

# COVID-19: Risk perception and Coping strategies. Results from a survey in Germany.

**Lars Gerhold (Freie Universität Berlin)**

Interdisciplinary Security Research Group  
Institute of Computer Science  
Freie Universität Berlin

Correspondence: lars.gerhold@fu-berlin.de

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## *Abstract*

This paper presents preliminary results of a representative survey of the German population focusing on perceptions of risk and ways of coping with COVID-19. Results show that older people estimate the risk of COVID-19 as being less than younger people. Women are more concerned about COVID-19 than men. People especially worry about being infected in places with high public traffic such as public transport and shops or restaurants.

Coping strategies are highly problem-focused and most respondents listen to experts' advice and try to behave calmly and appropriately. People accept that measures to tackle COVID-19 will take time to be effective. Bulk buying and storing of food is mainly justified by a combination of convenience and a perceived need to be prepared for potential quarantine.

## 1. Research question

With regard to the ongoing COVID-19 crisis, this study aims to understand how the German population are perceiving and coping with the situation. The main research questions are:

1. How do people in Germany perceive the risk of being infected by COVID-19 (Coronavirus SARS-CoV-2)?
2. How do people cope with the risk of being infected by COVID-19 (Coronavirus SARS-CoV-2) and the pandemic as such?
3. Are people changing their behavior with regard to the coronavirus disease – for example, are they storing food?

The survey therefore comprises three main sections as well as an investigation of the sociodemographic aspects of people's responses to the crisis:

- a. Risk perception and fear
- b. Coping
- c. Emergency food preparedness

### a) Risk perception

This section addresses two aspects of risk perception. Firstly, participants were asked about their perception of COVID-19 with regard to a cognitive and an affective dimension. While the first aspect asks respondents to give a personal rating of the likelihood of being affected by COVID-19, the second focuses on fear and general concerns. Secondly, based on the psychometric paradigm (Slovic 1987, Slovic, Fischhoff & Lichtenstein 2000) questions were asked that focus on the qualitative dimensions of the perception of COVID-19 such as perceived voluntariness, controllability, severity, and personal impact.

In detail, the questionnaire includes three questions asking respondents to rate the perceived likelihood of becoming infected by COVID-19 in future, seven questions designed to elicit information about their personal feelings of fear and insecurity, and 30 questions addressing several qualitative dimensions that can help to describe COVID-19 from a subjective point of view.

#### b) Coping

This section is theoretically based on the revised, German-language version of the Ways of Coping Scale (Folkman & Lazarus 1988, Ferring & Filipp 1989), drawing attention to the question of how people cope with COVID-19 from a psychological perspective. The German version differs especially in its distinction between problem-focused and emotion-focused coping strategies. In addition, concrete behaviors are part of the survey,<sup>1</sup> with particular focus on tangible instances of behavior like washing and disinfecting hands.

In the questionnaire, 28 questions with regard to problem-focused and emotion-focused strategies for coping with the COVID-19 crisis are included as well as seven items concerning concrete behavior. Additionally four questions are focusing on trust in politics, authorities from the medical field and companies.

#### c) Emergency food preparedness

Several political and administrative strategies for dealing with COVID-19 in Germany focus on asking that people stay at home. As a consequence more and more people in Germany have started to buy greater quantities of certain foodstuffs. Although public authorities have repeatedly stressed that food supply chains are robust, people are continuing to hoard as the situation develops.

In the questionnaire, ten questions ask, for instance, about the number of days for which people have been storing food and their reasons for doing so.

## 2. Method and sample

A quantitative online survey was conducted using an online access panel. The data were collected from the 19th to the 23rd of March 2020<sup>2</sup> with support from an ISO-certified panel provider. The panel provider was responsible for the programming and the recruitment of respondents. All questions were mandatory. The survey was completed by 1300 adults (18 years or older) who, so far as they are aware, are not infected by COVID-19. The results are online-representative regarding gender, age and federal states distribution (see attachment). After data cleansing<sup>3</sup>, 1242 respondents remain in the data set. 49% are female, 51% are male; the age range of the sample is 18 to 74,<sup>4</sup> and the average age is 46 years (SD=15 years). Every federal state ("Bundesland") is represented.<sup>5</sup> 38% of the respondents live in urban areas with more than 100,000 inhabitants, and 20% in rural areas with fewer than 5000 inhabitants. All others live in cities with 5000 to 100,000 people.

