

## **Witnessing the Portugal 2017 unprecedented wildfire season: perception through the eyes of frontline firefighters**

This questionnaire is for fire-fighters that have been involved in fighting the fire in 2017 (mainly the ones that occurred in June and October). If you were not involved in these events, please, do not answer this questionnaire.

We ask you to think about your experience and reply to the following questions. This will take less than 15 minutes of your time.

Data collected will remain anonymous and the questionnaire does not ask for the identification of the compiler. The data collected will just be used for research purposes. For any questions, please contact Fantina Tedim, from the Faculty of Arts of the University of Porto, through e-mail (ftedim@letras.up.pt) or cell phone (917564145).

**You lived 2017 wildfire season as a front-line operator. Think about your experience and reply to the following questions that will take less than 20 minutes of your time**

### **SECTION I - GENERALITIES OF RESPONDENTS**

1. Age: \_\_\_\_\_
2. Sex: Male \_\_\_\_  
           Female \_\_\_\_  
           Prefers not to answer \_\_\_\_
3. Age classes
  - 25-29
  - 30-34
  - 35-39
  - 40-44
  - 45-49
  - 50-54
  - 55-59
  - 60-64
4. Education level
  - 2º cycle (6 years of studies)
  - 3º cycle (9 years of studies)
  - Secondary school (12 years of studies)
  - Bachelor or license
  - Master
5. Job starting date (YEAR)
  - 1973-1987
  - 1988-1997
  - 1998-2007
  - 2008-2021

6. You are:
- 6.1. Fulltime firefighter \_\_\_\_\_
- 6.2. Voluntary firefighter \_\_\_\_\_
7. Which was your category in firefighter career in 2017? If you are a Sapador firefighter answer question 7.1. If you are a Voluntary or Municipal firefighter answer question 7.2.
- 7.1. Bombeiro sapador.
- 7.1.1. Comandante de Regimento/Batalhão.
- 7.1.2. 2º Comandante de Regimento/Batalhão
- 7.1.3. Comandante de Companhia
- 7.1.4. Adjunto Comando de Regimento/Batalhão
- 7.1.5. Chefe principal
- 7.1.6. Chefe de 1.ª classe
- 7.1.7. Chefe de 2.ª classe
- 7.1.8. Subchefe principal
- 7.1.9. Subchefe de 1.ª classe
- 7.1.10. Subchefe de 2.ª classe
- 7.1.11. Bombeirosapador.
- 7.2. Municipal/voluntary firefighter career
- 7.2.1. Comandante
- 7.2.2. 2º Comandante
- 7.2.3. Adjunto de Comando
- 7.2.4. Chefe
- 7.2.5. Subchefe
- 7.2.6. Bombeiro de 1ª classe
- 7.2.7. Bombeiro de 2ª classe
- 7.2.8. Bombeiro de 3ª classe

## Section II - WILDFIRES PHYSICAL CHARACTERIZATION FROM FIREFIGHTERS' PERSPECTIVES

### Topic 1 - Facing the inferno: perception of EWEs characteristics

The following statements expresses different possible opinions considering 2017 wildfire season. Please express your opinion with an X in the column that best expresses your opinion:

Statement	Completely disagree =(1)	Disagree = (2)	Nor agree, nor disagree = (3)	Agree =(4)	Completely agree =(5)
In my firefighter career, I had never witnessed rural fires like the ones in 2017	1	2	3	4	5

I have never seen fire propagation speeds as high as in the 2017 fires	1	2	3	4	5
I have never seen the formation of so many spot fires as in the occurrences of 2017	1	2	3	4	5
I was impressed with the length and height of the flames.	1	2	3	4	5
I was impressed by the heat generated by the fires	1	2	3	4	5
I was impressed by the intense noise of the fires	1	2	3	4	5
I was impressed by the amount of sparks and incandescent material driven by the wind	1	2	3	4	5
This(these) fire(s) exceeded the fighting capacity	1	2	3	4	5

