ASSISTANCE

Adapted situation awareneSS tools and tallored training curricula for increaSing capabiliTie and enhANcing the proteCtion of first respondErs

European Commission

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Deliverable D8.4

Report on Gender Dimension Strategy GDS

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[1] PU: Public; PP: Restricted to other programme participants (including the EC services); RE: Restricted to a group specified by the Consortium (including the EC services); CO: Confidential, only for members of the Consortium (including the EC services).

ASSISTANCE

Nowadays different first responder (FR) organizations cooperate together to face large and complex disasters that in some cases can be amplified due to new threats such as climate change in case of natural disasters (e.g. larger and more frequent floods and wildfires, etc) or the increase of radicalization in case of man-made disasters (e.g. arsonists that burn European forests, terrorist attacks coordinated across multiple European cities).

The impact of large disasters like these could have disastrous consequences for the European Member States and affect social well-being on a global level. Each type of FR organization (e.g. medical emergency services, fire and rescue services, law enforcement teams, civil protection professionals, etc.) that mitigate these kinds of events are exposed to unexpected dangers and new threats that can severely affect their personal safety.

ASSISTANCE proposes a holistic solution that will adapt a well-tested situation awareness (SA) application as the core of a wider SA platform. The new ASSISTANCE platform is capable of offering different configuration modes for providing the tailored information needed by each FR organization while they work together to mitigate the disaster (e.g. real-time video and resources location for firefighters, evacuation route status for emergency health services and so on).

With this solution. ASSISTANCE will enhance the SA of the responding organisations during their mitigation activities through the integration of new paradigms, tools and technologies (e.g. drones/robots equipped with a range of sensors, robust communications capabilities, etc.) with the main objective of increasing both their protection and their efficiency.

ASSISTANCE will also improve the skills and capabilities of the FRs through the establishment of a European advanced training network that will provide tailored training based on new learning approaches (e.g. virtual, mixed and/or augmented reality) adapted to each type of FR organizational need and the possibility of sharing virtual training environments, exchanging experiences and actuation procedures.

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Disclaimer

Executive Summary

The Gender Dimension Strategy in the ASSISTANCE project focuses on addressing two main challenges. The first challenge involves understanding the gender dimension in the constraints and opportunities for rapid response. The second challenge consists of including gender aspects in design, tests and validation of the project developments and tools. This document presents the results of the former challenge. It has been written by the University of Cantabria (UC).

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Acronyms

AAHD	Ambulance and Emergency Physicians Association
AQ	Additional question
ASSISTANCE	Adapted situation awareneSS tools and tallored training curricula for increaSing capabiliTie and enhANcing the proteCtion of first respondErs
BRCS	Brief Resilience Coping Scale
BRS	Brief Resilience Scale
CBRN	Chemical, biological, radiological and nuclear
CEL	CYBERETHICS LAB SRLS
D#.#	Deliverable number #.# (D1.1 deliverable 1 of work package 1)
DoA	Description of Action of the project
DRR	Disaster Risk Reduction
E	Earthquake
EC	European Commission
EMS	Emergency Medical Service
EU	European Union
F	Fire
FR	First Responder
GD	Gender Dimension
GDS	Gender Dimension Strategy
H2020	Horizon 2020 Programme for Research and Innovation
IFV	INSTITUUT FYSIEKE VEILIGHEID
IQR	Interquartile range
PIAP	PRZEMYSLOWY INSTYTUT AUTOMATYKI I POMIAROW PIAP
PTSD	Posttraumatic Stress Disorder
Q#.#	Question
RISE	RISE RESEARCH INSTITUTES OF SWEDEN AB
RPS	Risk Propensity Scale
SD	Standard Deviation
SIA	Societal Impact Assessment
SO	Specific Objective
T	Terrorist attacks
Thales	THALES SA
UC	UNIVERSIDAD DE CANTABRIA
W	Extreme weather conditions

1. Introduction

1.1. Purpose of the document

The purpose of this document is to describe the approach for the measurement of effectiveness and impact of the gender dimension in disasters response, according to Task 8.5. This involves gender research on citizen's attitudes towards disasters and First Responder's perceptions of risk, resilience, and coping strategies.

1.2. Scope of the document

This deliverable D8.4 – *Report on Gender Dimension Strategy GDS* covers the outputs of Task 8.5 Gender Dimension produced during the second year of the project. It includes two case studies 1) online survey study on citizens attitudes towards disasters (510 men and 504 women) and 2) a web-based questionnaire on risk propensity, resilience and resilience coping in First Responders (242 males and 119 females).

The quantitative methods and statistical results presented here provide reference examples to incorporate gender studies in disaster response while exploring new approaches also promoting gendered perspectives in safety and security research activities.

1.3. Structure of the document

The deliverable is divided into two main parts, apart from this introduction. Section 2 presents the general approach and Section 3 presents a detailed description of the methodologies and main findings derived from the two case studies on gender dimension. Finally, Section 3 presents conclusions. To complete the document, additional information is provided in Annexes.

2. General approach

The Gender Dimension (GD) is a key element of the societal aspects in safety and security. In the ASSISTANCE project gender is being analysed from a twofold perspective. On the one hand understanding the gender dimension in the constraints and opportunities for rapid response and on the other hand including gender aspects in design, tests and validation of the project developments and tools. This report is directed towards the first part, understanding the gender dimensions.

The main objective of the proposed gender dimension strategy (GDS) in ASSISTANCE is to provide a reference document with examples of best practices, solutions, strategies, and lessons learned to analyse gender thus improving scientific excellence and innovation in the field of safety and security. The specific objectives to achieve this main objective, defined in D8.2, are displayed in Table 1. The present deliverable (D8.4) covers the specific objectives SO1, SO3 and SO4. The specific objective SO2 will be completed by the end of the project (D8.7) once the ASSISTANCE technologies and training approaches are tested and evaluated. It is important to note that SO1 is the main objective of this deliverable while SO3 and SO4 are transversal achievements.

Specific Objective	Description	Covered here
SO1	To incorporate gender dimension in the constraints and opportunities for rapid response to disasters.	✓
SO2	To include gender aspects in design, testing and validation of ASSISTANCE technologies.	X
SO3	To explore gender through new methods.	✓
SO4	To promote gendered perspective in research.	✓

Table 1 Specific objectives of Gender Dimension Strategy addressed in this report.

As stated by the DoA, the Gender Dimension (GD) to achieve the specific objective SO1 was assessed at two levels: citizens and First Responders (FRs). In the following, we present the participatory methodology and the main findings of two case studies involving these target groups to provide insights into the GD in disaster response.

3. Gender dimension in the constraints and opportunities for rapid response

3.1. Case study 1. Exploring gender impact on public perception of disasters

3.1.1. Summary

Background: Understanding different/similar perceptions and attitudes between men and women towards disasters can help to identify constraints and opportunities for efficient planning and response (e.g. new first responding policies and actions).
Method: A Survey study was conducted involving 1.014 participants between 18 and 80 years old (female n=504; male n=510) from five European countries (Spain, Poland, Sweden, France and Italy). The online questionnaire was divided into four sections: 1) Disaster awareness, 2) FRs capabilities, 3) Preparedness and 4) Risk perception. Responses were divided by gender and compared statistically.
Results: Results showed significant differences in 1) disaster awareness (women are more sensitive to the potential occurrence of extreme weather conditions and fire than men), 2) individual preparedness (men felt more prepared than women to face disasters) and 3) risk perception (women perceived higher risk for extreme weather conditions, fire and earthquake). However, we also found that overall, both women and men have the same inclination to be prepared for disasters.
Conclusion: Gender norms and gender relations appear to still have an impact on the perceptions and attitudes towards disaster across the EU citizens. Datasets produced here do not only have scientific value, but also have the potential to inform decision makers and First Responders for developing risk management policies, training and communication campaigns, thus improving disaster response and resilience of society under a gender perspective.

3.1.2. Background

The role of citizens to protect themselves and others is an important aspect before, during and after a disaster. In fact, individuals are likely to prepare and respond to those events they perceive to be significant. Gender roles and attitudes can be important predictors of such behaviours[2]. Understanding the differences/similarities between the attitudes of men and women can also help first responders (FRs) and policy-makers to improve disaster emergency planning and response. Although, some studies indicate that women and men differ in attitudes towards disasters, others are not definite. A study revealed higher self-preparedness reported by men[3]. Other studies reported that women were more likely to start evacuation[4][5] and help others[6]. However, another study conducted in Japan for assessing gender in earthquake response found that women's awareness was not necessarily low in comparison to men[7]. Yet, this study suggested that women lack opportunities for DRR (Disaster Risk Reduction) training and education. In this sense, the United Nations have developed a useful guideline to incorporate gender perspectives in DRR programs and initiatives[8]. How citizens perceive, understand, internalise, accept and may respond to threatening situations is a key subject-matter considered in ASSISTANCE. That is why we have conducted a case study through a survey to 1.014 EU citizens as part of Societal Impact Assessment (SIA). Importantly, this questionnaire was intended to collect responses of men and women in equal numbers providing us the opportunity to analyse disaggregated data and to determine gender differences/similarities in citizens perceptions, attitudes and behaviours. The aims of this case study were: 1) to report on the methods for the gender analysis of the questionnaire, 2) to briefly summarise the key findings and 3) to draw conclusions about the potential impact of gender on disasters.

3.1.3. Method

To provide exhaustive information on the survey and to facilitate reproducibility, we follow the Checklist for Reporting Results of Internet E-Surveys (CHERRIES)[9].

Design: The survey was designed to cover people's perceptions on four main factors: likelihood of a disaster to occur, FRs capabilities, preparedness to face the disaster and risk perception if a disaster occurs. The questions to investigate these factors are listed in Table 2.

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[2] Enarson, E. 2006, Sociologist for Women in Society ttps://www.socwomen.org/wpcontent/uploads/2010/05/fact_10-2006-disaster.pdfs or available upon request

[3] Cvetkovic, V.M. et al. 2018. The Role of Gender in Preparedness and Response Behaviors towards Flood Risk in Serbia. International Journal of Environmental Research and Public Health. 15, 22761; doi:10.3390/ijerph15122761

[4] Enarson, E. 2006. Mainstreaming in the Emergency Management: A Training Module for Emergency Planner; York University: Toronto, ON, Canada.

[5] Bateman, J.M. Edwards, B. 2002. Gender and evacuation: a closer look at why women are more likely to evacuate for hurricanes, Nat. Hazards Rev. 3(3): 107–117.

[6] Fothergill, A. 1996. Gender, risk, and disaster. International Journal of Mass Emergencies and Disasters 14(1): 33-56.

[7] Fulil, M and Kanabara, S. 2019. Analysis of Gender Differences in Disaster Preparedness for Nankai Trough Earthquake. 13(2), 644. DOI: 10.21767/1791-809X.1000644.

[8] Galvankova, B. et al. 2018. Gender and disaster risk reduction in Europe and Central Asia. Workshop Guide for Facilitators. United Nations Entity for Gender Equality and the Empowerment of Women (UN Women); United Nations Development Programme (UNDP)

[9] Eysenbach, G. 2004. Improving the Quality of Web Surveys: The Checklist for Reporting Results of Internet E-Surveys (CHERRIES). Journal of Medical Internet Research. 6(3):e34. 10.2196/jmir.6.3.e34

The detailed questionnaire (in English version) is available in Annex B of the present report.

Variable	Question	Available answers
Likelihood	*Q1.- How likely do you consider that the following event: (Extreme weather/Fire/Earthquake/Hazardous materials Accidents (CBRN)/Terrorist attack) will occur in: (Europe/your country/your village-town-city)?*.	4-point Likert scale responses: "Very likely", "Likely", "Unlikely" or "Highly unlikely".
FRs capabilities	*Q2.1.- In your opinion, the training level, and resources for first Responders (Firefighters, Emergency Medical Services, Police and Civil Protection) are in (Europe/your country/your village/town/city):.*	5-point Likert scale responses to each: "Excellent", "Good", "Fair", "Poor" and "Very poor".
	Q2.2.- How important to you are the following aspects to improve disasters response (more personnel/visible leadership and decision-making/Multi-agency coordination/Updated emergency plans/citizens collaboration/Training for FRs/Use of new technologies/other).	5-point Likert scale responses to each: "Very important", "Important", "Moderately important", "Slightly important", "Unimportant"
Preparedness	*Q3.1.- Which statement best represents your preparedness for (Extreme weather conditions/Fire/Earthquake/Hazardous Materials Accidents/Terrorist attack).*	3-point Likert scale responses: "I know what to do", "I fairly know what to do" and "I don't know what to do".
	Q3.2.- Could you share with us your opinions on the importance of citizen's preparedness to deal with disasters? • *Getting ready is worthwhile because (it is easier to get back to normal/people have information about what to do/taking action makes me worry less/if I'm ready, I can help others)* • *Getting ready is not worthwhile because (getting ready won't make a difference/It is not my responsibility/I would rather not think about bad things happening/It doesn't matter; disasters don't happen where I live/It takes too much time, effort, or money).*	5-point Likert scale responses: "strongly agree", "Agree", "Undecided", "Disagree", "Strongly disagree"
Risk perception	*Q4.- If the following emergencies/disasters occur in your vicinity (Extreme weather conditions/Fire/Earthquake/Hazardous materials accidents (CBRN)/Terrorist attack) what in your view is the risk for you and your family?*	4-point Likert scale responses: "Low risk", "Moderate risk", "High risk" and "Critical risk".

Table 2 Survey questions and the related available answers.

The respondents were also asked to provide socio-demographic information, including their age, gender, maximum level of education achieved and type of employment (if any). The survey contained a total of 44 items. The population sample involved citizens from five countries representative of north, centre and south of Europe (Sweden, Poland, France, Spain and Italy).

Ethics: The questionnaire was distributed by an online survey company (https://www.svalue.es/). The questionnaire was anonymous, and the privacy policy of the individual's posted information was noted (e.g. the purpose of the study, length of time to the survey, personal data and data protection, withdrawal rights, etc.). Due to the nature of this study written informed consent was not required. However, respondents gave consent to participate by filling in the agreement part of the survey form.

