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Deliverable 3.1

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Preface

This report presents the work that has been performed by SCORCH partners to obtain insights in population knowledge and awareness regarding heatwaves in Israel, Georgia and Tunisia.

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1. Introduction

1.1. Background & objectives of SCORCH

Extreme temperatures, including heat and cold waves, are climatological hazards. Both in the EU as in EU-Neighbourhood countries, research has shown that heatwaves cause a rise in morbidity and mortality. Since heatwaves are not restricted to country borders, a cross-border approach is required to ensure collective preparedness and response to mitigate the impacts on communities and limit the financial and health costs.

The overall objective of SCORCH is to reduce the impact of heatwaves on vulnerable, urban populations through improved risk communication strategies based on existing EU plans and guidelines. In addition, we will measure risk perception and behaviour in communities in EU-neighbourhood countries through surveys and foster a cross-country culture of prevention and cooperation.

1.2. Why population surveys?

None of the three EU Neighbourhood countries that are part of SCORCH, namely Tunisia, Georgia and Israel, currently have a risk communication strategy for heatwaves in place. The aim of our project is to develop this, based on good practices from EU countries (Work Package 2). However, to ensure that the strategies match the field realities of the three target countries, we conducted population surveys. The aim of these surveys was to measure the current risk perceptions towards heatwaves, people's sensitivity, their knowledge levels regarding risk groups, protective measures and symptoms, and the sources from which people currently receive information or would like to receive information in the future. This information will help in determining the information that needs to be included in each of the strategies, by identifying current knowledge gaps and preferences of the local populations.

2. Methodology

2.1. Selection of survey locations

For each country, we aimed to obtain a sample of study participants that is representative for that country. We estimated that with a sample of 400 participants, this would offer a good representation and give us the possibility to look at risk factors for heat sensitivity or a reduced risk perception. We selected three cities per country, that represent different parts of the country, also in terms of climate zones, see also the maps below (Fig. 1, 2 and 3).

Fig. 1. Selected cities in Tunisia, i.e. Tunis, Gafsa and Kairouan.

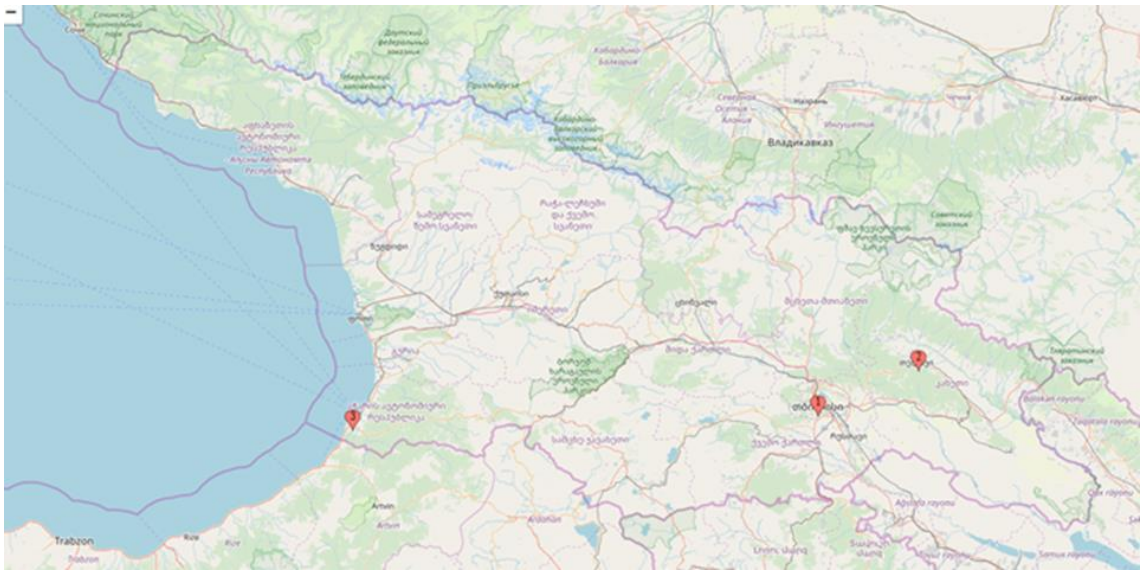

Fig. 2. Selected cities in Georgia, i.e. Tbilisi, Batumi and Telavi.

Fig. 3. Selected cities in Israel, i.e. Tel Aviv, Beer Sheva and Haifa.

2.2. Survey development

We developed a survey based on one that we previously used in four European countries, namely Netherlands, Belgium, Spain and Portugal (1,2). The survey contained the following sections:

- Demography;
- Awareness about occurrence of heatwaves;
- Awareness about health impact of heatwaves;
- Knowledge about and behaviour for reducing health impacts of heatwaves;
- Sources for information on heatwaves and measures.

We developed the survey in English. We made small adaptations for each country, based on particular specificities, although most of the questions remained the same. The survey in Israel included some additional questions, due to it being an internet survey. Also, some questions were asked in a different way (e.g. closed versus open). The three different surveys can be found in Annexes I, II and III. The final versions of the survey were translated into Tunisian Arabic (Tunisia), Georgian (Georgia), Hebrew and Arabic (Israel), as well as back-translated in order to check the accuracy.

2.3. Data collection

Tunisia and Georgia

In Tunisia and Georgia, we undertook a street survey in each of the selected cities. Per city, locations were selected based on the presence of a relatively large number of passer-by's (e.g. markets, malls, shopping streets). However, we avoided locations where people would be in a hurry, such as train or bus stations, and locations that would have a relatively low proportion of locals, such as touristic spots. In addition, we ensured that the selected locations represented areas where people from different socio-economic backgrounds can be found, i.e. high, low and mixed.

In each location, a survey team was positioned, consisting of a data manager and several enumerators. All of them had been previously trained in undertaking the survey in a standardised way (e.g. asking questions as literal as possible, and making sure to know which questions had to be asked in an open way). Random passer-by's were asked to participate, namely each fifth individual, to avoid including clusters of people from the same group (e.g. husband and wife). The survey started with a brief description of the study, after which the passer-by was asked for oral informed consent to participate. Only adults (≥ 18 years) living in the city of interest were eligible to participate. The duration of each survey was around 10 minutes. The data manager

kept track of the number of completed surveys, and as such he/she knew when the target number of surveys was reached, and the team could move to the next location.

In Tunisia, data were collected using tablets. In Georgia, data were collected using paper surveys. The data were collected in September 2019.

Israel

In Israel, an online panel was used to participate in the survey. We collaborated with iPanel, a survey company with the largest online panel of the country (> 100,000 participants). For each panellist, baseline information was known, such as gender, age, educational level and ethnicity. This enabled us to select a sample in the three study cities that reflected the composition of the Israeli population in terms of these characteristics. The survey was targeting a specific distribution between the Jewish population (80%) and the Arabic population (20%), reflecting the population of Israel and covering the two main ethnic groups.

The online survey took on average 15 minutes. It also included quality assurance questions, to eliminate respondents that clicked e.g. the first answer in all questions. The data were collected in September 2019

2.4. Data analysis

In Tunisia and Israel, the data were transposed into an SPSS file. For Georgia, the data were manually entered in SPSS. We carried out all analysis using IBM SPSS Statistics 25. All variables were presented in descriptive tables and figures, and Chi Square tests were carried out to test for significance between personal characteristics on the one hand, and risk perceptions, perceived sensitivity and level of awareness to heatwaves on the other hand. A p-value of $< .05$ was considered to be statistically significant.

3. Results

This section describes the results of our population survey. Results will be displayed for each of the three countries separately, after which we will provide a short comparison between the countries.

3.1. Tunisia

3.1.1. Setting

Geographic and climate characteristics

Tunisia is located at the northernmost tip of Africa. It borders the Mediterranean Sea to the North, Algeria to the west and Libya to the southeast. It´s the smallest country in Northern Africa and encompasses 163.610 square kilometres (3). Tunisia is divided into 24 governorates with the capital of Tunis being the smallest one (4).

While the northern part along the Atlas Mountains is mountainous, the rest of the country is characterized by low-lying plains and valleys (5). The climate of Tunisia is strongly influenced by its geographical position. The North is affected by the Mediterranean Sea and has a Mediterranean climate characterized by a summer that is hot and dry with a relatively mild and rainy winter. The South of the country, which is under the influence of the Sahara, has a desert arid climate with high temperatures and rainfall rarely exceeding 100 mm/year. The Central region, which is under the joint influence of the Mediterranean Sea and the Sahara, has a semi-arid climate characterized by relatively high temperatures and modest rainfall between 200 and 400 mm/year (6,7). Likewise, average temperatures vary geographically and seasonally with the northern regions experiencing daily average temperatures from 10°C in the winter months (December to February) to 27°C in the summer months (June to August), while daily average temperatures of the central and southern region range between 11°C in the winter months to 32°C during the summer (7). However, temperatures in summer can easily reach 40 °C, and even 45 °C in the South (8).

As for the cities we selected for this study, Tunis is located in in the North and has a Mediterranean climate, while Kairouan and Gafsa are part of the Central region. We did not include a city in the South, since the population size there is very small.

Demographic characteristics

Currently, Tunisia´s population is estimated to be around 11.6 million people with an average life expectancy of 76 years. Compared to its neighbouring countries the Tunisian population is relatively mature, with 25.3% of the population under 15 years old,

56.8% between the ages of 15 and 54 years old and inhabitants aged 55 years or older composing 18.0% of the population (9).

The population is ethnically heterogeneous with a mixture of Berbers, Arabs and migrants (4). Arabic is the official language of the country although informally the Arabic dialect Tunisian Arabic or Tounsi is spoken, as well as the Amazigh languages by the Berber population (10). French still plays a role in Tunisian society and is widely spoken in (educational) institutions, the press and the business sector. English is now considered the second foreign language and is introduced at the elementary school level (4). The majority of the population (99%) are Sunni Muslims with the rest following Christianity, Judaism or other religions (11).

Economic indicators

Approximately 70% of Tunisia's population lives in urban areas in the northern and coastal region, with 56% of the population living within an hour driving of one of the country's largest cities, Tunis, Sfax and Sousse. These three coastal cities make up the centre of Tunisia's economic activity and account for 85% of the country´s GDP (12). The country's GDP per capita encompassed $11,900 in 2017 (9). The unemployment rate dropped from 15.4% in 2018 to 15.3% in the first half of 2019, although unemployment among women (22.6%) remains significantly higher when compared to the overall unemployment rate. Data show that between 2010 and 2015 the rate of people living on the poverty line of $3.2/day in Tunisia fell from 9% in 2010 to 3% in 2015 (13).

3.1.2. Study population

Table 1 provides a descriptive overview of the study participants (N = 417). There were roughly equal numbers of men and women. The average age was 42.3, with a range of 18-88. Most participants were from Tunis, as this is also the largest city in the country. More than 90% had lived in their city for over 5 years. Educational level varied, but the largest group was those with college or university studies (27.1%). Most participants did not have small children (only 21.3%), and most were employed (34.4%). Among the employed, roughly half works mostly outdoors, and around 20% care of other people in their job. More than 80% participated in a fast in 2019 (Ramadan was from May 5th until June 3th), and around one quarter takes medication daily for a chronic disease.

Descriptive overview of study participants

	N (%)		N (%)
Gender		Employment	
Male	209 (50.1)	Student	47 (11.3)
Female	208 (49.9)	Employed	143 (34.4)
Average age (sd)	42.3 (16.0)	Business owner	67 (16.1)

City		Unemployed	51 (12.3)
Tunis	231 (55.4)	Retired	41 (9.9)
Gafsa	114 (27.3)	Housewife	67 (16.1)
Kairouan	72 (17.3)	Work mainly outdoors	
Lived for over 5 years		Yes	101 (50.5)
Yes	389 (93.3)	No	99 (49.5)
No	28 (6.7)	Work taking care of others	
Education		Yes	42 (21.0)
None	72 (17.3)	No	158 (79.0)
Primary education	53 (12.7)	Participated in (religious) fast	
Basic education	80 (19.2)	Yes	337 (80.8)
Secondary education	62 (14.9)	No	80 (19.2)
Vocational or prof. education	37 (8.9)	Medication for chronic disease	
College or university studies	113 (27.1)	Yes	108 (25.9)
Children below 12		No	309 (74.1)
Yes	89 (21.3)		
No	328 (78.7)		

Table 1. Descriptive overview of participant characteristics in Tunisia.

3.1.3. Awareness about heatwaves and their health impacts

Table 2 shows people's awareness about heatwaves, as well as their concern. Most people knew that the last heatwave took place in the same year as the survey (2019). More than 80% of participants considers heatwaves a problem in their city, and more than 75% believe that heatwaves will occur more frequently in the future. Equal proportions of people were very concerned, somewhat concerned and not concerned at all about the effects of heatwaves.

Awareness and concern related to heatwaves	
	N (%)
Knowledge on last heatwave	
Yes (correct)	328 (78.7)
Yes (incorrect)	55 (13.1)
No	34 (8.2)
Consider heatwaves a problem?	
Yes	339 (81.3)
No	75 (18.0)
I do not know	3 (0.7)
Believe that heatwaves will occur more frequently?	
Yes	320 (76.7)

No	62 (14.9)
I do not know	35 (8.4)
Concerned about heatwaves?	
Very concerned	140 (33.6)
Somewhat concerned	153 (36.7)
Not at all concerned	124 (29.7)

Table 2. Awareness and concern related to heatwaves of Tunisian study participants.

Fig. 4 shows the ten most commonly reported symptoms by respondents due to heatwaves. Exhaustion, also including fatigue, was reported most often. Skin problems also include sunburns. Out of all respondents, 19 were not able to name any symptom or indicated that heatwaves do not lead to health problems.

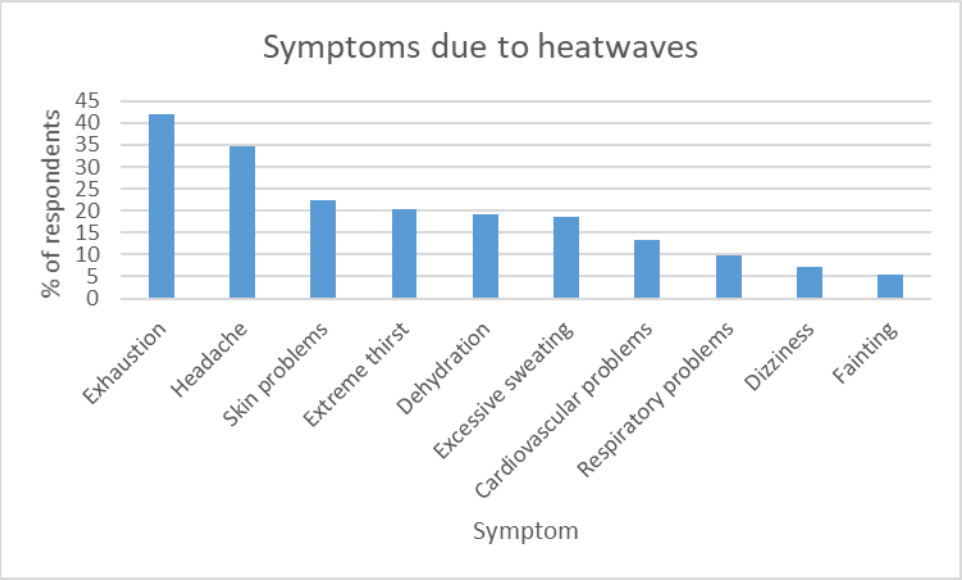

Fig. 4. Most often reported symptoms due to heatwaves by Tunisian respondents.

Respondents were asked which groups of people are at a higher risk to suffer from health effects due to heatwaves. The five most commonly reported groups are displayed in Fig. 5. More than 70% of respondents was aware of elderly as a risk group. People who perform a lot of physical effort were combined with people who work mainly outdoors. All other answers represent less than 3% of the respondents, and include pregnant women, socially isolated (including homeless) and people with light skin. In total, only 11 people were not able to name any risk group.

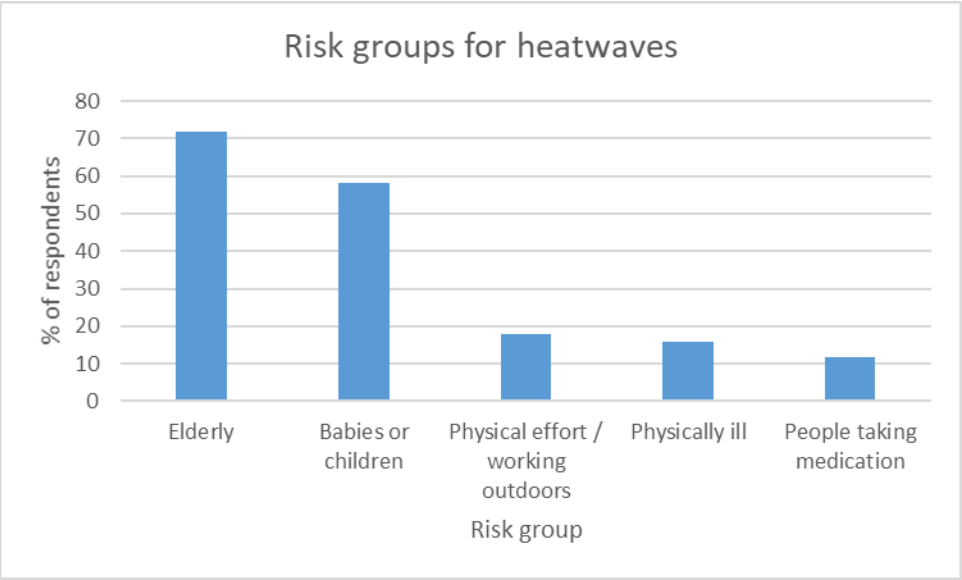

Fig. 5. Most often reported risk groups for heatwaves by Tunisian respondents.

For the individuals who reported to be either very or somewhat concerned about the effects of heatwaves (N = 293, 70.3%), we asked them what or who they are mostly concerned about (Fig. 6). Half of the respondents was concerned about their health, and equal proportions of around 40% about their children and elderly relatives. Other factors with smaller proportions are pets, financial aspects and the temperature at work/school.

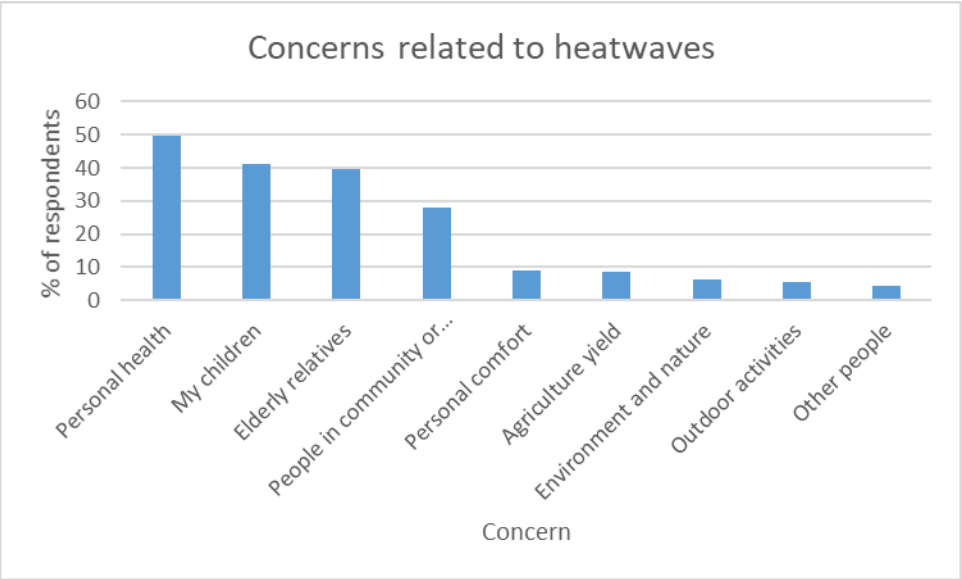

Fig. 6. Most often reported concerns for heatwaves by Tunisian respondents.