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<sup>1</sup> These items come from a survey carried out by the Faculty of Medicine at the Universität Duisburg-Essen (Teufel 2020). We aim at comparing and pooling our data.

<sup>2</sup> Within this timespan, cases of the COVID-19 coronavirus disease have been counted (source: Robert Koch Institute, rki.de) as follows: 20.3.20: 13,957 confirmed cases, 31 deaths; 21.3.20: 16,662 confirmed cases, 47 deaths; 22.3.20: 18,610 confirmed cases, 55 deaths; 23.3.20: 22,672 confirmed cases, 86 deaths.

<sup>3</sup> Deletion of all respondents who took less than seven minutes to complete the questionnaire.

<sup>4</sup> Age range is due to a limitation of the panel provider.

<sup>5</sup> Baden-Württemberg (n=165), Bavaria (198), Berlin (59), Brandenburg (36), Bremen (11), Hamburg (27), Hesse (88), Lower Saxony (117), Mecklenburg Western Pomerania (25), North Rhine-Westphalia (267), Rheinland-Pfalz (61), Saarland (15), Saxony (62), Saxony-Anhalt (34), Schleswig-Holstein (43), and Thuringia (34).

### 3. Results

#### a) Risk perception and fear

##### Risk perception of infection

Table 1: Risk perception of being infected by COVID-19

Risk perception of being infected by COVID-19	M	SD
How likely do you think it is that you might become infected with COVID-19 (Coronavirus SARS-CoV-2) in the near future?	2.87	0.94
How likely do you think it is that people in your family and friends might become infected with COVID-19 (Coronavirus SARS-CoV-2) in the near future?	3.17	0.93
How likely do you think it is to get COVID-19 (Coronavirus SARS-CoV-2) in general?	3.03	0.96

Note: 5-point Likert Scale (1=very unlikely, 5= very likely), N=1242

As can be seen in table 1, adults who have not yet tested positive for COVID-19 perceive a higher risk of infection for members of their family or friends than for themselves. More particularly:

- 22.7% believe it is likely or very likely they will be infected in the near future (women=22.6%; men=22.6%, n.s.),
- 33.7% believe it is likely or very likely members of their family or friends will become infected in the near future (women=33.8%; men=33.5%, n.s.), and
- 29.5% believe it is likely they will be infected at some point in general (women=30.2%; men=28.8%,  $p < .01$ ).

Elderly people significantly think they are less likely to be infected in general or in the near future than do younger people (Figure 1).

