

Opti-Alert

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

Report on Personalized/Regionalized Alerting Strategies

- May 2012 -

WORK PACKAGE	WP5: Personalized and adaptive multi-channel alerting
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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 5 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.5.1 “Report on personalized/regionalized alerting strategies” is the second out of five deliverables within work package (WP) 5: Personalized and adaptive multi-channel alerting. WP 5 will design a model for personalization and adaptation of alert messages based upon social, cultural and regional parameters, as identified within WP 2. This model serves as a basis for the development of a presentation producer which can automatically adapt the warning messages to the socio-cultural context and the current situation of the warning recipients.

Content List

1	Introduction to the Tables	5
2	Austria	8
3	France	14
4	Germany	19
5	Hungary	23
6	Italy.....	27
7	The Netherlands	31
8	Sweden	35

1 Introduction to the Tables

This “report on personalized/regionalized alerting strategies” is the first report within work package 5. It reviews the results of work package 2 with the goal to derive and specify factors and rules for personalized and regionalized alerting. Based upon regional specifics (risk perception in the area for a specific type of disaster (natural risk, man-made risk), risk perception of a specific type of region (rural, urban), media usage patterns, trust in authorities and media, etc.) the factors and rules for the regionalization of alerting strategies will be identified. These factors and rules will then serve as an input for the personalization and regionalization model (FHSS) as well as the alerting tool (EMESS, PROT, FHSS).

The basis of this report 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.

Specifically, this report encompasses an overall view of findings pertaining to the elements of all deliverables produced within work package 2 (see for a list: Deliverable D 2.7, p 5). It will display the results as country tables in order to allow a quick overview. The tables include the following information, distinguished by

- age (18-25 years; 26-59 years, 60 years and older),
- different localities (rural and urban¹),
- risk regions (natural risk area with recurring disasters; man-made risk area with a higher likelihood of being struck by a man-made disaster).

The tables furthermore take into account specific target groups: those groups which deserve special attention during an outbreak of a disaster and should clearly be in the focus of the crisis management: disabled persons, people in social institutions (eg. children in school or day care facilities, retired people living in elderly people’s homes, people committed to hospitals, etc.), people with language deficits (including immigrants and tourists) and families, as we find evidence that particularly families with smaller children have special requirements when it comes to a disaster, as frequently parents and children are not affected in the same location. As far as we can provide information on these target groups we have included this in the tables.

The following items will be covered:

- Do people trust authorities? Depending on the answers, the alerting tool, the sender of information and the message can be developed. Trust in authorities has a major impact on the coping strategies and, to some degree, on information behavior.

¹¹ We have distinguished within the focus groups between people from large cities and small towns. But as explained elsewhere (D 2.5) we can subsume both as simply “urban” as the differences between small town and large city were less pronounced than between the urban and the rural groups.

- Do people trust rescue organisations? The answer to this question is frequently distinguished from the answer to the question of trust in authorities: trust in authorities does not necessarily match with trust in rescue organisations and vice versa.
- Do people trust media? Which media are considered trustworthy and which rather not? Again, this information is central for the selection of an appropriate alerting channel.
- How is the risk perception of natural risks? How is the risk perception of industrial risks? Knowledge about risk perception of the public is central for the design of appropriate crisis communication. Risk perception is a central category when considering alerting strategies.
- What do people know about dealing with recurring natural disasters and what do they know in regard to industrial risks? Knowledge about crisis has a strong impact on coping strategies and, depending on the answer to the question, the alerting message needs to be developed: the more people know, the more specific the message can be designed, the less people know, the more information they need to cope with a disaster. Furthermore, this category gives important information to crisis management which often lacks a clear idea about the public's disaster knowledge. Based upon these findings, improved risk communication strategies can be developed.

The tables furthermore include alerting specific information as agreed at the internal project meeting in March 2012 in Berlin:

- Which alerting tool is considered useful by the respective population? The information provided here is important to crisis management facilities that do not necessarily inform their population according to their preferences.
- Who should be the sender of alerting messages? Based upon the information of who is considered trustworthy by the public, the appropriate sender/s of crisis communication can be identified.
- What kind of information should be provided within the message? (distinguished by natural and man-made disaster).² The actual framing of the message should be correlated with the knowledge people have as well as with the identified specific risk perception.

The current tables do not distinguish between sex and migration background. Contrary to previous reports (D 2.5 and D 2.7), we have not included this information for the following reasons: As reported in D 2.5 and D 2.7., we can identify differences between the sexes, in particular regarding the risk perception and also in regard to coping strategies. But based upon the findings, we do not consider sex to be a key variable for *crisis* communication. This is clearly different from *risk* communication, where differences in sex should well be considered and included. When it comes to a disaster, there is no need to distinguish between the sexes as other variables play a larger role. This evaluation is congruent with results reported in literature (for example, Gherseti 2011³).

² Please note: we will not design the message as such ('content'), which is not possible as it requires disaster-specific and local knowledge that varies in each case. Having said so, what we are able to provide here is information about specific requirements of a message ('context').

³ Gherseti, Marina (2011): Crises Communication in a Diversified Media Landscape. How Swedes use news media if crisis strikes. Paper presented at the IAMCR Conference on 13 to 17 July 2011, Istanbul, Turkey.

Although we have tried to cover people with migration background in our study, the actual number of migrants within our study was too small and too diverse to provide sufficient answers. In addition to the small number and diversity of migrants included in our study, the category migration background needs more specification: who is considered to be a migrant? This is clearly defined by several variables: Duration of stay within a particular country; place of birth within or outside the respective country; knowledge and command of language of the country, etc. We had participants in our focus groups who were very fluent in the respective language although they had only lived in the country for a short period of time, and vice versa. We therefore have included general information in regard to migrants only in the special target group section “people with language deficits”. A more sophisticated analysis would have deserved another composition of the focus groups, and has not been the objective of the Opti-Alert project.