3.1.4. Knowledge about and behaviour for reducing health impacts of heatwaves

We asked respondents whether they considered themselves sensitive to heat. More than half (55.9%) considered themselves very sensitive, while lower proportions considered themselves somewhat sensitive or not sensitive at all (27.6% and 16.5%, respectively). The majority of respondents (76.5%) adjust their behaviour during a heatwave.

Respondents were asked if they know what to do when someone suffers from a heatstroke or overheating, the results of which are displayed in Fig. 7. More than half the respondents would call emergency services, while almost one third would cool the body of the person. Other mentions by few individuals were adjusting clothing and halting physical activity. In total, 22 respondents did not come up with any measure.

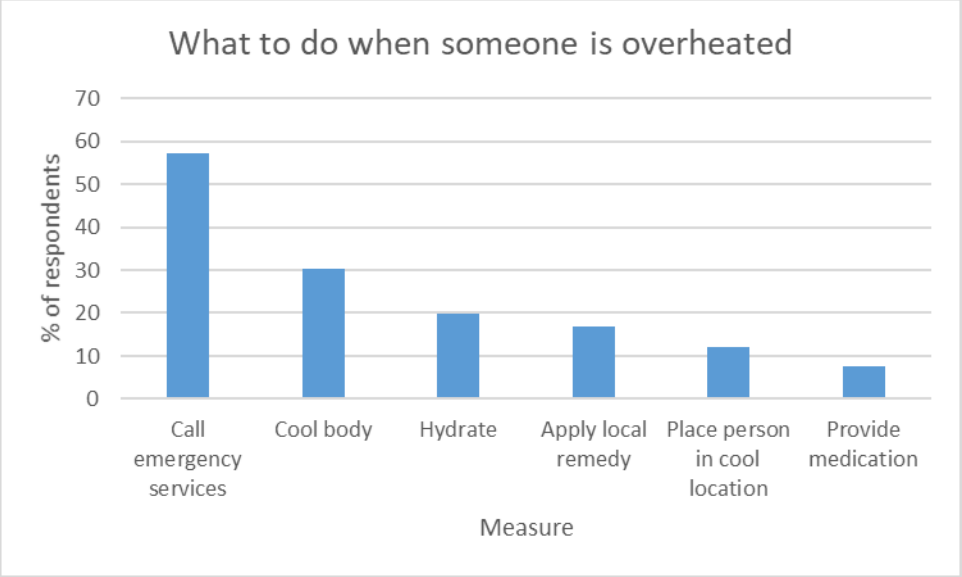

Fig. 7. Most often reported actions when someone is overheated by Tunisian respondents.

In addition, we asked respondents whether they could name measures to protect themselves from heatwaves, and whether they used these measures during the last summer (Table 3). More than half of respondents mentioned staying inside during warm times, followed by adjusting clothing and increasing fluid consumption (40.3 % and 30.7%, respectively). All other measures were mentioned by less than a quarter of the respondents. All measures were used by almost all of the respondents who mentioned them, the lowest being 'using a local remedy' (orange flower water) by 92.9%.

Knowledge and use of protective measures against heatwaves				
	Knowledge		Used	
	N	%	N	%
Stay inside during warm times	224	53.7	215	96
Adjust your clothing	168	40.3	162	96.4
Increase fluid consumption	128	30.7	127	99.2
Use a fan or air-conditioner	96	23	90	93.8
Cool your body	79	18.9	79	100
Visit cooler areas	72	17.3	72	100
Use sunscreen	48	11.5	46	95.8
Use local remedy	14	3.4	13	92.9
Adjust your medication	8	1.9	8	100
Avoid physical activity	5	1.2	5	100
Keep windows closed	4	1	4	100
Adjust diet	3	0.7	3	100

Table 3. Knowledge and use of protective measures against heatwaves by Tunisian respondents.

3.1.5. Sources for information on heatwaves and measures

More than half of the respondents consider themselves either very well or somewhat informed about heatwaves (Fig. 8). Almost 40% of people consulted their television as a source about the weather, followed by the internet and social media (22.3% and 21.3%, respectively, Fig. 9). More than 20% did not consult any source about the weather.

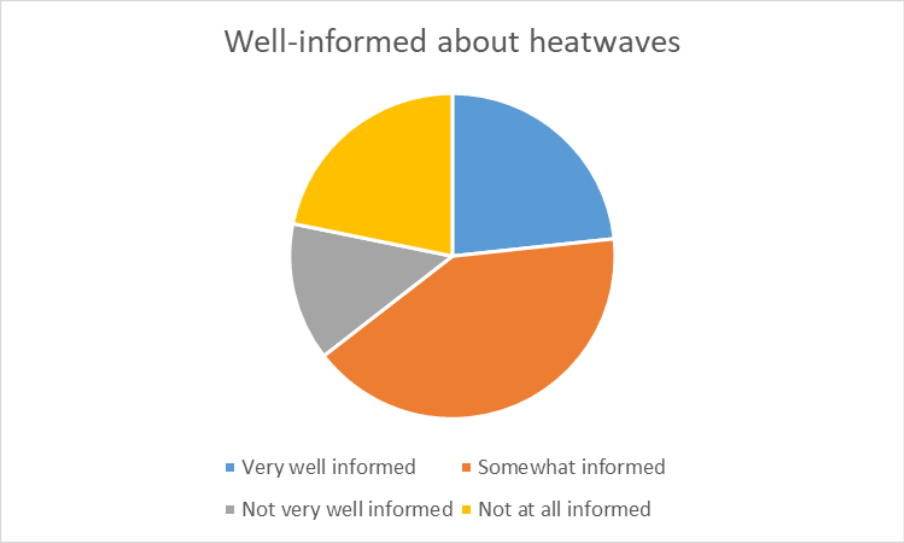

Fig. 8. The extent to which Tunisian respondents felt well-informed regarding heatwaves.

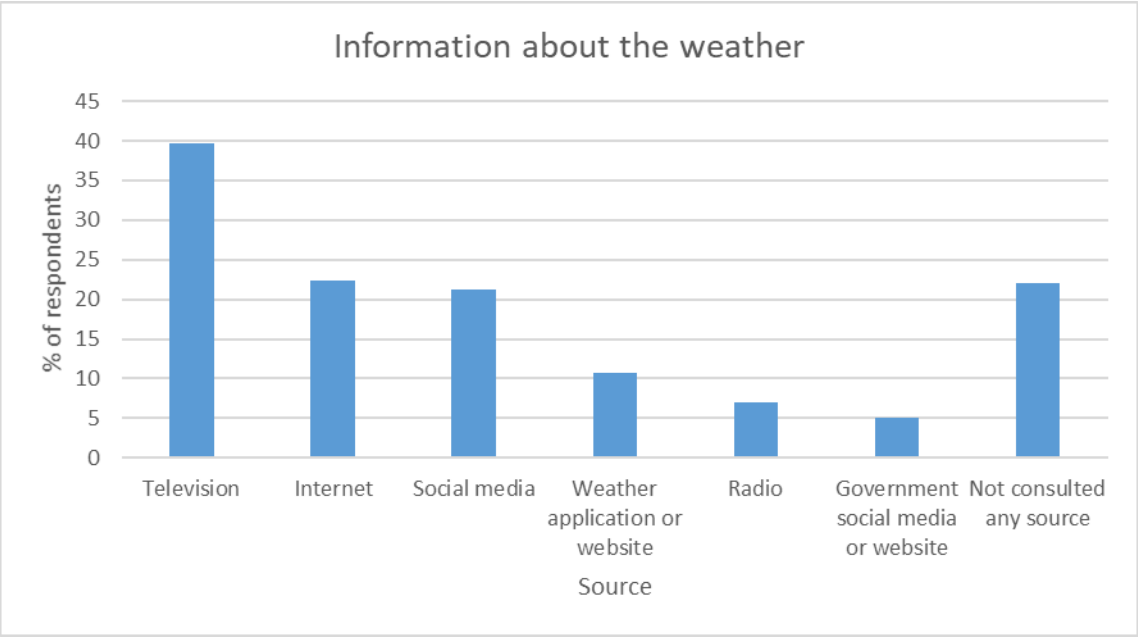

Fig. 9. Sources that Tunisian respondents most often consulted for information on the weather.

Only 10 respondents received a personal notification about the occurrence of a heatwave, mainly by phone (N = 7), although the overall majority (78.4%) would like to receive a heatwave notification in the future.

More than half of the respondents did not consult any source on protective measures for heatwaves during the past summer (Fig. 10). People that did look for information on measures mostly did this on television, the internet and social media.

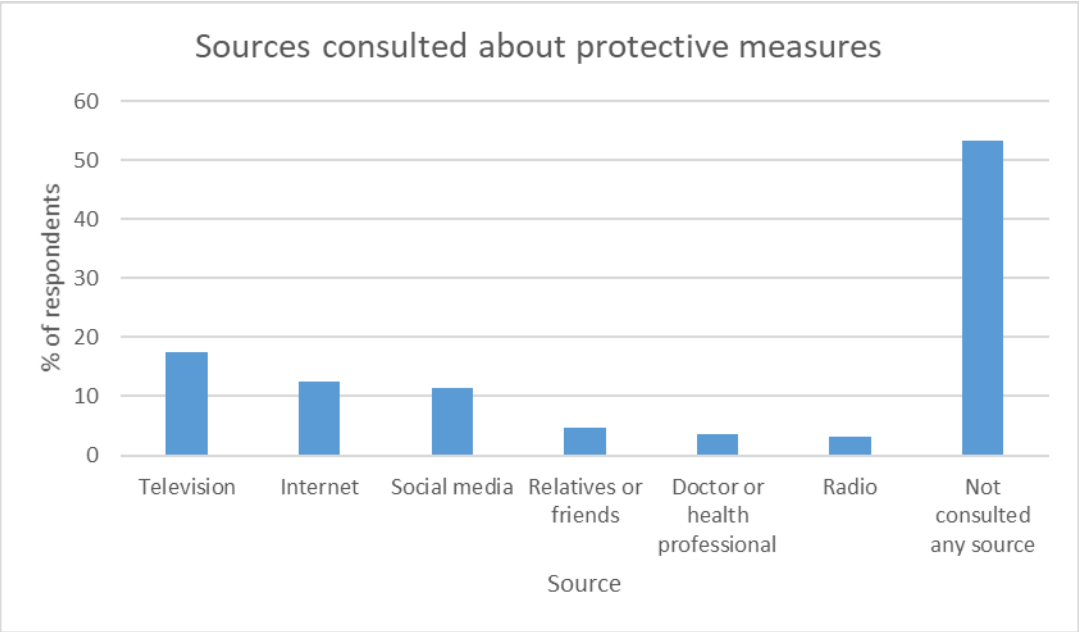

Fig. 10. Sources that Tunisian respondents most often consulted for information on protective measures for heatwaves.

When we asked respondents from whom they would expect information on what to do during the next heatwave, 40% indicated the meteorological agency (Fig. 11). Other governmental organisations were mentioned as well, such as a health authority, civil organisation or environmental organisation. More than 10% indicated that they do not expect information from anybody.

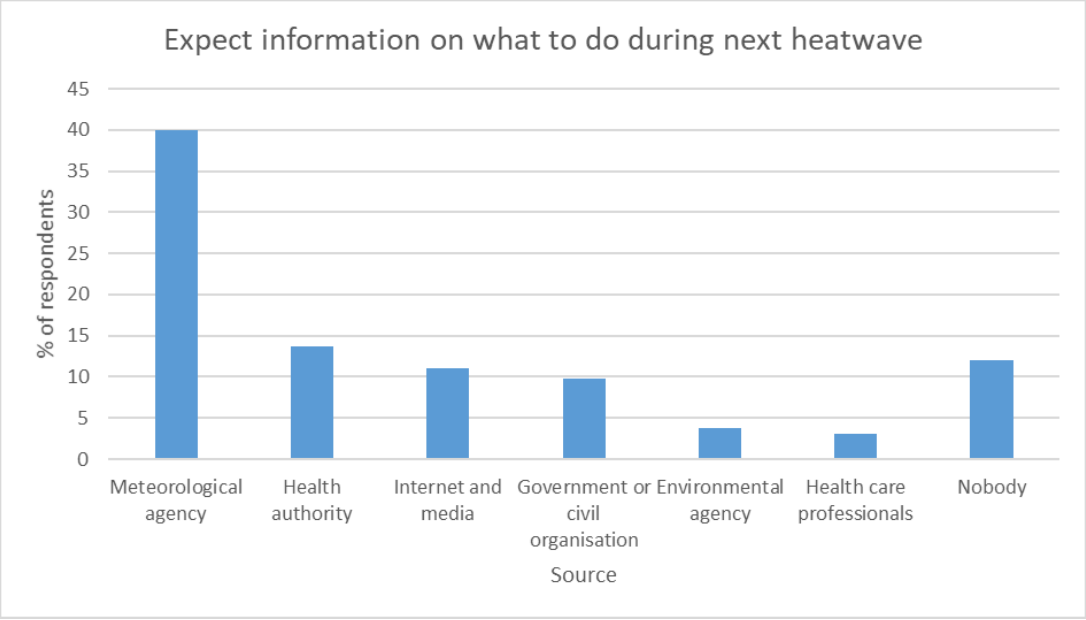

Fig. 11. Sources that Tunisian respondents expect to receive information on heatwave protective measures from.

3.1.6. Risk and protective factors for heatwave sensitivity and concern

We assessed what kind of personal characteristics of participants were associated with their level of concern about the effects of heatwaves / extreme temperatures (Table 4). We found that women are significantly more concerned than men, and that individuals living in Tunis were more concerned than those living in Gafsa and Kairouan. In addition, parents with children below the age of 12 were more concerned than individuals without children in that age group. Other factors, such as age, education or occupation were not associated with level of concern.

		Level of concern			
		Very concerned	**Somewhat concerned**	**Not at all concerned**	**p-value**
		N (%)	**N (%)**	**N (%)**	
Gender					< .001
	Male	60 (28.7)	66 (31.6)	83 (39.7)	
	Female	80 (38.5)	87 (41.8)	41 (19.7)	
Age					.897
	18-35 years	56 (33.5)	63 (37.7)	48 (28.7)	
	36-55 years	45 (32.1)	54 (38.6)	41 (29.3)	
	56 years and over	39 (35.5)	36 (32.7)	35 (31.8)	
City					.006
	Tunis	93 (40.3)	81 (35.1)	57 (24.7)	
	Gafsa	15 (20.8)	33 (45.8)	24 (33.3)	
	Kairouan	32 (28.1)	39 (34.2)	43 (37.7)	
Lived for over 5 years					.957
	Yes	131 (33.7)	142 (36.5)	116 (29.8)	
	No	9 (32.1)	11 (39.3)	8 (28.6)	
Education					.256
	None	27 (37.5)	26 (36.1)	19 (26.4)	
	Primary education	11 (20.8)	23 (43.4)	19 (35.8)	
	Basic education	24 (30.0)	24 (30.0)	32 (40.0)	
	Secondary education	19 (30.6)	26 (41.9)	17 (27.4)	
	Vocational or prof. education	15 (40.5)	12 (32.4)	10 (27.0)	
	College or university studies	44 (38.9)	42 (37.2)	27 (23.9)	
Children below 12					.042
	Yes	39 (43.8)	31 (34.8)	19 (21.3)	
	No	101 (30.8)	122 (37.2)	105 (32.0)	
Employment					.117

Student	17 (36.2)	18 (38.3)	12 (25.5)	
Employed	53 (37.1)	52 (36.4)	38 (26.6)	
Business owner	22 (32.8)	17 (25.4)	28 (41.8)	
Unemployed	10 (19.6)	21 (41.2)	20 (39.2)	
Retired	16 (36.6)	14 (34.1)	12 (29.3)	
Housewife	22 (32.8)	31 (46.3)	14 (20.9)	
Work mainly outdoors				.218
Yes	33 (32.7)	32 (31.7)	36 (35.6)	
No	42 (42.4)	32 (32.3)	25 (25.3)	
Work taking care of others				.629
Yes	14 (33.3)	16 (38.1)	12 (28.6)	
No	61 (38.6)	48 (30.4)	49 (31.0)	
Participated in (religious) fast				.800
Yes	111 (32.9)	126 (37.4)	100 (29.7)	
No	29 (36.3)	27 (33.8)	24 (30.0)	
Medication for chronic disease				.779
Yes	35 (32.4)	38 (35.2)	35 (32.4)	
No	105 (34.0)	115 (37.2)	89 (28.8)	

Table 4. Personal characteristics of Tunisian respondents associated with level of concern for heatwaves.

We also assessed whether certain personal characteristics are associated with being more sensitive to heat (Table 5). Almost two-thirds of women considered themselves very sensitive to heat, versus less than half of men. There was also a relation with occupation, where in particular housewives and retirees considered themselves more sensitive. Unexpectedly, there was no statistically significant association with age, although older people (56 years and over) seemed to consider themselves slightly more sensitive than younger people. The last characteristic that showed an association was taking medication for a chronic disease, where individuals that use medication reported being more sensitive than those without.

	Sensitivity to Heat			
	Very much	**Somewhat**	**Not at all**	**p-value**
	N (%)	**N (%)**	**N (%)**	
Gender				< .001
Male	97 (46.4)	57 (27.3)	55 (26.3)	
Female	136 (65.4)	58 (27.9)	14 (6.7)	
Age				.295
18-35 years	83 (49.7)	51 (30.5)	33 (19.8)	
36-55 years	83 (59.3)	35 (25.0)	22 (15.7)	

	56 years and over	67 (60.9)	29 (26.4)	14 (12.7)	
City					.222
	Tunis	125 (54.1)	69 (29.9)	37 (16.0)	
	Gafsa	60 (52.6)	34 (29.8)	20 (17.5)	
	Kairouan	48 (66.7)	12 (16.7)	12 (16.7)	
Lived for over 5 years					.865
	Yes	216 (55.5)	108 (27.8)	65 (16.7)	
	No	17 (60.7)	7 (25.0)	4 (14.3)	
Education					.619
	None	42 (58.3)	16 (22.2)	14 (19.4)	
	Primary education	30 (56.6)	10 (18.9)	13 (24.5)	
	Basic education	46 (57.5)	22 (27.5)	12 (15.0)	
	Secondary education	32 (51.6)	19 (30.6)	11 (17.7)	
	Vocational or prof. education	22 (59.5)	11 (29.7)	4 (10.8)	
	College or university studies	61 (54.0)	37 (32.7)	15 (13.3)	
Children below 12					.628
	Yes	53 (59.6)	21 (23.6)	15 (16.9)	
	No	180 (54.9)	94 (28.7)	54 (16.5)	
Employment					.035
	Student	22 (46.8)	16 (34.0)	9 (19.1)	
	Employed	75 (52.4)	46 (32.2)	22 (15.4)	
	Business owner	36 (53.7)	17 (25.4)	14 (20.9)	
	Unemployed	25 (49.0)	11 (21.6)	15 (29.4)	
	Retired	28 (68.3)	10 (24.4)	3 (7.3)	
	Housewife	47 (70.1)	14 (20.9)	6 (9.0)	
Work mainly outdoors					.372
	Yes	50 (49.5)	29 (28.7)	22 (21.8)	
	No	54 (54.5)	31 (31.3)	14 (14.1)	
Work taking care of others					.537
	Yes	25 (59.5)	11 (26.2)	6 (14.3)	
	No	79 (50.0)	49 (31.0)	30 (19.0)	
Participated in (religious) fast					.363
	Yes	185 (54.9)	98 (29.1)	54 (16.0)	
	No	48 (60.0)	17 (21.3)	15 (18.8)	
Medication for chronic disease					.004
	Yes	75 (69.4)	22 (20.4)	11 (10.2)	
	No	158 (51.1)	93 (30.1)	58 (18.8)	

Table 5. Personal characteristics of Tunisian respondents associated with considering themselves sensitive for heatwaves.