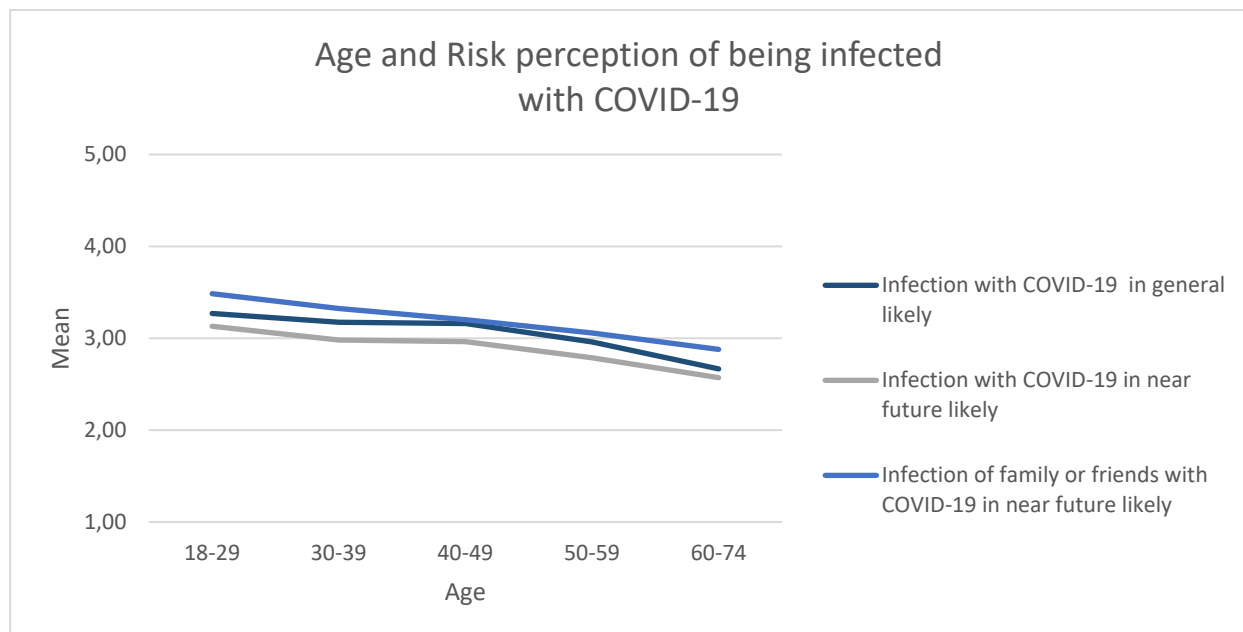


Figure 1: Age and Risk perception of being infected by COVID-19, (N=1242)

## Perceived characteristics of COVID-19

Following Slovic's psychometric paradigm (Slovic 1987; Slovic, Fischhoff & Lichtenstein 2000), the respondents were asked to assess selected characteristics that can be attributed to COVID-19 as a risk. Tables 2 and 3 show selected results divided into the factors dread risk and unknown risk (Slovic, Fischhoff and Lichtenstein 1982).

Table 2: Dread risk

Dread risk		M	SD
Global catastrophe	COVID-19 (Coronavirus SARS-CoV-2) is a global disaster.	4.46	0.88
Catastrophic	COVID-19 (Coronavirus SARS-CoV-2) will cause many deaths at once.	3.84	1.03
Easily reduced	You can easily reduce the dangers of infection.	3.77	0.97
High risk to future generations	COVID-19 (Coronavirus SARS-CoV-2) will still affect future generations.	3.48	2.00
Controllability	It is up to me how serious the consequences of COVID-19 (Coronavirus SARS-CoV-2) will be for me.	3.28	1.17
Consequences fatal	If I become infected with COVID-19 (Coronavirus SARS-CoV-2), I could die.	3.21	1.29
Increasing	COVID-19 (Coronavirus SARS-CoV-2) will become more and more dangerous over time.	3.20	1.12
Affects me	COVID-19 (Coronavirus SARS-CoV-2) affects me personally.	3.18	1.27
Inequitable	The risks posed by COVID-19 (Coronavirus SARS-CoV-2) are not equally distributed across society.	3.17	1.27
Voluntariness	I took the risk of becoming infected with COVID-19 (Coronavirus SARS-CoV-2).	2.20	1.09
Note: 5-point Likert Scale (1=strongly disagree, 5=strongly agree), N=1242			

Table 3: Unknown risk

Unknown risk		M	SD
New risk	COVID-19 (Coronavirus SARS-CoV-2) is something completely new for all of us.	4.26	1.08
Observable	The effects of COVID-19 (Coronavirus SARS-CoV-2) can be observed well.	3.70	1.04
Effect delayed	The consequences of COVID-19 (Coronavirus SARS-CoV-2) are delayed.	3.56	1.03
Risk known to experts	The experts know about COVID-19 (Coronavirus SARS-CoV-2).	3.15	1.01
Known to those exposed	I know that I will not be affected by COVID-19 (Coronavirus SARS-CoV-2).	2.14	1.13
Note: 5-point Likert Scale (1=strongly disagree, 5=strongly agree), N=1242			

Data show that most people in Germany perceive the COVID-19 coronavirus disease as a global disaster that will severely affect many people for a long time. On the other hand, it is perceived as a risk that is controllable and which can easily be reduced. It is indisputable that COVID-19 is perceived as “new” by most Germans.

## Fear

Table 4 shows that people in Germany are highly worried about COVID-19 in general, but less afraid of being infected.

Table 4: Fear of being infected by COVID-19

Fear of being infected by COVID-19	M	SD
The COVID-19 (Coronavirus SARS-CoV-2) worries me.	3.77	1.13
I am afraid of being infected by COVID-19 (Coronavirus SARS-CoV-2).	2.76	1.23

Note: 5-point Likert Scale (1=strongly disagree, 5=strongly agree), N=1242

In detail, 62.1% agree (answering either with “strongly agree” or “agree” on the 5-point Likert Scale) that they are worried about COVID-19 in general (women=68.2%, men=55.7%,  $p < .01$ ), while 28.2% (women=32.2%, men=24%,  $p < .05$ ) are afraid of being infected. Significant differences between women and men are shown in figure 2.