Each table give additional information at the bottom: “other specific” information that could not be subsumed in the table and general “recommendations” on crisis communication.

2 Austria

	Trust in authorities ¹	Trust in rescue organisations	Trust in Media	Risk Perception of natural risks	Risk perception of industrial risks ³	Disaster Knowledge of natural risks	Disaster Knowledge of industrial risks ³	Alerting tool	Sender ²	Message in case of natural disaster ⁵	Message in case of man-made/spontaneous disaster ⁵
Age (18-25) Urban	Very high	Yes, but not sure if rescue organisations could manage a big disaster	High In case of a big disaster additional information will be sought by German news channels	Very low	Very low	Low	Low	Sirens, SMS, loud-speaker, Internet, billboards mass media	Authorities, national broadcaster	Short warning, clear advice	Additional instructions clear advice
Age (18-25) Rural	Very high	Very high	High Trust in public service channels	High	Low	Medium	Low	Sirens, SMS, loudspeaker, Internet, mass media	Authorities national broadcaster	Short warning	Additional instructions clear advice
Age (18-25) Natural risk area	Very high	Very high	High Trust in public service channels	Very high	Low	High	Low	Sirens, SMS, loud-speaker, Internet, mass media	Authorities national broadcaster	Short warning	Additional instructions

	Trust in authorities ¹	Trust in rescue organisations	Trust in Media	Risk Perception of natural risks	Risk perception of industrial risks ³	Disaster Knowledge of natural risks	Disaster Knowledge of industrial risks ³	Alerting tool	Sender ²	Message in case of natural disaster ⁵	Message in case of man-made/spontaneous disaster ⁵
Age (18-25) Industrial risk area	Very high	Very high	High Trust in public service channels	Low	Low	Low	Low	Sirens, SMS, loud-speaker, Internet, billboards	Authorities national broadcaster	Short warning clear advice	Additional instructions clear advice
Age (26-59) Urban	Very high	Very high	High Trust in public service channels	Very low	Very low	Low	Low	Sirens, SMS loud-speaker, public / local TV and radio, billboards	Authorities national broadcaster	Additional instructions clear advice	Instructions clear advice
Age (26-59) Rural	Very high	Very high	High Trust in public service channels	High	Low	Medium	Low	Sirens, SMS loud-speaker, TV and radio personal communication	Authorities national broadcaster	Additional instructions	Instructions clear advice
Age (26-59) Natural risk area	Very high	Very high	High Trust in public service channels	Very high	Low	High	Low	Sirens, SMS loudspeaker, personal communication, TV, radio, SMS	Authorities national broadcaster	Short warning	Instructions, clear advice
Age (26-59) Industrial risk area	Very high	Very high	High Trust in public service channels	Low	Low ⁴	Low	Low	Sirens, SMS loud-speaker, TV & radio, billboards	Authorities national broadcaster	Additional instructions clear advice	Instructions clear advice

	Trust in authorities ¹	Trust in rescue organisations	Trust in Media	Risk Perception of natural risks	Risk perception of industrial risks ³	Disaster Knowledge of natural risks	Disaster Knowledge of industrial risks ³	Alerting tool	Sender ²	Message in case of natural disaster ⁵	Message in case of man-made/spontaneous disaster ⁵
Age (60+) Urban	Very high	Very high	High Trust in public service channels	Low	Low	Low	Low	Sirens, loudspeaker, public local TV and radio, billboards, Teletext personal communic.	Authorities national broadcaster	Additional instructions clear advice, contact persons	Instructions clear advice contact persons
Age (60+) Rural	Very high	Very high	High Trust in public service channels	High	Low	Medium	Low	Sirens, loudspeaker, public TV, radio, personal communication, Teletext	Authorities national broadcaster	Short warning, additional instructions contact persons	Instructions clear advice contact persons
Age (60+) Natural risk area	Very high	Very high	High Trust in public service channels	Very high	Low	High	Low	Sirens, TV loudspeaker, public, personal communication, radio, Teletext	Authorities national broadcaster	Short warning	Instructions clear advice contact persons
Age (60+) Industrial risk area	Very high	Very high	High Trust in public service channels	Low	Low ⁴	Low	Low	Sirens, loudspeaker, TV, radio personal communication, Teletext billboards	Authorities national broadcaster	Additional instructions clear advice contact persons	Instructions clear advice contact persons

	Trust in authorities ¹	Trust in rescue organisations	Trust in Media	Risk Perception of natural risks	Risk perception of industrial risks ³	Disaster Knowledge of natural risks	Disaster Knowledge of industrial risks ³	Alerting tool	Sender ²	Message in case of natural disaster ⁵	Message in case of man-made/spontaneous disaster ⁵
Disabled persons								Sirens, Mass media, personal communication	Authorities national broadcaster	Additional instructions clear advice	Instructions clear advice
People in social institutions (children in school, day care facilities for children and elderly, etc.)								Sirens, Personal communication	Authorities national broadcaster	Additional instructions clear advice	Instructions clear advice
Families				Greater concern for their families in case of disaster				Personal communication	Authorities national broadcaster	Additional instructions and information clear advice	Instructions and information clear advice
People with language deficits (migrants)								Sirens, Internet! Information in different languages, Personal communication	Authorities national broadcaster	Short warning, additional instruction to inform via internet (or something else) clear advice	Short warning, additional instruction to inform via internet(or something else)

	Trust in authorities ¹	Trust in rescue organisations	Trust in Media	Risk Perception of natural risks	Risk perception of industrial risks ³	Disaster Knowledge of natural risks	Disaster Knowledge of industrial risks ³	Alerting tool	Sender ²	Message in case of natural disaster ⁵	Message in case of man-made/spontaneous disaster ⁵
People with language deficits (tourists)								Loud-speaker, sirens, Information in different languages Personal communication	Authorities national broadcaster	Instructions Translation necessary!	Instructions clear advice translation necessary!

