack of resources and training – seems rather incomplete. The reports of Italians indicate that the public crisis management system is also deficient in terms of general safety regulations and crisis management plans. Therefore more money and training guides alone will not solve the problem, which can be expected to be rather deeply rooted in a generally weak administrative system in specific Italian regions. Therefore, improving crisis management must be part of a general strategy to improve public administration. A quicker approach may include a relocation of responsibilities from non-professional actors like mayors to the professional civil protection actors who are regarded as the sole actor fit to manage such critical situations.

Due to the missing focus group report from the **Netherlands** it is hard to make out improvements which are favoured by the public. Most references in this regard came from the biographic interviews with survivors of a disaster and were related to crisis communication, an issue that will be dealt with further below in this report. Nevertheless, there is also one statement referring to the structure of crisis management itself, which matches the analysis of one expert interviewed for this project: Regarding the relatively new safety regions he expected that it will take some time until the cooperation of the respective entities will function flawlessly and that problems could arise until then due to different internal configurations. What this could mean in the field was illustrated by one person who was

brought into a hospital where the staff was unprepared as the hospital happened to be just outside the border of the safety zone where the alert was published via the region's media channels only. Such problems, however, are expected to be fixed over the next years.

In **Sweden** there were no statements regarding substantial shortcomings regarding general crisis management by experts or the public, except for the doubt of some citizens whether resources would suffice during a major crisis as already mentioned above. Like in Germany during the large floods of 2003, only a major disaster will probably reveal whether this is only due to the "overconfidence" in authorities or if these will live up to their reputation.

2.4 Conclusions on risk management

The review of public crisis management structures and processes has shown that though the basic principle of subsidiarity shapes the systems in all countries, there are still considerable differences in reality and also different shortcomings. While in some countries like Austria or France these are clearly related to the structure itself (federalism or centralism), in other countries like Hungary and Italy problems result rather from unrelated issues like lack of funding and deficient planning. Nevertheless, improving the situation will be a challenge in several countries (with the exception of Germany, the Netherlands and Sweden) and require substantial political – in terms of a relocation of formal or de facto competencies – or financial and organisational efforts. Looking at the socio-demographic characteristic of the citizens voicing respective criticism, it can furthermore be concluded that shortcomings are – of course – recognized mostly by those who have already been affected by a disaster and have had a rather negative experience with public crisis management. Next to actual reforms, this category of people should therefore be addressed in the aftermath of such events in order to regain lost confidence and prevent future non-compliance. Sweden provides an example in this regard as some communities already provide this kind of "aftercare" by visiting victims to gather feedback on their operations and to clear out possible misconceptions.

3 Perceptual Patterns of Disaster

Improving risk communication by taking into account characteristics and preferences of the recipients needs to address patterns of risk perception as well. Does the public set other priorities than the authorities in regard to what is risky and what not? Do people worry more about natural disasters than about man-made disasters or the other way round? Are there certain socio-cultural groups who tend to underestimate risks? Finally, are authorities aware of such patterns? This section will address these questions by outlining patterns of risk perception and discussing related options for improved crisis communication.

3.1 Public risk perception and their assessment by authorities

Especially in regard to an abstract category like risk, perception patterns play a significant role. Even authorities are not free of such patterns, something which can be observed well over the course of time when risk priorities shift – sometimes putatively despite any change of conditions in the environment. Nevertheless, such patterns can be identified, reflected on and finally accounted for by risk and crisis management, which is a prerequisite for effective and sensible crisis communication. One result of this process is that nowadays in public crisis management there is hardly any hierarchy left in terms of which disaster risk is higher than others. The only exceptions to this rule are 1) communal crisis management plans in Italy and France which address certain risks experienced to be typical for the local area, 2) the Netherlands who have developed disaster management plans for 18 disaster risks believed to be most relevant for the country, and 3) Germany where crisis management experts stated their main worries to be natural disasters (and terrorist attacks). Save for these exceptions, authorities do not give priority to certain disaster risks and take each type equally seriously. This can be seen in the related legislation, which mostly refrains from addressing them according to type.

A different and often more fragmented picture can be found by looking at the risk perception of the populations of the seven countries examined in this project. In **Austria**, people have been found to be quite aware of natural disaster risks, particularly in the related risk areas. While in the focus group discussion conducted in the natural risk area, the local risks were recognized by all attendees. In the man-made risks area several mostly male persons tended to deny the risks connected to the local hazardous industries, being fully confident in the safety directives regulating the plants. According to a Eurobarometer-survey from 2007, Austrians worry slightly more about man-made disasters than about natural disasters, though. This paradox could be explained by the widespread concern regarding nuclear accidents, which exists despite the absence of nuclear power plants on Austrian territory and can be expected to be still a result of the Chernobyl-accident. Next to disaster type and sex, the community size appeared to be relevant for risk perception, as people from urban areas felt safer in regard to several natural disaster types like storms and floods which are expected to have a weaker impact there than in places with more open settlement structures. By contrast, residents of rural areas showed a higher risk consciousness as especially natural phenomena like storms are experienced more forcefully there.

As for the authorities, apart from occasional disregards of avalanche warnings or the like, Austrians are not expected to generally underestimate disaster risks. Rather, the public is known for an attentive and critical attitude towards crises, which refers mainly, however, to the subject of how such events are managed by the state.

Concerning the general disaster risk perception in **France**, authorities expect the public to systematically underestimate risks if they have never experienced a crisis before. This diagnosis is condensed into the thesis that French usually lack a “risk culture”. Looking at the answers from the focus group discussions and the biographic interviews with survivors, the risk perception of the public is indeed closely related to disaster experience: Especially younger persons without such experience often feel little concerned by disaster risks while adult and elder persons are more risk conscious. In the latter case, disasters lose the character of being exceptional or unthinkable events and turn into rare but expectable events. People then become confident of survival but are also aware that they can easily be affected again. This consciousness increases if people have a family to care for.

If we look at differences in perception in regard to specific disaster types, the Eurobarometer-survey tells us that French worry more about natural risks than about man-made risks. The picture presented by the qualitative approach applied in Opti-Alert is much more sophisticated, though: Risks related to natural disasters are taken as more “normal” or simply “natural” than man-made risks, however only in terms of their probability of occurrence. As a consequence, their occurrence is often met with attitudes that tend to be of a fatalistic nature (“it happens, wherever you live, whatever you might do or not”). On the other hand, regarding the impacts/consequences, especially people who already experienced this kind of disaster were confident of surviving another one by using their skills and knowledge, which is quite the opposite of fatalism. By contrast, the probability of occurrence of man-made risks is expected to become normal and controllable via adequate regulations, while the consequences of such events are more often met with fatalism (“when it is nature, well, you still have a chance – when the event is an explosion and a toxic gas cloud, what would we be able to do? Nothing. We don’t have no gas masks or anything else to protect ourselves.”). Apart from disaster experience and age, the marital status influences risk perception in France insofar as people with children are more risk conscious than those who have to care only for themselves.

In contrast to – or maybe precisely because of – the extensive crisis management structure and the vast amount of related resources and personnel in **Germany**, the public generally appears to feel quite safe, even in high risk areas, which is why most have not made any preparations for such events. This attitude was underlined by persons with migration background who stated to feel safer in Germany than in their respective countries of origin. One major exception to the feeling of safety is nuclear accidents which make several people feel slightly uneasy in their everyday life. The majority of the attendees of the focus group discussion held in the vicinity of a nuclear power plant felt quite safe nevertheless. While – as already mentioned – disaster management authorities put a special focus on natural disaster risks – according to Eurobarometer data, Germans worry about man-made disasters almost as much as about natural ones. All in all, no substantial influences of socio-cultural factors could be found, except that the feeling of unease in regard to nuclear risks was expressed mostly by female persons.

Looking again at the assessment by authorities, the German public is – just like the Austrian – expected to be very sensitive in regard to crises. However, this refers mainly to the management by authorities and crisis communication, less to the awareness of disasters. Other statements concerning the population in the disaster context did not indicate that authorities believe them to be either particularly risk conscious or ignorant. Neither did the experts mention a certain risk group which is likely to underestimate disaster risks and therefore has to be addressed with specific means.