The last question we looked at with respect to risk and protective characteristics was whether people considered themselves well-informed about heatwaves and extreme temperatures (Table 6). Study participants living in Tunis considered themselves better informed than those living in Gafsa and Kairouan. In terms of occupation, almost half of retirees considered themselves very well-informed, which is much higher than the other occupation categories. As the educational level is higher, people more often report to be well-informed, and less often that they are not at all informed. The relationship between working outdoors and being well-informed was borderline significant, where it seemed that people working mainly outdoors answered more often that they were 'very well' and 'not at all' informed than people not working mainly outdoors. Other variables, such as gender, age and taking chronic medication were not associated with being informed about heatwaves and extreme heat.

		Informed about heatwaves				
		Very well	**Somewhat**	**Not very well**	**Not at all**	**p-value**
		N (%)	**N (%)**	**N (%)**	**N (%)**	
Gender						.130
	Male	56 (26.8)	88 (42.1)	22 (10.5)	43 (20.6)	
	Female	41 (19.7)	84 (40.4)	35 (16.8)	48 (23.1)	
Age						.338
	18-35 years	31 (18.6)	70 (41.9)	24 (14.4)	42 (25.1)	
	36-55 years	32 (22.9)	59 (42.1)	21 (15.0)	28 (20.0)	
	56 years and over	34 (30.9)	43 (39.1)	12 (10.9)	21 (19.1)	
City						.001
	Tunis	68 (29.4)	88 (38.1)	36 (15.6)	39 (16.9)	
	Gafsa	23 (20.2)	50 (43.9)	8 (7.0)	33 (28.9)	
	Kairouan	6 (8.3)	34 (47.2)	13 (18.1)	19 (26.4)	
Lived for over 5 years						.271
	Yes	94 (24.2)	161 (41.4)	52 (13.4)	82 (21.1)	
	No	3 (10.7)	11 (39.3)	5 (17.9)	9 (32.1)	
Education						< .001
	None	13 (18.1)	19 (26.4)	10 (13.9)	30 (41.7)	
	Primary education	9 (17.0)	17 (32.1)	6 (11.3)	21 (39.6)	
	Basic education	21 (26.3)	26 (32.5)	15 (18.8)	18 (22.5)	
	Secondary education	16 (25.8)	32 (51.6)	6 (9.7)	8 (12.9)	
	Vocational or prof. education	8 (21.6)	20 (54.1)	4 (10.8)	5 (13.5)	
	College or university studies	30 (26.5)	58 (51.3)	16 (14.2)	9 (8.0)	
Children below 12						.548
	Yes	18 (20.2)	37 (41.6)	16 (18.0)	18 (20.2)	
	No	79 (24.1)	135 (41.2)	41 (12.5)	73 (22.3)	
Employment						< .001

Student	12 (25.5)	20 (42.6)	6 (12.8)	9 (19.1)	
Employed	37 (25.9)	63 (44.1)	20 (14.0)	23 (16.1)	
Business owner	8 (11.9)	31 (46.3)	13 (19.4)	15 (22.4)	
Unemployed	5 (9.8)	21 (41.2)	4 (7.8)	21 (41.2)	
Retired	20 (48.8)	15 (36.6)	2 (4.9)	4 (9.8)	
Housewife	14 (20.9)	22 (32.8)	12 (17.9	19 (28.4)	
Work mainly outdoors					.058
Yes	23 (22.8)	38 (37.6)	15 (14.9)	25 (24.8)	
No	16 (16.2)	52 (52.5)	18 (18.2)	13 (13.1)	
Work taking care of others					.734
Yes	9 (21.4)	17 (40.5)	9 (21.4)	7 (16.7)	
No	30 (19.0)	73 (46.2)	24 (15.2)	31 (19.6)	
Participated in (religious) fast					.883
Yes	81 (24.0)	138 (40.9)	46 (13.6)	72 (21.4)	
No	16 (20.0)	34 (42.5)	11 (13.8)	19 (23.8)	
Medication for chronic disease					.466
Yes	31 (28.7)	40 (37.0)	14 (13.0)	23 (21.3)	
No	66 (21.4)	132 (42.7)	43 (13.9)	68 (22.0)	

Table 6. Personal characteristics of Tunisian respondents associated with considering themselves informed about heatwaves.

3.2. Georgia

3.2.1. Setting

Geographical and climate characteristics

Georgia is located in the central and western part of the southern Caucasus. It borders Russia in the north, Turkey, Azerbaijan and Armenia in the south and the Black Sea to the west. It has a total land area of 69.700 square kilometres (14), which also includes two autonomous regions (Abkhazia and South-Ossetia) (15). The country is furthermore divided in nine provinces and the capital Tbilisi, which is divided into different municipalities that are self-governing units (16).

Georgia's geography is marked by different climates and landscapes due to its orographic structure, which consists of low- and high-land, mountain regions as well as flat plains (17). Two-thirds of the country are mountainous with 20% having an altitude of 2000 meters or more above sea level. In the North, the majority of the area consists of the Great Caucasus mountain ridge, while in the South both volcanic mountains and the Small Caucasus determine the landscape. Low mountain relief, such as the inter-mountain plain between the Great- and Small Caucasus, occupy less than a quarter of the country (18).

The climate of the different regions of Georgia depends on their geographical location. While the West is defined by rather mild winters and hot summers, the eastern climate is continental, with the mountain region being the coldest (18,19). The majority of Georgia has a subtropical climate, with the average daily temperature in the flat plains varying between -2°C and 3°C in January to approximately 27°C in July. In the mountains, the average daily temperature can drop to -18°C during the winter. The average amount of rain varies between regions with 300 mm/year in the east to 2800 mm/year in the west (14). Heatwaves are common occurrences in Georgia, reaching temperatures well over 40 °C (20).

As for the cities we selected for this study, Tbilisi and Telavi are located in the East and have a continental climate, while Batumi is located in the West. We did not include a city in the mountain region, since the population size there is small and this region is affected less by heatwaves than the rest of the country.

Demographic characteristics

Georgia has a population of 4 million people with an average life expectancy of 73.5 years (21). From 2005 to 2009, the childbirth index per 1000 population varied between 10.7 to 14.4, which is rather low compared to other countries in the region. 18.4% of the Georgian population is under 15 years old, 64.7% between the ages of 15 and 64 years

old and 16.9% over 65 years of age (21). It is expected that the demographic aging of the population will become an increasing economic burden for the working population in the future (18).

The average population density of Georgia is 71 people per km^2, with 46.2% of the population residing in rural settings, and the capital of Tbilisi being the most densely populated urban area (22). Georgian society is traditionally multi-ethnic: at the end of the Soviet era, around 30% of the population was composed of ethnic minorities. Currently, minorities such as Aziris, Armenians and Russians make up approximately 13.2% of the population (23).

Orthodox Christianity is the primary religion of the country, with 83.9% of the population being a member of the Georgian or Russian Orthodox Church. 9.9% of the population is Muslim, 3.9% Armenian Apostolic and 0.8% Catholic (24). Georgian is the official language of the country, with 17 (regional) dialects within the language (25).

Economic indicators

The Georgian economy has grown robustly over the last decade (26). This is partly due to significant reforms in economic management and governance, which focused on the formation of attractive business opportunities. This resulted in an inflow of foreign investments and the creation of new business- and employment opportunities (18). Poverty declined from 32.5% in 2006 to 16.3% in 2017, mainly due to the Government's social policies as well as new economic opportunities (26).

This economic growth favoured mainly urban areas in Georgia. Approximately one quarter of the entire population is situated Tbilisi (1.17 million), which produces almost half of Georgia's GDP (total GDP per capita of 4.068) and contributes 60-70% of the country's key statistics in entrepreneurial and construction activities (26,27). The unemployment rate has declined to 12.7% in 2018, which lowered the national poverty rate and had a positive influence on both urban and rural poverty rates (26).

3.2.2. Study population

Table 7 provides a descriptive overview of the study participants (N = 420) The sample contained slightly more women than men (54 vs. 46 %). The average age was 48.6, with a range of 18-89. More than 60% of participants were from Tbilisi, which is the capital and largest city in the country. All study participants had lives in their city for more than 5 years. Half of the sample finished college or university studies, and as such is relatively highly educated. Almost 75% did not have small children, and more than two-thirds were employed or self-employed. Among the employed, half of them work mainly outdoors, and almost 10% take care of other people in their job. The

majority (63%) took part in a religious fast in the previous year, and almost half (43%) takes medication for a chronic disease.

Descriptive overview of study participants			
	N (%)		N (%)
Gender		Employment	
Male	195 (46.4)	Student	27 (6.4)
Female	225 (53.6)	Employed or self-employed	292 (69.5)
Average age (sd)	48.6 (18.0)	Unemployed	33 (7.9)
City		Retired	44 (10.5)
Tbilisi	265 (63.1)	Housewife	22 (5.2)
Batumi	85 (20.2)	Other	2 (0.5)
Telavi	70 (16.7)	Work mainly outdoors	
Lived for over 5 years		Yes	148 (50.5)
Yes	420 (100)	No	145 (49.5)
No	0 (0)	Work taking care of others	
Education		Yes	29 (9.9)
None	0 (0)	No	264 (90.1)
Primary education	12 (2.9)	Participated in (religious) fast	
Secondary education	145 (34.5)	Yes	154 (36.7)
Vocational or prof. education	53 (12.6)	No	266 (63.3)
College or university studies	210 (50.0)	Medication for chronic disease	
Children below 12		Yes	180 (42.9)
Yes	111 (26.5)	No	240 (57.1)
No	308 (73.5)		

Table 7. Descriptive overview of participant characteristics in Georgia.

3.2.3. Awareness about heatwaves and their health impacts

Table 8 presents the awareness regarding heatwaves and the concerns of study participants. Almost half the people knew that the last heatwave took place in the same year as the survey (2019), and almost 20% thought it had been in another year. More than two-third of the participants considered heatwaves a problem, and an almost equally big group believes that heatwaves will occur more frequently in the future. More than 90% of participants was concerned about heatwaves, the majority of whom very concerned.

Awareness on occurrence and concern related to heatwaves	
	N (%)
Knowledge on last heatwave	
Yes (correct)	201 (48.0)

Yes (incorrect)	83 (19.8)
No	135 (32.2)
Consider heatwaves a problem?	
Yes	297 (70.7)
No	80 (19.0)
I do not know	43 (10.2)
Believe that heatwaves will occur more frequently?	
Yes	275 (65.5)
No	33 (7.9)
I do not know	112 (26.7)
Concerned about heatwaves?	
Very concerned	208 (49.8)
Somewhat concerned	175 (41.9)
Not at all concerned	35 (8.4)

Table 8. Awareness and concern related to heatwaves of Georgian study participants.

Fig. 12 presents the ten most commonly reported symptoms due to heatwaves. The most commonly mentioned problem was headache (41%), followed by exhaustion (including fatigue) and cardiovascular problems (29 and 25%, respectively). In total, 27 respondents indicated that they do not know any symptoms that are caused by heatwaves.

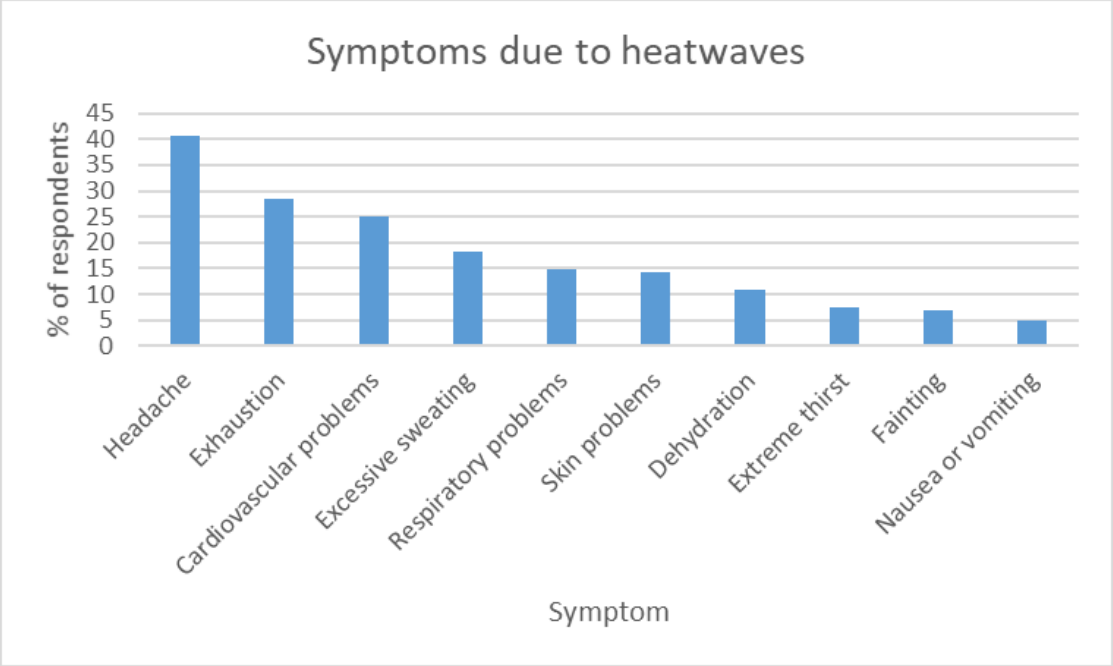

Fig. 12. Most often reported symptoms due to heatwaves by Georgian respondents.

The most commonly reported risk group by respondents was the elderly, by 58% (Fig. 13). Other risk groups are known by only one third of the respondents or less (e.g. babies and children by only 24%). There were 38 people who did not know any groups particularly at risk for heatwaves.

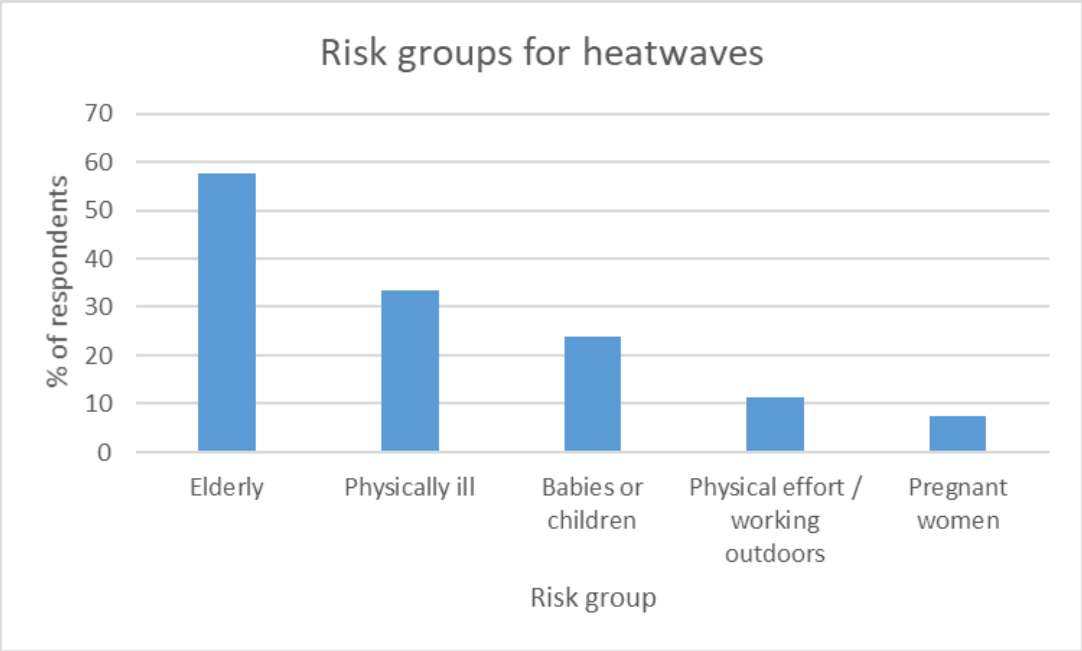

Fig. 13. Most often reported risk groups for heatwaves by Georgian respondents.

The respondents who reported to be either very or somewhat concerned about the effect of heatwaves (N = 383, 91.6%) were asked what they are mainly concerned about (Fig. 14).The most commonly reported concern was people's personal health, by 44% of respondents. This was followed with some distance by other people in the community, respondents' children, and elderly relatives (21, 19 and 19%, respectively).

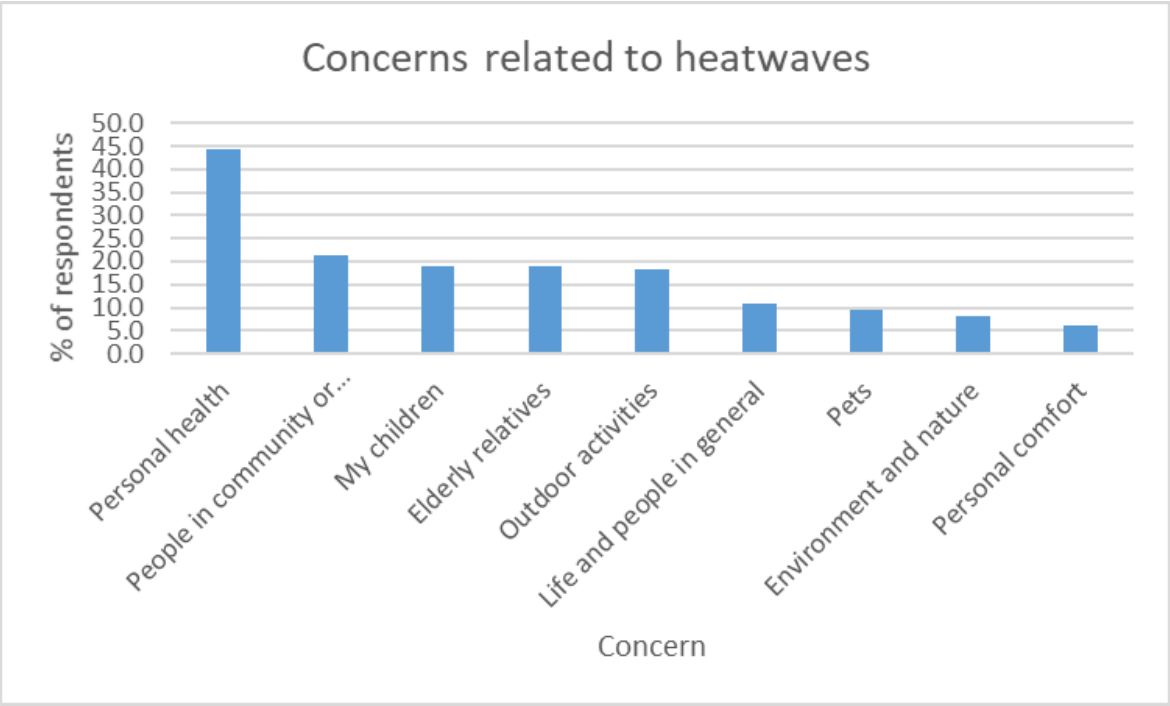

Fig. 14. Most often reported concerns for heatwaves by Georgian respondents.