¹**Trust in authorities:** Usually high, but the handling of the nuclear accident in Chernobyl has caused a deep insecurity and lack of trust in the government that still continues and shows where and who can still remember the disaster, especially elderly and middle-aged people. Some mostly elderly participants are sceptical about public information policy.

²**Sender:** While people partly distrust the risk communication in case of a nuclear (or a similarly devastating) disaster, there is a high degree of agreement about the information policy. This is not inconsistent with a general high degree of trust and confidence in the crisis communication.

³**Risk perception in regard of man-made-disaster:** In general Austrians are aware of risks (some of the attendees hold food inventories), independent of age and region. This is confirmed by the results of the Special Eurobarometer (2009) and the results of the telephone survey (D 2.6). Widespread concern of nuclear accidents.

⁴**Risk perception in regard of man-made-disaster:** Only several women (middle-aged, older ones) express that they perceive a risk, but they feel they must live with it and trust that no disaster will happen, because otherwise that would have consequences.

⁵**Message:** Austrians mostly asked for clear instructions.

Migrants: In terms of overall assessment and risk awareness, there were no differences compared to Austrian participants without migration background.

Other Specifics

- Elderly persons more often expressed the wish to help others, while younger persons depicted a rather passive behaviour, focussed on keeping calm and gathering information
- People in urban areas tend to take disaster-related risks less seriously as they feel protected by urban maintenance structures. Nevertheless, several people hold food inventories.
- Women showed a higher risk awareness than men
- While SMS seems a promising alerting channel, there are some groups who appear to use it rather seldom: middle aged women and elderly persons

Recommendations

- Except for natural disasters occurring in areas known for such risks alerting messages have to provide **basic knowledge on appropriate behaviour**. This is important especially in regard to industrial disasters
- As **men** tend to take risks less seriously than women, personalized messages to this group could take this pattern into account by emphasizing the risk more strongly
- As the high trust in safety regulations and measures related to **man-made risks** can cause a sense of false security, alerting messages should openly and clearly address when these safety precautions have been overcome by a disaster and no longer provide protection
- Alerting messages in **urban areas** should include the advice that the city is not a completely safe place despite the extensive maintenance structure. It seems advisable to give examples for risks associated with disasters which are typical for urban structures to illustrate the dangers
- As **face-to-face communication** is considered important by many Austrians, rescue services could provide information on-site if possible

3 France

	Trust in authorities	Trust in rescue organisations	Trust in Media	Risk Perception of natural risks	Risk perception of industrial risks	Disaster Knowledge	Alerting tool	Sender	Message
Age (18-25) Urban	Low trust in authorities, but high trust in crisis management capabilities*	Rather low**	High for public media, low for Internet or social networks***	Very low	Very low	Insufficient	Sirens + SMS, local public TV/ radio, Internet, billboards	Raising awareness: authorities; further information: experts	Localized information, regular updates, detailed information on behaviour, self-customization (!) “end of crisis message”
Age (18-25) Rural	Low-high*	Rather low**	High for public media, low for Internet or social networks***	Very low	Very low	Insufficient	Sirens + SMS, local public TV/ radio, personal contacts, loudspeaker	Raising awareness: authorities; further information: experts	Localized information, regular updates, detailed information on behaviour, self-customization (!) “end of crisis message”
Age (18-25) Natural risk area	Low-high*	Rather low**	High for public media, low for Internet or social networks***	High	Very low	Insufficient	Sirens + SMS, local public TV/ radio, Internet, loudspeaker billboards	Raising awareness: authorities; further information: experts	Localized information, regular updates, detailed information on behaviour, self-customization, (!) emphasis on danger“ end of crisis message”
Age (18-25) Industrial risk area	Low-high*	Rather low**	High for public media, low for Internet or social networks***	Very low	Very low	Insufficient	Sirens + SMS, local public TV/ radio, Internet loudspeaker, billboards	Raising awareness: authorities; further information: experts	Localized information, regular updates, detailed information on behaviour, self-customization (!)“end of crisis message”

*Low trust in authorities, but high trust in crisis management capabilities

	Trust in authorities	Trust in rescue organisations	Trust in Media	Risk Perception of natural risks	Risk perception of industrial risks	Disaster Knowledge	Alerting tool	Sender	Message
Age (26-59) Urban	Low-high*	Rather high**	High for public media, low for Internet or social networks***	Medium	Low-medium (high for risks related to transports)	Low-medium	Sirens + SMS, local public TV/ radio, Internet, hotlines, loudspeaker, billboards	Raising awareness: authorities; further information: experts	Localized information, regular updates, self-customization (!), "end of crisis message"
Age (26-59) Rural	Low-high*	Rather high**	High for public media, low for Internet or social networks***	Medium	Low-medium (high for risks related to transports)	Medium	Sirens + SMS, local public TV/ radio, personal contacts, hotlines, loudspeaker	Raising awareness: authorities; further information: experts	Localized information, regular updates, self-customization (!), "end of crisis message"
Age (26-59) Natural risk area	Low-high*	Rather high**	High for public media, low for Internet or social networks***	High	Low-medium (high for risks related to transports)	Medium	Sirens + SMS, local public TV/ radio, hotlines, loudspeaker, billboards	Raising awareness: authorities; further information: experts	Localized information, regular updates, self-customization (!), emphasis on danger, "end of crisis message"
Age (26-59) Industrial risk area	Low-high*	Rather high**	High for public media, low for Internet or social networks***	Medium	Low-medium (high for risks related to transports)	Low-medium	Sirens + SMS, local public TV/ radio, hotlines, loudspeaker, billboards	Raising awareness: authorities; further information: experts	Localized information, regular updates, self-customization (!), "end of crisis message"