In **Hungary** there are no clear references as to whether authorities believe the population over- or underestimates disaster related risks. However, the engagement in various related risk education measures indicates the latter. Such an assessment would fit the actual situation: The awareness among the population is generally rather low, especially among people without

previous disaster experience: Many have never thought about the risk of being confronted with a crisis situation. Furthermore, less Hungarians have made disaster preparations than people from the other six countries – only one out of ten, compared to two out of ten on average. Among potential factors influencing risk perception the (risk) area a person is living in appears to be most relevant: Firstly, in the man-made risk area the risk perception clearly differed between natural and man-made disasters. While risks from natural disasters (which were present in this area, too) were judged to be controllable, man-made disasters are regarded as impossible to control. As a consequence, many attendees tended to ignore the topic completely and therefore would be completely surprised in the case of an accident. Secondly, like in Austria, residents of urban environments clearly expressed different concerns in regard to disasters as people from rural areas. The majority from the respective focus group reported feeling safe from most type of disasters as they live in sturdy multi-storey houses which are regarded to be resistant against storms and floods. By contrast, earthquakes are a major concern in this area. Thirdly and not surprisingly, in risk areas people clearly showed more risk awareness while in non-risk areas Hungarians felt quite safe.

Similar to France, authorities in **Italy** diagnosed a lack of risk culture among the population, meaning that people expect that a disaster will not affect them personally even though it may occur in the area one lives. A second aspect of this problematic risk culture as interpreted by crisis management experts is that disaster related risks are often disregarded due to superstition: Italians “don’t want to take into consideration risks, we prefer not talking about risks because – in order to ward off bad luck” (expert quote).

Both aspects reappeared in the interviews with affected people and the focus groups. Despite the frequent occurrence of natural disasters in everybody’s assessment when speaking about the topic – the majority of the attendees had been previously affected by a flood or an earthquake at least once – a clear tendency to block out such events was visible. Most interviewees did not want to think about risks and therefore blocked out dangers even if there were related alerts. This critical condition is reinforced by fatalistic attitudes among several persons, which in turn are sometimes influenced by the belief that disasters are a divine punishment for earthly misconducts. Given this background it is not surprising that, despite of the rich disaster history in Italy, several people who had experienced a disaster were confident that this was a singular event which would not repeat. There were other single voices though, mostly by younger and single persons who acknowledged the risks and sometimes therefore moved to another area which was perceived as less risky.

With a view to potential differences in the perception regarding natural and man-made disasters, Italians strongly reflect that their country is most often affected by events belonging to the first category, especially floods and earthquakes. The resulting tendency to neglect man-made disasters is even visibly in areas harbouring several industrial plants, where the discussion mostly centred on natural risks as well³.

Finally, like in Austria and Hungary, a city's size seems to matter as well, as participants from the large city group felt relatively safe due to their location, especially when they compared their situation to living in a nearby rural area which was known to be heavily devastated by previous floods.

Like in some other countries, experts interviewed in **the Netherlands** think that the public tends to block out risks from disasters in their everyday life. The same diagnose is provided by one person from the biographic interviews. On the other hand, especially in risk areas, Dutch people have been found to be quite aware of the local risks, i.e. industrial facilities.

According to Eurobarometer, risk perception in the Netherlands is high for industrial as well as for natural disaster risks. Furthermore, of the countries reviewed in Opti-Alert the

³ It has to be mentioned that a series of floods had occurred in Italy shortly before the focus group discussions took place, though, which may have influenced this outcome.

Netherlands have the highest share of population having made preparations for disasters (three out of ten persons), which is an indicator for high risk awareness.

Due to the missing focus group discussions no socio-cultural influences could be identified.

Other than most countries, disaster management authorities interviewed in **Sweden** believed the population to have a quite pronounced safety culture, meaning that they would always comply with safety advice. While this may indicate high risk awareness concerning disasters, the picture provided by the focus group discussions is a bit more complex. Though Swedes recognize local risks around them they are often unperturbed by them. Most have not considered potential consequences of a disaster in their region nor have they elaborated the question what they would do in such a situation. As for the different disaster types, according to Eurobarometer, concern is substantially higher in regard to man-made disasters. The focus group discussions confirmed these findings and revealed that this applies particularly to non-stationary risks like transports of hazardous cargoes by train through densely populated areas.

Relevant socio-cultural factors influencing risk perception, disaster experience is, like in most other countries, a strong indicator for higher risk awareness. Furthermore, in the man-made risk area there was a clear division between men and women in assessing the risks posed by the local industries: While male attendees tended to neglect the risk, several women were quite concerned by their existence and the related frequent smelly emissions.

3.2 Implications for risk and crisis communication

All in all, the assessment of public risk perception by crisis management authorities is usually not far off the truth. No expert interviewed had an unjustified positive picture regarding the risk awareness among the population. On the other hand, the influence of socio-cultural factors on risk perception and the consequences for successful alerting are by and large unrecognized. The above analysis shows, however, that the perception of disasters often exhibit country-specific patterns and varies furthermore in regard to several socio-cultural aspects.

One obvious factor which is visible in almost all countries is direct disaster experience: If people have already been affected by a crisis they usually take this category of risks and related warnings more seriously. This pattern was most evident in France, while Italy is one exception in this regard. Though most of the persons interviewed have had a disaster experience there were several who still tended to ignore the associated dangers. Apart from the Italian case, this pattern could be used to personalize crisis communication and thus optimize its effectiveness. Higher risk awareness can be expected in communities or areas which are frequently affected by the same type of disaster which is why, after an initial alert crisis, communication can more quickly focus on further information like behavioural advice or specifics of the current event. On the other hand, in areas where there has not been a major crisis for several decades people can be expected to be much less aware of an upcoming event and ignore the first warning messages. These should therefore not be limited to sirens but accompanied by other means like SMS or loudspeaker if possible.

Looking at the specific situation in the different countries, in **Austria** the influence of being male or female attracts attention, a phenomenon well known in the risk-related literature. As men tend to take risks less seriously than women, personalized messages to this group could account for this pattern by emphasizing the risk more strongly. Another lesson from the focus group discussions is that additional efforts in terms of alerting are necessary regarding non-nuclear man-made risks. As most people feel safe in this regard due to their trust in authorities and safety regulations, effective warning during an industrial accident is all

the more important. In industrial risk areas it should be considered whether, if safety precautions have been overcome, this should be openly addressed within alerting messages. Thirdly, the relatively high feeling of safety in urban areas has to be kept in mind by public crisis managers. Alerting messages in large cities could include advice that the city is not a completely safe place despite the extensive maintenance structure. It may be also advisable to give examples for risks associated with disasters which are typical for urban structures.

In **France**, next to disaster experience itself, age has been identified as a relevant aspect for risk perception, though both aspects are closely related. Therefore, special attention has to be given by crisis communication in regard to younger persons as these tend to ignore risks until they are directly affected due to their lack of disaster experience.

In **Germany** the identification of relevant socio-cultural factors in terms of disaster risk perception proved difficult. Nevertheless, one result of the focus group discussions was that people living near a nuclear power plant appeared to be less prepared for related disasters as they tend to ignore the associated risks. As a consequence, additional alerting tools could be advisable, i.e. the distribution of alerting devices in concerned regions – something already put into practice in Sweden – or programs to encourage subscription to SMS alerts if available. Such additional measures are all the more advisable given the fact that risks from nuclear power plants have been neglected by public actors until the accident of Fukushima due to political reasons.

In **Hungary** people from the man-made risk area showed a tendency to block out industrial risks and to show fatalistic attitudes in this regard. Alerting in related cases has to be very extensive and should be combined with strong advices for safe behaviour. Secondly, similar to Austria, alerting in urban areas should account for the relative carefreeness of city residents living in multi-storey houses, especially in cases where these do not provide sufficient protection. People should be reminded that these building structures can also pose additional risks sometimes, for example during floods when ‘urban canyons’ increase the pressure and speed of the water.

Italy is one of the most challenging cases for risk and crisis communication in terms of risk perception. Particularly in regions with strong religious traditions and known tendencies to interpret disasters as divine punishment, risk communication has to carefully address this aspect and the related fatalistic attitudes. As for crisis communication, like in Hungary the neglect of man-made risks and risks in general in urban areas should be addressed by emphasizing the urgency of appropriate behaviour.

In **Sweden**, special attention has to be given again to male persons in man-made risk areas. As it is a well-known phenomenon that men tend to underestimate technological risks, crisis communication addressing them must be very firm and unmistakable to receive the desired result. This applies particularly to persons associated with the industry in professional terms, as this may involve an additional bias in risk perception due to the familiarity with technology.