Development: A pilot was conducted before the current large-scale survey allowing us the possibility to know whether a designed questionnaire fulfilled the purpose of the study (Deliverables 8.2 and 8.3). CEL provided additional questions on preparedness to complement the original form questionnaire (items of Q3.2 in Table 2). The English version of the questionnaire was reviewed by technical partners (RISE) and FRs (AAHD) and then translated into the target languages: RISE (Swedish version), CEL (Italian version), THALES (French version), PIAP (Polish version) and UC (Spanish version). During the translation process we paid special attention to achieve semantic, idiomatic, experiential, and conceptual equivalence to the original version. The initial translation into each target language was made by two independent translators to detect and resolve subtle differences/discrepancies. Also, the resulting versions were back-translated to ensure the accuracy of the translation. Then, the online prefinal versions were sent again to the translators for checking and final approval.

Check-box answers were provided to reduce the time to answer each item (Annex B). The 5-point Likert scale (Q3.2) had a neutral option for respondents while the 4-point Likert responses (Q1, Q2.1, Q2.2 and Q4) did not (i.e. they were required to form an opinion). The 3-point Likert responses (Q3.1) offered polar points along with a neutral option. Country and place of residence (village/town/city), demographic data (age and gender), level of education (primary/ secondary/ university/ other) and socio-professional category (self-employed/ employee/ retired/ unemployed/ student/ other) were gathered at the starting section of the questionnaire.

Survey administration: The usability and functionality of the electronic questionnaires were tested before fielding the final versions. The survey company sent an email invitation to individuals living in the targeted countries who accessed the website of the company. Respondents belonged to validated databases and were given a monetary incentive for their participation. The questionnaire had in total 44 items divided into four screens (15 items/10 items/10 items/9 items) in addition to sociodemographic information of the first screen. Items were randomized to prevent biases in responses. Overall, the questionnaire took approximately 15-20 min to complete. The responses (only one per participant) were automatically captured and checked. The timeframe for the data collection was from 1st to 14th November 2020.

Participants: A dedicated effort was made to use a representative population sample from the different countries (i.e. different ages, several education levels and socio-professional profiles). It is important to note that a requirement was to collect responses from an appropriate gender balance (50% women and 50% men). Figure 1 shows the characteristics of the surveyed participants.

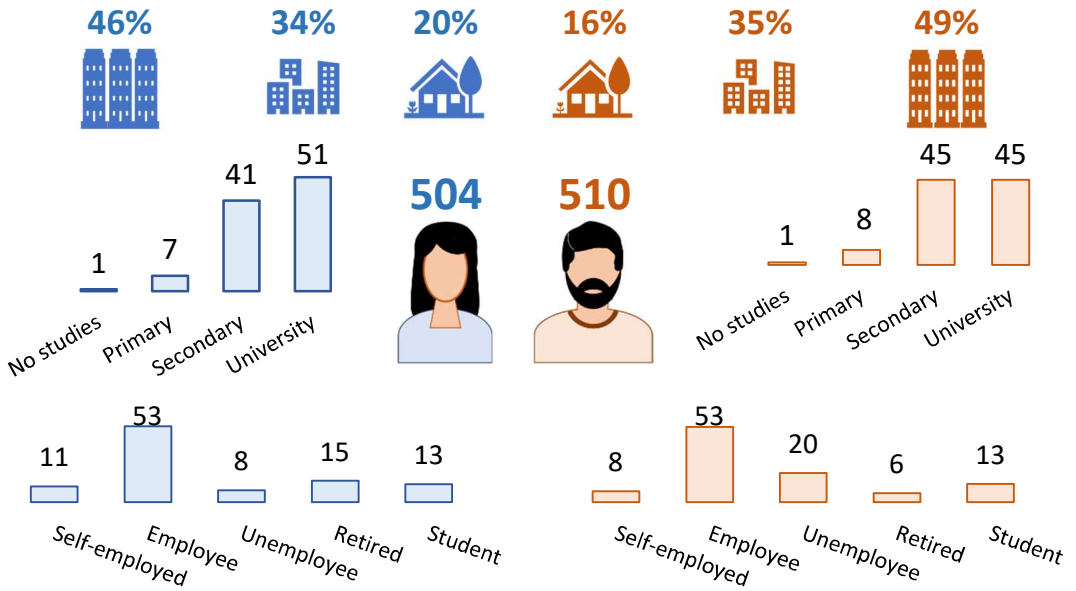


Figure 1: Percentages of levels of education, places of residence and socio-professional categories of respondents.

Analysis: Each item on the questionnaire was scored: 5-point Likert scale (responses ranging from 1 to 5), 4-point Likert scale (responses ranging from 1 to 4) and 3-point Likert scale (responses ranging from 1 to 3). Frequency of responses, Median and IQR (Interquartile Range) were computed for descriptive statistics. Each item scores from respondents were considered as an independent sample for statistical analysis in this study. Non-parametric methods were used in statistical inference by conducting Mann-Whitney U tests to compare disaggregated data samples i.e assessing whether the two samples come from the same distribution (See Annex A). The level of statistical significance is expressed as *p*-values. The smaller the *p*-value, the stronger the evidence that the null hypothesis (no impact of gender) should be rejected. *p*-values < 0.05 were considered as statistically significant denoting strong evidence against the null hypothesis. The Internal reliability of each section was assessed by Cronbach's alpha[10] (between 0 and 1) to measure how reliable the responses of a questionnaire are. Higher alpha values show greater reliability. The acceptability of this indicator of consistency may depend on the nature of the test and how this measure is applied[11,12]. In this basic research a value of 0.70 or above was considered as an acceptable range of Cronbach's alpha[13]. The statistical software PSPP (GNU PSPP version 1.2.0-g0fb4db) was used for statistical tests.

[10] Cronbach, Lee J. (1951). «Coefficient alpha and the internal structure of tests». Psychometrika. 16 (3): 297-334. doi:10.1007/BF02310555.
[11] Cho, E., & Kim, S. 2015. Cronbach's Coefficient Alpha: Well Known but Poorly Understood. Organizational Research Methods, 18(2), 207.
[12] Cortina, J. M. 1993. What is coefficient alpha? An examination of theory and applications. Journal of Applied Psychology(1), 98.
[13] Nunnally, J. C. (1978). Psychometric theory: New York : McGraw-Hill, c1978. 2d ed.

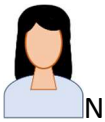
3.1.4. Results

Likelihood: Participants were asked about the likelihood of different disasters in Europe, their own country, and their place of residence (village/town/city). The overall internal reliability of this section was "good" with 0.86 (Cronbach's alpha). Figures 2-4 show the responses (frequency, Median and IQR) of male and female participants.

Likelihood in Europe?

N=510

	W	F	E	H	T
Highly unlikely (1)	2.5	3.3	7.1	6.1	3.3
Unlikely (2)	9.8	9.4	28.4	28.0	7.1
Likely (3)	52.5	47.1	44.3	49.4	36.5
Highly likely (4)	35.1	40.2	20.2	16.5	53.1
Mdn (IQR)	3 (1)	3(1)	3(1)	3(1)	4(1)



N=504

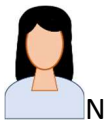
	W	F	E	H	T
Highly unlikely (1)	3.8	3.8	7.5	5.2	2.4
Unlikely (2)	9.7	7.3	26.8	24.8	7.9
Likely (3)	47.4	43.7	46.4	52.6	43.7
Highly likely (4)	39.1	45.2	19.2	17.5	46.0
Mdn (IQR)	3(1)	3(1)	3(1)	3(1)	3(1)

Figure 2: Frequency (%), median and IQR of disasters likelihood in Europe. W= extreme weather, F= fire, E= earthquake, H= hazardous materials accident (CBRN), T= terrorist attack.

Likelihood in your country?

N=510

	W	F	E	H	T
Highly unlikely (1)	3.5	2.4	20.4	10.6	5.1
Unlikely (2)	11.2	10.4	26.7	34.7	25.9
Likely (3)	49.0	46.3	33.3	39.2	37.5
Highly likely (4)	36.3	41.0	19.6	15.5	31.6
Mdn (IQR)	3(1)	3(1)	3(1)	3(1)	3(2)

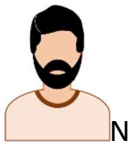


N=504

	W	F	E	H	T
Highly unlikely (1)	3.8	3.8	7.5	5.2	2.4
Unlikely (2)	9.7	7.3	26.8	24.8	7.9
Likely (3)	47.4	43.7	46.4	52.6	43.7
Highly likely (4)	39.1	45.2	19.2	17.5	46.0
Mdn (IQR)	3(1)	3(1)	3(1)	3(1)	3(2)

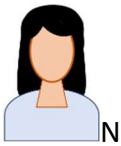
Figure 3: Frequency (%), median and IQR disasters likelihood in countries. W= extreme weather, F= fire, E= earthquake, H= hazardous materials accident (CBRN), T= terrorist attack.

Likelihood where you live?



N=510

	W	F	E	H	T
Highly unlikely (1)	13.1	9.0	36.7	29.0	27.1
Unlikely (2)	28.2	25.5	33.9	40.2	34.3
Likely (3)	44.7	48.0	22.4	25.3	26.3
Highly likely (4)	13.9	17.5	7.1	5.5	12.4
Mdn (IQR)	3(1)	3(1)	2(2)	2(2)	2(2)



N=504

	W	F	E	H	T
Highly unlikely (1)	9.7	6.2	33.7	29.0	25.0
Unlikely (2)	26.0	20.8	35.9	41.3	38.7
Likely (3)	47.8	53.6	24.4	25.4	28.4
Highly likely (4)	16.5	19.4	6.0	4.4	7.9
Mdn (IQR)	3(1)	3(1)	2(2)	2(2)	2(1.25)

Figure 4: Frequency (%), median and IQR for disasters likelihood in proximity. W= extreme weather, F= fire, E= earthquake, H= hazardous materials accident (CBRN), T= terrorist attack.

We found no significant gender differences for disaster awareness in most cases (Table 3). An interesting result that emerged from the data is that there were differences when anticipating the occurrence of extreme weather (W) and fire (F) nearby i.e. where respondents live (*city-town-village*). Women reported significantly higher likelihood than men (W: U=119481, z=-2.07, *p* =.019; F: U=118458, z=-2.34, *p* =.009, one tailed).

	W	F	E	H	T
Europe	-0.80(*.423*)	-1.60(*.110*)	-0.01(*.985*)	-1.25(*.209*)	1.90(*.067*)
Country	0.04*(.966)*	-0.78(*.433)*	-0.78(.432)	-0.89*(.370)*	-0.05*(.955)*
Residence	-2.07*(.038)*	-2.34*(.019)*	-0.66*(.508)*	0.29*(.774)*	0.53*(.594)*

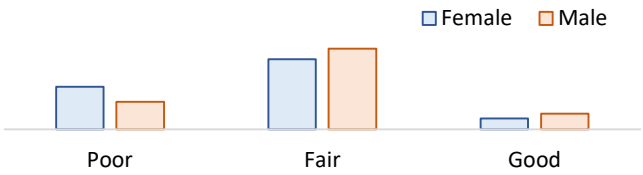
Table 3 Mann Whitney U test z-scores (*p* values) results (two tailed) on differences in respondents' perception between males versus females on the likelihood of disasters. W= extreme weather conditions, F= fire, E= earthquake, H= hazardous materials accident (CBRN), T= terrorist attack. Results in red= gender difference is statistically significant ($\alpha < 0.05$).

Preparedness: The aim of this section was to look at gender differences/similarities in 1) the perceived individual preparedness to handle different disasters and 2) the attitudes towards readiness.

1) Individual preparedness: Figure 5 shows the descriptive statistics of the responses. For simplicity, responses were transformed to Good ("*I know what to do*"), Fairly ("*I fairly know what to do*") and Poor ("*I do not know what to do*"). The internal reliability of this sub-section of the questionnaire was acceptable with a Cronbach´s alpha value of 0.76.

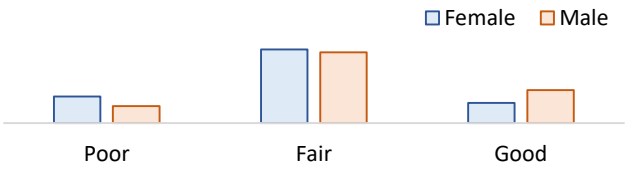
Extreme weather conditions

	Female	Male
Poor	34.5	22.2
Fair	56.7	65.1
Good	8.7	12.7
Mdn (IQR)	2(1)	2(0)



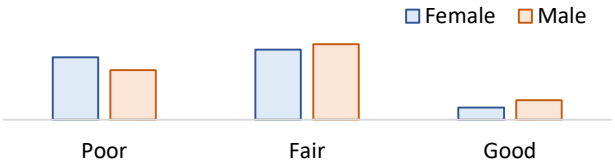
Fire

	Female	Male
Poor	22.0	13.9
Fair	61.3	58.8
Good	16.7	27.3
Mdn (IQR)	2(0)	2(1)



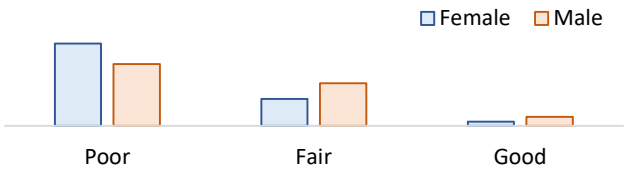
Earthquake

	Female	Male
Poor	43.3	34.3
Fair	48.4	52.2
Good	8.3	13.5
Mdn (IQR)	2(1)	2(1)



Hazardous materials accident (CBRN)

	Female	Male
Poor	72.6	54.5
Fair	23.6	37.6
Good	3.8	7.8
Mdn (IQR)	1(1)	1(1)



Terrorist attack

	Female	Male
Poor	65.7	46.3
Fair	30.8	42.0
Good	3.6	11.8
Mdn (IQR)	1(1)	2(1)

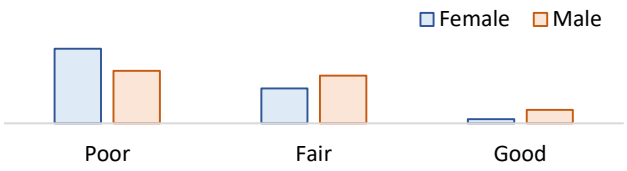


Figure 5: Frequency (%), Median and IQR for self-preparedness to face different disasters.