*Low trust in authorities, but high trust in crisis management capabilities

	Trust in authorities	Trust in rescue organisations	Trust in Media	Risk Perception of natural risks	Risk perception of industrial risks	Disaster Knowledge	Alerting tool	Sender	Message
Age (60+) Rural	Low-high*	Rather high**	High for public media, low for Internet or social networks***	Medium-high	Low-medium (high for risks related to transports)	Medium	Sirens, local public TV/ radio, hot-lines, personal comm., loudspeaker	Raising awareness: authorities; further information: experts	Localized information, regular updates, self-customization (!), "end of crisis message"
Age (60+) Urban	Low-high*	Rather high**	High for public media, low for Internet or social networks***	Medium-high	Low-medium (high for risks related to transports)	Medium	Sirens, local public TV/ radio, hot-lines, billboards, loudspeaker	Raising awareness: authorities; further information: experts	Localized information, regular updates, self-customization (!), "end of crisis message"
Age (60+) Natural risk area	Low-high*	Rather high**	High for public media, low for Internet or social networks***	High	Low-medium (high for risks related to transports)	Medium	Sirens, local public TV/ radio, hot-lines, loudspeaker personal comm.	Raising awareness: authorities; further information: experts	Localized information, regular updates, self-customization (!), "end of crisis message"
Age (60+) Industrial risk area	Low-high*	Rather high**	High for public media, low for Internet or social networks***	Medium-high	Low-medium (high for risks related to transports)	Medium	<u>Sirens</u> , local public TV/ radio, hot-lines, loudspeaker, personal comm.	Raising awareness: authorities; further information: experts	Localized information, regular updates, emphasis on danger, self-customization (!), "end of crisis message",

	Trust in authorities	Trust in rescue organisations	Trust in Media	Risk Perception of natural risks	Risk perception of industrial risks	Disaster Knowledge	Alerting tool	Sender	Message
Disabled persons							Hearing impaired persons wish for SMS, pers. communication.		“end of crisis message” Clear advice
People in social institutions (children in school, day care facilities for children and elderly, etc.)							Personal communication		“end of crisis message” Clear advice
Families				High	Medium		SMS, personal communicat.		Pick up children from school/ kindergarten or not? , clear advice, “end of crisis message”
People with language deficits							Personal communication		Translation necessary! “end of crisis message”

*: Although trust in authorities is not very high in France, generally high trust in crisis management capabilities of authorities but rather low trust in reliability of information (people expect authorities to cover up inconvenient facts)

** : Refers to (corporatist) NGOs like Red Cross

***: Exceptions are websites of known public institutions like ASN (Autorité de Sûreté Nucléaire) or renown NGOs

Other specifics

- Risk perceptions are very specific: regarding natural disasters, risk awareness is high regarding the probability of occurrence, while risk awareness is low regarding the related dangers (“it will happen but it won’t be serious”); it is the other way round for man-made risks
- In rural contexts personal contacts play a vital role for receiving information, whereas in urban context technical media are key information sources
- Risk awareness, disaster related knowledge and trust in authorities increase with disaster experience, something which is naturally linked to a higher age
- Trust in authorities is mixed with high trust in capabilities but low trust in reliability of official information (in rural contexts it is the other way round regarding local authorities)
- Both people from rural and urban context wish for personal contacts -> while in rural contexts these exist, in urban setting their absence is deplored
- French citizens wish for proactive information, they do not want to be dependent on looking for information themselves

Recommendations

- **Sirens** alone are not enough to convince people without disaster experience of an imminent danger: they have to be complemented by additional means like loudspeakers or SMS
- Special attention has to be given to persons in areas without previous **disaster experience** as these tend to ignore risks until they are directly affected - warning messages have to emphasize the danger
- Special attention has to be given in regard to **natural risk areas** insofar as even though people are likely to expect the occurrence of such an event they are often confident of survival due to earlier experiences which may prove a false security: thus in times of very serious events their singularity should be emphasized
- As people usually react according to instinct, alerting should address **typical errors** that accompany this strategy (i.e. the instinctive but usually wrong reaction to leave a building during an earthquake) and emphasize proper behaviour in such cases
- Crisis communication (to **young parents**) should clearly address the issue of whether to go and fetch the children or not
- French citizens wish for **regional or local information** relevant for their specific residential area; general information at a larger geographical level are often disregarded
 - People do not like **message customization** ‘behind their back’: several rather asked for the possibility to customize SMS-alerts on their own via the Internet, in order to regulate their own thresholds and content

4 Germany

	Trust in authorities	Trust in rescue organisations	Trust in Media	Risk Perception of natural risks	Risk perception of industrial risks	Disaster Knowledge	Alerting tool	Sender	Message
Age (18-25) Urban	High, esp. in local authorities	Very high	High for public media, mixed for Internet	Low	Low	Insufficient	Radio, TV, Internet, SMS or loudspeaker	Authorities	Behavioural advice
Age (18-25) Rural	High, esp. in local authorities	Very high	High for public media, low for Internet	Low-medium	Low	Insufficient	Radio, TV, SMS, sirens, loudspeaker	Authorities	Behavioural advice
Age (18-25) Natural risk area	Very high, esp. in local authorities	Very High	High for public media, mixed for Internet	High*	Low	Sufficient	Radio, TV, SMS, sirens, loudspeaker, hotline, neighbours	Authorities, specialized local NGO	Basic alerting*
Age (18-25) Industrial risk area	High, esp. in local authorities	Very high	High for public media, mixed for Internet	Low	Low	Insufficient	Radio, TV, SMS, teletext, sirens, loudspeaker	Authorities	Behavioural advice
Age (26-59) Urban	High, esp. in local authorities	Very high	High for public media, mixed for Internet	Low	Low	Insufficient	Radio, TV, Internet, SMS or loudspeaker	Authorities	Behavioural advice
Age (26-59) Rural	High, esp. in local authorities	Very high	High for public media, mixed for Internet	Low-medium	Low	Insufficient	Radio, TV, SMS, sirens, loudspeaker	Authorities	Behavioural advice