4 Knowledge Structures on Alerting and Disasters

Successful alerting has not only to account for different patterns of risk perception but also for varying levels of knowledge: Do people already know what to do in a crisis situation? Are they even familiar with the signals of sirens and can therefore be expected to have turned on radio and TV to receive further information? This section briefly presents and compares the answers given by disaster management experts and the public, looking for differences in the assessments. In this context, it will be addressed – where possible – how well-informed people *feel* and how much they know *in reality*. The answers will also be analysed in regard to the influence of socio-economic factors and reasonable improvements for alerting.

4.1 Knowledge: Assessment by experts and the public

The population of **Austria** is expected by experts to possess only basic knowledge in the field of disasters, which mainly refers to the existence of sirens as alerting tool and its general meaning in terms of signalling a critical situation. Though some have expressed doubts as to whether people are familiar with the signals, regular surveys show that three out of four Austrians do indeed know their meaning. Notwithstanding this aspect, most people feel ill-informed especially in regard to the question of what one should do in a crisis. This feeling deepens when people think of man-made and especially nuclear disasters. Irrespective of that, people are aware of the municipality and disaster relief forces like fire brigades as their point of contact during these events.

Experts interviewed in **France** expect an equally low level of disaster-related knowledge among the population, though information is provided regularly, particularly in schools. Better knowledge could only be found in areas where people have already experienced a disaster and gathered relevant information during the event. This differentiation matches the information obtained by the biographic interviews and focus group discussion: Attendees with disaster experience clearly felt more knowledgeable and thus confident of surviving another event, while those without disaster experience felt insufficiently informed: Even if they had received leaflets or other information material they could not remember “anything useful” and expected to be overwhelmed by a crisis situation. This was true especially with younger people who naturally have less disaster experience than adult or elderly persons. Concerning actual knowledge of disasters or alerting-issues most attendees were familiar with basis crisis management structures at the local level; several furthermore knew that in a severe crisis the Ministry of the Interior and other high-level actors will be involved. On the other hand, the majority did not know how to interpret the different signals of sirens.

Among experts in **Germany** there are no precise expectations on the part of the authorities concerning a certain level of minimum knowledge or the like. However, they have published detailed brochures and online-information about appropriate behaviour in different crisis situations, hoping that people will pick up basic knowledge. One expert referred to the general assumption of his profession that the knowledge on the signals of sirens is very low (like in Austria); in his personal career in the rescue services however he has had the experience that people do know the signals indeed. This personal experience could, however, not be confirmed by the statements from the other interviews and focus groups: Most attendees did not know which signal meant what. The most knowledge could be found in the natural risk area where people have been regularly confronted with flooding. Other influential factors are sex (male persons displayed more knowledge in the discussions while several women in the rural group reported a lack of knowledge concerning appropriate behaviour during disasters) and migration background (people with migration background appeared to have very little to no knowledge concerning disasters).

In **Hungary** knowledge and knowledge expectations are still influenced by the communist history: Experts rate the public as having very little knowledge due to the situation before 1990 when the authorities were expected to fully account for all relevant risks and no individual responsibility was expected. On the other hand, today's children are also expected to lack knowledge important for surviving disasters: "They do not even have elementary self-rescuing skills, and have many wrong ideas about the topic" (expert quote). As in France, this is despite extensive educational instruments like publications, lectures, public information events and trainings for disaster preparedness in schools and kindergartens. According to the experts, another risk-group in terms of disaster knowledge are tourists, pensioners, housewives, unemployed, guest workers and others as they are neglected in existing disaster education programs. Looking at the general population, these programs do not appear to have a substantial effect as most knowledge reported by the attendees of focus groups came from mass media or personal experience. People are familiar with emergency hotlines. Apart from that, knowledge is rather low, particularly in regard to appropriate behaviour. Next to disaster experience, age can be identified again as a relevant factor, as several of the older persons had undergone some kind of civil protection training before 1990. On top of that, disaster-related knowledge was also found to be higher in persons with high educational degrees.

Experts from **Italy** have refrained from making statements about the knowledge they believe the public to have. Regarding the crisis management structure and the alerting system, Italians basically know – like people from other countries – that they can turn to fire brigades, the civil protection units, the police and other disaster relief forces. Knowledge of coping strategies is as low as in other countries and often dependent on previous disaster experience. All in all it is not surprising that the majority judge their knowledge to be too shallow and do not feel adequately prepared, which is quite surprising considering the frequency of disasters and the risk people are factually facing in this region.

In **the Netherlands** we find a quite special situation. Though like in other countries there are several measures to raise knowledge and awareness in relation to disasters (leaflets, campaigns, websites etc.), experts do not really expect people to have precise knowledge of what to do. In their eyes, the public does not want to be 'bothered' with this type of information as they do not like to think about worst case scenarios. Rather they expect them to be watchful and self-reliant and to gather the relevant knowledge when necessary. On the one hand, this approach may be realistic given the experience from the other countries with extensive educational measures but quite little knowledge among the population. On the other hand, people from man-made risk areas reported to feel ill-informed concerning the risks posed by the nearby industrial plants and clearly wished for more detailed information.

As for **Sweden**, experts and authorities clearly wish the population to be well-informed as they engage in several educational measures directed at schools but also at new residents coming to a community. Like in the other countries, the results of these efforts are barely perceptible. Though most are familiar with the existence and general meaning of sirens and know where to turn to during a disaster, further knowledge about potential effects of a specific disaster type or proper behaviour are mostly nonexistent. General knowledge appears to be even lower than in other countries as even the existence of crisis management plans and the role of the mayor during a crisis is widely unknown or subject to guesswork. Regarding socio-cultural influences, as in France men appear to be more knowledgeable than women, at least in regard to the meaning of sirens.

4.2 Implications for risk and crisis communication

In all seven countries the majority of the people interviewed are, or at least feel, ill-informed. This is despite often extensive information efforts which are usually concentrated

on trainings in schools, leaflets and websites. It is striking that while in several countries there is a special website for information for all types of disasters no one has even mentioned those. Therefore a simple extension of risk communication will not solve the problem. Rather crisis communication has to consider the low level of knowledge and react accordingly. Special attention in this regard should be given to sirens, which are still a key element of alerting. In several countries there was a substantial share of attendees who did not know the meaning of the signals (France, Germany, Austria and Sweden). Therefore many wished for complementary information via loudspeakers and other channels. This may be important especially for younger people who have found to be often less knowledgeable, either because of a lack of experience or – in the case of Hungary – because they did not receive the same education as their parents did.

A second conclusion is that advice for correct behaviour should be included in alerting messages wherever possible. This was recommended by the vast majority in all countries.

As knowledge was found to be highest in high risk areas and other communities with risk experience, it may furthermore be reasonable to consider this when designing alerting messages. People in areas with regular flooding can be expected to know the basic rules of appropriate behaviour, which is why the content of alerting messages could be more advanced in such cases. However, this could be problematic concerning new residents, which is why such a customization should be planned with due care.

Finally, in Germany and Hungary attendees highly recommended regular and sometimes even mandatory risk education, not only in schools but also in workplaces. As the knowledge obtained in trainings during school fades away after some years this is perceived to be insufficient. At the same time, when asked whether they would attend a voluntary training afterwards even those who made the proposal had their doubts. Therefore the idea to make these trainings a mandatory element in companies seems promising. A less paternalistic approach was made by Swedish attendees who recommended that basic crisis information should be regularly included in the community newsletter or similar publications.

5 Crisis Behaviour - Coping Strategies and Compliance

Coping strategies can take very different forms and be more or less appropriate for a given crisis situation. Information about these strategies, including reasons for non-compliance, is important for understanding failures of crisis communication. In this section the assessment of coping strategies and compliance by experts and authorities will be compared with assumed and actual responses to crises by the interviewees. Once again, special attention will be given to the influence of socio-cultural factors.

5.1 Behaviour: Assessment by experts and the public

Authorities in **Austria** reported to have had little experience with compliance-issues in the last decades. If there were any incidents at all where people were injured or killed, these could be attributed to the carelessness of people who disregarded, for example, avalanche warnings. Reports of interviewees who have been affected by a disaster likewise indicate that such behaviour is a very rare exception as they have mostly stayed at home and – if available – followed the instructions given by disaster relief forces. As many asked for advice for safe behaviour it can be assumed that these will be followed if received. The high trust and confidence in public crisis management which has been outlined above underlines this pattern which is independent of age, sex and other socio-demographic aspects.