Results revealed that men expressed higher levels of self-confident in being prepared to face each disaster with score mean values of W= 1.91; F= 2.13; E= 1.79; H=1.53; T= 1.65 versus women with mean values of W= 1.74; F= 1.95; E= 1.65; H=1.31; T= 1.38 (Figure 6). This difference was confirmed statistically, and the results are displayed in Table 4.

2) Attitudes towards readiness: Questions consisted of two subscales, one measuring the *Pros* (4 items) and one measuring the *Cons* (5 items) of preparedness. In some manner, these subscales can be used to measure how predisposed men and women are, that is the individual inclination to be prepared for disasters. Table 5 displays the relation between the questions and the conceptual elements of the subjacent theoretical construct: willingness of being ready. The internal reliability (Cronbach alpha) of this section of the questionnaire was 0.75 ("acceptable") for the *Pros* subscale and 0.86 ("good") for the *Cons* subscale.

Disaster	U	z-score	*p*-value
W	146405	4.43	*<.001*
F	147809	4.73	*<.001*
E	142842	3.40	*<.001*
H	152350	6.04	*<.001*
T	156177	6.73	*<.001*

Table 4 Mann Whitney U test results (one tailed) on differences in individual preparedness between males versus females for each of the five disasters. W= extreme weather conditions, F= fire, E= earthquake, H= hazardous materials accident (CBRN), T= terrorist attack. *p*-values in red= gender difference is statistically significant (i.e. men felt more prepared than women).

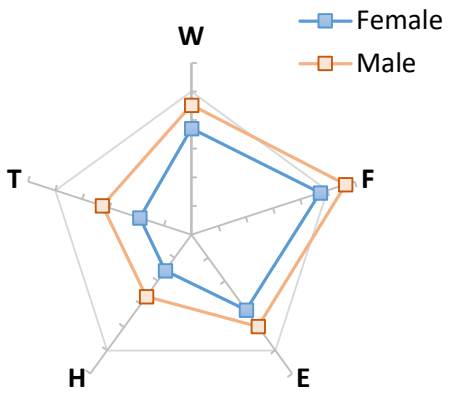


Figure 6: Mean score values in terms of individual preparedness (range 1-3) for each of the five disasters. W= extreme weather conditions, F= fire, E= earthquake, H= hazardous materials accident (CBRN), T= terrorist attack.

Pros: *Getting ready is worthwhile because…*	
Item/statement	**Concept**
it is easier to get back to normal	Resilience
people have information about what to do	Information
taking action makes me worry less	Confidence
if I'm ready, I can help others	Assistance
Cons: *Getting ready is not worthwhile because…*	
Item/statement	**Concept**
getting ready won't make a difference	Uselessness
It is not my responsibility	Buck-passing
I would rather not think about bad things happening	Avoidance
It doesn't matter; disasters don't happen where I live	Denial
It takes too much time, effort, or money	Cost

Table 5 Item statements for citizens attitudes to handle disasters and the derived conceptual elements for the analysis.

Descriptive statistics are shown in Figure 7 (frequency of responses, Median and IQR). From Figure 7 it is possible to see that *Pros* subscale produced high frequencies for "Agree" and "Strongly agree" responses across the conceptual elements: *Resilience* (72% of females; 71% of males), *Information* (66% of females; 65% of males), *Confidence* (73% females; 69% of males) and *Assistance* (84% of females; 79% of males). This denotes that both women and men had positive attitudes towards getting ready for disasters.

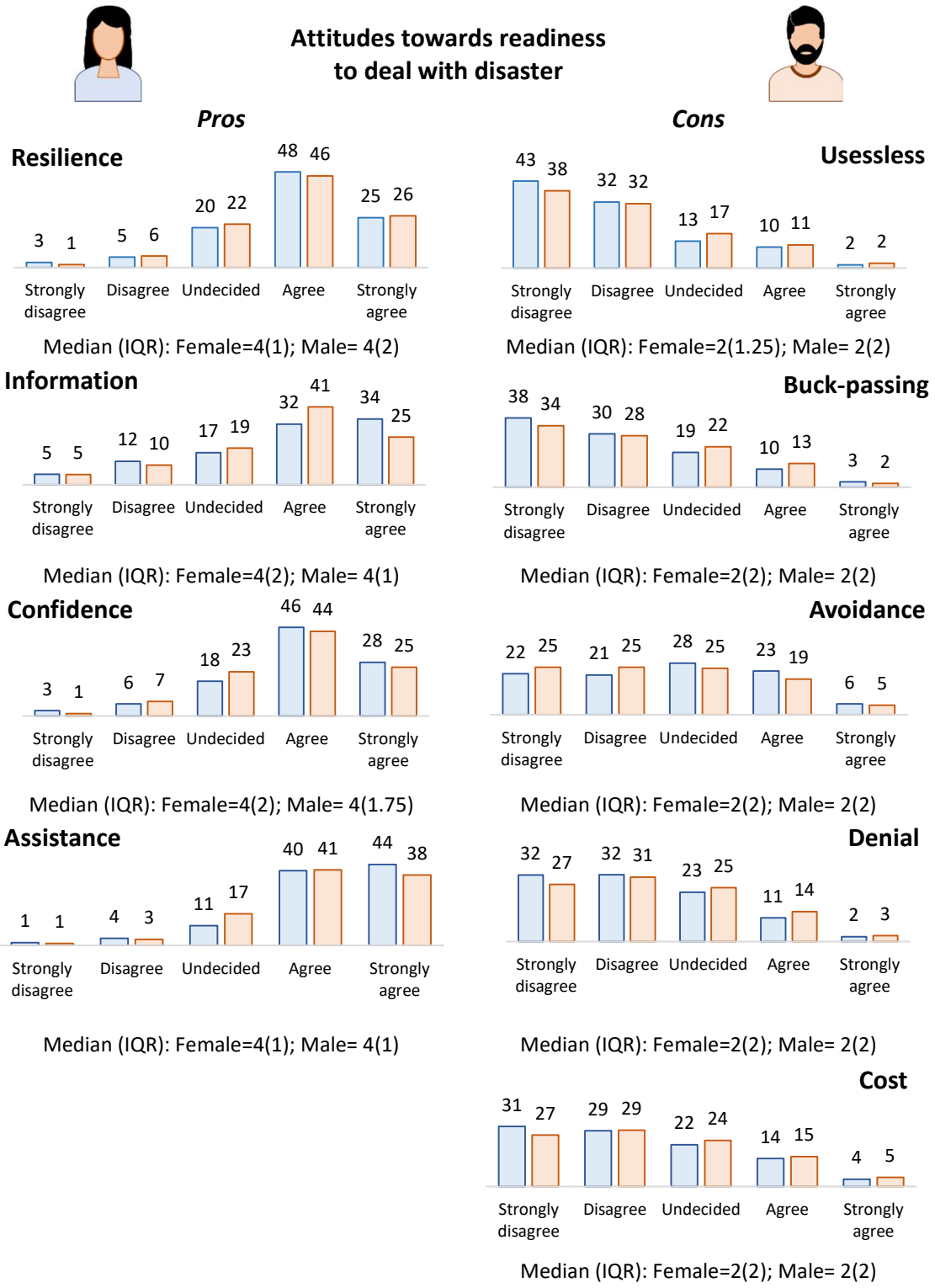


Figure 7: Frequency (%), Median and IQR of responses for *Pros* and *Cons* subscales of attitudes towards readiness for disasters.

The response pattern for *Cons* subscale is also similar between males and females. But, contrary to our initial expectation, responses had lower degree of consensus (50% or more responses are within 2 scores of the Median).

Around one fourth of respondents did not form an opinion and chose the neutral option "undecided" for *Buck-passing* (19 % female; 22% male), *Avoidance* (28% female; 25% male), *Denial* (23% female; 25% male) and *Cost* (22% female; 24% male); See Table 2 for reference of terms.

Table 6 displays inferential statistics when comparing item scores of males and females. Overall, no significant differences were found for *Pros* and *Cons* of being ready for disasters. At subscale level null findings were produced for *Resilience* (*"it is easier to get back to normal"*), *Information* ("*people have information about what to do*") and *Confidence* ("*taking action makes me worry less*") as *Pros* of readiness. Interestingly, the importance of being prepared for helping others (i.e. *Assistance*) was significantly higher for women than for men (U=118836, *p* =.012, one tail). Regarding *Cons* of being ready, no significant differences were found for *Buck-passing* (*"It is not my responsibility"*) and *Cost* ("*It takes too much time, effort, or money*"). Yet, differences were statistically significant for *Uselessness* ("*getting ready won't make a difference*"), *Avoidance* ("*I would rather not think about bad things happening* ") and *Denial* ("*It doesn't matter; disasters don't happen where I live"*). *Uselessness* and *Denial* were greater for males (*Uselessness* U=137090, *p*= .03; *Denial* U=137854, *p*= .02, one tail) and *Avoidance* was greater for females (U=138848.50, *p*= .01, one tail).

Pros: ***Getting ready is worthwhile***	**U**	**z-score**	***p*-value**
Resilience	128773.00	0.06	.95
Information	135992.00	1.67	.09
Confidence	122719.00	-1.32	.19
Assistance	118836.00	-2.24	.03
Cons: ***Getting ready is not worthwhile***	**U**	**z-score**	***p*-value**
Uselessness	119950.00	-1.94	.03
Buck-passing	120491.50	-1.80	.07
Avoidance	138848.00	2.28	.02
Denial	137854.00	2.08	.04
Cost	135412.00	1.59	.11

Table 6 Mann Whitney U test results (two tailed) on differences in attitudes towards readiness between males and females. *p*-values in in red= gender difference is statistically significant.

Risk perception: This section of the questionnaire allowed us the opportunity to explore gender influence on the risk perceived concerning the occurrence of disasters in close vicinity. This section of the questionnaire had a Cronbach alpha of 0.84 ("good"). Descriptive statistics are shown in Figure 8 (frequency of responses, Median and IQR). By looking at the mean and standard deviation scores in Figure 9 it is possible to see that females reported higher risk perception for weather (W), fire (F), earthquake (E). This was confirmed by the results in Table 7. However, the item score distributions of the risk perception in males and females for hazardous materials accidents (H) and terrorist attack (T) did not differ significantly.

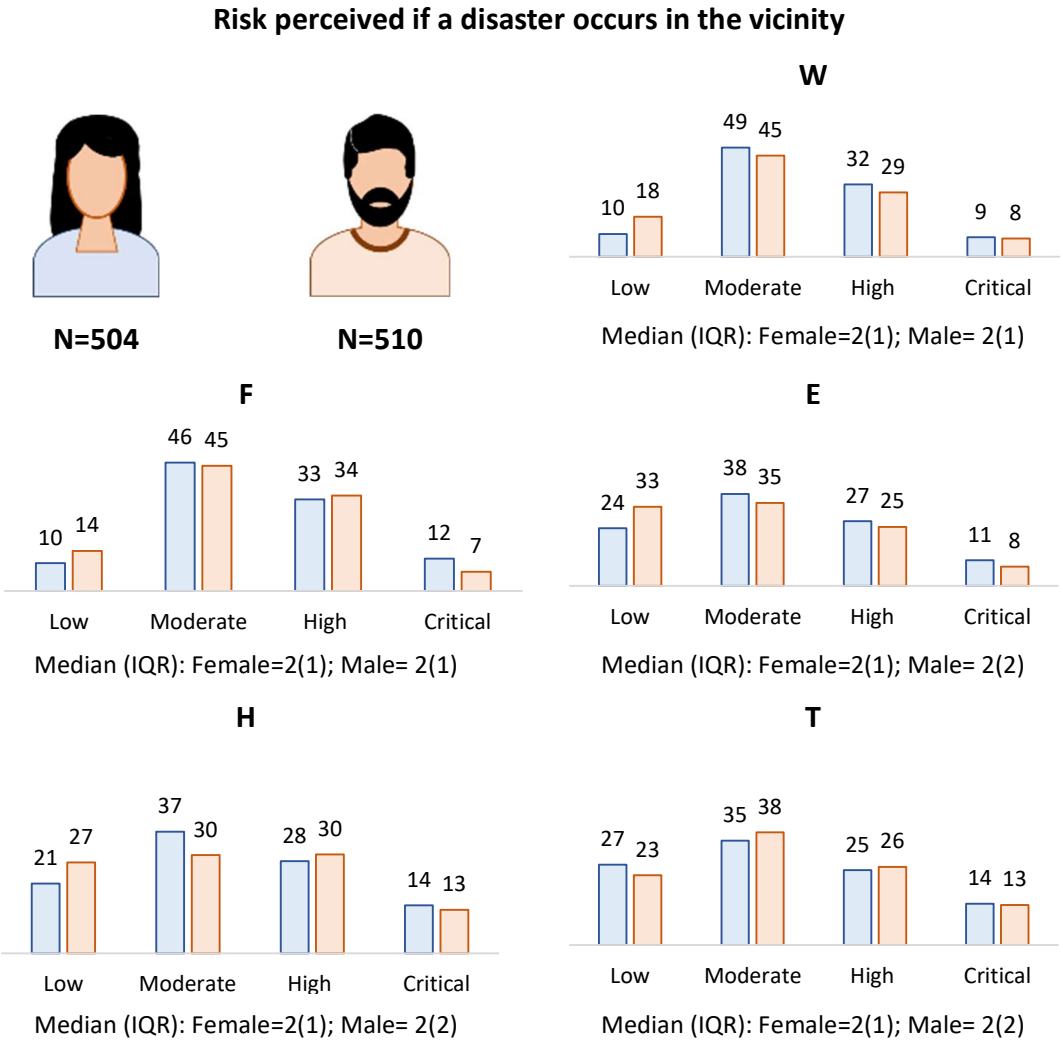


Figure 8: Frequency (%), Median (IQR) of risk perception between males versus females for each of the five disasters. W= extreme weather conditions, F= fire, E= earthquake, H= hazardous materials accident (CBRN), T= terrorist attack.