	Trust in authorities	Trust in rescue organisations	Trust in Media	Risk Perception of natural risks	Risk perception of industrial risks	Disaster Knowledge	Alerting tool	Sender	Message
Age (26-59) Natural risk area	Very high, esp. in local authorities	Very high	High for public media, mixed for Internet	High*	Low	High	Radio, TV, SMS, sirens, teletext, loudspeaker, hotline, neighbours	Authorities, specialized local NGO	Basic alerting*
Age (26-59) Industrial risk area	High, esp. in local authorities	Very high	High for public media, mixed for Internet	Low	Low	Insufficient	Radio, TV, SMS, teletext, sirens, loudspeaker	Authorities	Behavioural advice
Age (60+) Urban	High, esp. in local authorities	Very high	High for public media	Low	Low	Insufficient	Radio, TV, loudspeaker, teletext	Authorities	Behavioural advice
Age (60+) Rural	Very high, esp. in local authorities	Very high	High for public media	Low-medium	Low	Sufficient	Radio, TV, sirens, teletext loudspeaker	Authorities	Behavioural advice
Age (60+) Natural risk area	Very high, esp. in local authorities	Very high	High for public media	High*	Low	High	Radio, TV, sirens, loudspeaker, hotline, teletext, neighbours	Authorities, specialized local NGO	Basic alerting*
Age (60+) Industrial risk area	Very high, esp. in local authorities	Very high	High for public media	Low	Low	Insufficient	Radio, TV, teletext, sirens, loudspeaker	Authorities	Behavioural advice

	Trust in authorities	Trust in rescue organisations	Trust in Media	Risk Perception of natural risks	Risk perception of industrial risks	Disaster Knowledge	Alerting tool	Sender	Message
Disabled persons							Personal communication, sirens	Authorities	Clear advice, contact persons
People in social institutions (children in school, day care facilities for children and elderly, etc.)							Personal communication, sirens	Authorities	Clear advice, contact persons
Families							Personal communication, sirens billboards	Authorities	Clear advice
People with language deficits							Personal communication Internet Sirens billboards	Authorities	Translations necessary!

*: The natural risk area group has experienced regular severe flooding. As a consequence, a special NGO was founded, organizing risk management in a crisis situation in addition to authorities.

Other specifics

- Risk perception is different for **nuclear risks**: people from most groups feel uneasy regarding this risk type
- Risk perception 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
- **Nuclear accidents** are regarded by some as a disaster type where common parameters of public crisis communication (transparency, credibility) lose their relevance: in such cases a higher distrust in information by any source is likely
- People with **migration background** feel very safe in Germany and show a high trust in authorities

Recommendations

- While **nuclear risks** are an exception to the otherwise generally low risk awareness, this does not apply to the industrial risk area (which included a NPP) -> alerting in a nuclear crisis therefore has to be very clear/unambiguous, subscriptions for SMS-alerting should be advertised in such regions
- **Behavioural advice** is important especially for **women and people with migration background** as these groups tend to have less than average disaster-related knowledge (i.e. regarding coping strategies)
- Regarding **alerting channels**, sirens should be maintained and complemented with other means like SMS and public mass media. The Internet is currently not an advisable channel due to a lack of trust often associated with it.
- Crisis communication should be provided in other relevant **languages** (English, Turkish etc.) too, as there are many people without sufficient language skills, being currently dependent on translation opportunities by friends and neighbours.

5 Hungary

	Trust in authorities**	Trust in rescue organizations	Trust in Media	Risk Perception of natural risks	Risk perception of industrial risks	Disaster Knowledge	Alerting tool*	Sender	Message
Age (18-25) Urban	Low-High	Low	Very low	Very low	Very low	Insufficient	SMS, Sirens, radio, loudspeaker, Internet/social media, TV, personal comm.	Authorities/experts, trustworthy persons	"Keep calm!", links to further information
Age (18-25) Rural	Low-High	High	Low	Low	Low	Insufficient	SMS, Sirens, radio, TV loudspeaker, Internet/social media, personal comm.	Authorities/experts, trustworthy persons	"Keep calm!", links to further information
Age (18-25) Natural risk area	Low-High	High	Low	High	Low	Insufficient	SMS, Sirens, radio, loud-speaker, personal comm. Internet/social media, TV	Authorities/expert trustworthy persons	"Keep calm!", links to further information
Age (18-25) Industrial risk area	Low-High	Medium	Low	Low	Low	Insufficient	SMS, Sirens, radio, personal comm., loud-speaker, Internet/social media, TV	Authorities/experts trustworthy persons	"Keep calm!", Type+extent of disaster, strong behavioural advices
Age (26-59) Urban	Low-High	Low	Low	Very low	Very low	Insufficient	SMS, Sirens, radio, pers. comm., loud-speaker, Internet, TV	Authorities/experts trustworthy persons	"Keep calm!", links to further information, property assurance