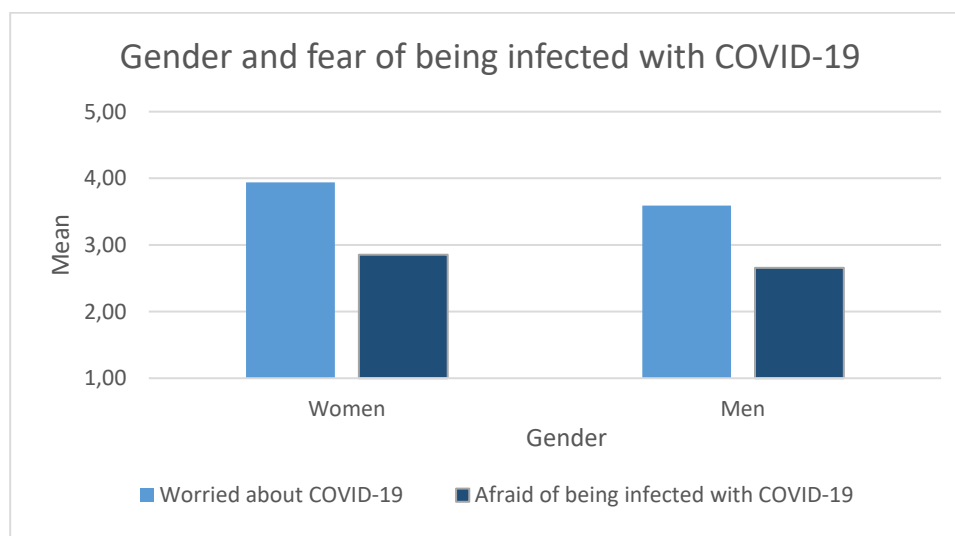


Figure 2: Gender and fear of being infected by COVID-19, 5-point Likert Scale (1=strongly disagree, 5=strongly agree), N=1242

With regard to the age of the respondents, elderly people are significantly more worried than younger people. At the same time there are no significant age differences with respect to fear of being infected. In detail, only 8.5% of the 60 to 74 year old respondents are afraid of being infected by COVID-19 (answering either with “strongly agree” or “agree” on the 5-point Likert Scale), while 67.4% of the same age group are worried about COVID-19 in general. This is surprising because, according to experts in epidemiology, the “probability of serious disease progression increases with increasing age and existing previous illnesses” (RKI 2020).

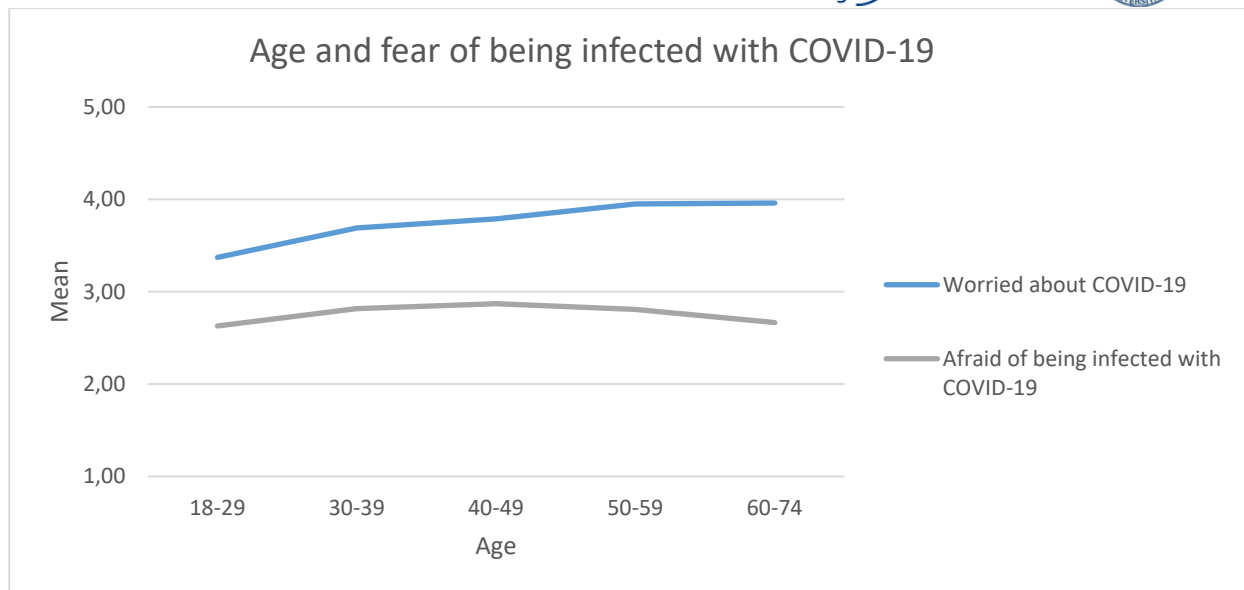


Figure 3: Age and fear of being infected with COVID-19, 5-point Likert Scale (1=strongly disagree, 5=strongly agree), N=1242