3.2.4. Knowledge about and behaviour for reducing health impacts of heatwaves

We asked respondents whether they considered themselves sensitive to heat. Just over one third (38%) considered themselves very sensitive, and a group of equal size considered themselves somewhat sensitive (39%). The smallest group consisted of those who did not consider themselves sensitive at all (24%).

Respondents were asked if they know what to do when someone suffers from a heatstroke or overheating, the results of which are displayed in Fig. 15. The most commonly reported action is to place someone in a cool location (42%), closely followed by hydrating someone (36%). Other answers by smaller numbers of individuals (not included in the figure) were providing medication and not going outside. Exactly 20% of the respondents did not know what to do in such a situation.

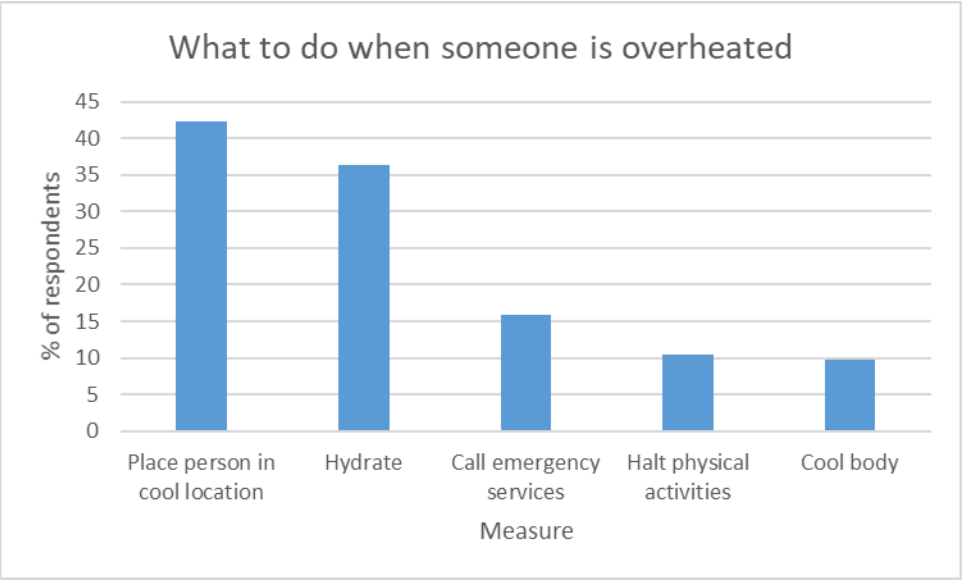

Fig. 15. Most often reported actions when someone is overheated by Georgian respondents.

The next question was on whether respondents could name measures to protect themselves from heat, and whether they used these during the last summer, as displayed in Table X. More than half of respondents mentioned increasing fluid consumption as a measure, followed by visiting cooler areas and staying inside during warm times of the day (both forms of heat avoidance). The fourth most commonly reported with 26% was using a fan or air-conditioner. Most of the measures were also used by the majority of respondents who mentioned them. The measure that was used least often by people who reported it was adjusting clothing (81%).

Knowledge and use of protective measures against heatwaves				
	Knowledge		Used	
	N	%	N	%
Increase fluid consumption	224	53.2	219	97.8
Visit cooler areas	158	37.5	141	89.2
Stay inside during warm times	128	30.4	125	97.7
Use a fan or air-conditioner	110	26.1	106	96.4
Adjust your clothing	75	17.8	61	81.3
Cool your body	61	14.5	50	82.0
Avoid physical activity	23	5.5	21	91.3
Keep windows closed	20	4.8	19	95.0
Adjust your medication	10	2.4	9	90.0
Adjust diet	8	1.9	8	100.0
Use sunscreen	7	1.7	6	85.7

Table 9. Knowledge and use of protective measures against heatwaves by Georgian respondents.

3.2.5. Sources for information on heatwaves and measures

Almost half of the respondents considered themselves either very well or somewhat informed about heatwaves, among which the largest share was for somewhat informed (Fig. 16). More than 40% of respondents consulted their television as a source about the weather, closely followed by the internet (e.g. Google) (Fig. 17). There were only few people (4%) who did not consult any source.

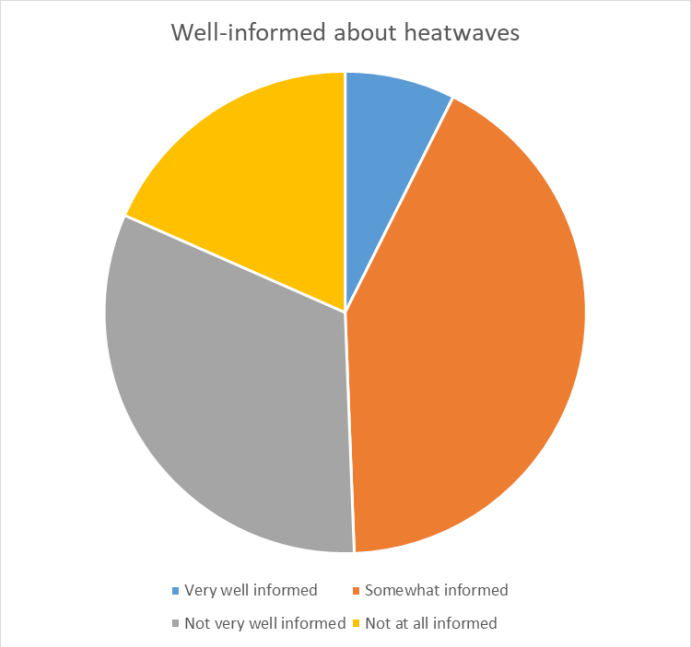

Fig. 16. The extent to which Georgian respondents felt well-informed regarding heatwaves.

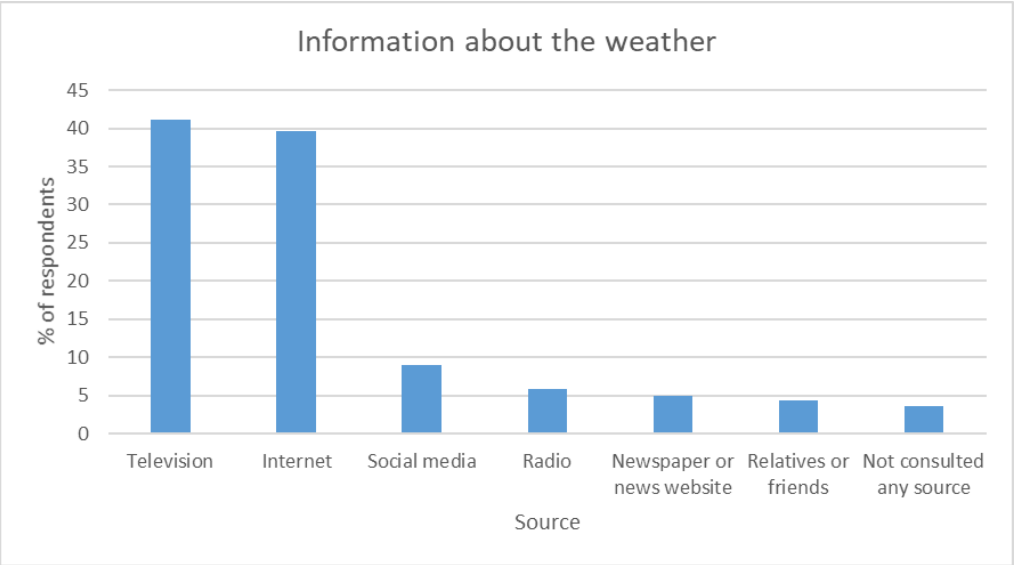

Fig. 17. Sources that Georgian respondents most often consulted for information on the weather.

Only 5 people received a personal notification about the occurrence of a heatwave in the past. However, 71% would like to receive a heatwave notification in the future.

When asked which sources they consulted on protective measures for heatwave, one third indicated that they use the television, followed by the internet for almost one fourth (Fig. 18). An equally large group did not consult any source about protective measures for heatwaves.

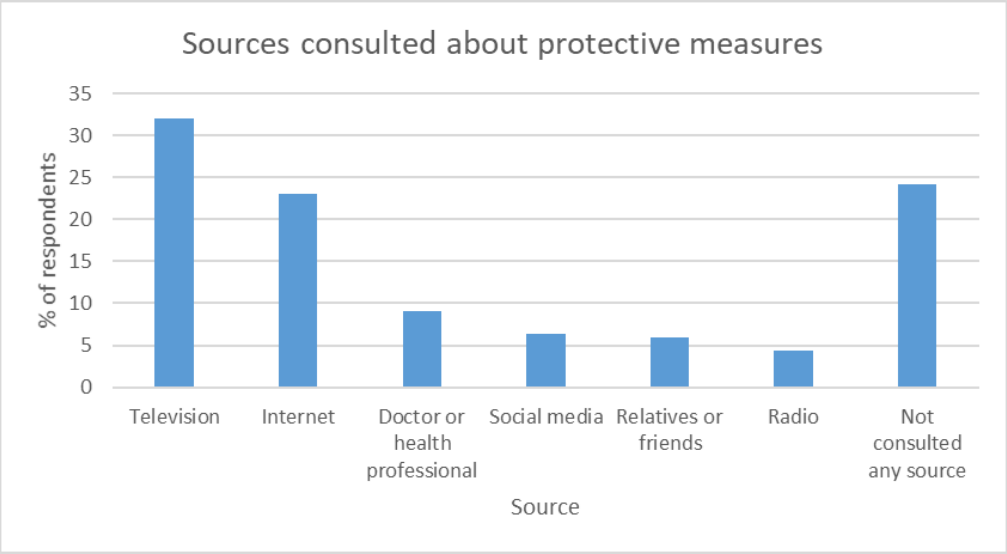

Fig. 18. Sources that Georgian respondents most often consulted for information on protective measures for heatwaves.

We asked from whom respondents expected information on what to do during the next heatwave (Fig. 19), and the largest group (38%) indicated they would prefer information from a health authority. This was followed by smaller numbers of respondents who indicated health care professionals (26%) and the meteorological agency (23%). There were also some people who indicated that it does not matter who informs them, as long as they receive information, and an even smaller group who indicated that they do not need to receive information from any organisation.

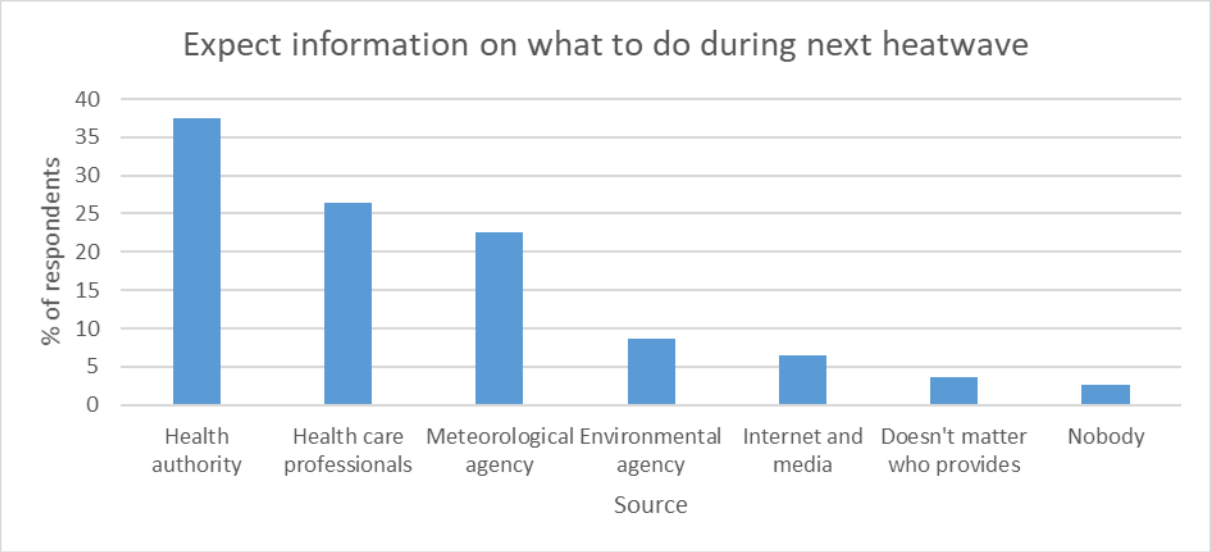

Fig. 19. Sources that Georgian respondents expect to receive information on heatwave protective measures from.

3.2.6. Risk and protective factors for heatwave sensitivity and concern

We assessed what kind of personal characteristics of participants were associated with their level of concern about the effect of heatwaves / extreme temperatures (Table 10). We found that in Georgia, women are on average more concerned than men. Age did not appear to affect how concerned people are, and neither did the city where people live, whether people have children below the age of 12, their employment, and whether they take medication for a chronic disease. There seems to be a borderline association between level of concern and educational level, where, people with vocational or professional education are less concerned than those from other educational levels, but this association is not statistically significant.

	Level of concern			
	Very concerned	Somewhat concerned	Not at all concerned	p-value
	N (%)	N (%)	N (%)	
Gender				.005
Male	84 (43.3)	86 (44.3)	24 (12.4)	
Female	124 (55.4)	89 (39.7)	11 (4.9)	
Age				.828
18-35 years	62 (51.2)	50 (41.3)	9 (7.4)	
36-55 years	63 (52.9)	47 (39.5)	9 (7.6)	
56 years and over	83 (46.6)	78 (43.8)	17 (9.6)	
City				.557
Tbilisi	138 (52.3)	105 (39.8)	21 (8.0)	
Batumi	42 (49.4)	36 (42.4)	7 (8.2)	
Telavi	28 (40.6)	34 (49.3)	7 (10.1)	
Education				.084
Primary education	7 (58.3)	4 (33.1)	1 (8.3)	
Secondary education	76 (52.8)	53 (36.8)	15 (10.4)	
Vocational or prof. education	16 (30.8)	30 (57.7)	6 (11.5)	
College or university studies	109 (51.9)	88 (41.9)	13 (6.2)	
Children below 12				.937
Yes	55 (50.0)	45 (40.9)	10 (9.1)	
No	152 (49.5)	130 (42.3)	25 (8.1)	
Employment				.166
Student	19 (70.4)	7 (25.9)	1 (3.7)	
Employed or self-employed	149 (51.4)	115 (39.7)	26 (9.0)	
Unemployed	10 (30.3)	18 (54.5)	5 (15.2)	
Retired	19 (43.2)	23 (52.3)	2 (4.5)	
Housewife	10 (45.5)	11 (50.0)	1 (4.5)	
Other	1 (50.0)	1 (50.0)	0 (0.0)	
Work mainly outdoors				.091
Yes	84 (57.1)	49 (33.3)	14 (9.5)	
No	66 (45.8)	66 (45.8)	12 (8.3)	
Work taking care of others				.218
Yes	16 (57.1)	12 (42.9)	0 (0.0)	
No	134 (51.0)	103 (39.2)	26 (9.9)	
Participated in (religious) fast				.914
Yes	78 (51.0)	63 (41.2)	12 (7.8)	
No	130 (49.1)	112 (42.3)	23 (8.7)	
Medication for chronic disease				.348
Yes	92 (51.1)	77 (42.8)	11 (6.1)	
No	116 (48.7)	98 (41.2)	24 (10.1)	

Table 10. Personal characteristics of Georgian respondents associated with level of concern for heatwaves.

We also assessed which personal characteristics are associated with being more sensitive to heat (Table 11). Almost half of women considered themselves very sensitive, versus a quarter of men. Overall, older people reported to be more sensitive than younger people. There was also a clear association between sensitivity and participation in a (religious) fast: more than half of people who participated in a fast reported to be very sensitive to heat, compared to 29% of people who did not participate in a fast. Finally, more than half of participations who took medication for a chronic disease reported to be very sensitive, which is significantly more than people who do not take medication.

		Sensitivity to Heat			
		Very much	Somewhat	Not at all	p-value
		N (%)	N (%)	N (%)	
Gender					< .001
	Male	51 (26.3)	83 (42.8)	60 (30.9)	
	Female	106 (47.1)	80 (35.6)	39 (17.3)	
Age					.003
	18-35 years	32 (26.4)	47 (38.8)	42 (34.7)	
	36-55 years	46 (38.3)	47 (39.2)	27 (22.5)	
	56 years and over	79 (44.4)	69 (38.8)	30 (16.9)	
City					.477
	Tbilisi	107 (40.4)	101 (38.1)	57 (21.5)	
	Batumi	26 (30.6)	36 (42.4)	23 (27.1)	
	Telavi	24 (34.8)	26 (37.7)	19 (27.5)	
Education					.618
	Primary education	5 (41.7)	3 (25.0)	4 (33.3)	
	Secondary education	56 (38.9)	52 (36.1)	36 (25.0)	
	Vocational or prof. education	15 (28.3)	26 (49.1)	12 (22.6)	
	College or university studies	81 (38.6)	82 (39.0)	47 (22.4)	
Children below 12					.947
	Yes	43 (38.7)	42 (37.8)	26 (23.4)	
	No	114 (37.1)	121 (39.4)	72 (23.5)	
Employment					.280
	Student	10 (37.0)	10 (37.0)	7 (25.9)	
	Employed or self-employed	110 (37.8)	111 (38.1)	70 (24.1)	
	Unemployed	5 (15.2)	18 (54.5)	10 (30.3)	
	Retired	21 (47.7)	15 (34.1)	8 (18.2)	
	Housewife	10 (45.5)	9 (40.9)	3 (13.6)	

Other	1 (50.0)	0 (0.0)	1 (50.0)	
Work mainly outdoors				.478
Yes	61 (41.2)	52 (35.1)	35 (23.6)	
No	50 (34.7)	59 (41.0)	35 (24.3)	
Work taking care of others				.130
Yes	11 (37.9)	15 (51.7)	3 (10.3)	
No	100 (38.0)	96 (36.5)	67 (25.5)	
Participated in (religious) fast				< .001
Yes	80 (51.9)	51 (33.1)	23 (14.9)	
No	77 (29.1)	112 (42.3)	76 (28.7)	
Medication for chronic disease				< .001
Yes	91 (50.6)	62 (34.4)	27 (15.0)	
No	66 (27.6)	101 (42.3)	72 (30.1)	

Table 11. Personal characteristics of Georgian respondents associated with considering themselves sensitive for heatwaves.