	Trust in authorities	Trust in rescue organisations	Trust in Media	Risk Perception of natural risks	Risk perception of industrial risks	Disaster Knowledge	Alerting tool	Sender	Message
Age (26-59) Rural	Low-High	High	Low	Low	Low	Low	SMS, Sirens, radio, pers. comm., loudspeaker, Internet, TV	Authorities/experts trustworthy persons	"Keep calm!", links to further information, property assurance
Age (26-59) Natural risk area	Low-High	High	Low	High	Low	Low	SMS, Sirens, radio, pers. comm., loudspeaker, Internet, TV	Authorities/experts trustworthy persons	"Keep calm!", links to further information, property assurance
Age (26-59) Industrial risk area	Low-High	Medium	Low	Low	Low	Low	SMS, Sirens, radio, personal comm., loudspeaker, Internet, TV	Authorities/experts trustworthy persons	"Keep calm!", Type+extent of disaster, strong behavioural advice, property assurance
Age (60+) Urban	Low-High	Low	Low	Very low	Very low	Medium	Sirens, radio loudspeaker, personal comm., TV, church bells	Authorities/experts trustworthy persons	"Keep calm!", links to further information, property assurance
Age (60+) Rural	Low-High	High	Low	Low	Low	Medium	Sirens, radio, loudspeaker, TV Church bells, personal comm.	Authorities/experts trustworthy persons	"Keep calm!", links to further information, property assurance
Age (60+) Natural risk area	Low-High	High	Low	High	Low	Medium	Sirens, radio, loudspeaker, TV Church bells, pers. comm.	Authorities/experts trustworthy persons	"Stay calm!", links to further information, property assurance
Age (60+) Industrial risk area	Low-High	Medium	Low	Low	Low	Medium	Sirens, radio, loudspeaker, TV Church bells, pers. comm.	Authorities/experts trustworthy persons	"Keep calm!", type & extent of disaster, strong behavioural advices, property assurance

	Trust in authorities	Trust in rescue organisations	Trust in Media	Risk Perception of natural risks	Risk perception of industrial risks	Disaster Knowledge	Alerting tool	Sender	Message
Disabled persons							Hearing impaired persons have requested SMS, pers. comm.		
People in social institutions (children in school, day care facilities for children and elderly, etc.)						Children: very little knowledge according to experts	Pers. comm.		Messages to children should include even the most basic behavioural advice(very little knowledge)
Families							Pers. comm.		
People with language deficits							Tourists and guest-workers should be addressed via tourist-specific channels (i.e. railway stations) Pers. comm.		Translation necessary!

* Internet is used particularly by the middle aged group by those with higher education

** : Although trust in authorities is not very high in Hungary, generally trust in crisis management capabilities of local authorities

Other specifics

- Especially female persons assumed they would panic during a disaster
- The share of adult and older persons using online social networks is highest compared to all other Opti-Alert countries
- The low trust in media results especially from the Chernobyl-experience and is therefore most relevant with similar events

Recommendations

- Crisis communication has to become more **proactive and transparent** in order to account for the distrust among the population induced by Chernobyl - > the credibility of the sender is essential in this regard
- **Panic reactions** are clearly a characteristic of Hungary -> alerting strategies should therefore urge the need to stay calm and to react in a calm manner, especially in regard to women who appear to be a high risk group in this context; more than in other countries it seems advisable to wisely balance the need for emphasizing dangers and for preventing a panic
- In **urban areas** the tendency to underestimate or ignore the risks posed by many natural disasters has to be considered: alerting messages should remind people of the risks posed by supposedly harmless natural phenomena in urban landscapes
- In **man-made risk areas** the tendency to block out the risk (fatalistic attitudes) has to be considered, either via risk communication or emphasis on alerting messages (always while considering the risk of panic)
- In **low risk areas** the awareness in regard to disaster related risks is very low – alerting has to be very extensive and firm there
- Though there are no clear references to non-compliance, the importance of protecting **property and valuables** can be expected to cause non-compliance with evacuation orders -> authorities should therefore emphasize that the safety of private property will be guaranteed
- Experts recommended that attention should be given to tourists, pensioners, guest-workers, unemployed persons as special risk groups -> this could mean using special information channels used by these groups (i.e. in the case of tourists, timetables at railway stations or airports, “arrival”-SMS when crossing a national border, etc.) or reminders to the general public to pass

6 Italy

	Trust in authorities	Trust in rescue organisations	Trust in Media	Risk Perception of natural risks	Risk perception of industrial risks	Disaster Knowledge	Alerting tool	Sender	Message
Age (18-25) Urban	Low trust in authorities, high trust in civil protection*	Partly yes	Low for TV, high for Internet	Low	Low	Insufficient	loudspeaker, Internet, personal communication, billboards	Civil Protection organisations	Type and location of risk, behavioural advice
Age (18-25) Rural	Low-High*	Partly yes	Low for TV, high for Internet	High	Low	Insufficient	loudspeaker, Internet, personal communication	Civil Protection organisations	Type and location of risk, behavioural advice
Age (18-25) Natural risk area	Low-High*	Partly yes	Low for TV, high for Internet	High	Low	Insufficient	Sirens, loudspeaker, Internet personal communication	Civil Protection organisations	Type and location of risk, behavioural advice
Age (18-25) Industrial risk area	Low-High*	Partly yes	Low for TV, high for Internet	High	Mixed	Insufficient	loudspeaker Internet, billboards	Civil Protection organisations	Type and location of risk, behavioural advice
Age (26-59) Urban	Low-High*	Partly yes	Low for TV, high for Internet	Low	Low	Insufficient	loudspeaker local TV and radio, billboards, Internet	Civil Protection organisations	Type and location of risk, behavioural advice
Age (26-59) Rural	Low-High*	Partly yes	Low for TV, high for Internet	High	Low	Insufficient	loudspeaker personal communication, TV, Internet	Civil Protection organisations	Type and location of risk, behavioural advices

*Trust in authorities is low, but trust in civil protection is high.