### **Integrative questions**

**Indicate what was, in your perception, the maximum estimated height/length of the flames in the 2017 fires**

1. <4m
2. 4-6m
3. 6-10m
4. 10-15 m
5. 15-30m
6. > 30m
7. *no answer*

**Mention at least one element/condition that most impressed you in the fires of 2017**

1. Wind
2. Noise
3. Heat
4. Darkness
5. People in panic (screams, disorientation, shock)
6. Fatalities and injured people
7. Smoke
8. High rate of spread
9. Lack of organization of firefighter
10. Flying embers
11. Spotting distance
12. Heat, high rate of spread, explosion of LPG bottles

13. High number of buildings burning
14. Other (Please specify)

**In all your life which was the worst fire you experienced? (Indicate the year and place of occurrence).** \_\_\_\_\_

**In 2017, which was the worst fire you operated?**

**Municipality:**

**"Name" of the fire:**

### **SECTION III - WILDFIRE SUPPRESSION ACTIVITIES RELATED TO 2017 JUNE OR/AND OCTOBER FIRES-**

#### **Topic 2 Efficacy, difficulties, and weakness of wildfire operations**

The following table presents statements about the efficacy of wildfire operations. Please mark with an X in the column that best expresses your opinion:

Statement	Completely disagree (1)	Disagree (2)	Nor agree, nor disagree= (3)	Agree (4)	Completely agree (5)
The use of hand tools was inefficacious due to the behavior of fire	1	2	3	4	5
The use of counter fire or backfire to extinguish or contain the flames was efficacious		2	3	4	5
The use of direct attack, with hoses, to extinguish the flames from the ground, was efficacious throughout the duration of the fire(s).	1	2	3	4	5
The use of direct attack to extinguish the flames, through aerial means, was efficacious throughout the duration of the fire(s).	1	2	3	4	5

The use of aerial means was hampered by wind	1	2	3	4	5
The use of aerial means was hampered by smoke	1	2	3	4	5
The indirect attack by special means (example: bulldozers or tractors) was efficacious	1	2	3	4	5
Due to the extreme behavior of fire some orders from the command could not be followed because they were no longer adequate	1	2	3	4	5
Communication with the command post was always possible during fires	1	2	3	4	5
Communication with the operational teams was always possible during fires	1	2	3	4	5
In my opinion, no action was efficacious to contain the force and violence of the 2017 fires	1	2	3	4	5
Land resources were manifestly insufficient to control the fire(s)	1	2	3	4	5
Air resources were manifestly insufficient to control the fire(s)	1	2	3	4	5

### Topic 3 On the front of flames: problems and feelings

The following table presents statements about the problems and feelings you faced during wildfire operations. Please mark with an X in the column that best expresses your opinion.

Statement	Completely disagree	Disagree (2)	Nor agree,	Agree (4)	Completely agree
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	(1)		nor disagree= (3)		(5)
During the fire(s), I felt lost, not knowing what to do or where to go in the absence of orders	1	2	3	4	5
During operations sometimes I lost communications with command	1	2	3	4	5
During operations Sometimes I was/felt alone	1	2	3	4	5
A few times during operations I ran out of water necessary to fight the fire(s)	1	2	3	4	5
During the fire(s) I always correctly used Personal Protective Equipment	1	2	3	4	5
I was physically well prepared to fight the fire(s) of 2017	1	2	3	4	5

**Topic 4 Emotions and inner feelings: Difficulties, emotions, and personal reactions faced during June and/or October 2017 wildfire operations**

The following table presents statements aspects of emotions and inner feelings you faced during wildfire operations. Please mark with an X in the column that best expresses your opinion

Statement	Completely disagree (1)	Disagree (2)	Nor agree, nor disagree (3)	Agree (4)	Completely agree (5)
During operations, I felt powerless to protect citizens and their property	1	2	3	4	5
During operations, I had difficulty in breathing, not only due to smoke or burning material in the air	1	2	3	4	5

I feared for my safety	1	2	3	4	5
I feared for the safety of my colleagues	1	2	3	4	5
I feared for my family's safety	1	2	3	4	5
I felt completely unable to fight the fire(s)	1	2	3	4	5
I was afraid of being surrounded by flames and unable to escape	1	2	3	4	5
I thought about giving up the fight and trying to save myself	1	2	3	4	5