Experts from **France** expect the public to cope and comply according to their risk culture, which means a general attitude towards risks including awareness and habits: “If people have a risk culture and know that if there is an alert, [that] it is potentially dangerous, compliance is no problem” (expert quote). Having a risk culture is believed to depend on the disaster experience: French who have never experienced a crisis are expected to ignore a risk until it affects them directly, which is why this group is believed to be prone to non-compliance. Regarding general behaviour, people are expected to perform the correct basic reactions by instinct, for example staying inside, closing doors and windows, turning on the radio/TV etc. However, authorities also think it wise to sometimes refrain from publishing all information as they expect it to trigger a panic, which is obviously regarded as an instinctive behaviour of some sort too.

All of these theses except the last one are confirmed by the answers of the interviewees of the biographic interviews and focus groups: Firstly, people having already experienced a disaster do indeed take disaster risks more seriously which is why they are more likely to comply with alerting messages than people without disaster experience. This can be concluded from the fact that, secondly, people without disaster experience tend to ignore a risk until they can directly perceive it (which is often too late). One couple for example reported to have ignored the sirens due to their belief that if they were personally at risk there would be additional hints like police cars and helicopters in their neighbourhood or information from neighbours. Thirdly, in reports of coping strategies people classified their behaviour as guided by instinct, especially when there were no instructions given out by authorities.

Next to disaster experience a second relevant factor is sex, but only in regard to a very specific aspect: That is that female persons (especially young mothers) are very focussed on looking after their children during a disaster. Women would more often go and fetch their children from school/ kindergarten, despite knowing that this behaviour was wrong and dangerous, than men who tended more often to assume that their children would be save with the teachers or kindergarteners and would adopt a “me first, than my family”-safety strategy (this difference disappears with young fathers, though). Finally, one reference to non-compliance has been made in regard to the age factor: Some elderly people are believed to

refuse to evacuate with someone they do not personally know (i.e. a fire-fighter). Instead, they have to be accompanied by a person they trust, which can, of course, turn into a difficult task during a disaster situation.

In **Germany**, authorities judge public response to be a delicate matter: Like in France, too early or too blunt warnings are believed to potentially trigger a hysteria which cannot be controlled. However, in contrast to this assumption, during disasters panics are known to be very unlikely and usually limited to crowded places. In regard to compliance issues experts have refrained from making a judgement as there are no reliable data available on this subject. Nevertheless they expect that coping behaviour and compliance are influenced by certain socio-demographics, of which they assume migration background to be the most likely one due to language matters. If we look at the reports given by people affected by disasters, coping strategies are quite normal and comparable to most of the other countries: staying inside, calling family members and friends, looking for further information etc. Naturally, those from the area with regular flooding had the most elaborated strategies. Otherwise there are no hints for the influence of other factors. Non-compliance with a certain recommendation or order has not been reported or assumed by anyone.

Again, **Hungary** stands out in this respect. Firstly, the experts interviewed reported that every disaster is accompanied by public panic. Therefore alerting and other crisis communication has to be strict and resolute. Secondly, studies have revealed low levels of disaster preparedness among the population. This is underlined by a Eurobarometer study finding that only one out of ten Hungarians having made preparations – a value that is lower than in most other countries of this project. Thirdly, disaster relief forces have occasionally experienced negative attitudes by the population, i.e. in terms of refusals to make way in traffic or in terms of insults. This point, however, could not be confirmed in the focus groups where no one made a disrespectful comment against these actors. Fourthly, Hungarian authorities give special consideration to the large amount of minorities on their national territory, which concerns first of all Romani people. In order to provide crisis communication which is understood by all, and thus reduce the probability of non-compliance, crisis communication is provided in additional languages in each area where the share of a certain minority exceeds 10 %.

If we look at the reports and assumptions by the other interviewees the authorities' fear of panic is clearly justified. The majority assumes that they could panic in a crisis situation, a pattern very distinct from all other countries where such behaviour was only assumed by one or two persons at the most. Especially female persons assumed this reaction while male attendees emphasized the need to stay and act rational. Another noticeable aspect is that the coping strategies prominently feature "sticking together" and rescuing valuables with the latter aspect sometimes being linked to prejudices against Romani people who are believed to plunder houses which are temporarily abandoned during a crisis.

Italy is another case with a quite specific situation in regard to crisis response, or more precisely in regard to compliance. While representatives of the civil protection reported that there are usually no compliance problems as long as messages are transparent and clear, non-compliance is explicitly expected to be linked to political issues like the overall rejection of a mayor or the national government. This diagnosis has to be limited to non-acute crisis communication, though: In the midst of an emergency situation, political issues become irrelevant; rather leaving ones possessions, and especially homes, in general is believed to be the reason in this context. According to the experts, this applies first and foremost to elderly people and peasants. Another distinct group identified to be potentially unimpressed by official crisis messages are certain immigrant communities. Their beliefs and values are expected to sometimes run opposite to advice from authorities, i.e. in cases where these lead to the under- or overestimation of the probability of occurrence of a disaster.

As for the actual or assumed behaviour by attendees of the focus groups and biographic interviews, no reference to non-compliance was made. Coping-strategies resembled those in other countries, being rather intuitive and centring on looking after the family and helping others (especially elder and male persons) etc. Again, those with disaster experience had more elaborated strategies than those without.

In regard to **the Netherlands**, it was already mentioned that Dutch citizens are quite critical of their authorities, which is why experts expect them to disregard instructions i.e. given by the police more often than in other countries. However, this has been a general statement not directly related to crisis situations. In any case, a higher chance for compliance is expected if the message source is trustworthy and if the behavioural advice is embedded in information about what is happening and why a specific behaviour is needed. Furthermore, the experts interviewed expect higher compliance in places with people with immigration background if crisis communication would be offered in other languages, too.

Due to the missing focus group results there is no comprehensive picture in regard to actual or assumed coping-strategies by the public. The biographic interviews neither contained any references to behaviour different to reactions in other countries nor clues for non-compliance. All people affected by disasters basically reported to have stayed at home and looked for more information.

Finally, authorities in **Sweden** reported a strong safety culture in Sweden, meaning that people take safety advice seriously. Though this does not relate to disaster in particular, it can be assumed that authorities expect no serious compliance problems in such cases either. Regarding the influence of socio-demographics, the local authorities from Gothenburg mentioned an incident with people with immigration backgrounds: After a discotheque fire in Gothenburg where rescue services were accused of having done too little to save the people (who often had a migration background) the services were attacked with stones in some neighbourhoods by immigrant communities. Therefore the Gothenburg rescue services started to engage in risk education in schools and attends city meeting with new residents with immigration background.

Concerning the citizens interviewed for Opti-Alert, non-compliance is not an issue: People put high trust in authorities and follow their instructions and first response actions usually fit general safety instructions given by authorities (stay inside, look for further information, call rescue services). However, one person who experienced an accident at a chemical plant reported that there were people who ignored the curfew order in order to look after their relatives or pets, which, at this time, could have had fatal consequences under different wind conditions. This example illustrates that non-compliance can also occur in countries with a very high trust in authorities and is not necessarily limited to ignorance or property issues.

5.2 Implications for crisis communication

All in all, coping-strategies are more or less the same in all of the countries examined in this project. People with previous disaster experiences have more elaborate strategies than those without such experience, with the latter group mostly being guided by intuition. Basic reported and assumed reactions were ensuring personal safety, staying at home, looking after relatives and friends, collecting further information and assisting those who are in need of help.

A special situation can be furthermore found in **Hungary** where experts and the public alike assume panicked reactions. Alerting in Hungary should therefore definitely account for this attitude, i.e. by including in alerting messages the clear demand to keep calm. It is furthermore advisable to balance between the need to clearly communicate a danger but not to make people panic. Another particularity in Hungary was the concern in regard to valuables

and property in general. One couple having experienced a flood reported that they took turns keeping watch and sleeping in their house despite the flood, so that no “gypsies” would plunder their possessions. As the picture of poor and thievish Romani people is still prevalent in many parts of Hungarian society it can be assumed that this is not an isolated case and thus many may refuse evacuation orders for fear of plunder. It is therefore important for alerting to account for this aspect, i.e. by integrating the assurance that the safety of private property will be guaranteed by the police or other institutions into alerting messages.