	Trust in authorities	Trust in rescue organisations	Trust in Media	Risk Perception of natural risks	Risk perception of industrial risks	Disaster Knowledge	Alerting tool	Sender	Message
Age (26-59) Natural risk area	Low-High*	Partly yes	Low for TV, high for Internet	High	Low	Basic re. natural risks	Sirens, loudspeaker personal communication, TV, Internet	Civil Protection organisations	Type and location of risk, behavioural advice
Age (26-59) Industrial risk area	Low-High*	Partly yes	Low for TV, high for Internet	High	Mixed	Insufficient	Loudspeaker, TV, radio, billboards, Internet	Civil Protection organisations	Type and location of risk, behavioural advice
Age (60+) Urban	Low-High*	Partly yes	Low for TV, high for Internet	Low	Low	Insufficient	loudspeaker, local TV and radio, billboards personal communication	Civil Protection organisations	Type and location of risk, behavioural advice
Age (60+) Rural	Low-High*	Partly yes	Low for TV, high for Internet	High	Low	Insufficient	loudspeaker TV, personal communication, radio	Civil Protection organisations	Type and location of risk, behavioural advice
Age (60+) Natural risk area	Low-High*	Partly yes	Low for TV, high for Internet	High	Low	Basic re. natural risks	Sirens, loudspeaker, TV, personal communication, radio	Civil Protection organisations	Type and location of risk, behavioural advice
Age (60+) Industrial risk area	Low-High*	Partly yes	Low for TV, high for Internet	High	Mixed	Insufficient	Loudspeaker, radio TV, personal communication, billboards	Civil Protection organisations	Type and location of risk, behavioural advice
Disabled persons							In presence communication		

*Trust in authorities is low, but trust in civil protection is high.

	Trust in authorities	Trust in rescue organisations	Trust in Media	Risk Perception of natural risks	Risk perception of industrial risks	Disaster Knowledge	Alerting tool	Sender	Message
People in social institutions (children in school, day care facilities for children and elderly, etc.)							In presence communication		
Families				Greater concern for their families in case of disaster			In presence communication		
People with language deficits							Internet! In presence communication		Translation necessary!

Other specifics

- Disaster experience is influential regarding two aspects: trust in authorities (decreases with experience), trust in the Civil Protection system (increases with experience)
- Compliance problems (evacuation refusal) have been registered only in regard to elderly people and peasants
- Many persons, particularly female, assume panicky reactions during a disaster
- People with migration background are even more concerned about their relatives than Italians without migration background
- Religious beliefs and superstition is often relevant for disaster risk perception in Italy, i.e. in terms of fatalist attitudes

Recommendations

- Though risk awareness regarding natural disasters is usually high (exception: youths), **fatalist attitudes** are common -> alerting in natural risk areas should therefore focus not only on raising attention but also calling for action / protective behaviour
- Risk awareness and knowledge regarding **industrial disasters** is very low -> alerting in such cases is therefore extremely important, basic behavioural advices are necessary
- Natural risks are often underestimated in **urban areas** -> alerting messages should emphasize the seriousness of such events in these areas, i.e. by identifying typical risks related to natural disasters in urban settlement structures
- **Classic mass media** like TV and radio play a very little role for young and middle-aged people looking for information during a disaster; however, as the consumption of these media channels is common nevertheless, they should be used for raising attention in the first place. Further information should be given through the Internet or on-site communication

7 The Netherlands⁴

	Trust in authorities	Trust in rescue organisations	Trust in Media	Risk Perception of natural risks	Risk perception of industrial risks	Disaster Knowledge	Alerting tool*	Sender	Message
Age (18-25) Urban	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	SMS, sirens, loudspeaker, radio, TV (disaster channel), Internet	Authorities	n.a.
Age (18-25) Rural	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	SMS, sirens, loudspeaker, radio, TV (disaster channel), Internet	Authorities	n.a.
Age (18-25) Natural risk area	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	SMS, sirens, loudspeaker, radio, TV (disaster channel), Internet	Authorities	n.a.
Age (18-25) Industrial risk area	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	SMS, sirens, loudspeaker, radio, TV (disaster channel), Internet	Authorities	n.a.

⁴ There is only little information available for the Netherlands due to the fact that we don't have findings from Dutch focus groups.

	Trust in authorities	Trust in rescue organisations	Trust in Media	Risk Perception of natural risks	Risk perception of industrial risks	Disaster Knowledge	Alerting tool	Sender	Message
Age (26-59) Urban	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	SMS, sirens, loudspeaker, radio, TV (disaster channel), Internet	Authorities	n.a.
Age (26-59) Rural	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	SMS, sirens, loudspeaker, radio, TV (disaster channel), Internet	Authorities	n.a.
Age (26-59) Natural risk area	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	SMS, sirens, loudspeaker, radio, TV (disaster channel), Internet	Authorities	n.a.
Age (26-59) Industrial risk area	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	SMS, sirens, loudspeaker, radio, TV (disaster channel), Internet	Authorities	n.a.

	Trust in authorities	Trust in rescue organisations	Trust in Media	Risk Perception of natural risks	Risk perception of industrial risks	Disaster Knowledge	Alerting tool	Sender	Message
Age (60+) Urban	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	SMS, sirens, loudspeaker, radio, TV (disaster channel), Internet	Authorities	n.a.
Age (60+) Rural	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	SMS, sirens, loudspeaker, radio, TV (disaster channel), Internet	Authorities	n.a.
Age (60+) Natural risk area	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	SMS, sirens, loudspeaker, radio, TV (disaster channel), Internet	Authorities	n.a.
Age (60+) Industrial risk area	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	SMS, sirens, loudspeaker, radio, TV (disaster channel), Internet	Authorities	n.a.
Disabled persons									
People in social institutions (children in									

school, day care facilities for children and elderly, etc.)									
Families									
People with language deficits									Translation necessary!