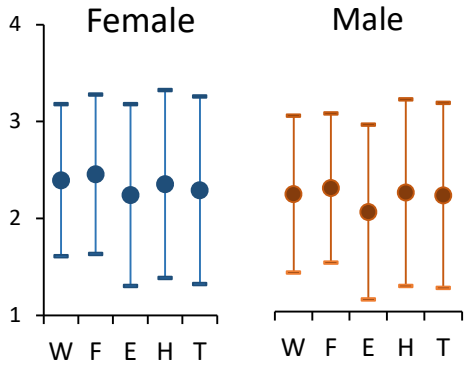


Figure 9: Mean and Standard Deviation scores of risk perception in males and females.

Disaster	U	z-score	*p-value*
W	117916	-2.45	*.001*
F	119433	-2.09	*.018*
E	115751	-2.87	*.002*
H	123588	-1.10	*.135*
T	125507	-0.67	*.250*

Table 7 Mann Whitney U test results (one tailed) on differences in risk perception. *p*-values in red= gender difference is statistically significant (< 0.05) i.e. women perceive greater risk than men.

3.1.5. Discussion

Datasets from an online survey on citizens' attitudes towards natural and man-made disasters were used to explore the differences between males (n=510) and females (n=504). Hence, the information collected can enable the study of how gender influences how people perceive and would behave in a disaster. Such valuable information does not only have scientific relevance, but also has the potential to inform decision makers and First Responders for developing risk management policies, training and communication campaigns, thus improving disaster response and resilience.

This case study showed gender differences and similarities across the EU population on awareness, preparedness, and risk perception towards potential disasters. Both male and female respondents agreed when rating disasters likelihood at European and national levels. Our results show that females are more aware of the fatal consequences of extreme weather (W) and fire (F) (potential casualties and damage) if they occur nearby. The gender differences in weather fear have been reported in the literature[14] but, to our knowledge, this is not the case for fire events.

We confirm that gender is an important factor in individual preparedness. Males reported being significantly more prepared to face disasters than females[15,16,17]. A possible explanation is that women may be less confident than men, but this perhaps denotes a more realistic view about self-preparedness [3]. Moreover, participants were also asked about the *Pros* and *Cons* of preparedness to evaluate their willingness to be prepared. Overall differences were not significant. However, responses to some items differed between genders. The importance of being prepared to help others (*Assistance*) was significantly higher in women. This result is in line with previous studies attesting that women tend to be more altruistic than men (see[18,19,20,21] for some references).

The statements that being prepared for disasters "*won't make a difference" (Uselessness*) and that disasters "*don't happen where I live*" (*Denial*) had significantly higher scores in men denoting possibly gender differences in overconfidence of judgments based upon such events. This is an important aspect of preparedness since overconfidence can keep individuals from realizing how little they know and how much information they may need to be ready. By contrast, women were significantly more likely to "*not think about bad things happening*" (*Avoidance*) than men.

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This result supports previous studies attesting that gender is a significant predictor of avoidance when accounting for distress[22]. Avoidance here can be associated with information avoidance leading to misinformation which has been recently analysed in the context of the COVID 19 pandemic[23,24]. Though, more research is needed to explore gender influence on this aspect of behaviour in the context of disasters.

Gender differences in risk perception have been reported in the literature[25]. In our study females exhibited higher perception of risk than males for events where there is a possibility to have some forecast and therefore a chance to get prepared: e.g. extreme weather (W), fire (F) and earthquake (E). For more surprising and unexpected events, such as terrorist attack (T) and hazardous materials accidents (H) there was no significant difference. It is important to note that men and women can give priority to different risks and/or show different concerns about the same risks and that items may not necessarily have the same meaning for women and men[26]. For example, women may be more oriented toward home and family when thinking about risks. The questions of this section included "*what in your view is the risk for you and your family*". Our results are in line with previous findings confirming that women worry more about natural hazards than men, especially if family members are threatened[27,28]. Also, natural hazards can be perceived by women as having immediate effects, better known, more uncontrollable and involuntary[29]. Our null findings for man-made disasters contrasts with previous research indicating that men are more concerned about industrial accidents[30] but reinforces no gender effects in the perceived vulnerability regarding terrorist attacks[31].

Gender should not only be seen as a single variable to distinguish groups of the population. Results presented in this study constitute the first process of gender analysis (e.g. data collection, data processing, and analysis) and advocates to conduct the second process which is interpretative in nature by seeking practical solutions to mitigate gender issues in disaster response. The gender discrepancies are likely to show the underlying mechanisms apart from biological and physiological differences[32] such as power relations, economic status, everyday life behaviours and beliefs as well as stereotypes derived from gender norms.

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Conceivably socioeconomic and cultural differences between men and women are more evident in lower-income countries leading to a higher exposure of women to risks[8]. The present results suggest that key gender issues in disasters may persist in European societies. The different social roles and activities of men and women within the household and community are examples of how gender norms and ideals manifest.

It should be noted that gender relations in society are reflected by identities, perceptions, attitudes, and status of individuals[33]. Different gender roles can be reinforced following a disaster because expectations for men and women are based on stereotypes[8]. A recent study focused on actions during the large Swedish forest fire, indicated that women were praised when they followed the traditional norms but denigrated when they performed what was perceived as male-coded tasks[34]. Studies may suggest that the role of nurturer and caregiver primarily played by women may be associated with a greater concern about the risk of potential disasters and well-being of others[35]. Similarly, research in the field has pointed out that the higher confidence of men in their self-preparedness may be due, at least in part, to the roles they usually play in society[4]. According to social expectations, men are more involved in official and open-air preparedness (rescue and recovery efforts) and physically demanding tasks that often put them at greater risk. Moreover, literature on gender and preparedness showed that women are slightly present in emergency planning and disaster management programs but more involved in household and community care in practice [8,25,33]. The participation of women in response to disasters is often ignored in official evaluations after disasters or in disaster management studies[32]. But it is argued here that gender skills may benefit prevention and mitigation of hazard situations. Given this, the most robust approach can be using the strengths of individuals (both women and men) in a complementary way to enhance community response and resilience. Yet more efforts need to be done to achieve this.

Although limited to awareness, risk perception and preparedness, the outcomes of this study can provide insights for the integration of gender sensitive practices in disaster preparedness and response. First, conducting more qualitative and quantitative research for understanding more on gender-based roles and responsibilities is highly desirable. For studying a complex area as gender constructs and roles, a multi-disciplinary research team could be beneficial. Second, improving women's capacities and knowledge (training and education) can increase individual and community resilience. Third, promoting policies and actions to involve women in official emergency management programs and decision making is essential to minimize gender gaps in disaster planning and response.

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3.2. Case study 2. Risk propensity and resilience in male and female First Responders

3.2.1. Summary

Background: The research questions investigated were: 1) Does gender influence risk propensity exerted by first responders on duty? 2) Do female and male first responders differ in their resilience and coping with stressors? Risk propensity here refers to be attracted to, or the willingness to tolerate, options that entail a potentially high risk of loss on duty. Resilience is defined as the ability to bounce back from stress as well as coping with such stress adaptively.
Method: A sample of 366 first responders (242 males and 119 females) filled out a pilot survey to test the research questions. Risk propensity, resilience and resilient coping were measured.
Results: The results indicated that 1) females can be as risk seeking as their gender counterparts with a significantly higher risk tendency in women firefighters in the frontline, 2) females are less resilient than males and 3) first response personnel, both male and female, are high resilient copers with no significant differences between both sexes in total scores. Although significant, most differences were found to be trivial.
Conclusion: Small differences in females versus males were found suggesting that the hypothetical gender discrepancies in risk propensity, resilience and coping may be reduced in first responding occupational contexts. Further research is needed to confirm this.

3.2.2. Background

Women and men are likely to bring distinct and unique biological and physiological qualities to their role as first responders. Gender may also be relevant in the way first responders face different risks and recover from stressful and traumatic situations. Risk-taking can be considered as part of the first responding culture. A qualitative and exploratory study focused on gender safety behaviours in firefighters, paramedics and EMTs showed that women perceived risk differently than their male colleagues[36]. It has become well-accepted that women are more risk averse than men[37]. But to date, research has yet to confirm whether women in high-risk occupations are as prone to risk-taking as their gender counterparts. First responders are high risk professionals who experience health and mental consequences due to their exposure to critical incidents as part of their job. Empirical evidence showed that women are likely to have higher rates of anxiety, Posttraumatic Stress Disorder (PTSD)[38] and suicide[39].

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A study on Emergency Medical Services (EMS) workers found gender-based differences in stress, burnout and coping behaviours[40]. Coping refers to the strategies to deal with negative psychological outcomes[41] while resilience is the adaptive capacity to recover from stressful situations[42]. Hence the study of resilience and coping is still of crucial importance to identify potential gender differences and needs to enhance the health, well-being, and occupational functioning of first response personnel.

ASSISTANCE is devoted to the protection of first responders. Therefore, a pertinent analysis consists of exploring the gender dimension in relation to risk-taking behaviours and the capability to bounce back to normality. Self-reporting questionnaires focused on gender differences/similarities can be important sources of information. We used validated scales to explore the likely impact of gender on risk propensity, resilience and resilience coping using a convenience sample of 366 first responders. This case study provided us with the opportunity to: 1) report on the methods for the gender analysis of the questionnaire, 2) briefly summarise the key findings and 3) draw conclusions about the potential impact of gender on safety behaviour and protection of first responders.

3.2.3. Method

Design and setting: A pilot cross-sectorial web-based survey was carried out from January 14, 2021 to February 21, 2021. The questionnaire comprised three validated scales (in the public domain) that were used to investigate gender in risk propensity and resilience in First Responders (FRs): Risk Propensity Scale (RPS)[43,] Brief Resilience Scale (BRS)[44,45,46] and Brief Resilience Coping Scale (BRCS)[47,48].

The English versions of the scales were translated by the project partners into Swedish (RISE), Italian (CEL), Turkish (AAHD), Polish (PIAP) Dutch (IFV) and Spanish (UC). The translation is aimed at achieving equivalence to the original versions. The initial translation into each target language was made by two independent translators to detect and resolve subtle differences/discrepancies. Also, the resulted versions were back-translated to ensure the accuracy of the translation. Then, the online prefinal versions were sent again to the translators for checking and final approval.

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The target participants of this survey were first responders (FRs) who were/will be -directly or indirectly- participating in disasters response. This study followed the ethical requirements stated in the ASSISTANCE project and was performed under ethical principles. The questionnaire was anonymous, and the privacy policy of the individual's posted information was noted. Due to the nature of this study and considering that no personal data would being collected or stored, written informed consent was not required. However, respondents gave consent to participate by filling in the agreement part of the survey form.

Study, participants and recruitment: The participating FRs included firefighters, police officers, emergency medical service and civil protection personnel. In addition to the type of service, participants were classified as operational, leading and training personnel. The online survey was distributed by the project partners through email to internal end users (ASSISTANCE project partners) and external FRs (e.g. Dutch female firefighters association, cluster of EU projects) through their organizations. The survey was also announced through social networks and available on the ASSISTANCE project website. The web-based questionnaire was distributed on January 14, 2021, with a predefined closure date of February 21, 2021.

Survey items: The questionnaire was generated using Google Forms, a cloud-based survey development application. The detailed questionnaire (in English version) is available in the supplementary Annex C. It comprised four parts. The first part collected data on the participants' demographics and characteristics including gender, age, type of service, current position, number of years in service and whether respondents seek for promotion in the future.

The second part of the survey comprised the Risk Propensity Scale (RPS) which is a scale that measures people's tendency to take risks. The questionnaire has 7 items (Table 8) and the scale runs from 1 (Totally disagree) to 9 (Totally agree). In item 7 the original 9-point score is labelled from 1 (Risk avoider) to 9 (Risk seeker). The key point here was to explore if gender impacted on risk propensity in first response personnel. It is important to note that while the original version of this instrument focuses on general risk-taking/tendency in the more mundane risks, the current approach tries to focus on occupation-specific risk propensity. In other words, everyday risk taking or risk-taking for high-risk sports (e.g. sensation seeking) highly differ from the willingness/voluntariness to take risks on duty (e.g. rescue operations). To more focus on first responding behaviour, we included an item to the original RPS: AQ1 "*I have experienced benefits from risky actions*" also with a 9-point Likert scale. This item is related to incentive (cost/benefit) of risky performances on duty.

The third part of the questionnaire comprised the items of the Brief Resilience Scale (BRS) which is one of the best and highly recommended scales for measuring resilience in the context of stress. It is a self-reported scale that can be used to essentially assess "the ability to bounce back from stress". The BRS is a 6 items questionnaire with 5-point Likert scale scores (1 Strongly disagree and 5 Strongly agree) (Table 9). The possible score range on the BRS is from 1 (low resilience) to 5 (high resilience).

The fourth part of the questionnaire included the Brief Resilience Coping Scale (BRCS). This is another scale that captures trends to cope with stress adaptively. It is a very short self-reported questionnaire with only 4 items with 5-point Likert scale (Table 10). According to the authors, of the total BRCS scores can be interpreted as follows:4-13 Low resilient copers, 14-16 Medium resilient copers and 17-20 High resilient copers.

Please indicate the extent to which you agree or disagree with the following statements. Please do not think too long before answering; usually your first inclination is also the best one.									
	1 Totally disagree								9 Totally agree
	1	2	3	4	5	6	7	8	9
RPS1. Safety first (R)	o	o	o	o	o	o	o	o	o
RPS2. I do not risk with my health (R)	o	o	o	o	o	o	o	o	o
RPS3. I prefer to avoid risks (R)	o	o	o	o	o	o	o	o	o
RPS4. I take risks regularly	o	o	o	o	o	o	o	o	o
RPS5. I really dislike not knowing what is going to happen (R)	o	o	o	o	o	o	o	o	o
RPS6. I usually view new risks as a challenge	o	o	o	o	o	o	o	o	o
AQ1. I have experienced benefits from risky actions	o	o	o	o	o	o	o	o	o
	1 Risk avoider								9 Risk seeker
	1	2	3	4	5	6	7	8	9
RPS7. I view myself as:	o	o	o	o	o	o	o	o	o

R= reverse scores

Table 8 Risk Propensity Scale (RPS). *AQ1* is an additional question to the original scale.