As fear often relates to specific places and times, we also asked how safe people feel in different places. Data (from respondents answering either with “strongly agree” or “agree” on the 5-point Likert Scale) show that:

- 94.6% of the respondents feel safe in their own homes,
- 54.3% of the respondents feel safe outside their homes outdoors,
- 38.4% of the respondents feel safe outside their homes in the private homes of others,
- 8.3% of the respondents feel safe outside their homes in shops or restaurants,
- 7.3% of the respondents feel safe outside their homes in public spaces or public transport.

With regard to the federal states of Germany it can be found that people in Mecklenburg Western Pomerania are more worried than those in other states, while people in Bayern, Hamburg, Berlin and Schleswig-Holstein feel less frightened than those in other states. This is a surprising result for the first three, because these have the highest rates of infection per inhabitant across Germany (RKI 2020).

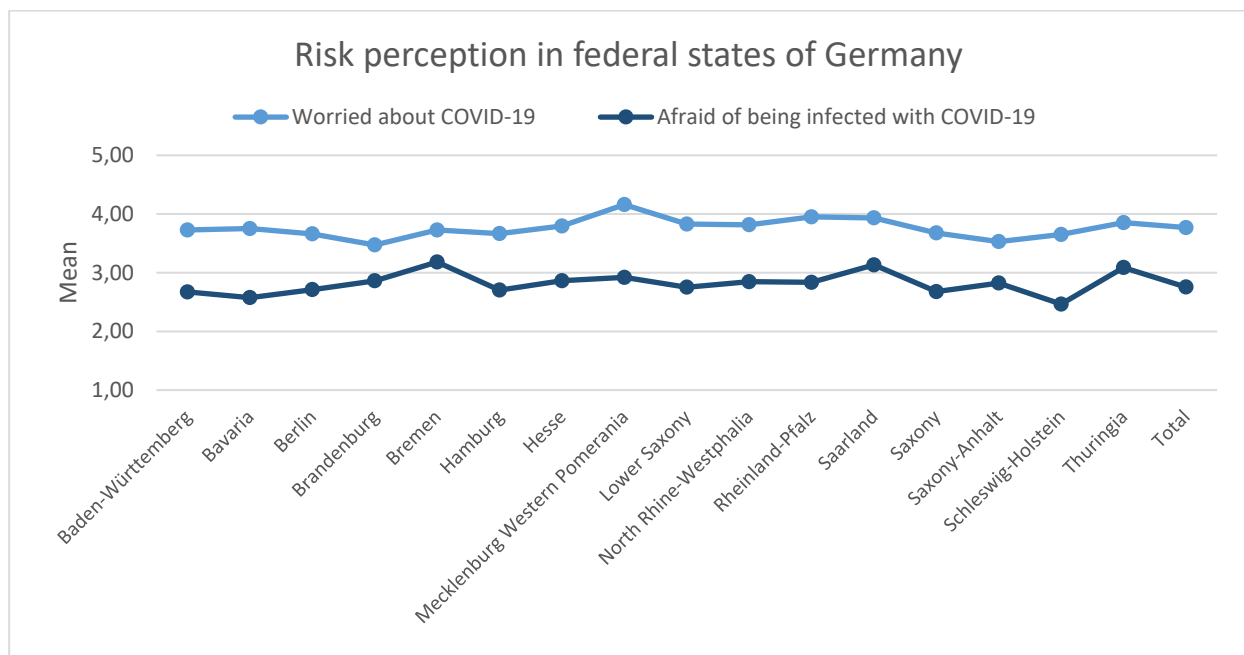


Figure 4: Federal states and their inhabitants' fear of being infected by COVID-19, 5-point Likert Scale (1=strongly disagree, 5=strongly agree), N=1242

## b) Ways of coping

Stress theories that focus on coping with stressful life events have shown that many strategies can essentially be reduced to a problem-focused dimension and an emotion-focused dimension. Results from items of both dimensions are displayed in tables 3 and 4.