The last question we reviewed in terms of the association with personal characteristics was whether people considered themselves to be well-informed about heatwaves (Table 12). On average, women reported to be better informed than men. Education was also significantly associated: people with a higher education felt better informed than those with lower education. In terms of employment, people who work mainly outdoors reported to be less informed than those who work mainly indoors. Persons taking medication for a chronic disease were less often 'not at all informed'. None of the other characteristics (e.g. age, city of residence, having children below 12) was associated with feeling well-informed or not.

	Informed about heatwaves				
	Very well	**Somewhat**	**Not very well**	**Not at all**	**p-value**
	N (%)	**N (%)**	**N (%)**	**N (%)**	
Gender					.011
Male	12 (6.2)	71 (36.6)	63 (32.5)	48 (24.7)	
Female	19 (8.4)	105 (46.7)	72 (32.0)	29 (12.9)	
Age					.910
18-35 years	12 (9.9)	51 (42.1)	35 (28.9)	23 (19.0)	
36-55 years	8 (6.7)	50 (41.7)	40 (33.3)	22 (18.3)	
56 years and over	11 (6.2)	75 (42.1)	60 (33.7)	32 (18.0)	
City					.295
Tbilisi	22 (8.3)	103 (38.9)	90 (34.0)	50 (18.9)	
Batumi	7 (8.2)	35 (41.2)	28 (32.9)	15 (17.6)	
Telavi	2 (2.9)	38 (55.1)	17 (24.6)	12 (17.4)	

Education					.005
	Primary education	1 (8.3)	4 (33.3)	2 (16.7)	5 (41.7)
	Secondary education	7 (4.9)	52 (36.1)	50 (34.7)	35 (24.3)
	Vocational or prof. education	1 (1.9)	19 (35.8)	23 (43.4)	10 (18.9)
	College or university studies	22 (10.5)	101 (48.1)	60 (28.6)	27 (12.9)
Children below 12					.786
	Yes	10 (9.0)	46 (41.4)	33 (29.7)	22 (19.8)
	No	21 (6.8)	130 (42.3)	102 (33.2)	54 (17.6)
Employment					.744
	Student	2 (7.4)	11 (40.7)	11 (40.7)	3 (11.1)
	Employed or self-employed	21 (7.2)	123 (42.3)	92 (31.6)	55 (18.9)
	Unemployed	3 (9.1)	10 (30.3)	10 (30.3)	10 (30.3)
	Retired	4 (9.1)	18 (40.9)	16 (36.4)	6 (13.6)
	Housewife	1 (4.5)	13 (59.1)	6 (27.3)	2 (9.1)
	Other	0 (0.0)	1 (50.0)	0 (0.0)	1 (50.0)
Work mainly outdoors					.011
	Yes	10 (6.8)	49 (33.1)	55 (37.2)	34 (23.0)
	No	11 (7.6)	74 (51.4)	37 (25.7)	22 (15.3)
Work taking care of others					.217
	Yes	1 (3.4)	14 (48.3)	12 (41.4)	2 (6.9)
	No	20 (7.6)	109 (41.4)	80 (30.4)	54 (20.5)
Participated in (religious) fast					.094
	Yes	9 (5.8)	69 (44.8)	56 (36.4)	20 (13.0)
	No	22 (8.3)	107 (40.4)	79 (29.8)	57 (21.5)
Medication for chronic disease					.003
	Yes	10 (5.6)	84 (46.7)	66 (36.7)	20 (11.1)
	No	21 (8.8)	92 (38.5)	69 (28.9)	57 (23.8)

Table 12. Personal characteristics of Georgian respondents associated with considering themselves informed about heatwaves.

3.3. Israel

3.3.1. Setting

Geographic and climate characteristics

Israel is located in the Middle East. It borders Lebanon and Syria to the North, Jordan to the East, Egypt to the South and the Mediterranean Sea to the West. The country encompasses 22.145 sq.km with Jerusalem being the capital and governmental seat (28). Although Jerusalem is Israel's largest city with 815.300 inhabitants, the metropolitan region of Tel Aviv encompasses 1.6 million people and is known as a cultural and business hub (29).

Israel can be divided into four geographical regions: 1) the Mediterranean coastal plain, which runs parallel to the sea and is composed of a sandy shoreline and borders stretches of agricultural land; 2) the Hills, which are composed of several mountain ranges such as the Golan Heights, the hills of Galilee and the hills of Samaria and Judea; 3) the Negev desert, which dominates the southern part of Israel and comprises almost half of the country's land mass (although it is inhabited by only 8% of the population); 4) the Jordan Valley and the Arava, of which the northern parts are fertile while the south is semi-arid (30,31).

Israel's climate ranges between temperate and tropical depending on the geographical location. It is characterized by two distinctive seasons, a rainy winter period lasting from November to May and a dry summer period lasting from June to October. These seasons vary regionally with humid summers and mild winters along the coast, dry summers and moderately cold winters in the hill regions, hot dry summers and mild winters in the Jordan valley and annual semi-desert conditions in the Negev desert. Rainfall is relatively heavy in the northern and central part of the country, with much less rain falling in the northern part of the Negev desert to almost none in the southern parts of the desert (30). Heatwaves are a common phenomenon, with temperatures above 40 °C, and sometimes even reaching almost 50 °C (32).

As for the cities we selected for this study, Tel Aviv and Haifa are located in the Mediterranean coastal plan, while Beer Sheva is located in the Negev desert, with semi-desert climate conditions.

Demographic characteristics

Israel has a diverse ethnic population of 9.1 million residents, with an overall life expectancy of 83 years of age. Of the overall population 26.8% are 14 years old or younger, 61.3% are between the ages of 15 and 64 years and 12.0% are older than 65 years of age (28).

Accounting for 79% of the population, Jews encompass the largest ethnic group. In Israel, the Jewish population is mainly compromised of two groups: Ashkenazi and Sephardi/Mizrahi. Ashkenazim Jews trace their ancestry back to Europe while Sephardic Jews descent from communities in the Middle East and North Africa. Furthermore, there is a small (approximately 125.000 people) Ethiopian Jewish population in Israel (33). Although the majority of Jews practice Judaism, religious observance differs. Nearly all Jews identify with one of four categories: ultra-Orthodox, Orthodox, traditional and secular (34).

Israeli-Arabs make up the second largest ethnic group and account for 21% of the population. Most of the Israeli-Arabs are members of the Sunni denomination and they reside mostly in the northern part of the country. The Arab population also practices other branches of Islam as well as Christianity throughout Israel (35).

Hebrew and Arabic are the official languages of Israel, but English is widely spoken as well. Although the majority of the population is Jewish, only 49% of the entire population considers Hebrew as their first language. 18% of the Israeli population speak Arabic as a first language and 15% Russian. Because of the high migration rate to Israel, 18% of the population speak another language in their homes, such as English, Yiddish or Spanish (33).

Economic indicators

Israel is a member of the Organization for Economic Co-operation and Development (OECD) and consistently registered as one of the strongest preforming countries in the Organization. The Israeli economy has shown expansion for fifteen consecutive years, whereby the GDP growth reached 3.6% in 2018 and the current GDP per capita is $36,400 (28,36). Furthermore, unemployment has declined and the Israeli labor market is close to full employment. However, the Israeli society is marked by a lack of social cohesion and significant disparities between residents. Inequality has declined since 2007 due to higher employment rates among the Arab and ultra-orthodox (Haredim) population. Nevertheless, poverty remains relatively high among these groups, with significantly weaker labor market opportunities available to them (37).

3.3.2. Study population

Table 13 provides a descriptive overview of the study participants (N = 556). The study sample contained somewhat more women than men. The average age was 36.3, with a range of 18-70. Most participants were from Tel Aviv, which is also the largest city in the study, followed by Haifa and Beer Sheva, respectively. The overall majority of people (84%) had lived in their city for more than 5 years. More than half of the study participants completed college or university studies, followed by a group that

completed secondary education (roughly one-third). Around one-third of the study participants had children below the age of 12, and around one-fourth reported that they take care of a dependent relative (e.g. child or parent). The income level varied, although the proportion of participants below average is slightly higher than that above average. More than two-third of the participants worked, although only small proportions work mainly outside or take care of others in their work (19% and 16%, respectively). Around one-fourth participated in a religious fast in 2019, and one-fifth take medication for a chronic disease. More than half of study participants did not consider themselves religious. The proportion of Hebrew and Arabic participants (roughly 80 and 20%, respectively), reflects those of the general population.

Descriptive overview of study participants

	N (%)		N (%)
Gender		Employment	
Male	202 (36.3)	Student	71 (12.8)
Female	353 (63.5)	Employed or self-employed	398 (71.6)
Other	1 (0.2)	Unemployed	25 (4.5)
Average age (sd)	36.3 (13.5)	Retired	23 (4.1)
City		Other	39 (7.0)
Tel Aviv	233 (41.9)	Work mainly outdoors	
Beer Sheva	119 (21.4)	Yes	106 (19.1)
Haifa	204 (36.7)	No	292 (52.5)
Lived for over 5 years		Work taking care of others	
Yes	469 (84.4)	Yes	86 (15.5)
No	87 (15.6)	No	312 (56.1)
Education		Participated in (religious) fast	
None	2 (0.4)	Yes	146 (26.3)
Primary education	3 (0.5)	No	410 (73.7)
Secondary education	174 (31.3)	Medication for chronic disease	
Vocational or prof. education	85 (15.3)	Yes	119 (21.4)
College or university studies	292 (52.5)	No	437 (78.6)
Children below 12		Religious status	
Yes	182 (32.7)	Secular	292 (52.5)
No	374 (67.3)	Traditional	187 (33.6)
Taking care of dependent relative		Religious	63 (11.3)
Yes	143 (25.7)	Ultra orthodox	14 (2.5)
No	413 (74.3)	Ethnic group	
Income level of family		Hebrew	438 (78.8)
Less than average	193 (34.7)	Arabic	118 (21.2)
Average	145 (26.1)		
More than average	157 (28.2)		
Refuse to answer	61 (11.0)		

Table 13. Descriptive overview of participant characteristics in Israel.

3.3.3. Awareness about heatwaves and their health impacts

Table 14 shows participants' awareness about the occurrence of heatwaves, as well as their concerns. Only a small proportion of people knew that the last heatwave took place in the same year as the survey (2019). Almost two-third of participants consider heatwaves to be a problem in their city, and more than 80% believe that heatwaves will occur more frequently in the future. Most people (62%) were somewhat concerned about heatwaves, and only a small group (11%) was not at all concerned.

Awareness on occurrence and concern related to heatwaves	
	N (%)
Knowledge on last heatwave	
Yes (correct)	98 (17.6)
Yes (incorrect)	48 (8.6)
No	410 (73.7)
Consider heatwaves a problem?	
Yes	365 (65.6)
No	125 (22.5)
I do not know	66 (11.9)
Believe that heatwaves will occur more frequently?	
Yes	454 (81.7)
No	32 (5.8)
I do not know	70 (12.6)
Concerned about heatwaves?	
Very concerned	151 (27.2)
Somewhat concerned	345 (62.1)
Not at all concerned	60 (10.8)

Table 14. Awareness and concern related to heatwaves of Israeli study participants.

Fig. 20 presents the nine most commonly reported symptoms by respondents due to heatwaves. The symptom that was by far more often mentioned than any other was dehydration (58% of respondents). This was followed with some distance by headache, exhaustion and fainting, with equal proportions of respondents (around one-fifth). In total, 64 respondents were not able to name any symptom.

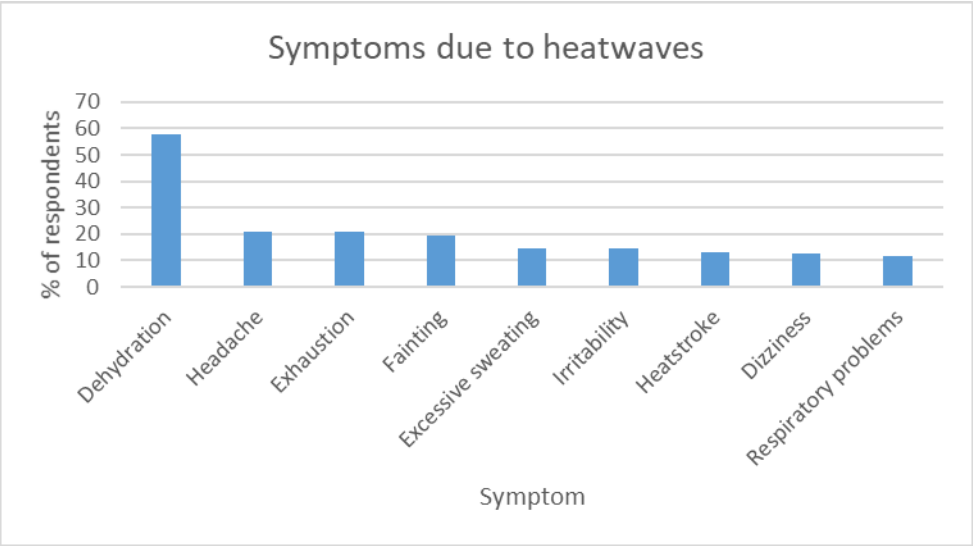

Fig. 20. Most often reported symptoms due to heatwaves by Israeli respondents.

Respondents were asked which groups of people are at a higher risk to suffer from health effects due to heatwaves. The five most commonly reported groups are displayed in Fig. 21. Almost 60% of the respondents listed babies and/or children as a risk group, followed by the elderly and people who are physically ill (both slightly more than half of respondents). Almost one-fifth of the respondents considered everyone to be at risk. All answers not included in the figure were answered by less than 6% of respondents and include obese people, people working outdoors and the handicapped / mobility impaired. In total, 69 respondents did not name any risk group for heatwaves.

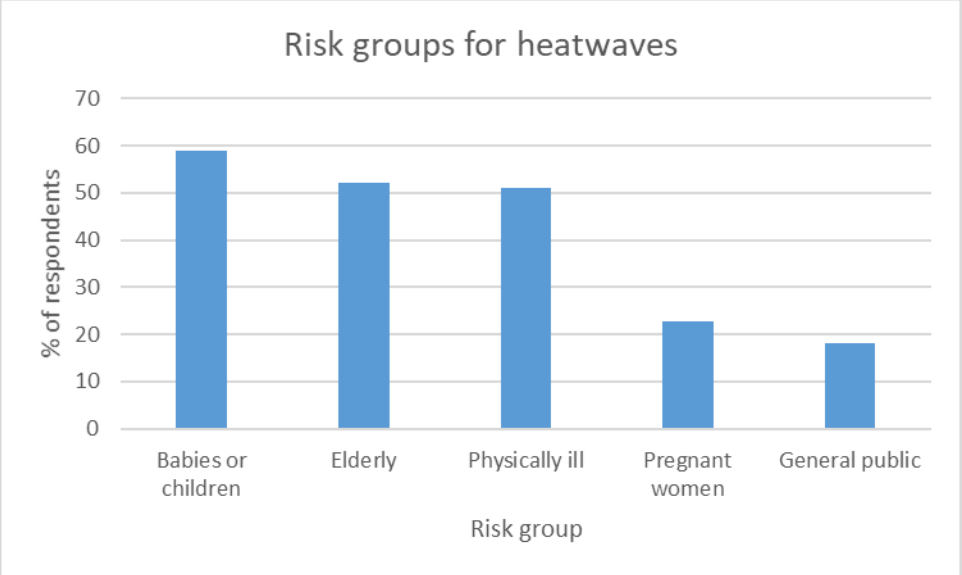

Fig. 21. Most often reported risk groups for heatwaves by Israeli respondents.

For the respondents who reported to be either very or somewhat concerned about the effects of heatwaves (N = 496, 89.2%), we asked them to which extent they were concerned about a predefined list of topics. This was a closed question, with the four answer options ranging from 'very concerned', to 'not at all concerned'. Fig. 22 presents the proportion of respondents who indicated to be 'very concerned' about the topic listed. Almost 60% of respondents were very concerned about elderly relatives, followed by their children (55%) and outdoor activities (41%). Respondents were least concerned about financial aspects (18%).

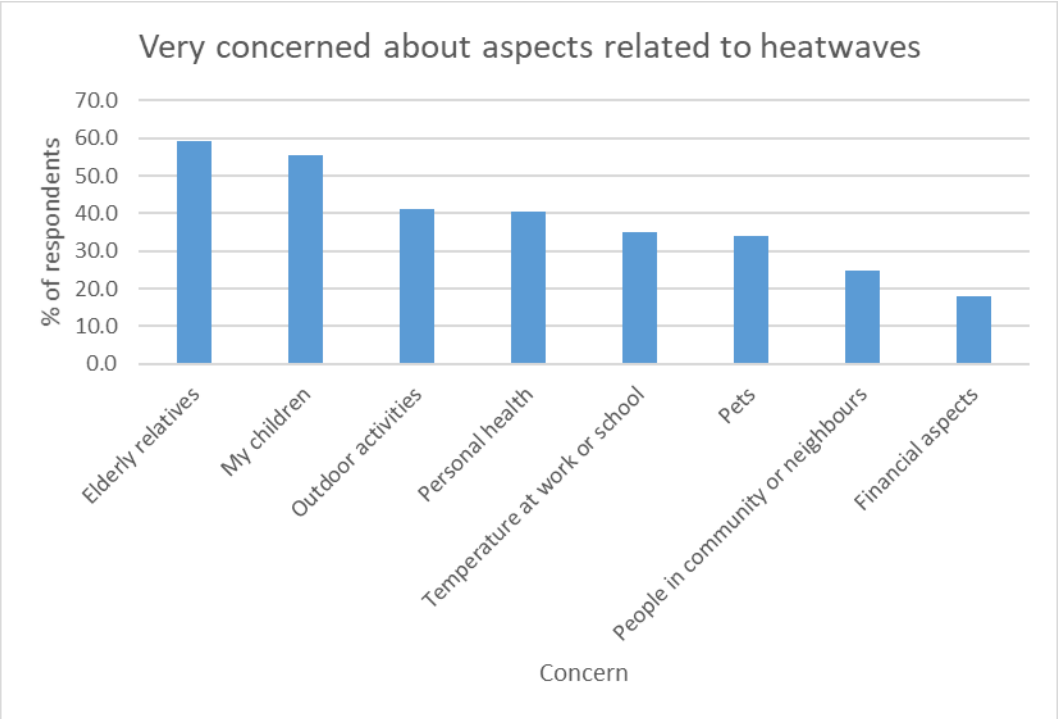

Fig. 22. Proportion of Israeli respondents who indicated to be 'very concerned' about each of the aspects indicated in the figure.

3.3.4. Knowledge about and behaviour for reducing health impacts of heatwaves

We asked respondents whether they considered themselves sensitive to heat. Less than one-third considered themselves to be very sensitive (31.1%), while the majority indicated that they are somewhat sensitive (53.2%). The smallest group consisted of respondents who did not consider themselves sensitive at all (15.6%).