### Topic 5 Psychological support

The following table presents statements aspects of psychological support you faced during wildfire operations. Please mark with an X in the column that best expresses your opinion

Statement	Completely disagree (1)	Disagree (2)	Nor agree, disagree (3)	Agree (4)	Completely agree (5)
Due to the fires of 2017, I needed psychological support	1	2	3	4	5
Right after the 2017 fires, I needed psychological support, but I didn't get it	1	2	3	4	5
I was psychologically prepared to fight the fire(s) of 2017	1	2	3	4	5
Even today it is hard for me to talk about what I experienced in the fires of 2017	1	2	3	4	5

Considering your personal experience, what are the main lessons you draw from the 2017 fire season? (free question)

## SECTION IV. HOW 2017 WILDFIRE SEASON CHANGED THE APPROACH AND PROCEDURES TO FIRES

**Topic 6 Lessons learned from the 2017 wildfire season and procedure changes, if any, after the experience of the 2017 wildfire season**

The following table presents possible changes in procedures after the experience lived in the 2017 fire season. Please mark with an X in the column that best expresses your opinion

Statement	NO (1)	I DO NOT KNOW (3)	Ye (5)
Higher priority was given to the safety of operatives	1	3	5
Changes have been made to combat activities	1	3	5
Changes were made in the organization of combat teams	1	3	5
Decision processes have been improved	1	3	5
More efficient operational training began to be carried out	1	3	5
The training of operational personnel became more specialized (example: changing the content and duration of training; creation of new training modules)	1	3	5
My fire brigade is equipped with more new equipment (example: off-road vehicles; PPE; hand tools)	1	3	5
In my team/corporation we discussed about the lessons learned from the fire(s) of 2017	1	3	5
Changes were made to the protocol for communicating the situation of the teams in the field	1	3	5
After 2017, fire brigades/teams are more involved in prevention and surveillance activities.	1	3	5
Firefighters became more involved in public awareness raising campaigns	1	3	5
There has been greater sharing of data and information between organizations in the civil protection system	1	3	5
There has been more active collaboration between organizations	1	3	5



A review and/or reclassification of the firefighter career was carried out	1	3	5
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In your opinion, after the experience of the 2017 fires, what changes would you like to see implemented in the organization of the Civil Protection system? (Free question)

Since we are deeply aware that the 2017 wildfires have significantly marked firefighters, we address a profound thank you for the time you have spent sharing your experience.

We hope that, somehow, the results of this investigation can contribute to discuss and solve some of the problems that firefighters face.

Table S1: Topic 6 - Index of agreement

ITEMS		PF				VF				Total			
		No	Do not know	Yes	IA	No	Do not know	Yes	IA	No	Do not know	Yes	IA
1	Priority to firefighter safety	7	11	44	2.44	21	17	85	2.23	28	28	129	2.30
2	Changes in firefighting acts	20	6	36	1.38	35	21	67	1.19	55	27	103	1.25
3	Changes in crews organization	25	9	28	0.82	43	24	56	0.83	68	33	84	0.83
4	Improvement in Decision-making processes	7	14	41	1.95	22	34	67	1.19	29	48	108	1.40
5	More efficient training	19	6	37	1.48	42	22	59	0.92	61	28	96	1.07
6	More specialized training	30	10	22	0.55	53	24	46	0.59	83	34	68	0.58
7	More equipments	25	3	34	1.21	49	2	72	1.41	74	5	106	1.34
8	Lessons learned sharing	8	1	53	5.89	11	3	109	7.78	19	4	162	7.04
9	Improved communication protocol among/with? crews	29	12	21	0.51	46	37	40	0.48	75	49	61	0.49
10	More involvement in monitoring and prevention	27	5	30	0.93	44	20	59	0.92	71	25	89	0.93
11	More involvement in public awareness raising	18	7	37	1.48	39	19	65	1.12	57	26	102	1.23
12	More data sharing	14	12	36	1.38	42	62	23	0.22	56	74	59	0.45
13	More istitutional collaboration	12	13	37	1.48	25	39	59	0.92	37	52	96	1.07
14	Firefighter career revision	49	10	3	0.05	90	21	12	0.10	139	31	15	0.09