Table 5: Problem-focused ways of coping

<b>Problem-focused ways of coping</b>	<b>M</b>	<b>SD</b>
I listen to the experts and follow their advice.	4.14	0.99
I think carefully about what to do and stick to it.	4.05	0.95
I try not to do anything rash.	4.05	1.00
I focus on what to do next.	3.63	1.01
I focus on what I will do next.	3.52	1.02
I talk to others to learn more about the situation.	3.36	1.15
I know what to do and try to do everything with double force.	3.31	1.04
I change things in my life to be able to cope better with it all.	3.08	1.23
I have repeatedly thought about it and try to understand it.	3.02	1.20
I've been thinking about what I usually do with other viral infections.	2.95	1.20
I talk to someone who knows about it.	2.48	1.17
I'm doing something completely new that I would never have done in other circumstances.	2.41	1.17
I ask for advice from highly respected people and adhere to it.	2.19	1.17
I've seen something like this before.	1.40	0.83
Note: 5-point Likert Scale (1=strongly disagree, 5=strongly agree), N=1242, Cronbach's $\alpha$ = .80		

Table 6: Emotion-focused ways of coping

<b>Emotion-focused ways of coping</b>	<b>M</b>	<b>SD</b>
It will emerge over time; there is nothing more to do but wait.	3.71	1.07
I turn to my work or other activities to distract myself.	3.35	1.16
I imagine how the whole thing could end.	3.20	1.21
I imagine things that improve my mood.	2.79	1.21
I submit to my fate; sometimes you're just unlucky.	2.68	1.21
I tell myself things that make it easier for me.	2.63	1.22
I do things that are probably of no use, but I feel like at least I am doing something.	2.57	1.18
I wish I could change my worries and feelings.	2.52	1.22
I hope for a miracle.	2.51	1.45
I try to make myself feel better by eating, drinking, smoking or taking medication.	2.26	1.23
I take refuge in daydreams and imagine times when it was better than today.	2.02	1.18
I try to leave the whole thing behind and want to rest or go on vacation.	1.97	1.11
I refuse to believe what is happening.	1.69	1.00
Note: 5-point Likert Scale (1=strongly disagree, 5=strongly agree), N=1242, Cronbach's $\alpha$ = .79		



In sum, problem-focused strategies in coping with COVID-19 are more widespread in the German population. Germans will follow experts' advice, think carefully about what to do, stick to it and try not do anything rash. The emotion-focused items draw attention to the timespan that is perceived to relate to the corona pandemic. Germans also tend to say that there is nothing to do but wait and will turn to work or other activities to distract themselves.

All 28 items were transferred onto the previously cited problem-focused coping scale (13 items, e.g. "I refuse to believe what is happening", where the internal consistency is good: Cronbach's  $\alpha = .80$ ) and emotion-focused coping scale (14 items, e.g. "I listen to the experts and follow their advice", where the internal consistency is again good: Cronbach's  $\alpha = .79$ ). With regard to these scales, problem-focused coping strategies were rated higher ( $M=3.1$ ,  $SD=.57$ ,  $N=1242$ ) than emotion-focused strategies ( $M=2.6$ ,  $SD=.63$ ,  $N=1242$ ) with regard to their relevance in dealing with the COVID-19 coronavirus disease. For emotion-focused coping a significant difference between women and men can be found ( $p < .001$ ). Women ( $M=2.69$ ,  $SD=.61$ ,  $n=630$ ) agree more often with emotion-focused strategies than men ( $M=2.52$ ,  $SD=.65$ ,  $n=612$ ). The same applies for problem-focused strategies. Women ( $M=3.18$ ,  $SD=.56$ ,  $n=612$ ) agree more often with problem-focused strategies than men ( $M=3.04$ ,  $SD=.58$ ,  $n=612$ ). Regarding the age of respondents it was found that the older the respondents, the less likely are they to use emotion-focused coping strategies ( $r = -.14$ ,  $p < .01$ ). No significant correlations could be found for problem-focused strategies and age.