Respondents were asked if they know what to do when someone suffers from a heatstroke or overheating, the results of which are displayed in Fig. 23. More than half the respondents would hydrate the person suffering from overheating, while more than

one-third would cool their body. Other mentions by fewer individuals (and as such not included in the figure) were adjusting clothing, giving food and providing medication, mentioned by less than 4% of respondents.

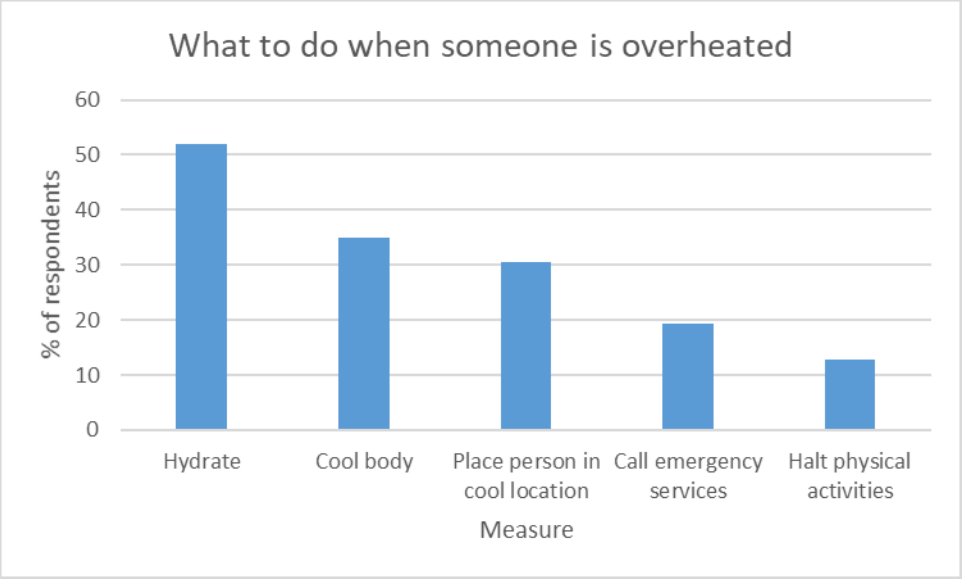

Fig. 23. Most often reported actions when someone is overheated, by Israeli respondents.

In addition, we asked respondents whether they could name measures to protect themselves from heatwaves (Fig. 24). Similarly, the measure most often reported was to increase fluid consumption (60% of respondents). This was followed by staying inside / visiting a cooler area (38%) and adjusting clothing (30%).

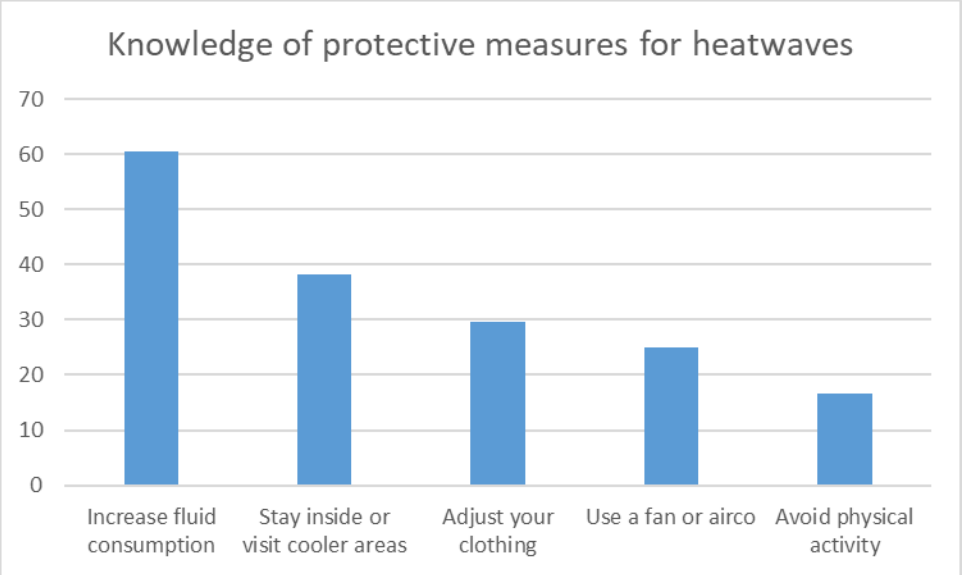

Fig 24. Knowledge of protective measures for heatwaves by Israeli respondents.

The last part related to this section is on which protective measures respondents actually used during the last heatwave. This was a closed question, with the answer options ranging from 'always', to 'usually', 'occasionally', 'never' and 'not relevant'. Fig. 25 presents the proportion of respondents who indicated that they 'always' used the measure in question during the last heatwave. In total, 64.2% of respondents always used a fan or air-conditioner, while 43.5% increased their fluid consumption and 36.5% stayed inside. Measures that were less frequently answered with 'always', and as such are not included in the figure, were eating light meals, staying in a park, adjusting medication and taking medication to lower body temperature.

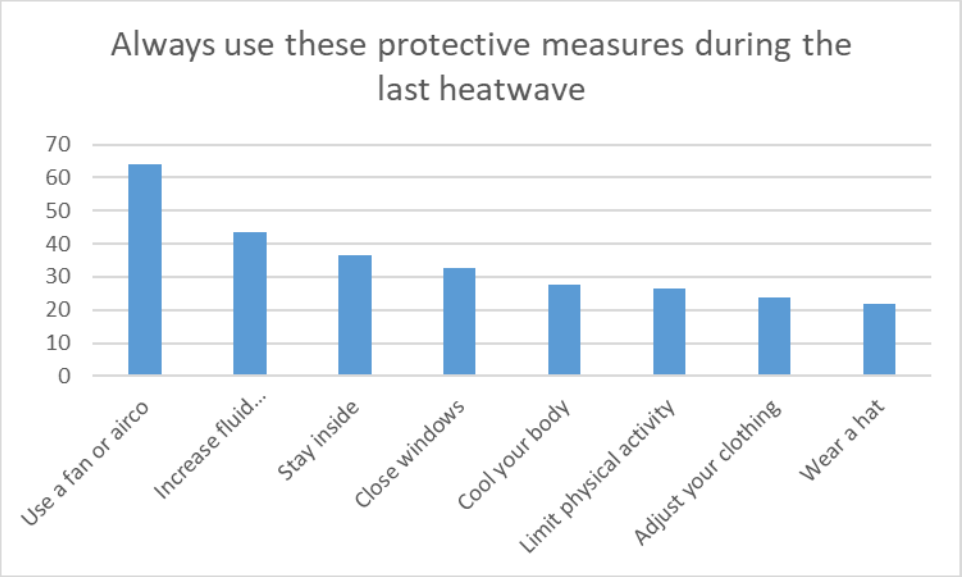

Fig. 25. Proportion of Israeli respondents who indicated to 'always' have used the listed protective measure during the last heatwave.

3.3.5. Sources for information on heatwaves and measures

A large majority (81.3%) considers themselves somewhat informed or not very well informed (Fig. 26). Small groups of similar sizes consider themselves very well informed or not at all informed. When asked which source respondents consulted about heatwaves out of a predefined list, around 38% indicated their television as a source of information about the weather, followed by newspapers / news websites and government social media / websites (33.6% and 29.0% of respondents, respectively) (Fig. 27). Almost one-third of the respondents did not consult any source about the weather.

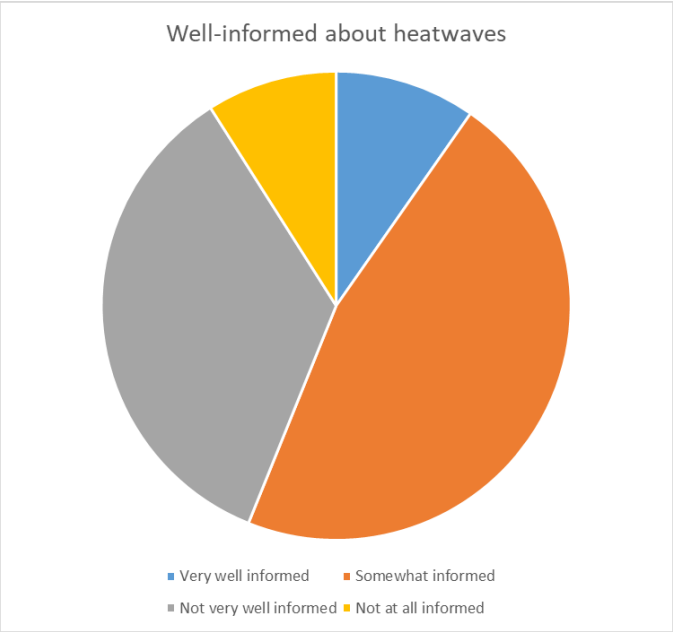

Fig. 26. The extent to which Israeli respondents felt well-informed regarding heatwaves.

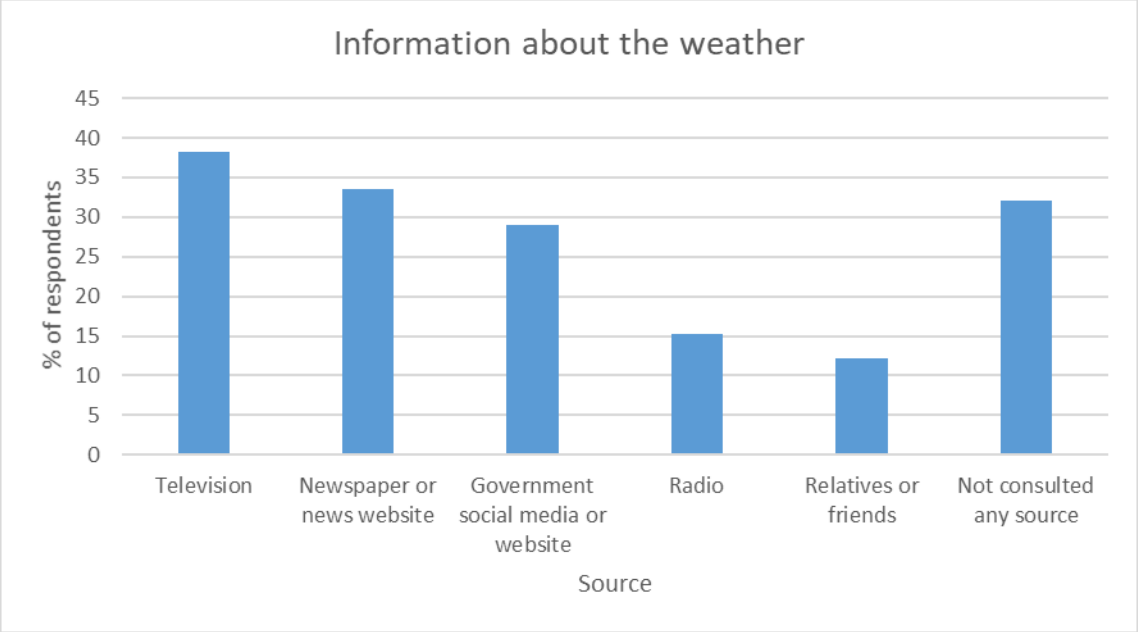

Fig. 27. Sources that Israeli respondents most often consult for information on the weather.

Only 11 respondents indicated that they received a personal notification about the occurrence of a heatwave in the past, mainly by email (N = 5) and phone (N = 3). The overall majority (73.2%) would like to receive a heatwave notification in the future.

We asked respondents which information sources, out of a predefined list, they consulted on protection measures for heatwaves during the past summer (Fig. 28). The sources follow the same order as those that people consulted on heatwaves. The proportion of people that did not consult any source of information is slightly higher, with 37.6%.

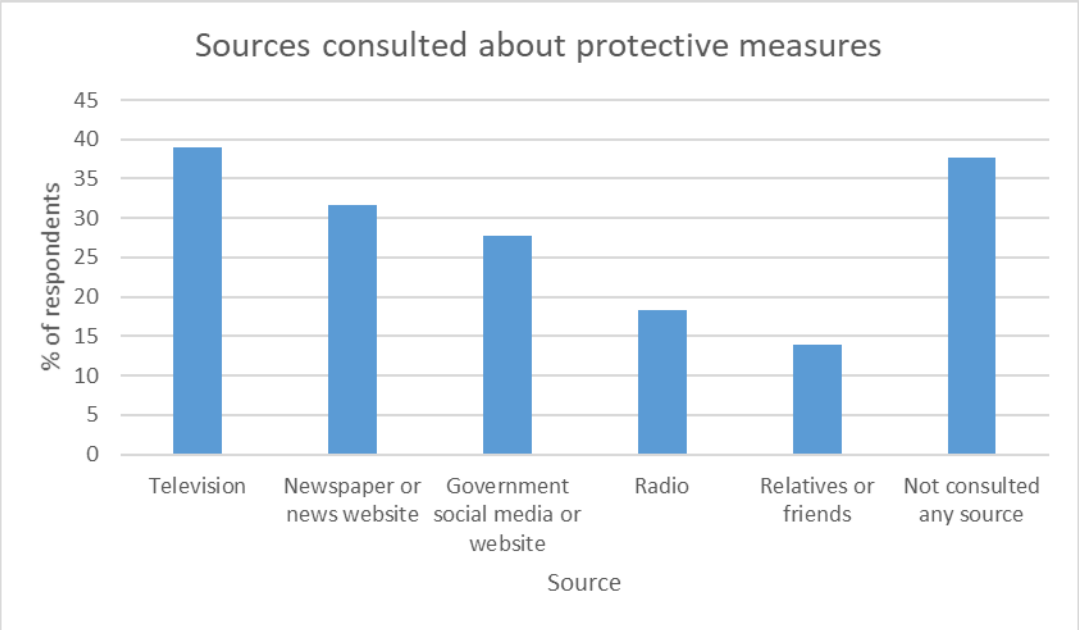

Fig. 28. Sources that Israeli respondents most often consulted for information on protective measures for heatwaves.

Finally, we asked respondents from whom they would expect information on what to do during the next heatwave. For each source from a predefined list, respondents could answer 'yes' or 'no' (Fig. 29). Almost all respondents agreed that the media is a main source of information, in total 91.7%. This was followed by health care professionals (83.5%) and the fire brigade (67.1), although also more than half of respondents indicated relatives and friends as a source of information. This indicates that people see it as a social responsibility of their society.

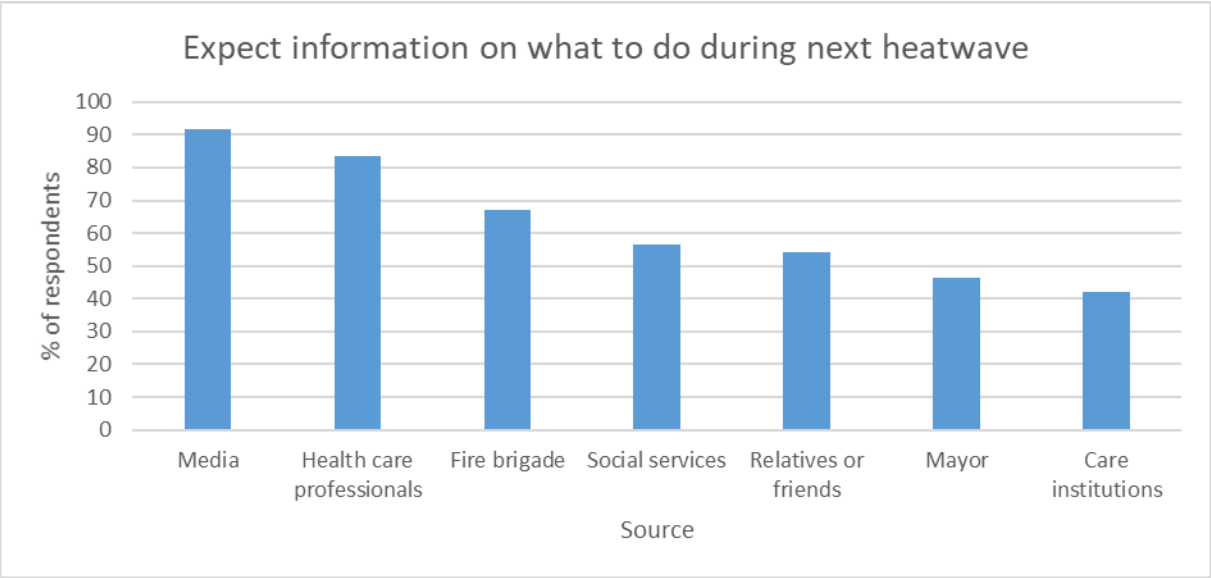

Fig. 29. Sources that Israeli respondents expect to receive information on heatwave protective measures from.

3.3.6. Risk and protective factors for heatwave sensitivity and concern

We assessed which personal characteristics of respondents were associated with their level of concern about the effects of heatwaves / extreme temperatures (Table 15). We found that on average, women are significantly more concerned than men, and that people who work mainly outdoors are more concerned than those who don't. Also, people who take medication for a chronic disease are on average more concerned than those who do not take this. Education also showed statistical significance, although this might be due to the very small numbers of respondents in the groups without education or with only primary education. Other factors were not significantly associated with level of concern of respondents.

		Level of concern			
		Very concerned	**Somewhat concerned**	**Not at all concerned**	**p-value**
Gender					.001
	Male	40 (19.8)	128 (63.4)	34 (16.8)	
	Female	111 (31.4)	216 (61.2)	26 (7.4)	
Age					.090
	18-35 years	78 (24.2)	212 (65.8)	32 (9.9)	
	36-55 years	46 (28.0)	96 (58.5)	22 (13.4)	
	56 years and over	27 (38.6)	37 (52.9)	6 (8.6)	
Population group					.579

	Hebrew	116 (26.5)	272 (62.1)	50 (11.4)	
	Arabic	35 (29.7)	73 (61.9)	10 (8.5)	
City					.717
	Tel Aviv	62 (26.6)	143 (61.4)	28 (12.0)	
	Beer Sheva	31 (26.1)	73 (61.3)	15 (12.6)	
	Haifa	58 (28.4)	129 (63.2)	17 (8.3)	
Education					.006
	None	0 (0.0)	0 (0.0)	2 (100.0)	
	Primary education	0 (0.0)	2 (66.7)	1 (33.3)	
	Secondary education	49 (28.2)	111 (63.8)	14 (8.0)	
	Vocational or prof. education	22 (25.9)	56 (65.9)	7 (8.2)	
	College or university studies	80 (27.4)	176 (60.3)	36 (12.3)	
Children below 12					.079
	Yes	40 (22.0)	117 (64.3)	25 (13.7)	
	No	111 (29.7)	228 (61.0)	35 (9.4)	
Taking care of dependent relative					.314
	Yes	43 (30.1)	89 (62.2)	11 (7.7)	
	No	108 (26.2)	256 (62.0)	49 (11.9)	
Employment					.382
	Student	16 (22.5)	48 (67.6)	7 (9.9)	
	Employed or self-employed	108 (27.1)	243 (61.1)	47 (11.8)	
	Unemployed	8 (32.0)	14 (56.0)	3 (12.0)	
	Retired	10 (43.5)	11 (47.8)	2 (8.7)	
	Other	9 (23.1)	29 (74.4)	1 (2.6)	
Income level of family					.131
	Less than average	62 (32.1)	111 (57.5)	20 (10.4)	
	Average	40 (27.6)	94 (64.8)	11 (7.6)	
	More than average	31 (19.7)	103 (65.6)	23 (14.6)	
	Refuse to answer	18 (29.5)	37 (60.7)	6 (9.8)	
Work mainly outdoors					.048
	Yes	38 (35.8)	59 (55.7)	9 (8.5)	
	No	70 (24.0)	184 (63.0)	38 (13.0)	
Work taking care of others					.104
	Yes	28 (32.6)	53 (61.6)	5 (5.8)	
	No	80 (25.6)	190 (60.9)	42 (13.5)	
Participated in (religious) fast					.304
	Yes	33 (22.6)	98 (67.1)	15 (10.3)	
	No	118 (28.8)	247 (60.2)	45 (11.0)	
Medication for chronic disease					.025
	Yes	44 (37.0)	64 (53.8)	11 (9.2)	
	No	107 (24.5)	281 (64.3)	49 (11.2)	
Religious status					.065

Secular	89 (30.5)	168 (57.5)	35 (12.0)
Traditional	50 (26.7)	123 (65.8)	14 (7.5)
Religious	8 (12.7)	46 (73.0)	9 (14.3)
Ultra orthodox	4 (28.6)	8 (57.1)	2 (14.3)

Table 15. Personal characteristics of Israeli respondents associated with level of concern for heatwaves.