There are several other reasons for assumed or reported cases of non-compliance: Language problems of minorities or people with migration background have already been addressed in Hungary and Sweden, either by providing crisis communication in other languages or by intensified risk communication during “peace times”. In **Italy**, cultural issues like superstition regarding certain aspects of disasters have been experienced as an obstacle, a phenomenon which is hard to tackle and hardly allows for a general strategy. Nevertheless it is important to make out such patterns in advance in order to be able to address them properly, which is most likely easiest with risk communication rather than crisis communication. Another risk group are elderly people and peasants refusing to leave their property. In areas where such behaviour was found to be prominent, alerting messages could emphasize the need to protect oneself first, and, again, that disaster relief forces will look after the property. In **France**, where sirens alone appear insufficient to convince people without disaster experience of an imminent danger, this instrument has to be complemented by additional means like loudspeakers or SMS. In addition to this, French crisis communication should clearly address the issue of whether to go and fetch the children from schools or kindergartens or not. This can be implemented also via risk communication during peacetime, i.e. by setting up standard procedures in schools with the participation of parents. In **the Netherlands**, potential compliance problems due to a critical attitude towards authorities should be addressed by embedding behavioural advice in information which explains their need or usefulness in order to persuade rather than give orders. The case of **Sweden** where a curfew order was disregarded as people went looking after relatives or pets is a warning for crisis communication to address this motive, either by making exceptions for the people concerned (i.e. relatives of care recipients living alone are allowed to go to their houses) or by emphasizing the need to protect oneself first. Especially this point is likely to appear in all countries as the worry about relatives and friends (and sometimes pets) is prominent among all people regardless of their nationality or other socio-demographics.

6 Information Behaviour & Expectations

This subchapter deals with questions of risk and crisis communication by the authorities in the seven examined countries on the one hand, and information behaviour and information expectations in case of a disaster by the public in these countries on the other hand. *Inter alia* the following topics will be covered: Which **channels** do authorities/industries use to alert the population? Which **infrastructure** is available for this purpose? Which role do they assign to **new media** (SMS, Internet incl. social networks) in this context? In contrast to the authorities and/or industry: which channels are preferred by the population for attracting attention in case of a disaster and how people do want to be informed to receive further information? How is **trust in media** addressed by the public? According to habits, expectations and preferences, which channels should be extended or added, which are possibly negligible? Who should be the **sender of information**?

6.1 Channels & infrastructure for crisis communication and alerting used by authorities

In all examined countries we find similar infrastructure and channels for alerting and crisis communication, though the meaning of the respective alerting tool sometimes varies. For example, in all seven countries *sirens* are used. But whereas sirens are considered in France as the major instrument for alerting, in other countries the relevance of the present siren system is in decline, as reported for Austria or Hungary for example. There is an unknown number of sirens in Germany, which, in addition, varies from region to region; whereas in Sweden the number of sirens could not only be clearly given, but is furthermore dependent and in a particular ratio to inhabitants (sirens are present in places with more than 1000 inhabitants). In Italy sirens are present only in territories frequently affected by (natural) risks, like the island of Stromboli (volcano) or the Province of Messina (flood). Sirens play an important alerting role in case of a crisis in an industrial plant in all examined countries.

We also find in all countries classical alerting tools such as loudspeakers and cars with megaphones or specialised emergency hotlines (in addition, in some areas in France calling machines are used). Italy and France also reported displaying alerting message on electronic billboards.

All countries recognised the importance of media (in particular radio and TV, but also newspapers) for alerting the population and for crisis communication, in several cases media representatives (basically from one nominated public media) are either present within the crisis unit (such as Austria or Germany) or will be informed accordingly by press releases. Press releases and regular updates will be given in all countries via the website of crisis management actors. Who will actually display this information varies according to the scope of the disaster: either just local or, depending on the respective political system, state or federal/central level government. The necessity to provide regularly updated and comprehensive information on the respective website was mentioned by authorities and public alike. Comprehensibility includes, for example, the request by the public to provide emergency communication not just in one language, but also in other important languages for the respective country in order not to exclude immigrants or tourists.

Basically all countries follow a “one-message strategy” which means that the message should not be just clearly, precisely, transparently and authoritatively distributed, but should not, in addition, distinguish between different target groups specified by socio-demographic

criteria. An Italian quote could be regarded as quite representative for all examined countries: “If you have to diffuse an alarm, you have to communicate to all the people, it is important that everybody get the message, so no differentiation is made. (...) To customize the message according to the different public does not make any sense” (Italian expert report, p 20f., D 2.2). Differentiation could only be made prior to or after the disaster (that is risk communication), but not during a crisis (that is crisis or emergency communication). Not distinguishing target groups regarding communication in case of an immediate crisis does not mean not distinguishing target groups at all. In fact, we found evidence in most countries that target groups are addressed when considering particularly vulnerable groups, such as disabled or older people, children, or people committed to hospital – all people who need special intervention or assistance during a crisis. Especially for those target groups, but also in more general terms, personal communication is increasingly regarded in several countries as key to sufficient crisis communication. “Personal communication” (France) or “in-presence communication” (Italy) or “face-to-face communication” (Sweden) means to count on individual persons who function as multipliers in case of the disaster, because they are either known to the affected population (for example trustworthy people from the community) or considered as otherwise trustworthy (such as known sportspersons, actors or similar, as mentioned in Hungary). In France, personal communication is regarded as even more efficient than crisis communication via mass media. Compliance and correct disaster behaviour could be substantially increased via personal communication. An example from Sweden also stressed that face-to-face communication straight after the event could help to clear out misconceptions of the crisis.

Special assistance in terms of language is also frequently necessary for people with migration background. In fact, only Hungary addressed this obvious fact, where it is a necessary precondition in crisis communication that, in areas with more than 10% non-Hungarian inhabitants, crisis communication should also be communicated in the language of the dominant minority (here: Roma and Sinti). All other examined countries follow a one-language approach, assuming that the message will be translated by someone to the immigrants or tourists.

Apart from similarities, we found several country specificities: For example, in Germany there is a “satellite-based communication system” (SatWas) that connects every German state’s interior ministries via integrated control centres to mass media stations, press agencies, one major Internet provider, one paging-service and the railway service – all actors whose work could be facilitated as multipliers of crisis communication which, in fact, enables an immediate transmission of alerts. The existing SatWas system is currently being modified and extended into a modularized warning system: ModWaS that allows even for alerts in a precisely defined geographical area via everyday technical devices such as in-house smoke alarm systems, car alarm systems or radio alarm clocks.

The most advanced crisis communication system in our study in terms of variability and amount of existing methods was identified in the Netherlands. All existing alerting media are considered useful for alerting purposes: Some for simply spreading information (like mass media), others for reacting to conflicting or false alarm, information and answering questions from the public (like the Internet, social media or telephone hotlines). We found in the Netherlands – contrary to any other country – not only an expression for the local broadcasting station that is used in the respective affected area for crisis communication “disaster channel”, the term is moreover very well-known by the Dutch public as well as the interpretation of it: as soon as people become aware of an alert (via siren, via megaphone, via SMS or any other alerting tool), people know that they should put on the local radio or TV station – then called “disaster channel” – and ask there for further information and advice on

what to do. Furthermore, Dutch mayors are expected to launch a public statement within the first hour after the event (“Golden Hour”). Furthermore, the Dutch alerting system was in April 2012 enriched by a new automatic text message based communication system “NL Alert”, currently working and “received well on telephones on the 2G network (GSM telephones)”⁴. It still needs improvements for mobiles and smart phones, but the technical development is well underway.

The role of new media: SMS and social networks

The Dutch NL Alert is already an example of a new generation of alerting tools as it is based on the SMS system. One great advantage of NL alert in that regard is that the system works automatically, no prior registration into any kind of system (official or private sector) is necessary: all people in the crisis affected area receive an automatic alerting message via SMS that basically “contains information about the nature and the seriousness of a calamity, the possible personal risks involved, and what to do to bring oneself to safety” (ibid). (In fact this kind of automatic alerting without any precondition was considered in several examined countries (in particular in the German and Austrian focus groups) as key to sufficient crisis communication and, consequently, as key to compliance.)

We found in no other studied country a similarly well established SMS alerting system as part of a national crisis communication strategy comparable to the Dutch NL Alert system. In most countries SMS alerting is currently under development: in France SMS alerting (together with the Internet) is considered to be a good alternative to the expensive described siren system; in Hungary some rescue services already provide the option to alert and inform via SMS (as this was requested by hearing impaired persons – the same rationale was mentioned in France, too), though not yet widely used. The same applies for Italy, where SMS alerting is an innovation recently used, but not yet much diffused or often applied because of privacy problems. In Germany and Austria SMS alerting was considered as an interesting new approach, but not yet central for crisis communication compared to other alerting tools, though the potential for future alerting was clearly recognised by these countries as well.