Please indicate the extent to which you agree with each of the following statements by using the following scale 1 = Strongly disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly agree					
	1	2	3	4	5
BRS1. I tend to bounce back quickly after hard times	o	o	o	o	o
BRS2. I have a hard time making it through stressful events (R)	o	o	o	o	o
BRS3. It does not take me long to recover from a stressful event	o	o	o	o	o
BRS4. It is hard for me to snap back when something bad happens (R)	o	o	o	o	o
BRS5. I usually come through difficult times with little trouble	o	o	o	o	o
BRS6. I tend to make a long time to get over set-backs in my life (R)	o	o	o	o	o

R= reverse scores

Table 9 Brief Resilience Scale (BRS).

Consider how well the following statements describe your behaviour and actions. 1= Does not describe me at all, 2= Does not describe me, 3= Neutral, 4= Describes me, 5= Describes me very well.					
	1	2	3	4	5
BRCS1. I look for creative ways to alter difficult situations	o	o	o	o	o
BRCS2. Regardless of what happens to me, I believe I can control my reaction to it	o	o	o	o	o
BRCS3. I believe that I can grow in positive ways by dealing with difficult situations	o	o	o	o	o
BRCS4. I actively look for ways to replace the losses I encounter in life	o	o	o	o	o

Table 10 Brief Resilience Coping Scale (BRCS).

Statistical analysis: We summarized the data by gender. The continuous variables are expressed as Mean ± Standard Deviation (SD). The categorical variables are expressed as percentages and Median (Mdn) with interquartile range (IQR). Responses in the Likert scales were analysed as continuous values not as ordinal variables. The statistical differences at both scale and subscale level were estimated using Student's t-test for normally distributed and the Mann-Whitney U-test for non-normally distributed data (see Annex A). The categorical variables were compared using the chi-square test because the expected values were more than 10. Scale reliability was assessed by Cronbach's alpha assuming a cut-off acceptability value of 0.6 in this exploratory study (See Annex A). Data were analysed using the statistical software GNU PSPP version 1.2.0-g0fb4db and *p*-values <0.05 were considered statistically significant in all tests.

3.2.4. Results

Participants' characteristics. Participant characteristics are summarized in Table 11. Among 366 respondents, 5 who did not specify their gender male/female and chose the option "*Prefer not to say*" were excluded from the analysis; the analytic cohort consisted of 361 participants. There were 242 men (67%) and 119 women (33%) most firefighters (75.6 %), emergency medical staff (14.1 %), police officers (5.8 %) and civil protection personnel (4.4 %). Of these 271 (75.1%) were people in the frontline, 63 (17.4%) managed operations and 27 (7.5%) worked as training and education personnel. A chi-square test of independence showed that there was no significant association between gender and seeking for promotion, X^2 (1, N = 361) = 1.07, p = .30.

Variables	**Overall** ***(n=361)***	**Male** ***(n=242, 67%)***	**Female** ***(n=119, 33%)***
Age, years	41±11	41±11	39±10
Type of service *n* (%)			
Firefighters	273 (75.62)	183 (75.62)	90 (75.63)
Civil Protection	16 (4.43)	11 (4.55)	5 (4.20)
EMS	51 (14.12)	29 (11.98)	22 (18.49)
Police	21 (5.81)	19 (7.85)	2 (1.68)
Current position *n* (%)			
Operational	271 (75.06)	178 (73.55)	93 (78.15)
Leading	63 (17.45)	42 (17.36)	21 (17.65)
Training & education	27 (7.47)	22 (9.09)	5 (4.20)
Years of experience *n* (%)			
<1 year	10 (2.77)	7 (2.89)	3 (2.52)
1-5 years	77 (21.33)	51 (21.07)	26 (21.85)
6-10 years	56 (15.51)	35 (14.46)	21 (17.65)
11-15 years	70 (19.39)	41 (16.94)	29 (24.37)
16-20 years	56 (15.51)	34 (14.05)	22 (18.49)
>20 years	92 (25.48)	74 (30.58)	18 (15.13)
Seek for promotion? *n* (%)			
Yes	214 (59.28)	148 (61.16)	66 (55.46)
No	147 (40.72)	94 (38.84)	53 (44.54)

Table 11 Baseline characteristics of study participants.

Risk propensity: The degree and detailed content of the respondent's risk propensity are shown in Figure 10 and Table 12. The obtained result of the Cronbach's alpha value in this part of the questionnaire was 0.64 indicating an acceptable level of internal consistency of the items for this pilot questionnaire. As expected, respondents rated their self-protective concerns as relatively low-risk tendency (RPS1, RPS2 and RPS3) and duty related concerns as relatively high-risk tendency (RPS4, RPS5, RPS6, RPS7 and AQ1). Perhaps surprisingly, our results showed that risk aversion (RPS3) was significantly higher in males than females. We also found that female respondents were significantly less worried about uncertainty than male respondents (RPS5). However, the overall risk propensity scores did not differ significantly (Table 12), despite women (Mean=34.81, SD=8.98) attaining higher scores than men (Mean=33.51, SD=9.24).

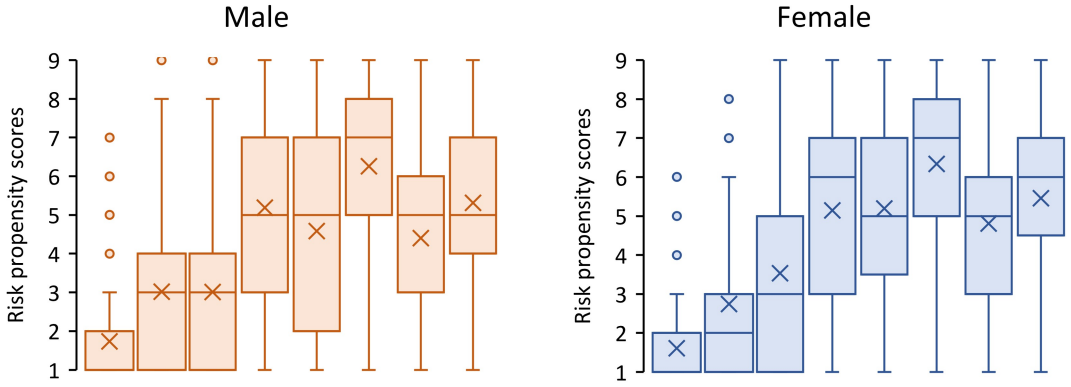


Figure 10: Box plots of responses for risk propensity. Items are in order from left to right*: RPS1, RPS2, RPS3, RPS4, RPS5, RPS6, RPS7* and *AQ1.* Higher scores indicate greater risk taking (1= Low; 9= High)

Item	**Male** *Mean ± SD*	**Female** *Mean ± SD*	***p*-value**
RPS1. Safety first (R)	1.73 ± 1.10	1.61 ± 0.97	.33
RPS2. I do not risk with my health (R)	3.02 ± 1.95	2.74 ± 1.70	.28
RPS3. I prefer to avoid risks (R)	3.01 ± 1.93	3.53 ± 2.13	.03
RPS4. I take risks regularly	5.19 ± 2.50	5.14 ± 2.33	.85
RPS5. I really dislike not knowing what is going to happen (R)	4.59 ± 2.71	5.19 ± 2.54	.04
RPS6. I usually view new risks as a challenge	6.26 ± 2.32	6.34 ± 2.01	.88
RPS7. I view myself as: risk avoider (1)/risk seeker (9)	4.40 ± 2.15	4.81 ± 2.08	.08
AQ1. I have experienced benefits from risky actions	5.31 ± 2.34	5.45 ± 2.05	.59
Overall	4.19 ± 1.16	4.35 ± 1.12	.17

R= reverse scores; SD=Standard deviation

Table 12 Mean scores, standard deviations and *p*-values derived from the items of the Risk Propensity Scale and the additional question (AQ1). *p*-values in red= gender differences are statistically significant (α=0.05).

To increase our understanding of risk propensity and to explore the potentiality of the generated dataset we conducted an additional statistical analysis for firefighters in the frontline. Results revealed a difference between females (Mean=36.72, SD=7.38) and males (Mean=34.29, SD=9.03) in the general risk-taking tendency, $t(210)=1.95$, $p=.026$, one tailed.

Then, we compared firefighters in the frontline with less than 10 years of experience and we confirmed again that females scored significantly higher risk propensity than males; $t(89)=2.40$, $p=.009$, one tailed.

Resilience: The overall obtained Cronbach´s alpha for this scale was 0.64 (acceptable). Figure 11 shows the box plots of responses (1=low resilience and 5=high resilience). There was less consensus among female respondents (IQR>2 in all items) compared to male respondents (IQR≤2) when scoring the different items. The results showed a significant statistical difference in BRS1 since male respondents felt more resilient "*I tend to bounce back quickly after hard times*" than female respondents. However, females felt significantly more resilient than males concerning "*getting over set-backs in my life*". The rest of items had no statistically significant difference to be noted. Though, we found statistically significant differences for gender on the overall scores of the BRS: Male (Mean=3.73; SD=0.70); Female (Mean=3.58; SD=0.60) i.e. males scored higher resilience than females (Table 13).

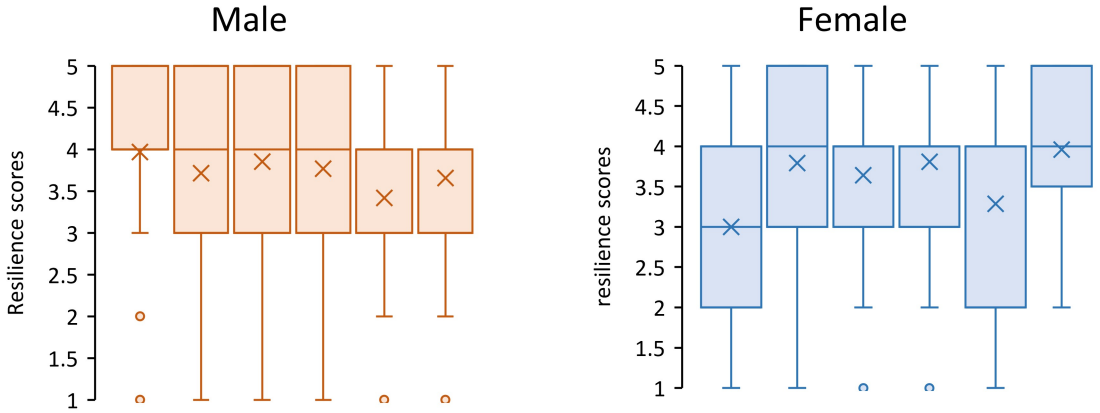


Figure 11: Box plots of responses for the items of the Brief Resilient Scale. Items are from left to right: *BRS1, BRS2, BRS3, BRS4, BRS5 and BRS6*. (1= Low resilience; 5= High resilience).

Item	**Male** ***Mean ± SD***	**Female** ***Mean ± SD***	***p*-value**
BRS1. I tend to bounce back quickly after hard times	3.97 ± 1.00	3.00 ± 1.38	<.001
BRS2. I have a hard time making it through stressful events (R)	3.71 ± 1.13	3.79 ± 1.13	.53
BRS3. It does not take me long to recover from a stressful event	3.38 ± 1.05	3.64 ± 1.10	.07
BRS4. It is hard for me to snap back when something bad happens (R)	3.77 ± 1.12	3.81 ± 0.97	.89
BRS5. I usually come through difficult times with little trouble	3.42 ± 1.19	3.29 ± 1.19	.33
BRS6. I tend to make a long time to get over set-backs in my life (R)	3.66 ± 1.06	3.96 ± 0.95	.01
Overall	3.73 ± 0.70	3.58 ± 0.60	.04

R= reverse scores; SD=Standard deviation

Table 13 Mean scores, standard deviations and *p*-values derived from the items of the Brief Resilience Scale. *p*-values in red= gender difference is statistically significant (α=0.05).

Coping: Additional results presented here allowed us the possibility to explore the capability of male and female FRs to adapt positively despite the adversities or traumas that they experience. The overall obtained Cronbach alpha for this scale was 0.67 (over the assumed threshold of 0.6 for this exploratory analysis). Both males and females provided high resilient coping values with a Median= 4 and IQR=1 in most items except item BRCS 4 for females with an IQR=2.

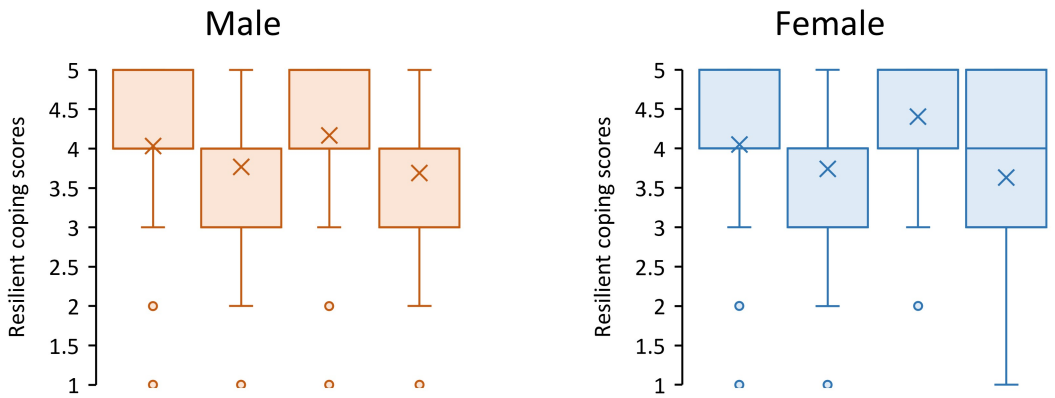


Figure 12: Box plots of responses for the items of the Brief Resilient Coping Scale. Items are in order from left to right: *BRCS1, BRSC2, BRCS3 and BRCS4* (1= Low resilience copers; 5= High resilience copers).

Mann Whitney U tests revealed statistically significant difference between resilient coping behaviour of males and females in BRCS 3 "*I believe that I can grow in positive ways by dealing with difficult situations*". In this case females had greater optimism for resilient coping than males (U=12197, *p*=.004). As summarized in Table 14, the rest of items and the overall resilient coping scores had no statistically significant differences to be noted as the mean differences were practically trivial (males 15.66; females 15.82). Moreover, the proportion of respondents who scored Low (3-13)/Medium (14-16)/High (17-20) resilient coping did not differ by gender, X^2 (2, N = 361) = 5.67, *p* = .58.