### **Behavioral dimension of coping**

Alongside the items from the Ways of Coping Scale, questions addressing individual behavior by adults who have not been tested positive for COVID-19 were also included in the survey.<sup>6</sup>

In detail, from all respondents (who answered either with "strongly agree" or "agree" on a 5-point Likert Scale,  $N=1242$ ):

- 87.2% wash or disinfect their hands more often than usual.
- 87.2% avoid public places/events.
- 85.2% are avoiding public transport (subway, tram, bus, train).
- 78.0% avoid contact with risk groups (old people, people with previous illnesses).
- 15.9% have bought larger quantities of hand disinfectant/soap, or intend to buy more in the near future.
- 14.0% have bought larger amounts of staple foods (flour, sugar, pasta, rice, canned food) due to COVID-19 (Coronavirus SARS-CoV-2), or will buy more in the near future.
- 6.8% have bought large quantities of toilet paper and other hygiene items, or will buy more in the near future.

### **Trust in politics, authorities and companies**

Coping with macrosocial stressors often requires trust in politics and those who have to deal with COVID-19 at the forefront. From all respondents who have not been tested positive for COVID-19 respondents (who answered either with "strongly agree" or "agree" on a 5-point Likert Scale,  $N=1242$ ),

- 76.2% trust hospitals, emergency services and other aid organizations to do the right thing to protect them.
- 71.0% trust authorities and medical experts (e.g. Robert Koch Institute) to do the right thing to protect them.
- 64.8% trust companies e.g. in the field of food supply to do the right thing to protect them.
- 54.5% trust politics (federal government, state parliaments) to do the right thing to protect them.

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<sup>6</sup> Note: these were developed in a survey carried out by the Faculty of Medicine at the Universität Duisburg-Essen (Teufel 2020) and will be used for comparison with one another in further data analysis.



With regard to the responses elicited, it could be said that Germans are highly problem-focused in their ways of coping with the COVID-19 coronavirus disease. They are strictly following experts' advice like washing hands and avoiding contact with risk groups, think before they act and try not to behave rashly. Trust is highest in experts from the medical field.

### c) Emergency food preparedness

With regard to their emergency food preparedness, respondents were asked to assess the number of days for which they have been storing food. Figure 5 shows that at least 50% of the German population stored food to last for 10 to 11 days. 10 days is the period recommended by the Federal Office of Civil Protection and Disaster Assistance in Germany (BBK 2018), whereas 88% stored food for 2 to 3 days, which can be viewed as in line with the international standard length of time (Gerhold, Cortez Garcia & Guerrero Lara 2019). Previous studies have suggested that a mere third of the population typically store food for 10 to 11 days (Gerhold, Wahl & Dombrowsky 2019).

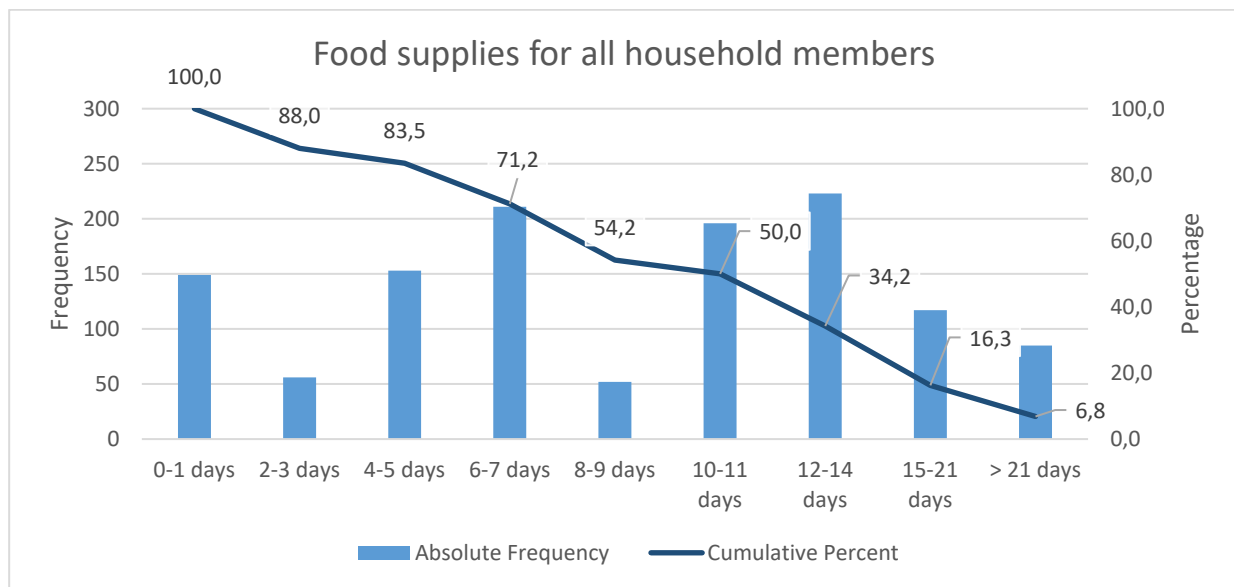


Figure 5: Food supplies for all household members, N=1242

Respondents were also asked whether they were buying more food supplies than usual due to COVID-19, to which 41.9% either partially, rather or strongly agreed.