Apart from the official disaster management system, SMS already play a role in all countries in regard to weather warnings. Several meteorological services as well as insurance companies in joint venture with weather services (for example Uniqa with Ubimet in Austria or Hungary) provide the possibility of weather forecasting SMS to their customers.

Similarly to the SMS system, the Netherlands are the only country of our study that actively use social media such as Twitter and Facebook as alerting tools to spread crisis information to the public and to quickly react to rumours. Much to our surprise, however, hardly any of the other countries made reference to social media (like in Sweden, Germany, Hungary or Italy) or responded that the release of alerting and crisis information via these new media is considered to be too time consuming and not effective (like in Austria). Only French experts expected social media to play a more prominent role in the future, though there are no references to authorities’ plans to use those in the near future.

6.2 Information channels preferred by the public in case of a disaster

As a matter of principle, people in all countries who participated in our study, whether within focus group discussions or by an in-depth biographical interview, wanted to be alerted

⁴: For more information on NL Alert please visit: <http://www.government.nl/documents-and-publications/press-releases/2011/12/23/nl-alert-introduced-nationally.html>.

in a crisis by all channels available. In order to ensure that as many people as possible affected by a certain threat will be aware of the disaster and could handle the situation in the best way possible for themselves, they suggested using a variety of alerting tools: from traditional alerting tools, such as sirens, loudspeakers, megaphones, radio and TV, to new alerting tools, including SMS, Internet or E-mail. A distinction was made, however, regarding the communication tools for attracting attention (alerting) and for further or continuous information in a crisis (crisis or emergency communication).

In **Austria**, sirens, SMS, loudspeakers and billboards in public traffic systems were regarded as suitable alerting tools for reaching the great majority of the affected Austrian population. For further information Austrians would use traditional media channels, such as radio or TV, Internet (in particular public service media websites; in case of severe weather conditions, specialised websites from weather services) and SMS services. In addition, the importance of face-to-face contacts in case of a crisis was mentioned. Contrary to that, social media was not mentioned at all, neither as alerting tool nor as a means for further crisis communication.

In particular public service media appear to be trustworthy sources of crisis information both for natural and man-made disasters. In case of severe weather conditions, privately run weather services are also considered trustworthy. In terribly severe disasters that might have a further political component, not only Austrian media will be contacted, but also German media that appear, particularly for young Austrian men, as another reference point that is trusted. Here again, public-service German media are important.

The situation in **Germany** is very similar to what we have just described in Austria: the same alerting tools were mentioned for attracting attention as in Austria; sirens are considered as one of the most important alerting tools. In addition, some older people also mentioned church bells; in natural risk areas the meaning of private telephones was stressed. Also in the latter case, the importance of personal contact, here neighbours, as mediators for alerting regarding the natural risk was emphasised. People reported using Teletext for specific information surprisingly frequently, as it allows up-to-date information independently from the current TV programme and at the moment the person would need it. SMS was also mentioned as a suitable tool, especially for urban Germans. Further information in the course of the disastrous event should be provided above all by radio, then by TV, always as locally as possible. The role of the Internet for crisis communication in Germany was rated differently and we did not get a coherent picture: Whereas some German participants regarded the large amount of information that the Internet provides as confusing, irritating and problematic for diluting the most important urgent information (and therefore resort to the radio), others found the variety of potential information an advantage in the crisis situation, in particular as it allows cross-checking information provided elsewhere and raising specific questions – and to get answers accordingly – within chat rooms and blogs. Although social media is frequently used by young Germans (over 80% of people aged 16-24 use social media daily), almost none of the young attendees of our focus groups mentioned social media in context of crisis communication. Even when asked directly by the moderator if Facebook or Twitter (much less prominent in Germany than Facebook) would be a good means for crisis communication and alerting, as it would, in particular, allow local information, the vast majority of the young participants were more than sceptical and explained that social media is considered only as a tool for sharing personal relationships with friends, but that social media would not even come to their minds when considering a crisis situation.

Public service media are slightly more trusted in Germany compared to private media. Trust in the Internet is ambivalent and dependant on the individual's overall capability to use

the Internet. Social media are, as already seen, not regarded as trustworthy for crisis communication as everyone can post everything. The situation would be different, if an authoritative source (such as official disaster risk management) would release the information on social media, then people would be more confident in the credibility of the message. Sirens are considered, particularly by (large) city inhabitants, as problematic, as first of all the sound of a siren would be regarded as a test alarm and training, not as a real and urgent emergency case. Like in most other European countries, any background information released by a scientist would also be regarded in Germany as a trustworthy source of information (Eurobarometer).

Unlike in Austria or Germany, **French** people consider themselves as very affected by natural and man-made disasters, which corresponds with the disasters they had to suffer in recent years (storm “Xynthia” in 2010, industrial fire of the chemical plant in Toulouse 2002, terrorist attacks in the late 1970s and 1990s). This explains why we found quite sophisticated answers on information behaviour and expectations in France. In the French focus groups not just attracting attention and further information was discussed, but also information that should be given to the public in case of long-lasting events and information after an event.

Like in Austrian and Germany, all available means should be activated for alerting the population. Especially sirens and radio and TV channels were mentioned as good means for alerting people. What is more, SMS was proposed by many French attendees as an ideal *additional* alerting tool that could also provide important information such as a special Internet link, an emergency hotline number or further advice on coping and behaving during the crisis. Unlike Austria and Germany, information during the critical phase of a disaster should not be provided by the “usual” preferred information sources (such as TV or radio), but by the rescue services and private contacts as the usual media are not expected to provide urgent and adequately localised information. The aspect of receiving as locally specific information as possible was regarded as key for crisis communication in France. Loudspeakers and city billboards should therefore be used as a good means for continuous and locally adapted information for the public during the crisis. After the critical phase or in case of a longer-lasting disaster, TV, radio and also the press will again have an important role to play for informing the public. Specialised hotlines are considered necessary for advice. Whereas personal contacts were mentioned as very important sources of information throughout all steps of a crisis by rural people, also urban people expressed their wish for personal communication in long-lasting events. Another proposal emerged in France as an appropriate alternative way of crisis communication in long-lasting events: the “missing child” alert for crisis, which is basically news alert on all local, regional and national mass media whenever a child is missing, consisting of a certain acoustic signal, a message and a hotline number.

One element of crisis communication showed up in France which was not mentioned anywhere else: In practically all French groups people requested to receive an “end of alert” or “end of crisis” message as people, particularly those who already suffered a disaster, reported that they were unsure when the threat was over and when they could leave their shelter again.

Trust in different information channels is quite differentiated in France: Although sirens are considered as one key alerting tool, sirens alone appear to be insufficient and should be accompanied by other alerting tools. TV, radio stations and newspapers that are not tabloids or free daily newspapers are regarded in general as trustworthy source of information. Unlike other countries (for example Italy), the Internet is regarded as less trustworthy with the exception of websites released by public institutions or well-known NGOs. Like in Germany or Austria, social media are not considered as trustworthy and adequate information sources

for emergency situations. With SMS, although regarded as an ideal new alerting tool, the trustworthiness of the message clearly depends on the sender: an SMS is assumed to be trustworthy when it was released by an official source like the mayor or a rescue service.

Hungarians also mentioned all available channels for attracting attention: Sirens and loudspeakers were rated positively by most participants; radios were considered as particularly relevant as one could listen to it even in the car or (sometimes) office. Radio and TV are furthermore seen as good alerting channels as they could interrupt their ongoing programmes and forward the alerting message including advice on where to get further information and how to deal with the disaster in concerned areas. SMS and Emails were also mentioned as appropriate. Older people also mentioned church bells as a good way to attract people's attention. Like in most countries, personal communication is seen as a key element for receiving an alert or any other crisis relevant information. Further information will be acquired via mass media (public and private channels alike), in particular local broadcasters when the event is only local, and, particularly, via the Internet, including social media – the latter makes Hungary unique in this study. Internet use (including social media) is high among young people and among persons with higher education and is regarded as superior to classic crisis communication channels in terms of speed and content. Although mobile phones and SMS are very popular media in Hungary, several people expressed their doubts, whether the system will function during a disaster or if the lines will be either disconnected or occupied because of the disaster.