Item	**Male** ***Mean ± SD***	**Female** ***Mean ± SD***	***p*-value**
BRCS1. I look for creative ways to alter difficult situations	4.03 ± 0.90	4.05 ± 0.88	.90
BRCS2. Regardless of what happens to me, I believe I can control my reaction to it	3.77 ± 0.85	3.74 ± 0.98	.88
BRCS3. I believe that I can grow in positive ways by dealing with difficult situations	4.17 ± 0.82	4.40 ± 0.66	.009
BRCS4. I actively look for ways to replace the losses I encounter in life	3.69 ± 1.04	3.63 ± 1.12	.64
Overall	3.91 ± 0.64	3.96 ± 0.66	.66

R= reverse scores; SD=Standard deviation

Table 14 Mean scores, standard deviations and *p*-values derived from the items of the Brief Resilience Coping Scale. *p*-values in red= gender difference is statistically significant (α=0.05).

3.2.5. Discussion

The physical and psychological wellbeing of first responders is important for supporting the overall disaster response. The study aimed to investigate gender in relation to risk taking behaviours and resilience in first responders. We used three validated instruments in which participants were asked for scoring statements related to risk propensity, resilience and coping. Practically, this study provides information to aid policymakers and first responding institutions in addressing potential gender gaps (e.g. stereotypes) related to first responding activities.

The overall results showed that risk propensity did not differ significantly between male and female first responders. However, it should be noted that samples included different professionals (police, firefighting, medical, etc.) with different experiences working in different positions. This exploratory finding suggests that the general propensity to take risks in female first responders may depend on other factors (e.g. years of experience, leadership roles and crewmates).

Risk-taking also may depend on personal risk/gain analysis regardless the gender. That is why we conducted a further analysis focused on firefighters in the frontline and firefighters in the frontline with less than 10 years of service. Perhaps surprisingly we found that the scores for women firefighters were statistically significantly higher on the RPS than for men firefighters. Higher achievement motivation in women firefighters (i.e. competition with a standard of excellence) may explain this difference[49]. The social pressure women firefighters may feel in this profession may contribute to higher risk taking. Women firefighters may feel motivated to prove something to their workmates, superiors, and the society. Our results contrast with previous findings suggesting that, rather than the hypermasculine culture, females' views may improve safety behaviours (i.e. weighing risk and benefits of dangerous situations)[36]. Also, previous analyses using RPS were not conclusive for the genders in the general population[43]. Therefore, given that our results are rather more indicative than definitive, the formulated question: do gender influence risk propensity exerted by in first responders on duty? remains open and still needs to be answered in the future.

Resilience can protect mental health among first responders. Although the samples included heterogeneous personnel, it was assumed that all participants had experienced stressors and potentially traumatic events on the job. We found that overall, first responders are resilient, as demonstrated by their resilience scores, but the male gender had a statistically significant relationship with self-assessing themselves as having greater resilience. Therefore, based on the presented results we can confirm that female first responders are likely to view themselves as less resilient to face job stressors than male first responders. In a study using the BRS including a sample of firefighters (at-risk individuals), Smith and colleagues identified male gender as predictor of greater resilience[44].

[49] Hamilton, J. O. 1974. Motivation and risk taking behavior: A test of Atkinson's theory. Journal of Personality and Social Psychology, 29(6), 856–864. doi:10.1037/h0036463

Our results provide further support for this, although the differences in the total scores between the two groups were not very large. More specifically the responses to BRS suggest that female participants exhibited more encouraging behaviour to get over setbacks in life but more difficulties to recover fast after hard times than male participants.

Finally, in this pilot study we did not find significant differences in the inclinations to cope with stress between male and female first responders. It is important to note that the obtained high scores from the BCRS showed that participants are capable to cope with stress in a highly adaptive manner. According to the results of BRCS first responders (both males and females) are expected to be goal directed, belief in their ability to address adverse situations, and usually succeed in their selected challenges[47,48].

Although differences were found, the effects of these differences were trivial. The resulting investigation for risk propensity, resilience and resilient coping were mixed, with gender differences found for some items but not for others at subscale level except for resilience (BRS) that showed gender differences at a scale level in line with our initial expectations. The most remarkable and unexpected result was found looking at risk propensity (BRP) in firefighters with higher risk tendencies in women than men. It, therefore, remains an open question for further research to investigate the potential gender discrepancies on risk propensity among first responders with bigger samples also using additional instruments and methods, which have not been considered in this study. The findings of this study suggest that gender is a valid basis for which to understand health and safety behaviour in order to improve first responder's protection and warrants further analysis. In other words, this case study provides an exciting opportunity to promote the importance and study of first response personnel with a gender dimension perspective.

4. Conclusion

The Gender Dimension (GD) was introduced by the European Commission (EC)[5051] and has received increased attention since several funding institutions around the world support its integration in technology and research actions. The EC encourages scholars and participants to integrate GD in their projects, when relevant[52] thus reducing bias, enabling social equality in scientific outcomes and promoting opportunities for discovery and innovation[53].

[50] European Commission. Structural Change in Research Institutions: Enhancing Excellence, Gender Equality, and Efficiency in Research and Innovation. Luxembourg: Office for Official Publications of the European Communities, 2011.
[51] European Commission. Regulation of the European Parliament and of the Council: Establishing Horizon 2020, The Framework Programme for Research and Innovation, 2014-2020, Article 15. Brussels: European Commission, 2011.
[52] https://ec.europa.eu/research/participants/docs/h2020-funding-guide/cross-cutting-issues/gender_en.htm
[53] Tannenbaum, C., Ellis, R.P., Eyssel, F. et al. 2019. Sex and gender analysis improves science and engineering. Nature 575: 137–146. doi:10.1038/s41586-019-1657-6.

Essentially GD means that gender should be part of research and innovation processes[54]. It should be noted here that GD is not the same as gender balance and equality in research[5556]. This process involves questioning stereotypes and investigating gender attitudes, behaviours and needs to enhance knowledge, technologies, and innovations[57,58].

This Deliverable (D8.4) comprises GD applied to two case studies conducted within the ASSISTANCE project to explore whether and how gender could be relevant in disaster response. Two target groups were involved: EU Citizens (n=1.014) and first responders (n=361). The general methodology described in Deliverable 8.2 to conduct GD was used. The presented studies provide information to aid policymakers and first responding institutions in addressing potential gender gaps and also gender opportunities related to first responding activities.

The following conclusions were drawn:

1) GD needs to be addressed in most projects involving humans, especially those projects that include some features, or some topics directly or indirectly related to gender in the field of safety and security. There is no specific methodology to conduct GD but a plausible process should involve two main steps where qualitative and quantitative research are combined: 1) research on gender to find differences/similarities (e.g. data collection, data processing, and analysis) and 2) exploring the sources of gender differences when found (explaining the underlaying mechanism). The first step involves pure and well-known scientific principles and methods. It should be noted that reporting no gender differences can be also a reasonable finding. The second step is interpretative in nature and requires a good understanding of the situations and contexts through a multidisciplinary research group thus proposing solutions to mitigate gender issues. More specifically the GD process may be structured as other gender analysis according to the following steps:

- Initial literature review for framing the problem
- Formulating key questions about gender.
- Analysing roles and activities of human beings with different gender identities
- Including target population in the participatory processes.
- Collecting and analysing gender disaggregated data.
- Collecting qualitative data through interviews, observations or focus group
- Applying a theoretical framework with gender theories on the data
- Considering gender relations (people-people and people-institutions).
- Identifying strengths, vulnerabilities and gender needs.
- Defining intervention actions.

[54] Korsvik, T. R. and Rustad, L. M. What is the gender dimension in research?. Case studies in interdisciplinary research. Kilden genderresearch.no. Research Council of Norway.
[55] https://eige.europa.eu/gender-mainstreaming/toolkits/gear
[56] http://www.geecco-project.eu/links/
[57] Nielsen, M. W., Bloch, C. W. and Schiebinger, L.2018. Making gender diversity work for scientific discovery and innovation. Nature Human Behaviour 2: 726-734. doi:10.1038/s41562-018-0433-1
[58] Woodward, K., Woodward, S. 2015. Gender studies and interdisciplinarity. Palgrave Commun 1, 15018. doi:10.1057/palcomms.2015.18

2) Gender norms and gender relations appear to influence EU citizens attitudes towards disasters (Likelihood, preparedness and risk perception). The expectations socially produced about how women and men should be and act and the distribution of power (e.g. male domination on disaster response and gender segregation in labour) can be the underlying mechanism that explains why the responses of women and men differed in some cases (risk perception and individual preparedness) and did not in others (disasters likelihood and opinions on readiness). The integration of gender perspective may benefit prevention and mitigation of hazard situations. Given this, the most robust approach would be creating societal preconditions that allow every individual, independent of gender identity, to participate and utilize their unique capacities and skills in community crisis response. Yet more efforts need to be done to achieve this.

Policy-makers and safety and security authorities can benefit from the promotion of such gender-responsive approaches and enabling the active involvement and participation of women in decision-making and official planning and management programs. This is not only a matter of efficiency in DRR and resilience but a matter of full and equal participation of women and men, and other gender identities, alike[59].

3) Women cover a small percentage of active employees in the fire and law enforcement and pretty much higher in emergency medical services. However, the numbers of women as FRs are expected to increase worldwide. Hence improving working and safety conditions, encouraging women inclusion and promotion and exploring the benefits of gender diversity are the main issues likely to be addressed through GD. Literature on risk propensity and resilience in first responders is limited. The present study and previous studies on gendered behaviour in first responders showed small differences suggesting that the hypothetical gender discrepancies may be reduced in the occupational contexts. In other words, gender norms may not influence first responders' attitudes. Small gender differences in resilience of first responders have been previously reported and the higher risk propensity in female firefighters may be associated with higher achievement motivation and socio-professional pressure. Further research to explore psychological aspects of males and females first responders is highly desirable to improve our understanding of the first response workforce.

Further actions planed include extending the Gender Dimension Strategy to study gender aspects in design, testing and validation of the ASSISTANCE project outcomes. The methodological approaches described in D8.2 and D8.3 will be applied during the piloting actions and training assessment and the results will be included in D8.7- Human Factor Impact Assessment (M36).

[59] Enarson, E. 2006. SWS Fact sheet: Women and Disaster. Applied Disaster and Emergency Studies Department Brandon University, Manitoba. https://socwomen.org/wp-content/uploads/2018/03/fact_10-2006-disaster.pdf

5. Annexes

5.1. ANNEX A: Statistics

This Annex presents a brief explanation of the statistical tests conducted.

Mann-Whitney U test

The Mann-Whitney U test[60] is a nonparametric test (data do not fit to normal distribution) alternative of the two-sample t-test (data fit to normal distribution). The test compares two groups (e.g. males and females). It is used to test the null hypothesis (H_0) that the two populations come from the same distributions (i.e. have the same Median) or alternatively (H_1) whether observations in one group tend to exceed the observations in another.

Unlike t-test that compares the means, the Mann-Whitney U test compares every observation in the group 1 with every observation in the group 2. If the samples (n_1 and n_2) have the same Median then each observation from the group 1 has a probability of 0.5 to be greater or smaller than each observation in the group 2. The number of times that observations from the group 1 is greater than observations from the group 2 and vice versa are counted. The resulted numbers are U_1 and U_2 that under the null hypothesis would be approximately equal. The test statistic for the Mann Whitney U Test is denoted U and is the smaller of U_1 and U_2, defined below:

$$U_1 = R_1 - \frac{n_1(n_1+1)}{2}$$

or

$$U_2 = R_2 - \frac{n_2(n_2+1)}{2}$$

Where R_1 is the sum of the ranks of group 1 and R_2 is the sum of the ranks of group 2. When computing U the number of comparisons equals the product of the number of values in group 1 times the number of values in group 2. If the null hypothesis is true, then the value of U should be about half that value. If the value of U is much smaller than that, the *p*-value will be small. The smallest possible value of U is zero. The largest possible value is half the product of the number of values in group 1 times the number of values in group 2. For large samples, U is approximately normally distributed. In that case, the standardized value z-score is compared to the standard normal quantiles to obtain a *p*-value (H_0: if $z < 1.96$ and H_1: if $z > 1.96$).

[60] Mann, Henry B.; Whitney, Donald R. 1947. "On a Test of Whether one of Two Random Variables is Stochastically Larger than the Other". Annals of Mathematical Statistics. 18 (1): 50–60. doi:10.1214/aoms/1177730491.

Cronbach's alpha

Cronbach's alpha is a measure of internal consistency, that is, it estimates how reliable the responses of a questionnaire are. It is given by:

$$\alpha = \frac{N\bar{c}}{\bar{v} + (N-1)\bar{c}}$$

Where *N* is the number of items, $\bar{c}$ is the average inter-item covariance among the items and $\bar{v}$ equals the average variance. The resulted value is a coefficient that ranges from 0 to 1. Higher alpha values show greater reliability. It should be noted that there is not a universal cut-off value for acceptability[61]. The minimum reference value to accept this indicator of consistency may depend on the nature of the test and how this measure is applied[62,63]. An acceptable cut-off value of 0.7[64] has been frequently assumed but misleading by several authors[65]. Lower limits of acceptability such as 0.5[66] and 0.6[67] have been suggested for exploratory research.

Student´s t-test

The t test is usually conducted to determine if the means of two independent samples/groups are significantly different from each other. Precisely speaking Student´s t-test can only be used if both group samples are normally distributed, and the variances are assumed to be equal. Therefore, normality test (e.g. Shapiro-Wilk test) and equality of variances test (e.g. Levene´s test) have to be conducted in advance to ensure this requirement. The corresponding null hypotheses that test the mean of the first group m_1, against the mean of the second group m_2, are: (H_0: $m_1 = m_2$; H_0: $m_1 \leq m_2$; H_0: $m_1 \geq m_2$). The t statistic is calculated as follows:

$$t = \frac{m_1 + m_2}{S_p\sqrt{\frac{1}{n_1} + \frac{1}{n_2}}}$$

Here m_1 and m_2 are the mean values from the two samples and S_p is the pooled variance calculated from all observations, $n = n_1 + n_2$ (where these are the number of observations in the two groups). The larger the t score, the greater evidence that there is a significant difference between groups. Every t-value has a *p*-value to go with it (it can be consulted from t table and/or using *p*-value calculators)[68].