We also assessed whether personal characteristics of respondents are associated with being more sensitive to heat (Table 16). There was a significant association between age and sensitivity, where people above 56 reported more often to be very sensitive to heat, compared to younger people. Respondents with children below the age of 12 reported to be less sensitive to heat than respondents without children in that age group. Also, employment was strongly related to heat sensitivity, where in particular respondents who were unemployed and retired reported to be more sensitive. The latter can again be due to the age of the retirees. Respondents who take care of others reported to be more sensitive to heat than those who don't, and those who use medication for a chronic disease as well. All other characteristics were not significantly associated with heat sensitivity.

		Sensitivity to Heat			
		Very much	**Somewhat**	**Not at all**	**p-value**
		N (%)	**N (%)**	**N (%)**	
Gender					.200
	Male	56 (27.7)	107 (53.0)	39 (19.3)	
	Female	116 (32.9)	189 (53.5)	48 (13.6)	
Age					.045
	18-35 years	97 (30.1)	181 (56.2)	44 (13.7)	
	36-55 years	48 (29.3)	80 (48.8)	36 (22.0)	
	56 years and over	28 (40.0)	35 (50.0)	7 (10.0)	
Population group					.202
	Hebrew	138 (31.5)	226 (51.6)	74 (16.9)	
	Arabic	35 (29.7)	70 (59.3)	13 (11.0)	
City					.831
	Tel Aviv	69 (29.6)	127 (54.5)	37 (15.9)	
	Beer Sheva	35 (29.4)	63 (52.9)	21 (17.6)	
	Haifa	69 (33.8)	106 (52.0)	29 (14.2)	
Education					.277
	None	0 (0.0)	2 (100.0)	0 (0.0)	
	Primary education	1 (33.3)	1 (33.3)	1 (33.3)	
	Secondary education	63 (36.2)	91 (52.3)	20 (11.5)	

Vocational or prof. education	30 (35.3)	43 (50.6)	12 (14.1)	
College or university studies	79 (27.1)	159 (54.5)	54 (18.5)	
Children below 12				.006
Yes	48 (26.4)	93 (51.1)	41 (22.5)	
No	125 (33.4)	203 (54.3)	46 (12.3)	
Taking care of dependent relative				.076
Yes	55 (38.5)	70 (49.0)	18 (12.6)	
No	118 (28.6)	226 (54.7)	69 (16.7)	
Employment				< .001
Student	17 (23.9)	47 (66.2)	7 (9.9)	
Employed or self-employed	114 (28.6)	210 (52.8)	74 (18.6)	
Unemployed	17 (68.0)	8 (32.0)	0 (0.0)	
Retired	12 (52.2)	9 (39.1)	2 (8.7)	
Other	13 (33.3)	22 (56.4)	4 (10.3)	
Income level of family				.106
Less than average	66 (34.2)	106 (54.9)	21 (10.9)	
Average	42 (29.0)	77 (53.1)	26 (17.9)	
More than average	43 (27.4)	80 (51.0)	34 (21.7)	
Refuse to answer	22 (36.1)	33 (54.1)	6 (9.8)	
Work mainly outdoors				.156
Yes	38 (35.8)	51 (48.1)	17 (16.0)	
No	76 (26.0)	159 (54.5)	57 (19.5)	
Work taking care of others				.043
Yes	28 (32.6)	50 (58.1)	8 (9.3)	
No	86 (27.6)	160 (51.3)	66 (21.2)	
Participated in (religious) fast				.963
Yes	45 (30.8)	79 (54.1)	22 (15.1)	
No	128 (31.2)	217 (52.9)	65 (15.9)	
Medication for chronic disease				.002
Yes	53 (44.5)	52 (43.7)	14 (11.8)	
No	120 (27.5)	244 (55.8)	73 (16.7)	
Religious status				.785
Secular	99 (33.9)	149 (51.0)	44 (15.1)	
Traditional	53 (28.3)	105 (56.1)	29 (15.5)	
Religious	18 (28.6)	33 (52.4)	12 (19.0)	
Ultra orthodox	3 (21.4)	9 (64.3)	2 (14.3)	

Table 16. Personal characteristics of Israeli respondents associated with considering themselves sensitive for heatwaves.

Finally, we looked at whether people with certain characteristics considered themselves more or less informed about heatwaves (Table 17). Gender was significantly associated,

with women considering themselves slightly more informed than men. Among the different age groups, those of 56 years and over reported more often that they were very well or somewhat informed compared to the other groups. Respondents with an income level of more than average seemed to report less often that they are very well informed compared to others. The last characteristic that showed significance was education, but as previously mentioned, this could be due to the small numbers of respondents in some of the groups.

		Informed about heatwaves				
		Very well	Somewhat	Not very well	Not at all	p-value
		N (%)	N (%)	N (%)	N (%)	
Gender						.027
	Male	14 (6.9)	105 (52.0)	66 (32.7)	17 (8.4)	
	Female	39 (11.0)	153 (43.3)	128 (36.3)	33 (9.3)	
Age						.007
	18-35 years	29 (9.0)	134 (41.6)	129 (40.1)	30 (9.3)	
	36-55 years	14 (8.5)	83 (50.6)	49 (29.9)	18 (11.0)	
	56 years and over	11 (15.7)	41 (58.6)	16 (22.9)	2 (2.9)	
Population group						.059
	Hebrew	41 (9.4)	213 (48.6)	151 (34.5)	33 (7.5)	
	Arabic	13 (11.0)	45 (38.1)	43 (36.4)	17 (14.4)	
City						.757
	Tel Aviv	18 (7.7)	113 (48.5)	82 (35.2)	20 (8.6)	
	Beer Sheva	13 (10.9)	58 (48.7)	37 (31.1)	11 (9.2)	
	Haifa	23 (11.3)	87 (42.6)	75 (36.8)	19 (9.3)	
Education						.032
	None	0 (0.0)	0 (0.0)	1 (50.0)	1 (50.0)	
	Primary education	1 (33.3)	2 (66.7)	0 (0.0)	0 (0.0)	
	Secondary education	16 (9.2)	76 (43.7)	64 (36.8)	18 (10.3)	
	Vocational or prof. education	15 (17.6)	31 (36.5)	35 (41.2)	4 (4.7)	
	College or university studies	22 (7.5)	149 (51.0)	94 (32.2)	27 (9.2)	
Children below 12						.824
	Yes	15 (8.2)	84 (46.2)	67 (36.8)	16 (8.8)	
	No	39 (10.4)	174 (46.5)	127 (34.0)	34 (9.1)	
Taking care of dependent relative						.308
	Yes	19 (13.3)	68 (47.6)	44 (30.8)	12 (8.4)	
	No	35 (8.5)	190 (46.0)	150 (36.3)	38 (9.2)	
Employment						.263
	Student	9 (12.7)	23 (32.4)	29 (40.8)	10 (14.1)	
	Employed or self-employed	36 (9.0)	190 (47.7)	137 (34.4)	35 (8.8)	
	Unemployed	2 (8.0)	9 (36.0)	12 (48.0)	2 (8.0)	
	Retired	3 (13.0)	15 (65.2)	4 (17.4)	1 (4.3)	

Other	4 (10.3)	21 (53.8)	12 (30.8)	2 (5.1)	
Income level of family					.011
Less than average	22 (11.4)	84 (43.5)	72 (37.3)	15 (7.8)	
Average	23 (15.9)	58 (40.0)	51 (35.2)	13 (9.0)	
More than average	5 (3.2)	89 (56.7)	49 (31.2)	14 (8.9)	
Refuse to answer	4 (6.6)	27 (44.3)	22 (36.1)	8 (13.1)	
Work mainly outdoors					.105
Yes	15 (14.2)	53 (50.0)	30 (28.3)	8 (7.5)	
No	21 (7.2)	137 (46.9)	107 (36.6)	27 (9.2)	
Work taking care of others					.157
Yes	13 (15.1)	40 (46.5)	27 (31.4)	6 (7.0)	
No	23 (7.4)	150 (48.1)	110 (35.3)	29 (9.3)	
Participated in (religious) fast					.231
Yes	18 (12.3)	61 (41.8)	57 (39.0)	10 (6.8)	
No	36 (8.8)	197 (48.0)	137 (33.4)	40 (9.8)	
Medication for chronic disease					.065
Yes	16 (13.4)	63 (52.9)	32 (26.9)	8 (6.7)	
No	38 (8.7)	195 (44.6)	162 (37.1)	42 (9.6)	
Religious status					.279
Secular	28 (9.6)	132 (45.2)	102 (34.9)	30 (10.3)	
Traditional	21 (11.2)	91 (48.7)	63 (33.7)	12 (6.4)	
Religious	5 (7.9)	26 (41.3)	27 (42.9)	5 (7.9)	
Ultra orthodox	0 (0.0)	9 (64.3)	2 (14.3)	3 (21.4)	

Table 17. Personal characteristics of Israeli respondents associated with considering themselves informed about heatwaves.

4. Conclusions

Here we provide a short conclusion, based on the findings for each of the countries. In addition, we also describe a short comparison between the countries.

4.1. Tunisia

The Tunisian respondents had a relatively good knowledge on heatwave occurrence. Nonetheless, the overall majority considers heatwaves a problem, and also believes that heatwaves will occur more frequently in the future. In addition, the majority indicated that they would like to receive heatwave notifications in the future, and they expect this in particular from the meteorological agency. The most important medium to obtain information remains the television. As such, we recommend that the meteorological agency is closely involved in the heatwave plan development, and that television is one of the main sources for broadcasting information.

In terms of knowledge, it appears that the majority of the population can identify the elderly and babies / children as risk group. The other risk groups are much less well-known, and as such need to be further emphasised. In terms of symptoms, each of the symptoms related to heatwaves was reported by less than half of respondents. It is nonetheless important to be able to recognise symptoms, in order to identify people suffering from heat stress, and this should be incorporated in future heat campaigns. Similarly, protective measures such as increasing fluid consumption, cooling the body and visiting cooler areas were reported by less than a third of respondents, which should be increased.

When looking at specific risk characteristics among the respondents, it seems that women are generally more concerned and more sensitive than men. People in Tunis are more concerned than in the other two cities, which could be linked to the finding that they consider themselves better informed. However, average temperatures in Gafsa and Kairouan are higher, and increasing awareness in these cities is therefore of particular importance. Retirees and people who take medication for a chronic disease reported to be particularly sensitive, and this should be pointed out in future heatwave campaigns. Respondents with lower education felt less-informed than people with higher education. Specific strategies should be developed to reach this population, and to translate the information in language understandable to everyone.

4.2. Georgia

In Georgia, respondents had mixed knowledge on heatwave occurrence. Around two-third of respondents consider heatwaves a problem and believe that they will occur

more frequently, and half of respondents is very concerned about heatwaves. Also, more than two-third would like to receive heatwave notifications in the future, and they expect information on what to do during a heatwave in particular from health authorities and health care professionals. The two main media that people use to obtain information about the weather and measures are television and internet (Google). As such, we recommend that information on heatwaves is broadly broadcast through these sources, and that health authorities and professionals are closely involved in these messages.

More than half of the respondents are aware of elderly as a risk group, but other groups are less well known (less than one-third of the population). The diversity of risk groups should as such be included in future heatwave campaigns. Similarly, knowledge on recognising symptoms was relatively low (apart from headache, all less than one-third), and this should be further emphasised as well. Protective measures on which knowledge should be improved are staying inside during warm times, adjusting clothing appropriately, cooling the body and avoiding physical activity.

Among the Georgian respondents, women were more concerned about and more sensitive to heatwaves than men. However, women also reported to be better informed than men. Other groups that consider themselves particularly sensitive to heat were people of 56 years and over, persons who take medication for a chronic disease, and people who participated in a religious fast. They should be included in campaigns as vulnerable groups. The finding that people who work mainly outdoors consider themselves not well-informed is problematic, since they are more exposed to heatwaves, and this group should be urgently addressed in future campaigns.

4.3. Israel

Respondents in Israel had a low level of knowledge on occurrence of the last heatwave. Nonetheless, the majority considers heatwaves a problem and feels that heatwaves will occur more frequently in the future. Only one-fourth of the respondents are very concerned about heatwaves, but despite this, more than 70% indicated that they would like to receive heatwave notifications in the future. They see the media as well as healthcare professionals as the main sources of information about what to do during a heatwave. In terms of the methods used, most people receive information through television and newspapers (either paper or online). As such, we recommend the involvement of healthcare professionals in formulating appropriate heatwave protection measures, which should be distributed broadly through various media channels.

The elderly, babies / children and those who are physically ill are known as risk groups for heatwaves by more than half of respondents. Other groups, such as pregnant women and those who perform physical activity, are less well-known, and knowledge on this should be improved. In terms of symptoms, only dehydration was named by a majority of the respondents, other symptoms that could help in recognising someone suffering from overheating were less well-known. In terms of protective measures, increasing fluid consumption was known by the majority, although less than half of the population actually applies it. The most commonly used protective measure was using a fan or air-conditioner. The use of other measures, such as staying inside, cooling the body and limiting physical activity, should be further encouraged.

In Israel, female respondents were more concerned than men, but they didn't report to have a higher sensitivity. Other concerned groups were people who work mainly outdoors, as they have higher exposure levels, and those who take medication for a chronic disease, which is a well-known vulnerable group. The latter group, as well as people of 56 years and over, also reported to be sensitive for negative effects of heat. Finally, males and those of 56 years and over reported to be less well-informed regarding heatwaves, and should receive specific attention in awareness-raising campaigns.

4.4. Country comparison

When comparing the countries, it seems that respondents in Tunisia generally had more knowledge on heatwave occurrence, and identifying symptoms, risk groups and protective measures than the other two countries. This is particularly reflected by the question on the year of the last heatwave, which was answered correctly by 79% of Tunisian respondents, followed by 48% in Georgia and 18% in Israel. Perhaps linked to this is that the level of concern about heatwaves is lowest in Tunisia, with almost 30% of respondents not concerned at all (versus around 10% in the other two countries).

There were also similarities between the countries. Overall, it seems that women are more concerned about and more sensitive for heatwaves than men. This sensitivity is also generally seen among elderly respondents, retirees, and people who take medication for a chronic disease, which reflects what is known about vulnerable groups for heat in scientific literature.

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Annexes

Annex I – Population Survey Tunisia

INTRODUCTION

Good morning / afternoon.

My name is …… We are currently working on a research project in which we aim to improve health services with respect to heatwaves in Tunisia. A heatwave is a period in which temperatures are extremely warm for multiple consecutive days. For this purpose, we need to better understand the awareness of the public about heat waves and their health impact, which is why we are conducting a survey.
The survey takes about 8 minutes to complete. All your answers are completely anonymous. We will ask you about your knowledge regarding heat waves and their health impact, your sources of information and your behavior during heat waves.

Do you agree to participate in the survey? YES / NO
If yes: Do you have any further questions before we get started?

A. DEMOGRAPHY

1. Do you currently live in CITY?

☐ No → **If no, not eligible for this study!** ☐ Yes

→ **If yes:** Have you lived here for over 5 years?

☐ No ☐ Yes

2. What is your age? ☐ **If under 18 → not eligible for this study**
3. Gender

☐ Male ☐ Female ☐ Other

4. What is your highest diploma?

☐ None
☐ Completed primary education
☐ Completed secondary education
☐ Completed vocational or professional education
☐ Completed college or university studies

5. Do you have children aged 12 years or under?

☐ No ☐ Yes

6. What is your current employment status?

☐ Student
☐ Employed
☐ Business owner
☐ Unemployed
☐ Retired
☐ Housewife
☐ Other ☐

6a. → **If "employed or business owner":** Does your job require you to work mainly outdoors between 10 AM and 3 PM?

☐ No ☐ Yes

6b. → **If "employed or business owner":** Does your job include taking care of other people? (e.g. nursery, school or elderly care centre)

☐ No ☐ Yes

7. Have you participated in a fast that lasted multiple, consecutive days between May and September (e.g. religious fast or diet)?

☐ No ☐ Yes

8. Do you take a medication every day for a chronic disease? (e.g. high blood pressure, diabetes, asthma)

☐ No ☐ Yes

B. AWARENESS ABOUT OCCURRENCE OF HEATWAVES

9. Do you know when the last heatwave took place in your city?

☐ No ☐ Yes, in year: _____

10. Do you consider heatwaves/extreme temperatures a problem in your city?

☐ No ☐ Yes ☐ I do not know

11. Do you believe that heatwaves will occur more frequently in your city in the future?

☐ No ☐ Yes ☐ I do not know

C. AWARENESS ABOUT HEALTH IMPACT OF HEATWAVES

12. Can you name some of the symptoms people may experience due to a heatwave? **(open question and multiple answers possible, do NOT present answers to respondent)**

☐ I don't know
☐ Headache
☐ Dehydration
☐ Sunburn
☐ Exhaustion
☐ Extreme thirst
☐ Excessive sweating
☐ Accelerated pulse
☐ Muscle cramps
☐ Nosebleed
☐ Other: _____

13. Can you name some groups of people who are at a higher risk to suffer from health effects due to a heatwave? **(open question and multiple answers possible, do NOT present answers to respondent)**

☐ I don't know
☐ Elderly
☐ Babies and children under 12
☐ Pregnant women

☐ People who take certain kind of medication
☐ People who are physically ill
☐ People who are mentally ill
☐ Handicapped people or with mobility problems
☐ People who are socially isolated (homeless persons / migrants)
☐ People who perform a lot of physical efforts (sports / construction work)
☐ Other : ☐

14. How concerned do you feel about the effects of heatwaves/extreme temperatures? **(answers can be presented to respondent)**

☐ Not at all concerned → **Go to Q16**
☐ Somewhat concerned
☐ Very concerned

15. If you answered 'somewhat' or 'very concerned', what or who are you concerned about? **(open question and multiple answers possible, do NOT present answers to respondent)**

☐ I don't know
☐ Personal health
☐ My children
☐ Elderly relatives
☐ People in my community or neighbors
☐ Personal comfort
☐ Financial aspects
☐ Temperature at work/school
☐ Pets
☐ Outdoor activities
☐ Agriculture yield
☐ Other : ☐

D. KNOWLEDGE ABOUT AND BEHAVIOUR FOR REDUCING HEALTH IMPACT OF HEATWAVES

16. Do you know what to do when someone suffers from a heat stroke/overheating? **(open question and multiple answers possible, do NOT present answers to respondent)**

☐ I don't know
☐ Halt physical activities
☐ Hydrate
☐ Place in cool location
☐ Call emergency services
☐ Taking a shower / drenches himself in water

☐ Other: ☐

17. Do you consider yourself sensitive to heat? **(answers can be presented to respondent)**

☐ Very much ☐ Somewhat ☐ Not at all

18. Do you adjust your behavior during a heatwave?

☐ Yes ☐ No

19. a) Are you familiar with some measures you can take to protect yourself from a heatwave? **(open question and multiple answers possible, do NOT present answers to respondent)**

b) → **After listing all measures, ask for each of the measures that were given as answers:** did you implement this measure this during the last summer?