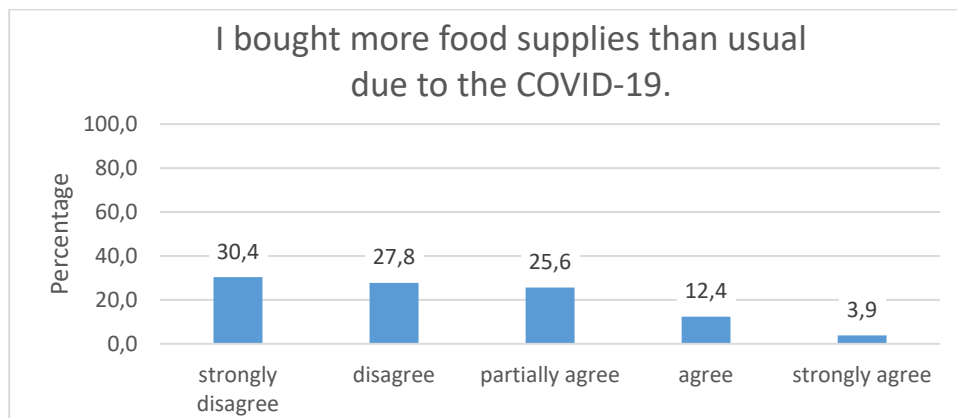


Figure 6: Storing more food supplies than usual due to COVID-19, 5-point Likert Scale (1=strongly disagree, 5=strongly agree), N=1242

These 41.9% of respondents (N=520) were asked to explain why they had bought more food supplies than usual (table 6). In detail, from all respondents who replied either with “strongly agree” or “agree” on a 5-point Likert Scale:

- 83.6% don't want to go shopping every day.
- 63.1% would like to be taken care of if I have to be quarantined.
- 48.5% always want to have a certain selection available.
- 33.5% buy large quantities of special offers.
- 24.5% deliberately stockpile in order to be prepared for this and other crises.
- 19.8% are worried that soon nothing will be available.
- 14.6% want to be flexible when they have visitors.

In sum, the results show that respondents' concerns about being in quarantine are a major justification for storing food. And the fact that more than 80% answered that they do not want to go shopping for food every day can also be interpreted in the light of the current crisis.

### 3. Summary

Older people estimate the risk of COVID-19 as being less than younger people. This can lead to political countermeasures such as social distancing being met with little acceptance and thus being less likely to be followed. Women are more concerned about COVID-19 than men. People especially worry about being infected in places with high public traffic such as public transport and shops or restaurants.

Coping strategies are highly problem-focused and most of the respondents listen to experts' advice and try to behave calmly and appropriately. People accept that COVID-19 will take time to tackle. Storing food is mainly justified by recourse to a combination of convenience and a perception of the need to be prepared for possible quarantine.

### Literature

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## Attachment

Table 7: Representative sample in comparison with official statistics

		Survey (in %)	Federal Statistical Office (Destatis) (in %)
gender	W	49.3	49.3
	M	50.7	50.7
age	18-29	19.1	19.2
	30-39	17.1	17.8
	40-49	18.0	17.4
	50-59	23.8	22.5
	60-74	22.0	23.2
federal states	Bremen	0.9	1.1
	Baden-Württemberg	13.3	12.8
	Bavaria	15.9	15.3
	Berlin	4.8	4.3
	Brandenburg	2.9	3.1
	Hamburg	2.2	1.8
	Hesse	7.1	7.5
	Lower Saxony	9.4	9.5
	Mecklenburg Western Pomerania	2.0	2.2
	North Rhine-Westphalia	21.5	21.6
	Rhineland-Palatinate & Saarland <sup>7</sup>	6.1	5.8
	Saxony	5.0	5.5
	Saxony-Anhalt	2.7	3.0
	Schleswig-Holstein	3.5	3.6
	Thuringia	2.7	2.8

<sup>7</sup> Rhineland-Palatinate & Saarland are listed together at Destatis