[61] Taber, K. S. 2016. The Use of Cronbach's Alpha When Developing and Reporting Research Instruments in Science Education. Res Sci Educ DOI 10.1007/s11165-016-9602-2
[62] Cortina, J. M. 1993. What is coefficient alpha? An examination of theory and applications. Journal of Applied Psychology(1), 98.
[63] Cho, E., & Kim, S. 2015. Cronbach's Coefficient Alpha: Well Known but Poorly Understood. Organizational Research Methods, 18(2), 207.
[64] Nunnally, J. C. 1978. Psychometric theory: New York : McGraw-Hill, c1978. 2d ed.
[65] Lance, C. E., Butts, M. M., & Michels, L. C. 2006. The Sources of Four Commonly Reported Cutoff Criteria: What Did They Really Say? Organizational Research Methods, 9(2), 202.
[66] Nunnally, J. C. 1967. Psychometric theory: McGraw-Hill [1967].
[67] Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. 2010. Multivariate data analysis: Pearson College Division.
[68] https://www.socscistatistics.com/pvalues/tdistribution.aspx

A *p*-value is the probability that the results from the data occurred by chance. *P*-values are from 0% to 100%. They are usually written as a decimal (i.e. a *p*-value of 5% is .05). Low *p*-values indicate that data did not occur by chance. A *p*-value of .01 indicates that there is a 1% that the results happened by chance. In most cases, a *p*-value of .05 (5%) is accepted to mean the data is valid[69].

Chi square test

The Chi-Square test of Independence determines whether two categorical variables are independent or related. It is a nonparametric test. The test uses crosstabulation in which the categories for one variable appear in the rows, and the categories for the other variable appear in columns. Each cell indicates the total count of cases for a specific pair of categories. For example, a table that displays the frequency of responses on seeking for promotion (yes and no) broken down by gender (females and males). The test compares the observed pattern of responses in the cells to the pattern that would be expected if the variables were truly independent each other. The statistic χ^2 is given by:

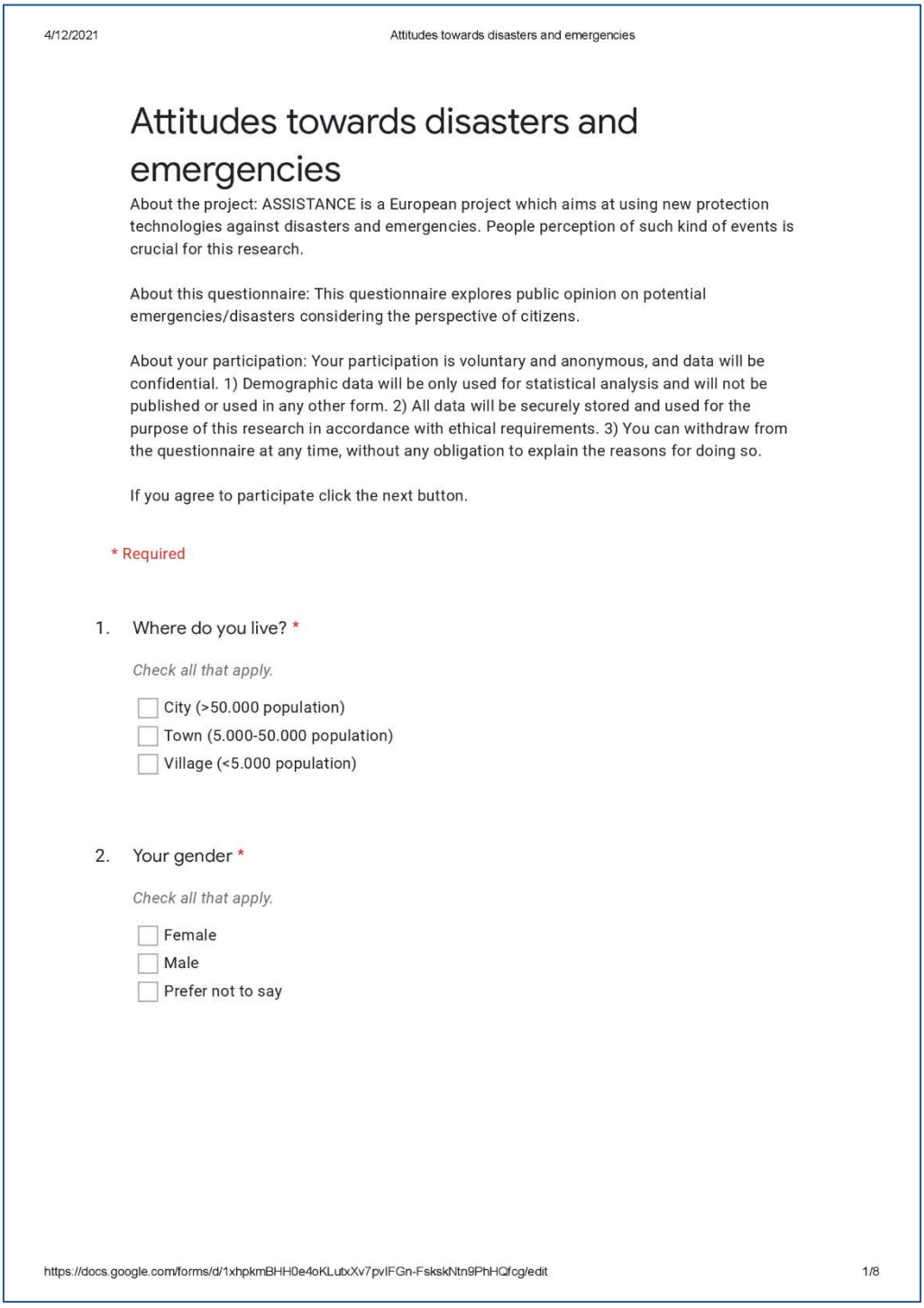
$$\chi^2 = \sum \frac{(f_0 + f_e)^2}{f_e}$$

where f_o is the observed frequency (the observed counts in the cells) and f_e is the expected frequency if no relationship existed between the variables. The resulted statistic χ^2 is compared against a critical value from the chi square distribution table (*p*-values table from chi-square values) to assess whether the observed cell counts are significantly different from the expected cell counts.

[69] Stephanie Glen. "T Test (Student's T-Test): Definition and Examples" From StatisticsHowTo.com: Elementary Statistics for the rest of us! https://www.statisticshowto.com/probability-and-statistics/t-test/

5.2. ANNEX B: Questionnaires on citizens attitudes towards disasters

Versions in other languages are available upon author request (cuestaar@unican.es).



4/12/2021 Attitudes towards disasters and emergencies

Attitudes towards disasters and emergencies

About the project: ASSISTANCE is a European project which aims at using new protection technologies against disasters and emergencies. People perception of such kind of events is crucial for this research.

About this questionnaire: This questionnaire explores public opinion on potential emergencies/disasters considering the perspective of citizens.

About your participation: Your participation is voluntary and anonymous, and data will be confidential. 1) Demographic data will be only used for statistical analysis and will not be published or used in any other form. 2) All data will be securely stored and used for the purpose of this research in accordance with ethical requirements. 3) You can withdraw from the questionnaire at any time, without any obligation to explain the reasons for doing so.

If you agree to participate click the next button.

* Required

1. Where do you live? *

Check all that apply.

- [ ] City (>50.000 population)
- [ ] Town (5.000-50.000 population)
- [ ] Village (<5.000 population)

2. Your gender *

Check all that apply.

- [ ] Female
- [ ] Male
- [ ] Prefer not to say

https://docs.google.com/forms/d/1xhpkmBHH0e4oKLutxXv7pvIFGn-FskskNtn9PhHQfcg/edit 1/8

3. How old are you? *

Check all that apply.

- [ ] 18-24
- [ ] 25-39
- [ ] 40-54
- [ ] +55

4. What is your academic level? *

Check all that apply.

- [ ] No studies
- [ ] Primary
- [ ] Secondary
- [ ] University

5. Which of the following best describes your current socio-professional category? *

Check all that apply.

- [ ] Self-employed
- [ ] Employee
- [ ] Unemployed
- [ ] Student
- [ ] Retired

6. Q1.1. How likely do you consider that the following events will occur in Europe? *

Check all that apply.

	Very likely	Likely	Unlikely	Highly unlikely
Extreme weather conditions (flood, storm, landslide)	☐	☐	☐	☐
Fire	☐	☐	☐	☐
Earthquake	☐	☐	☐	☐
Hazardous Materials Accidents (Chemical, Biological, Radiological and Nuclear)	☐	☐	☐	☐
Terrorist attack	☐	☐	☐	☐

7. Q1.2. How likely do you consider that the following events will occur in your country? *

Check all that apply.

	Very likely	Likely	Unlikely	Highly unlikely
Extreme weather conditions (flood, storm, landslide)	☐	☐	☐	☐
Fire	☐	☐	☐	☐
Earthquake	☐	☐	☐	☐
Hazardous Materials Accidents (Chemical, Biological, Radiological and Nuclear)	☐	☐	☐	☐
Terrorist attack	☐	☐	☐	☐

8. Q1.3. How likely do you consider that the following events will occur in your city/town/village? *

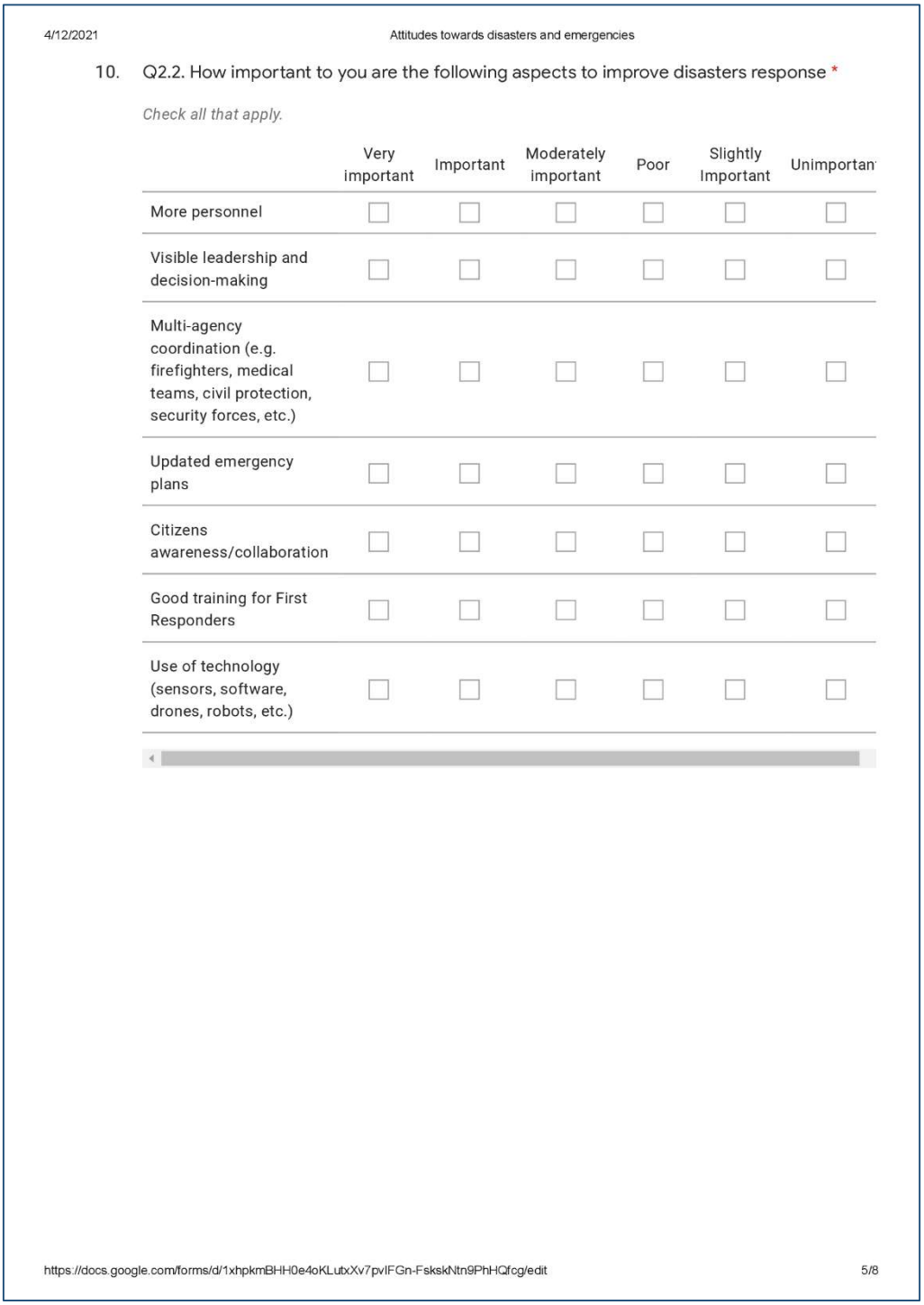
Check all that apply.

	Very likely	Likely	Unlikely	Highly unlikely
Extreme weather conditions (flood, storm, landslide)	☐	☐	☐	☐
Fire	☐	☐	☐	☐
Earthquake	☐	☐	☐	☐
Hazardous Materials Accidents (Chemical, Biological, Radiological and Nuclear)	☐	☐	☐	☐
Terrorist attack	☐	☐	☐	☐

9. Q2.1. In your opinion, the training level, and resources for first Responders (Firefighters, Emergency Medical Services, Police and Civil Protection) are: *

Check all that apply.

	Excellent	Good	Fair	Poor	Very poor
In Europe	☐	☐	☐	☐	☐
In your country	☐	☐	☐	☐	☐
In your City/town/village	☐	☐	☐	☐	☐



4/12/2021 Attitudes towards disasters and emergencies

10. Q2.2. How important to you are the following aspects to improve disasters response *

Check all that apply.