* Social media are used by the Dutch crisis management system

Other specifics

- Experts reported that Dutch people tend to block out disaster related risks from their everyday life
- Social media are used very actively by authorities in order to spread information but also to quickly react to rumours
- The Dutch authorities are the only country of this study that actively use social media for crisis communication. However, due to the fact that we have no information about information behaviour from Dutch focus groups, we do not know about experiences of the population regarding social media as alerting tool: we don't know if social media are in fact trusted by the people and if it is valued as credible and useful alerting tool.

Recommendations

- Transparency and an open information policy is crucial in order to account for the **critical but not negative attitude** of many citizens regarding authorities
- In the light of the concept of self-reliance (people are expected to actively look after their own safety in a crisis instead of relying on public institutions) it is all the more important to provide the public with **precise behavioural advice** in a crisis situation -> this should be embedded in information about the event and why certain behaviour is advisable
- Crisis information should be made available in **other languages** than Dutch too, i.e. the central crisis information website crisis.nl -> as Dutch authorities make extensive use of the Internet, this task could be easily addressed by implementing online translation tools

8 Sweden

	Trust in authorities	Trust in rescue organisations	Trust in Media	Risk Perception of natural risks	Risk perception of industrial risks*	Disaster Knowledge	Alerting tool**	Sender	Message
Age (18-25) Urban	Very high	Very high	High	Low	Low	Insufficient	TV, SMS, Internet, sirens, loudspeaker, RDS-alarm	Authorities/ rescue services	Behavioural advice, links to further information
Age (18-25) Rural	Very high	Very high	High	Low	Low	Insufficient	TV, SMS , face-to-face, sirens, RDS-alarm	Authorities, esp. municipality	Behavioural advice, links to further information
Age (18-25) Natural risk area	Very high	Very high	High	Low	Low	Insufficient	TV, SMS , Internet, sirens, RDS-alarm, face-to-face,	Authorities/ rescue services	Behavioural advice, links to further information
Age (18-25) Industrial risk area	Very high	Very high	High	Low	Low	Insufficient	TV, SMS , Internet, sirens, RDS-alarm, face-to-face,	Authorities/ rescue services	Behavioural advice, links to further information
Age (26-59) Urban	Very high	Very high	High	Low	Low	Insufficient	Radio, TV, Internet, SMS, sirens, loudspeaker, RDS-alarm	Authorities/ rescue services	Behavioural advice, links to further information

	Trust in authorities	Trust in rescue organisations	Trust in Media	Risk Perception of natural risks	Risk perception of industrial risks	Disaster Knowledge	Alerting tool	Sender	Message
Age (26-59) Rural	Very high	Very high	High	Low	Low	Insufficient	Radio, TV, neighbours, SMS, sirens, RDS-alarm, face-to-face,	Authorities, esp. municipality	Behavioural advice, links to further information
Age (26-59) Natural risk area	Very high	Very high	High	Low	Low	Insufficient	Radio, TV, Internet, SMS, sirens, RDS-alarm, face-to-face,	Authorities/ rescue services	Behavioural advice, links to further information
Age (26-59) Industrial risk area	Very high	Very high	High	Low	Low	Insufficient	Radio, TV, Internet, SMS, sirens, RDS-alarm, face-to-face,	Authorities/ rescue services	Behavioural advice, links to further information
Age (60+) Urban	Very high	Very high	High	Low	Low	Insufficient	Radio, TV, , sirens, loudspeaker, RDS-alarm, face-to-face,	Authorities/ rescue services	Behavioural advice, links to further information
Age (60+) Rural	Very high	Very high	High	Low	Low	Insufficient	Radio, TV, face-to-face, SMS, sirens, RDS-alarm	Authorities, esp. municipality	Behavioural advice, links to further information
Age (60+) Natural risk area	Very high	Very high	High	Low	Low	Insufficient	Radio, TV, sirens, RDS-alarm, face-to-face,	Authorities/ rescue services	Behavioural advice, links to further information

	Trust in authorities	Trust in rescue organisations	Trust in Media	Risk Perception of natural risks	Risk perception of industrial risks	Disaster Knowledge	Alerting tool	Sender	Message
Age (60+) Industrial risk area	Very high	Very high	High	Low	Low	Insufficient	Radio, TV, sirens, RDS-alarm, face-to-face,	Authorities/ rescue services	Behavioural advice, links to further information
Disabled persons							Stationary telephone signal, face-to-face comm.		
People in social institutions (children in school, day care facilities for children and elderly, etc.)							face-to-face comm.		Relatives of care recipients should be given advice whether to visit them or not
Families							face-to-face comm.		
People with language deficits/migration background	Rather low						face-to-face comm.		Translation necessary!

*Risk perception is higher for industrial risks, but in general low.

** : In contrast to most of the other countries, alerting via social networks is considered useful especially by young Swedes, provided the sender is trustworthy (authority or reliable friends). They proposed a community-profile on Facebook which can be connected with their own profiles and distribute emergency messages

Other specifics

- Women clearly showed a higher risk awareness in the industrial risk area
- Male persons appeared to have slightly more disaster related knowledge
- In the case of major disasters, esp. nuclear accidents, the likelihood of distrust in public and private information increases: even people who show a high trust in authorities start to assume that the government may withhold information in such cases in order to prevent a panic (“for their own sake”) and censor private media accordingly
- In small towns, some people consider social media as appropriate alerting tool providing that the sender would be a friend or public authority.

Recommendations

- As male persons clearly show a lower risk awareness compared to women, alerting messages to this group could include special emphasis on a threat from a certain event to account for their lower risk perception
- New media like SMS and social networks should complement existing alerting channels in order to account for changing media use patterns; current channels (mass media) should be maintained too, though, as elderly people use new media less often
- During curfew orders, crisis communication should address the topic of relatives living in other houses, 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