Trust is a rather delicate issue in Hungary as trust in both public and private media is rather low, although slightly more trust exists in public than private media. Many Hungarian expect these media either to exaggerate things or to cover critical issues up. This is true especially in crisis situations as most people remember the distorted media coverage during and after the Chernobyl accident, expecting similar consequences during a new crisis, despite the new system. Hungarian people expressed therefore the wish in our study to have crisis communication and alert announcements performed by “authentic” persons on TV or radio. An “authentic” person could be someone that people know such as an actor or a well-known sports person.

Italy is a country that is traditionally characterised by high TV consumption. Despite this fact for “peace time”, the situation turned out to be different in case of a disaster: Although there are of course several people who mentioned the TV as important information source in an emergency case (in particular elderly and/or less educated people who affirmed not to be able to adequately use a computer), the importance of the Internet came up as a central alerting and crisis communication channel in Italy. The Internet allows much more abundant and rapid information compared to TV which is considered to be rather slow and less reliable in case of emergency. *Inter alia*, immigrants mentioned the Internet as a very useful tool to gather information. They also explained that several of them would have problems with the official, Italian-only crisis communication (for example in radio and TV) and that the Internet will enable them to receive information in their own language. None of the participants would use Facebook or any other social media to get information about a disaster. None mentioned the use of SMS alerting systems, despite the high share of mobile phones in Italy. Sirens are not established in all parts of Italy, but just in those areas particularly threatened by recurring disasters (that is natural risk areas). Inhabitants of areas where sirens were only recently established explained that, despite their limited experience with the sirens, they would welcome the introduction of them. In other areas loudspeakers are seen as superior to sirens as they would allow giving more specific local information. Italy appears to be the country within our study where the meaning of personal communication in a disaster case was most

pronounced. For example, neighbours play an important role in more rural areas, in small towns or in natural risk areas as sources of information and word-of-mouth plays an important role in news circulation. Similar those Italians who reported not to use computers are much more likely to call up the civil protection, the fire brigades or the *carabinieri* directly for receiving more information on the crisis and asking for advice.

Like in Hungary, trust in authorities and in the public media is highly problematic in Italy. Here again, the Internet appears to probably be the most important and trusted source of information in Italy. In particular specific weather pages (in case of severe weather related disasters) or any other website that provide collected and summarized information about the current disastrous event are appreciated and trusted. In some cases, the local media (local stations and newspapers) are considered trustworthy. People do not seem to trust media at all, especially the national stations and national newspapers are considered untrustworthy. A general remark could be made for Italy: as soon as the source of information is political people mistrust it. Exceptions from this general observation are local governments (people who are known to the local public) and the civil protection.

Due to the fact that we have no focus group results for the **Netherlands**, findings on information behaviour and expectations of Dutch people are limited to the biographical interviews. Sirens, loudspeakers and SMS were mentioned by the interviewees as suitable channels for attracting attention. Further information on a disaster should be provided – mediated by the “disaster channel” – by radio and TV on the Internet (in particular municipal websites), SMS or mobile phones and via social media.

For attracting attention in **Sweden** most Swedes regard sirens as a good means, although some would prefer loudspeakers as they would provide more detailed information than sirens. RDS-alarms in cars were only mentioned in Sweden as a good way to reach many people in a situation where most of the other media would necessarily fail. SMS was mentioned by many people, which also emphasised the aspect of having a high alerting effect when several mobile phones would ring at the same time. The use of social media is neither common nor unusual in Sweden. Whereas social media were not mentioned at all in rural and large city groups, others, for example in small-towns, regarded social media as an appropriate channel that should be used by local authorities for alerting. For further information loudspeakers appear to many Swedes to be good for giving information after immediate danger. TV and in particular radio were rated positively for continuing information about the respective crisis. The Internet was mentioned as a channel providing a wealth of important information plus the extra of cross-checking information received elsewhere. Here particularly, online newspaper websites and municipality websites appear to be of interest. Like in most other countries, the meaning of personal contacts was very prominent in Sweden as well.

Sweden is, like Italy, outstanding in this study when it comes to trust in authorities and media – although on the opposite side as Italy: We identified in no other country a similarly high trust in authorities like Sweden – in some cases trust in authorities is even evaluated higher than personal contacts. Similar to the trust in authorities, the trust in media is very high in general, even if somewhat lower regarding tabloids which are expected to exaggerate the (disaster) stories in order to increase profit. Like in other countries where sirens are an appreciated alerting tool, Swedes also mentioned the problem that sirens might easily be misunderstood as training and therefore not taken seriously. Information provided via social media is trusted only when it comes from a friend or from an official authoritative source. The only obvious mistrust we identified in Sweden was regarding nuclear crisis, where some people reported that they would fear that the state or the media would conceal important information, but in order to prevent public panic.

6.3 Implication for Risk and Crisis Communication

This concluding chapter will compare the risk and crisis communication provided by the official crisis management with the information behaviour and expectations as identified by the respective public. It will, furthermore, summarize the most important findings for each examined country and will draw important implications for risk and crisis communication thereof.

In **Austria** all potential channels should be used. People of all age groups, sex, with or without migration background, and in all areas wanted to be alerted via sirens as one of the main basic alerting tool. Austrian crisis management authorities should be aware of this situation and may reconsider their policy of siren decline. The Austrian public trust their authorities as well as public service media, therefore the authorities are already well set up with the national broadcaster ORF included as multiplier for others within the crisis management unit. The most important media for the public are radio and TV; crisis communication should clearly address coping strategies and offer clear advice on how best to handle the current situation. All information given on the official website should be regularly updated and provide comprehensive information. Comprehensibility means also to refrain from the one-language policy and to include other Austrian-relevant languages as well, for example from the neighbouring countries (including Hungary, Slovenia and Italy) and English as the main foreign language worldwide. Austrian authorities are advised to consider SMS as an appropriate alerting tool that would be accepted, used and understood by a large proportion of the population, if not by all (including elderly people or those which use mobile phones just for calling, but which are not familiar with SMS). The evaluation of the authorities to consider social media currently not as an appropriate alerting tool is fully matched by the evaluation of the Austrian public, who do not attribute any particular meaning to social media as an alerting tool. The authorities should be furthermore aware that their population regard face-to-face communication as essential in case of a disaster.

Like in Austria, **German** authorities should maintain their extensive siren network (even if the current number is unclear) as many Germans consider sirens an ideal alerting tool to raise attention. The assessment of the authorities that the importance of SMS technology for alerting will increase in the future appear to be correct, as many Germans think of SMS as a good channel of alerting and would appreciate the extension of the SMS system for this purpose. What is more, German participants were very outspoken in regard to their request of an automatic alerting system – a system described as very similar to the Dutch NL Alert – where alert messages would be received via SMS automatically without prior registration somewhere and only in the region concerned. Hereby the modified modularized warning system (ModWaS) should be mentioned as this system will also automatically alert via in-house smoke detectors, radio-control watches or any other technical device of daily life. Like in Austria, the policy to include the public service media as part of the official crisis communication system is appreciated and effective as public service media are slightly more trusted by the population compared to private media. Again like in Austria, social media do not play any relevant role, neither for the authorities nor for the population – this applies even for the younger people. This situation might change in the future. If social media are considered as alerting tools at all, the sender should be a public authority. Internet is seen by parts of the German population as useful, whereas others regard the Internet as too complex and confusing. An updated and comprehensive website however should be considered to be

one pillar of crisis communication – in Germany and elsewhere. The information on the Internet of the disaster management authorities or any municipal website should provide for the most important languages in Germany, including Turkish, Polish, Greek and English. Apart from new alerting tools, it is important to stick to some traditional information tools for alerting, too, for example Teletext, emergency hotlines and church bells. Also personal contacts are very important for those people who are frequently affected by disasters like in recurring natural risk areas. In general, there are very few shortcomings in regard to structures and processes of public crisis communication, combined with a high trust in the competency and credibility of crisis management actors by the public.