	Very important	Important	Moderately important	Poor	Slightly Important	Unimportan
More personnel	☐	☐	☐	☐	☐	☐
Visible leadership and decision-making	☐	☐	☐	☐	☐	☐
Multi-agency coordination (e.g. firefighters, medical teams, civil protection, security forces, etc.)	☐	☐	☐	☐	☐	☐
Updated emergency plans	☐	☐	☐	☐	☐	☐
Citizens awareness/collaboration	☐	☐	☐	☐	☐	☐
Good training for First Responders	☐	☐	☐	☐	☐	☐
Use of technology (sensors, software, drones, robots, etc.)	☐	☐	☐	☐	☐	☐

https://docs.google.com/forms/d/1xhpkmBHH0e4oKLutxXv7pvIFGn-FskskNtn9PhHQfcg/edit 5/8

11. Q3.1. Which statement best represents your preparedness for an emergency/disaster? *

Check all that apply.

	I know what to do	I fairly know what to do	I don`t know what to do
Extreme weather conditions (flood, storm, landslide)	☐	☐	☐
Fire	☐	☐	☐
Earthquake	☐	☐	☐
Hazardous Materials Accidents (Chemical, Biological, Radiological and Nuclear)	☐	☐	☐
Terrorist attack	☐	☐	☐

Q3.2 Could you please share with us your opinions on the importance of citizens' preparedness to deal with a disaster?

12. Q3.2.1. According to your opinion, getting ready is WORTHWHILE because: *

Check all that apply.

	Strongly agree	Agree	Undecided	Disagree	Strongly disagree
Getting ready makes it easier to get back to normal	☐	☐	☐	☐	☐
People have gotten information about what to do	☐	☐	☐	☐	☐
Taking action makes me worry less	☐	☐	☐	☐	☐
If I'm ready, I can help those that need care	☐	☐	☐	☐	☐

13. Q3.2.2. According to your opinion, getting ready is NOT WORTHWHILE because: *

Check all that apply.

	Strongly agree	Agree	Undecided	Disagree	Strongly disagree
I think that getting ready won't make a difference	☐	☐	☐	☐	☐
I think that it isn't my responsibility	☐	☐	☐	☐	☐
I would rather not think about bad things happening	☐	☐	☐	☐	☐
It doesn't matter; disasters don't happen where I live	☐	☐	☐	☐	☐
It takes too much time, effort, or money	☐	☐	☐	☐	☐

14. Q4. If the following emergencies/disasters occur in your vicinity, what in your view is the level of risk for you (and your family)? *

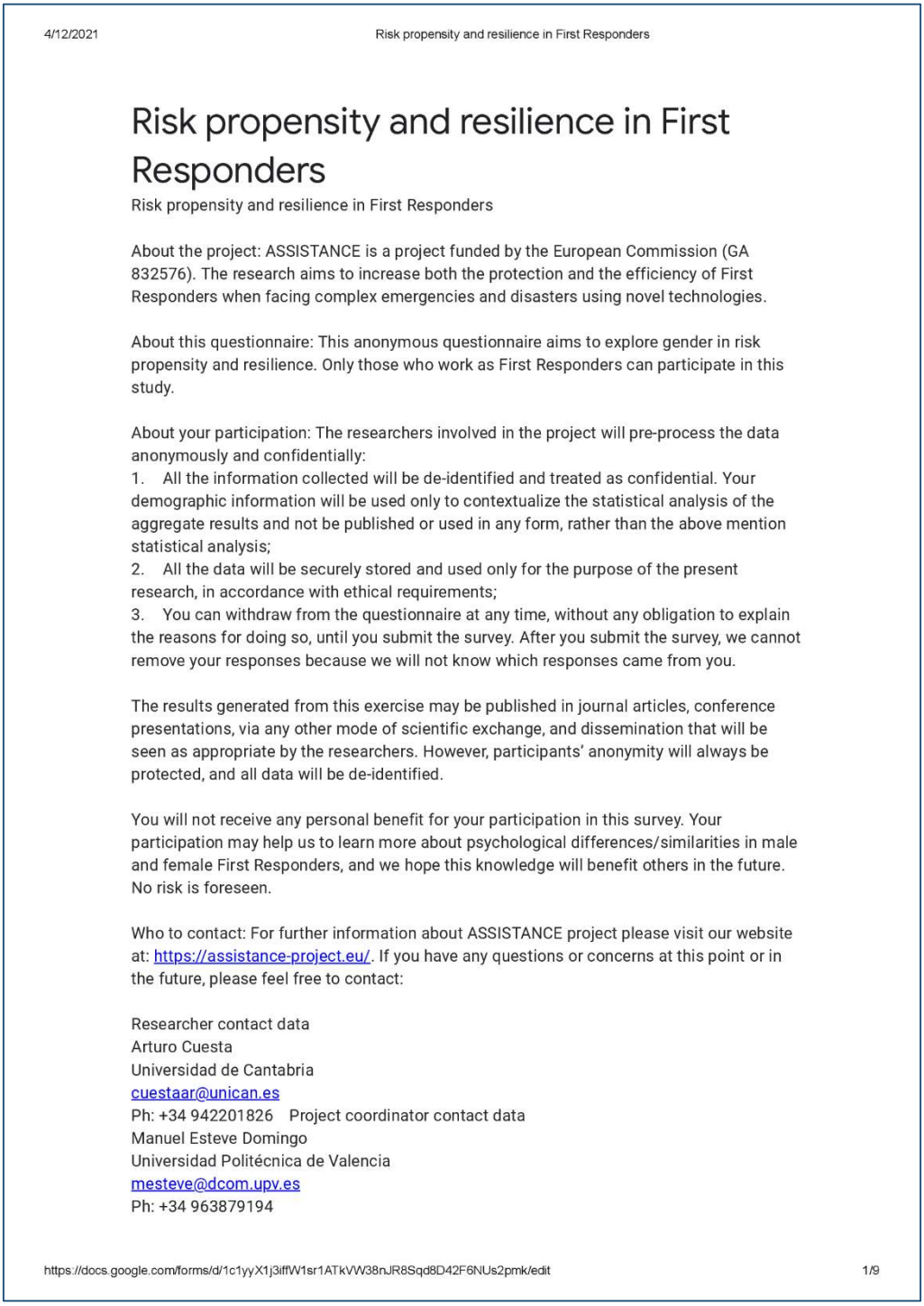
Check all that apply.

	Critical risk	High risk	Moderate risk	Low risk
Extreme weather conditions (flood, storm, landslide)	☐	☐	☐	☐
Fire	☐	☐	☐	☐
Earthquake	☐	☐	☐	☐
Hazardous Materials Accidents (Chemical, Biological, Radiological and Nuclear)	☐	☐	☐	☐
Terrorist attack	☐	☐	☐	☐

Thank you!!!

5.3. ANNEX C: Questionnaire on risk propensity and resilience in First Responders

Versions in other languages are available upon author request (cuestaar@unican.es).



4/12/2021 Risk propensity and resilience in First Responders

Risk propensity and resilience in First Responders

Risk propensity and resilience in First Responders

About the project: ASSISTANCE is a project funded by the European Commission (GA 832576). The research aims to increase both the protection and the efficiency of First Responders when facing complex emergencies and disasters using novel technologies.

About this questionnaire: This anonymous questionnaire aims to explore gender in risk propensity and resilience. Only those who work as First Responders can participate in this study.

About your participation: The researchers involved in the project will pre-process the data anonymously and confidentially:
1. All the information collected will be de-identified and treated as confidential. Your demographic information will be used only to contextualize the statistical analysis of the aggregate results and not be published or used in any form, rather than the above mention statistical analysis;
2. All the data will be securely stored and used only for the purpose of the present research, in accordance with ethical requirements;
3. You can withdraw from the questionnaire at any time, without any obligation to explain the reasons for doing so, until you submit the survey. After you submit the survey, we cannot remove your responses because we will not know which responses came from you.

The results generated from this exercise may be published in journal articles, conference presentations, via any other mode of scientific exchange, and dissemination that will be seen as appropriate by the researchers. However, participants' anonymity will always be protected, and all data will be de-identified.

You will not receive any personal benefit for your participation in this survey. Your participation may help us to learn more about psychological differences/similarities in male and female First Responders, and we hope this knowledge will benefit others in the future. No risk is foreseen.

Who to contact: For further information about ASSISTANCE project please visit our website at: https://assistance-project.eu/. If you have any questions or concerns at this point or in the future, please feel free to contact:

Researcher contact data
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Universidad Politécnica de Valencia
mesteve@dcom.upv.es
Ph: +34 963879194

https://docs.google.com/forms/d/1c1yyX1j3iffW1sr1ATkVW38nJR8Sqd8D42F6NUs2pmk/edit 1/9

* Required

1. If you agree with the following statement and wish to participate in the study, please check the box "I agree" below and click on the "Continue bottom"."I am at least 18 years of age, have read and understand the explanation provided to me and voluntarily agree to participate in this study." *

   Check all that apply.

   ☐ I agree

Print this "Informed Consent" page for future reference. Thank you for your collaboration! The ASSISTANCE consortium

2. Gender *

   Mark only one oval.

   ◯ Male
   ◯ Female
   ◯ Prefer not to say

3. How old are you? *

   _____

4. What type of service do you work for? *

   Mark only one oval.

   ◯ Firefigthing
   ◯ Police
   ◯ Emergency medical services
   ◯ Civil Protection

5. What country do you work in? *

6. Your current position is *

Mark only one oval.

- Operational personnel
- Leading operational personnel
- Training and education personnel

7. How long have you been working as a First Responder? *

Mark only one oval.

- <1 year
- 1-5 years
- 6-10 years
- 11-15 years
- 16-20 years
- > 20 years

8. Do you plan to seek promotion in the future? *

Mark only one oval.

- Yes
- No

Risk Propensity Scale (RPS)

Please indicate the extent to which you agree or disagree with the following statements. Please do not think too long before answering; usually your first inclination is also the best one. 1= Totally disagree; 9= Totally agree

9. RPS1. Safety first *

Mark only one oval.

	1	2	3	4	5	6	7	8	9	
Totally disagree	◯	◯	◯	◯	◯	◯	◯	◯	◯	Totally agree

10. RPS2. I do not risk with my health *

Mark only one oval.

	1	2	3	4	5	6	7	8	9	
Totally disagree	◯	◯	◯	◯	◯	◯	◯	◯	◯	Totally agree

11. RPS3. I prefer to avoid risks *

Mark only one oval.

	1	2	3	4	5	6	7	8	9	
Totally disagree	◯	◯	◯	◯	◯	◯	◯	◯	◯	Totally agree

12. RPS4. I take risks regularly *

Mark only one oval.

	1	2	3	4	5	6	7	8	9	
Totally disagree	◯	◯	◯	◯	◯	◯	◯	◯	◯	Totally agree

13. RPS5. I really dislike not knowing what is going to happen *

Mark only one oval.

	1	2	3	4	5	6	7	8	9	
Totally disagree	◯	◯	◯	◯	◯	◯	◯	◯	◯	Totally agree

14. RPS6. I usually view new risks as a challenge *

Mark only one oval.

	1	2	3	4	5	6	7	8	9	
Totally disagree	◯	◯	◯	◯	◯	◯	◯	◯	◯	Totally agree

15. RPS7. I view myself as: *

Mark only one oval.

	1	2	3	4	5	6	7	8	9	
Risk avoider	◯	◯	◯	◯	◯	◯	◯	◯	◯	Risk seeker

16. AQ1. I have experienced benefits from risky actions *

Mark only one oval.

	1	2	3	4	5	6	7	8	9	
Totally disagree	◯	◯	◯	◯	◯	◯	◯	◯	◯	Totally agreee

17. AQ2. I have been involved in extremely risky situations *

Mark only one oval.

	1	2	3	4	5	6	7	8	9	
Totally disagree	◯	◯	◯	◯	◯	◯	◯	◯	◯	Totally agreee

18. AQ3. I'm likely to get injured at work in the future *

Mark only one oval.

	1	2	3	4	5	6	7	8	9	
Not likely	◯	◯	◯	◯	◯	◯	◯	◯	◯	Very likely

Brief Resilience Scale (BRS)

Please indicate the extent to which you agree with each of the following statements by using the following scale: 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree

19. BRS1. I tend to bounce back quickly after hard times *

Mark only one oval.

	1	2	3	4	5	
Strongly disagree	◯	◯	◯	◯	◯	Strongly agree

20. BRS2. I have a hard time making it through stressful events *

Mark only one oval.

	1	2	3	4	5	
Strongly disagree	◯	◯	◯	◯	◯	Strongly agree

25. BRCS1. I look for creative ways to alter difficult situations *

Mark only one oval.

	1	2	3	4	5	
Does not describe me at all	◯	◯	◯	◯	◯	Describes me very well

26. BRCS2. Regardless of what happens to me, I believe I can control my reaction to it *

Mark only one oval.

	1	2	3	4	5	
Does not describe me at all	◯	◯	◯	◯	◯	Describes me very well

27. BRCS3. I believe that I can grow in positive ways by dealing with difficult situations *

Mark only one oval.

	1	2	3	4	5	
Does not describe me at all	◯	◯	◯	◯	◯	Describes me very well

28. BRCS4. I actively look for ways to replace the losses I encounter in life *

Mark only one oval.

	1	2	3	4	5	
Does not describe me at all	◯	◯	◯	◯	◯	Describes me very well

25. BRCS1. I look for creative ways to alter difficult situations *

Mark only one oval.

	1	2	3	4	5	
Does not describe me at all	◯	◯	◯	◯	◯	Describes me very well

26. BRCS2. Regardless of what happens to me, I believe I can control my reaction to it *

Mark only one oval.

	1	2	3	4	5	
Does not describe me at all	◯	◯	◯	◯	◯	Describes me very well

27. BRCS3. I believe that I can grow in positive ways by dealing with difficult situations *

Mark only one oval.

	1	2	3	4	5	
Does not describe me at all	◯	◯	◯	◯	◯	Describes me very well

28. BRCS4. I actively look for ways to replace the losses I encounter in life *

Mark only one oval.

	1	2	3	4	5	
Does not describe me at all	◯	◯	◯	◯	◯	Describes me very well