☐ I don't know

	Used during last summer?	
☐ Increase consumption of fluids	☐ Yes	☐ No
☐ Stay inside during the warmest times of the day	☐ Yes	☐ No
☐ Keep windows closed	☐ Yes	☐ No
☐ Adjust your clothing	☐ Yes	☐ No
☐ Visit areas where you can be cooler	☐ Yes	☐ No
☐ Cooling your body, e.g. by taking a shower	☐ Yes	☐ No
☐ Adjust your medication	☐ Yes	☐ No
☐ Using a fan or air conditioning at home	☐ Yes	☐ No
☐ Avoid physical activity	☐ Yes	☐ No
☐ Other: 1) 2) 3)	☐ Yes	☐ No
	☐ Yes	☐ No
	☐ Yes	☐ No

E. SOURCES FOR INFORMATION ON HEATWAVES AND MEASURES:

20. Do you consider yourself informed about heatwaves and extreme temperatures? **(answers can be presented to respondent)**

☐ Very well informed
☐ Somewhat informed
☐ Not very well informed
☐ Not at all informed

21. During the last heatwave, where did you look for information about the weather? **(open question and multiple answers possible, do NOT present answers to respondent)**

☐ I don't know
☐ Government social media or website
☐ Government brochure or poster
☐ Television
☐ Social media
☐ Google
☐ Radio
☐ Newspaper or online news website
☐ Doctor or other health professional
☐ Relatives/friends
☐ I did not consult any source for information on protective measures
☐ Other:

22. Did the government or another organization personally notify you about the occurrence of the heatwave?

☐ No ☐ I do not know
☐ Yes, from (organisation):

via (email, phone,…):

23. Would you prefer to get notified about the occurrence of a heatwave in the future?

☐ No ☐ Yes ☐ I do not know

24. Which of the following information sources did you consult during the past summer to look for information on measures to protect yourself from a heatwave? **(open question and multiple answers possible, do NOT present answers to respondent)**

☐ I don't know
☐ Government social media or website
☐ Government brochure or poster
☐ Social media
☐ Google
☐ Television
☐ Radio
☐ Newspaper or online news website
☐ Doctor or other health professional
☐ Relatives/friends
☐ I did not consult any source for information on protective measures
☐ Other:

25. From whom do you expect information about what to do during the next heatwave? **(open question and multiple answers possible, do NOT present answers to respondent)**

☐ I don't know
☐ Police/fire brigade
☐ Health authority
☐ Environmental agency
☐ Meteorological agency
☐ Health care professionals
☐ Care institutions
☐ Other:

Closure

Thank you very much for your participation. If you want to receive a short summary of our results, you can provide us with your email address. This will not be used for any other purpose.

Interviewer comments

Annex II – Population Survey Georgia

SURVEY

INTRODUCTION

Hello, my name is ….. And I represent NCDC. We are currently working on a research project in which we aim to improve health services with respect to heatwaves in Georgia. A heatwave is a period in which temperatures are extremely warm for multiple consecutive days. For this purpose, we need to better understand the awareness of the public about heat waves and their health impact, which is why we are conducting a survey.
The survey takes about 10 minutes to complete. All your answers are completely anonymous. We will ask you questions about your knowledge regarding heat waves and their health impact, your sources of information and your behavior during heat waves.

Do you agree to participate in the survey? YES / NO
If yes: Do you have any further questions before we get started to ask you questions?

F. DEMOGRAPHIC INFORMATION

26. Do you currently live in CITY?

☐ No → **If no, not eligible for this study!** ☐ Yes

→ **If yes:** Have you lived here for over 5 years?

☐ No ☐ Yes

27. What is your age? ☐ **If under 18 → not eligible for this study**

28. Gender

☐ Male ☐ Female ☐ Other

29. What is your educational level?

☐ None
☐ Completed primary/basic education (I – IX grades)
☐ Completed secondary education (I – XII grades)
☐ Completed vocational or professional education
☐ Completed college or university studies

30. Do you have children aged 12 years or under?

☐ No ☐ Yes

31. What is your current employment status?

☐ Student
☐ Employed or self-employed
☐ Unemployed
☐ Retired
☐ Housewife
☐ Other ☐

6a. → **If "employed or self-employed":** Does your job require you to work mainly outdoors in a open space between 10 AM and 3 PM?

☐ No ☐ Yes

6b. → **If "employed or self-employed":** Does your job include taking care of other people? (e.g. nursery, school or elderly care centre)

☐ No ☐ Yes

32. Have you participated in a fast or diet that lasted multiple, consecutive days between May and September?

☐ No ☐ Yes

33. Do you take a medication every day for a chronic disease? (e.g. high blood pressure, diabetes, asthma and etc.)

☐ No ☐ Yes

G. AWARENESS ABOUT OCCURRENCE OF HEATWAVES

34. Do you know when the last heatwave took place in your city?

☐ No ☐ Yes, please indicate the year: ☐

35. Do you consider heatwaves/extreme temperatures as a problem in your city?

☐ No ☐ Yes ☐ I do not know

36. Do you think, that heat waves will occur more frequently in your city in the future?

☐ No ☐ Yes ☐ I do not know

H. AWARENESS ABOUT HEALTH IMPACT OF HEATWAVES

37. Can you name some of the symptoms people may experience due to a heatwave? **(this is an open question and multiple answers are possible, do NOT present answers to respondent)**

☐ I don't know
☐ Headache
☐ Dehydration
☐ Sunburn
☐ Exhaustion
☐ Extreme thirst
☐ Excessive sweating
☐ Accelerated pulse
☐ Muscle cramps
☐ Other: ☐

38. Can you name some groups of people who are at a higher risk to suffer from health effects due to a heatwave? **(this is an open question and multiple answers are possible, do NOT present answers to respondent)**

☐ I don't know
☐ Elderly
☐ Babies and children under 12
☐ Pregnant women
☐ People who take certain kind of medication
☐ People who are physically ill
☐ People who are mentally ill
☐ Handicapped people or with mobility problems
☐ People who are socially isolated (homeless persons / migrants)
☐ People who perform a lot of physical efforts (sports / construction work)
☐ Other: ☐

39. How concerned do you feel about the effects of heatwaves/extreme temperatures? **(answers can be presented to respondent)**

☐ Not at all concerned → **Go to Q16**
☐ Somewhat concerned
☐ Very concerned

40. If you answered 'somewhat' or 'very concerned', what or who are you concerned about? **(thi is an open question and multiple answers are possible, do NOT present answers to respondent)**

☐ I don't know
☐ Personal health
☐ My kid (s)
☐ Elderly relative(s)
☐ People in my community or neighbors
☐ Personal comfort
☐ Financial aspects
☐ Temperature at work/school
☐ Pets
☐ Outdoor activities
☐ Other : ☐

I. KNOWLEDGE ABOUT AND BEHAVIOUR FOR REDUCING HEALTH IMPACT OF HEATWAVES

41. Do you know what to do when someone suffers from a heat stroke/overheating? **(this is an open question and multiple answers are possible, do NOT present answers to respondent)**

☐ I don't know
☐ Halt physical activities
☐ Hydrate (give water)
☐ Place in cool location
☐ Call emergency services
☐ Other: ☐

42. Do you consider yourself sensitive to heat? **(answers can be presented to respondent)**

☐ Very much ☐ Somewhat ☐ Not at all

43. Do you adjust your behavior during a heatwave?

☐ Yes ☐ No

44.

45. a) Are you familiar with some measures you can take to protect yourself from a heatwave? **(this is an open question and multiple answers are possible, do NOT present answers to respondent)**

☐ No ☐ Yes → **If yes:** Can you list the measures?

b) → **After listing all measures, ask for each of the measures that were given as answers:** did you implement this measure this during the last summer?

☐ I don't know

Used during last summer?

☐	Increase consumption of fluids	☐ Yes	☐ No
☐	Stay inside during the hottest times of the day	☐ Yes	☐ No
☐	Keep windows closed	☐ Yes	☐ No
☐	Wear adequate clothing	☐ Yes	☐ No

☐	Choose the areas where you can be cooler	☐ Yes	☐ No
☐	Cooling your body, e.g. by taking a shower	☐ Yes	☐ No
☐	Appropriate treatment	☐ Yes	☐ No
☐	Using a fan or air conditioning at home	☐ Yes	☐ No
☐	Avoid physical activity	☐ Yes	☐ No
☐	Other: 1) 2) 3)	☐ Yes	☐ No
		☐ Yes	☐ No
		☐ Yes	☐ No

J. <u>SOURCES FOR INFORMATION ON HEATWAVES AND MEASURES:</u>

46. Do you consider yourself informed about heatwaves and extreme temperatures? **(answers can be presented to respondent)**

☐ Very well informed
☐ Somewhat informed
☐ Not very well informed
☐ Not at all informed → **Go to Q23**

47. During the last heatwave, where did you look for information about the weather? **(this is an open question and multiple answers are possible, do NOT present answers to respondent)**

☐ I don't know
☐ Government/official body social media or website
☐ Government/official body information materials (e.g. brochure or poster)
☐ Television
☐ Social media
☐ Internet
☐ Radio
☐ Newspaper or online news website
☐ Doctor or other health professional
☐ Relatives/friends
☐ I did not consult any source for information on protective measures
☐ Other:

48. Did you personally notify you about the occurrence of the heatwave by the government or other organization?

☐ No ☐ I do not know
☐ Yes, from:
Via (email, phone…):

49. Would you prefer to get notified about the occurrence of a heatwave in the future?

☐ No ☐ Yes ☐ I do not know

50. Which of the following information sources did you consult during the past summer to look for information on measures to protect yourself from a heatwave? **(this is an open question and multiple answers are possible, do NOT present answers to respondent)**

- ☐ I don't know
- ☐ None
- ☐ Government/official body social media or website
- ☐ Government/official body information materials (e.g. brochure or poster)
- ☐ Social media
- ☐ Internet
- ☐ Television
- ☐ Radio
- ☐ Newspaper or online news website
- ☐ Doctor or other health professional
- ☐ Relatives/friends
- ☐ I did not consult any source for information on protective measures
- ☐ Other:

51. From whom do you expect information about what to do during the next heatwave? **(this is an open question and multiple answers are possible, do NOT present answers to respondent)**

- ☐ I don't know
- ☐ Police/fire brigade
- ☐ Ministry of Health or its structural units
- ☐ Environmental agency
- ☐ Meteorological agency
- ☐ Health care workers (doctors, nurses, public health professionals)
- ☐ Care institutions (e.g. nursery, school or elderly care center)
- ☐ Other:

Closure

Thank you very much for your participation. For more information, please visit our website - www.ncdc.ge or if you want to receive a short summary of our results, you can provide us with your email address. This will not be used for any other purpose.

Interviewer comments

Annex III – Population Survey Israel

ONLINE SURVEY

INTRODUCTION

Introduction and request for consent (see separate file)

☐ Yes ☐ No → **If no, not eligible for this study**

K. INCLUSION CRITERIA

52. Do you currently live in CITY/COUNTRY OF INTEREST?

☐ Yes ☐ No → **If no, not eligible for this study**

→ **If yes:** Have you lived here for over 5 years?

☐ Yes ☐ No

53. What is your age? ☐ **If under 18 → not eligible for this study**

L. AWARENESS ABOUT OCCURRENCE OF HEATWAVES

54. Do you know when the last heatwave took place in your city?

☐ No ☐ Yes, in year: ☐

55. Do you consider heatwaves a problem in your city?

☐ No ☐ Yes ☐ I do not know

56. Do you believe that heatwaves will occur more frequently in your city in the future?

☐ No ☐ Yes ☐ I do not know

M. AWARENESS ABOUT HEALTH IMPACT OF HEATWAVES

57. a) Can you name some of the symptoms people may experience due to heatwaves?

☐ No ☐ Yes: (include button "add answer", so only one answer per box) ☐

b) On a scale from "definitely not" to "definitely", which symptoms do you consider to be related to heatwaves?

	Definitely not	Probably not	Probably	Definitely	I don't know
Headache					
Dehydration					
Exhaustion					
Extreme thirst					
Vomiting / Nausea					
Muscle cramps					
Disorientation					

Fragmented sleep					
Diarrhoea					
Breathing difficulties (e.g. hyperventilation)					

58. a) Can you name some groups of people who are at a higher risk to suffer from health effects due to heatwaves?

☐ I don't know ☐ Yes: (include button "add answer", only 1 answer per box)

b) To what extent do you consider the following groups to be vulnerable to the health effects of heatwaves?

	Not at all vulnerable	Not very vulnerable	Vulnerable	Very vulnerable	I don't know
Elderly					
Babies and children under 12					
Pregnant women					
People who take medication every day					
People who are physically ill					
People who are mentally ill					
Physically handicapped people or people with mobility problems					
People living in cities					
People living in bad housing conditions (e.g. poor isolation)					
People who are socially isolated					
Homeless people					
People who are physically active					
People who are fasting					

59. How concerned do you feel about the effects of heatwaves for yourself or for others?

☐ Not at all concerned → **skip to question 9**
☐ Somewhat concerned
☐ Very concerned

→ **If "somewhat concerned or very concerned":** What or who are you concerned about and to what extent?

	Not at all concerned	Not very concerned	Concerned	Very concerned	I don't know
My personal health					
The health of my child(ren)					
The health of elderly relatives					
The health of my neighbours or people in my community					
Financial aspects					
Temperature at work or school					
The health of my pets					
My participation in outdoor activities					

Other:

N. KNOWLEDGE ABOUT AND BEHAVIOUR FOR REDUCING HEALTH IMPACT OF HEATWAVES

60. Do you know what to do when someone suffers from a heat stroke/overheating (multiple answers possible)?

☐ No ☐ Yes: (include button "add answer", so only one answer per box)

b) Which measures do you consider to be effective **to help someone** who suffers from a heatwave?

	Not at all effective	Not very effective	Effective	Very effective	I don't know
Halt his/her physical activities					
Hydrate					
Place the person in a cool location					
Call emergency services					
Remove warm clothing					

Place the person in a shower or sprinkle with lukewarm water					
Give person medication to lower body temperature					

61. Are you familiar with some measures you can take to protect yourself from a heatwave?

☐ No ☐ Yes: (include button "add answer", so only one answer per box)

b) Which measures do you consider to be effective **to protect yourself or others** from a heatwave:

	Not at all effective	Not very effective	Effective	Very effective	I don't know
Drinking more water					
Staying inside during hottest hours					
Staying in a park or green area					
Wearing clothing with light colours and materials					
Cooling my body by taking a shower					
Going for a swim					
Consult my doctor about my medication					
Using a fan or air conditioning					
Taking medication to lower my body temperature					
Wearing a hat					
Limiting physical activity					

Closing windows and curtains					
Eating light meals					

62. Do you consider yourself sensitive to heat?

☐ Very much ☐ Somewhat ☐ Not at all

63. During the last heatwave, indicate the extent to which you:

	Always	Usually	Occasionally	Never	Not relevant
Drank more water					
Stayed inside during hottest hours					
Stayed in a park or green area					
Wore clothing with light colours and materials					
Cooled your body by taking a shower or go swimming					
Adjusted your medication					
Used a fan or air conditioning					
Took medication to lower your body temperature					
Wore a hat					
Limited physical activity					
Closed windows and curtains					
Ate light meals					

O. SOURCES FOR INFORMATION ON HEATWAVES AND PROTECTION MEASURES:

64. Do you consider yourself informed about heatwaves?

☐ Very well informed
☐ Somewhat informed
☐ Not very well informed

☐ Not at all informed

65. During the last heatwave, where did you look for information about the weather? (multiple answers possible)

☐ Government social media or website
☐ Government brochure or poster
☐ Television
☐ Radio
☐ Newspaper or online news website
☐ Doctor or other health professional
☐ Relatives/friends
☐ I did not consult any source for information on protective measures
☐ Other:

66. Did the government or another organization personally notify you about the occurrence of the heatwave?

☐ No ☐ I do not know
☐ Yes, from:

Via (email, phone, …):

67. Would you prefer to get notified about the occurrence of a heatwave in the future?

☐ No ☐ Yes ☐ I do not know

68. Which of the following information sources did you use during the past summer to look for information on measures to protect yourself from a heatwave? (multiple anwers possible)

☐ Government social media or website
☐ Government brochure or poster
☐ Television
☐ Radio
☐ Newspaper or online news website
☐ Doctor or other health professional
☐ Relatives/friends
☐ I did not consult any source for information on protective measures
☐ Other:

69. From which of the following parties do you expect to receive information about what to do during the next heatwave?

	Yes	No	Not relevant
Police			
Fire brigade			
Mayor			
Media			
Religious leaders			

Health care professionals			
Social services			
Care institutions			
Family and friends			
Community leaders			

Other: ☐

P. DEMOGRAPHY

70. Gender

☐ Male ☐ Female ☐ Other

71. What is your educational level?

☐ None
☐ Completed primary education
☐ Completed secondary education
☐ Completed vocational or professional education
☐ Completed college or university studies

72. Do you have children aged 12 years or under?

☐ No ☐ Yes

73. What is your current employment status:

☐ Student → **skip to 23**
☐ Employed or self-employed
☐ Unemployed → **skip to 23**
☐ Retired → **skip to 23**
☐ Other → **skip to 23**

→ **If "employed or self-employed":** Does your job require you to work mainly outdoors between 10 AM and 3 PM?

☐ No ☐ Yes

→ **If "employed or self-employed":** Does your job include taking care of other people? (e.g. in a nursery, school or elderly care centre)

☐ No ☐ Yes

74. Do you take care of a dependent relative? (e.g. child, disabled relative, elderly relative)

☐ No ☐ Yes

75. Have you participated in a multiple day fast between May and September (e.g. religious fast)?

☐ No ☐ Yes

76. Do you take a medication every day for a chronic disease? (e.g. high blood pressure, diabetes, asthma)

☐ No ☐ Yes

77. To what level do you consider yourself to be religious?
☐ Not religious
☐ Slightly religious
☐ Moderately religious
☐ Very religious
☐ I don't know

78. The current average monthly salary per employee is NIS 10,800. In relation to this, what is the level of income of your family?
☐ Less than average
☐ Average
☐ More than average
☐ Refuse to answer

Closure

Thank you very much for your participation. If you want to receive a short summary of our results, you can provide us with your email address. This will not be used for any other purpose.

Do you have any other feedback for the researchers?