In **France** the siren system is still considered – unlike in the other examined countries – to be the main alerting instrument by the authorities (even if considered rather expensive). The fact fits well with the alerting expectations of the French population. However, according to the examined public, the siren warning should always be complemented by other channels in order to convince the people of the imminent danger (contrary to just a test alarm) and also to provide further information and advice for the affected population. The current provision of alerting via loudspeakers, megaphone cars or electronic billboards in cities meets the expectations of the public. Although media like radio and TV are also considered necessary by the public particularly in the days following a disaster, the public would expect alerting during the first critical hours most of all by members of the rescue service, relevant NGOs or local government. Locality is the key word in France. Crisis communication should take that into account and should be as local as possible as this will increase trust in the alerting message and decrease the risk of non-compliance due to the (wrong) assumption that the alert is only a general one and/or for training purposes and not meant for the respective person or region. Personal communication is very important in France when it comes to a disaster. The authorities' assessment, which regards personal communication as more efficient than even crisis communication via mass media, is shared by the public. Similarly, the French authorities match the expectations of the French public in regard to SMS for alerting: While it should be extended according to the French authorities, the French public emphasise that SMS is an "ideal" additional alerting tool which is particularly trustworthy when the message is released by an official source, such as the mayor, or by a rescue service. Two additional important proposals emerged in the French focus groups: firstly, the proposal to use the well-known "missing child alert" in severe and/or long-lasting crisis; secondly, to make "end of alert" or "end of crisis" a necessary component of official crisis communication that finalizes each crisis situation. With regard to social media, French people would not trust social media as a trustworthy alerting tool or an adequate source of disaster related information. This finding is contrary to the assumption of the French authorities that social media are likely to play a more prominent role for alerting in the near future. Although the provision of crisis information on the Internet by authorities is meanwhile normal, large parts of the French population doubt whether necessary information will be available and connections ready for use in case of a disaster. People reported finding the Internet information more important after the immediate crisis for receiving background information. Like in all other countries (apart from Hungary) the Internet presentation should include important information in other France-relevant languages as well (including Arabic, Moroccan, Algerian, Basque, German, Corsican, English, and others).

In **Hungary** the present siren system is in decline which is contrary to the expectations of the public who rated sirens and loudspeakers as particularly relevant for alerting. Hungary appeared to be the only country in our study that took the language problem in case of a disaster seriously and therefore implemented a passage that in regions with a minority share

of 10% or more crisis communication should always be transferred in the respective language. Hungary is in that regard well ahead of the other six countries. Nevertheless, it would be advisable for Hungary, too, to include more languages, for example, German or English into its crisis communication system. As the trust in authorities and public media is rather low in Hungary, the inclusion of actors considered trustworthy (“authentic persons”), known to the public, appears to be a wise step by the authorities, as personal communication is considered key for crisis communication by the public. When considering traditional alerting tools, in particular radio appears to be an important alerting tool for the public. When it comes to new alerting tools, it is striking that Hungarians are more interested and open to being alerted via social media than any other country’s population in our study. This fact should be taken into account by the Hungarian authorities as well, who seem not to be aware of this. Furthermore, particularly young and well educated Hungarians would inform themselves on the Internet when they are affected by a disaster. This fact could be taken up by authorities as trust in media is generally rather weak (slightly better for public media) and could work on a more transparent and proactive (Internet) presence to account for the distrust among the population induced by the Chernobyl disaster. SMS are already implemented as an alerting tool to a certain extent in Hungary (regarding hearing-impaired persons). The SMS alerting could clearly be extended for the whole Hungarian population as mobile phones and SMS have a widespread distribution and usage there. However, people are afraid that the system could fail in the course of the disaster.

Although sirens are established in **Italy** this is only true for recurring natural disaster areas. Where there are sirens installed, people seem to appreciate it. Traditional media are very important in Italy, TV in particular. Despite the fact that information will be provided by media, this appears to be not unproblematic in Italy, as public and most other media are not considered trustworthy at all. Several Italian people decided therefore to use the Internet instead of TV, radio or newspapers in order to inform themselves in an emergency case. The Internet appears therefore as the most trusted source of information when it comes to alerting. Italian authorities should keep that in mind when considering suitable ways of alerting. The Internet is particularly relevant for people with migration background as they reported to lack comprehensive information in their language from official channels. Like other countries, the Italian official crisis communication system should also take that into account and also provide alerts and other emergency information in other relevant languages, for example those of their minority populations (including German, Greek, Albanian, French and English). Italian authorities are aware that personal communication (“in-presence communication”) is key for crisis communication – this is an important finding that was also confirmed within our study of the Italian population.

Again, it is difficult to draw final conclusions for the **Netherlands** as a substantial part of the study is missing. This is particularly regrettable as the Dutch system appears to be clearly the most advanced system in regard to crisis communication of all examined, but we cannot provide an evaluation of the system by the public here. The Dutch system obviously uses more channels already than any other country in this study. In particular the automatic NL Alert system is of interest here, as participants of literally all other countries asked for an automated alerting system and described very much the Dutch NL Alert. Therefore, there seems to be no apparent need for extension or additional elements of the current system. Authorities should also keep the disaster channel as the expression and meaning appears to be well-established and known to the public. Like in the vast majority of countries, the Dutch crisis communication is lacking other languages for alerting apart from Dutch. Therefore languages to consider would include English, German, French, Moroccan, Turkish and

Friesian. In light of the self-reliance concept followed by Dutch authorities, it is important to provide the public with precise behavioural advice in a crisis situation. The Internet plays the most crucial role in both latter aspects (language and advice).

The **Swedish** authorities enjoy the most public trust of all countries in our study. This also applies to public media. Sirens are regarded by the public, as well as by public authorities, as a good means for alerting. In addition, Swedes would like to be informed in a disaster case via loudspeakers which would allow giving more concrete information. Face-to-face communication is regarded by both, authorities and the public alike, as very important for crisis communication. The Internet is regarded as providing a wealth of information. Again, Swedish crisis communication, on the Internet and elsewhere, should take into account other languages, including English, Finnish, Norwegian, Greenland, and Lapland). SMS was considered by Swedish authorities only as an interesting new tool for alerting, contrary to the Swedish population in our study, where many reported that they would appreciate receiving alerting and crisis communication via SMS. The topic social media for alerting was not addressed by the Swedish authorities. We found in our study that some Swedes would find it a useful alerting instrument – provided that the sender of information would be disaster management or any other well-known rescue service.

7 Executive Summary

What are the most important findings that derive from this study?

1. *Socio-cultural clustering* will ensure effective risk communication; target groups in case of a disaster are different from socio-cultural clusters as they are particularly vulnerable groups, such as disabled or old people, children, people committed to hospital, under certain circumstances immigrants – all people who need special intervention or assistance during a crisis. Apart from those, customizing the message during a crisis is not considered useful.
2. *Multi-channel alerting* is a pre-requisite of effective crisis management: there is nothing like a single alerting tool that will be understood and reach the whole population. It is necessary for crisis management to include a variety of alerting instruments, though not all of them may be meaningful in each case.
3. *Multi-layer alerting* should be pursued by authorities: sirens are considered as *the* main alerting tool in all examined countries. But, as sirens give no more additional information, other alerting tools that allow real crisis information and communication need to follow, such as alerting SMS, loudspeaker, megaphone cars, emergency hotlines, etc.
4. All crisis communication messages released by the authorities should include *behavioural advice* in order to enhance compliance and to avoid public panic.
5. Who should be the sender of the alerting message is strongly depending on *trust in authorities and trust in media*. As this varies strongly from country to country, it is advisable to take this into account for enhancing compliance.
6. The formulation of crisis messages should be as *concise and simple* as possible to be understood by most member of the public. It should include hints for further information, such as links to important websites or the number of the emergency hotline.
7. *Public knowledge on alerting and compliance is rather low* and often overestimated by the respective authorities. Even if people report to be knowledgeable, when looking more carefully it emerges to often be no more than just a feeling of being informed.
8. In the majority of cases, disaster behaviour is not based upon knowledge but purely *intuition*.
9. Crisis communication should be, in areas with people of migration background or many tourists, performed *not only in the national language* but also in other relevant languages in order to be understood by these people as well. This request is easy to implement on websites, but could be also done on electronic billboards, and subtitles on TV screens, etc.
10. The meaning of *personal communication* in case of a disaster could not be overestimated for compliance. Authorities should be aware of this and establish structures that allow the inclusion of either local people in the crisis management / crisis communication system or the inclusion of other persons considered trustworthy.
11. Alerting of disasters should not be dependent on prior registration, but should be done *automatically*. The Dutch NL Alert system could be considered as best practice here.
12. *SMS* appear to be the most promising new alerting tool for many people, though not for all.

13. Currently, *social media* cannot be considered to be an effective alerting tool, as even the majority of young people would not trust it in case of an emergency. It remains to be seen if this will change in the future.