

# How COVID-19 illness perceptions and individual shocks are associated with trust during the COVID-19 pandemic in Australia, France, Germany, and South Africa

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# How COVID-19 illness perceptions and individual shocks are associated with trust during the COVID-19 pandemic in Australia, France, Germany, and South Africa

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## ABSTRACT

The COVID-19 pandemic jeopardized individuals' health and economic stability, and the associated shocks might have decreased individuals' trust. In this paper, we study the relationship between subjective perceptions of the pandemic and individuals' institutional and interpersonal trust (e.g., trust towards the government or health representatives), while considering objective health and economic shocks due to the pandemic as drivers. We collected data across Australia, France, Germany, and South Africa during a later stage of the COVID-19 pandemic (i.e., from mid-April to early-June 2021) when individuals had time to personally experience the pandemic and its effects. COVID-19 illness perception was associated with lower institutional and interpersonal trust. The health shock of having experienced COVID-19 was associated with higher interpersonal trust, while economic shocks were associated with lower institutional trust when they were due to the pandemic. The results suggest that public policy interventions in a later stage of a pandemic should consider objective economic and health outcomes as well as subjective ones, such as individual's perceptions. Authorities should communicate in a way that helps concerned people understand that they can take control of their health and the possibility of infection, and reassure them that health measures such as vaccination can help prevent the spread of the virus.

## 1. Introduction

Trust is an enabler of well-being [43]. There are two types of trust: interpersonal and institutional. Interpersonal trust refers to connections among individuals and is often defined as social capital [59]. In contrast, institutional trust relates to trust in governments, political authorities, and other institutions, indicating individuals' perceived quality of these institutions [32]. Social capital theory predicts that trust among individuals and of these individuals toward authorities can promote desirable social and economic outcomes, but is prone to be affected by external shocks [50]. The outbreak of the COVID-19 pandemic created an unprecedented number of health, economic, and social shocks [57] and affected people's sense of trust (in 15 European countries [12]; in Sweden [21]; in Austria [28]; in The Netherlands [29]; in New Zealand

[58]; in South Korea [37]). In such conditions, a lack of social capital and trust in authorities might impair an effective response to the pandemic [20], as well as individual well-being and the social fabric of society [70].

The concept of trust is critical to explain social interactions and human behavior [8] and is related to the wider concept of social capital [51,67]. It has been argued that “[t]he entire fabric of our day-to-day living, of our social world, rests on trust [...] almost all our decisions involve trusting someone else” ([54], p. 443). Yet, despite its essential role in social theory, scholars still do not agree on its definition or adequate measurement model [7,31,56,63]. Most often, trust is understood and measured as an individual judgment about the trustworthiness of a trustee or trustees [7]. Generalized or social trust relates to a generalized situation-independent expectation (i.e., all other people)

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[31]. Yet, trust can also refer to a particularized or context- and situation-specific expectation of behavior from a certain trustee (e.g., personal doctor) at a certain moment in time (e.g., during the pandemic) to perform certain actions (e.g., inform on vaccines, prescribe drugs) [8]. Trust is a risk that individuals take in situations of vulnerability to receive support from other people or entities [22]. Most research on trust agrees that trust is relevant in a context of choice and is most important in situations of risk or vulnerability when one has to rely on other people [32] (e.g., during a pandemic). The main difference between interpersonal (social) and institutional (structural or political) trust lies in the specification of the trustee and the expected behavior, however, the two types of trust converge on their basic principles [8]. Interpersonal trust is formed based on experiences one has with other individuals, distinguishing between people who are known to you personally (e.g., personal doctor) and strangers (e.g., emergency doctors) [51,63]. In contrast, organizational or institutional trust is formed based on an issue-oriented perspective, where trust toward government and institutions depends on whether citizens are satisfied with current policies [11].

In the context of COVID-19, trust toward healthcare systems and authorities (i.e., institutional trust) and practitioners (i.e., interpersonal trust) is particularly relevant [71]. Studies indicate that interpersonal trust increased compliance with prevention norms and reduced the impact of the pandemic, including fewer deaths [6,71]. Trust in medical practitioners is associated with better health behaviors, including patients' adherence to treatment and continuity of care [66], better perception of one's health state and quality of life, and a higher intention to recommend one's medical practitioner to others [10,53]. Similarly, prior work found a positive relationship between public trust in the government and medical authorities and the likelihood of respondents taking personal protective measures [55]. Correspondingly, it was found that a more trustworthy healthcare system increases the probability of treatment-seeking behavior upon the manifestation of COVID-19 symptoms [3].

Despite the importance of trust during health crises, previous research leaves knowledge gaps. First, given the global variations in development, implemented policies, culture, and citizens' perceptions of COVID-19 [62], perceptions of trust during the COVID-19 pandemic should be examined beyond the limitations of a single country [29,41]. Second, as the different dimensions of trust are interconnected, it is essential to consider multiple dimensions, specifically institutional and interpersonal trust, and diverse trustees in order to gain a more comprehensive understanding [71]. It is important to take into account trust in physicians [41] vs. trust in health authorities. Third, while the COVID-19 pandemic was essentially a health-related crisis, its effects stretched far beyond the health domain, and, therefore, it is important to consider non-health factors as well, such as labor market participation [40]. Fourth, to fully understand trust during the pandemic, it is vital to actually use data on trust collected during the pandemic period [71].

The present research aims to address these knowledge gaps on the relationships between health and economic shocks and trust during crises. The main research question that we address is the role of one subjective shock, that is, the illness perception of COVID-19. Individuals' illness perception of COVID-19 relates to the various dimensions of illness judgements, beliefs, and emotional responses. As a pandemic affects all individuals, not just those infected by the virus, a comprehensive understanding of such perceptions is crucial for improving public policy interventions [9]. Furthermore, we extend prior studies beyond Europe [17] by examining the effects of objective and subjective shocks on trust in four different countries, including a less developed country and countries with different cultures (Australia, France, Germany, and South Africa). Finally, to capture several factors illuminating trust, we account for individual differences, such as age, education, ethnicity, residence area, income and wealth, and overall sanitary situation [38] and combine this with analyzing nationally representative data [29]. Next, we discuss this paper's theoretical

background and expected results.

### COVID-19 perception and trust

Illness perception relates to an individual's assessment of the negative impact of one's illness on one's quality of life and expectations on the long-term condition and consequences of one's state [13]. Existing studies focused on separate perceptions of COVID-19, such as fear, risk perception, or pandemic-related worry, but did not employ a comprehensive measurement of illness perception such as the IPQ-R [44] or brief illness perception questionnaire. Furthermore, during a pandemic, all individuals are affected by the virus and exhibit concerns relating to the impact, duration, and possibility of catching it. Therefore, it is necessary to extend the understanding of illness perception to all individuals and not only to those infected.

Both theoretical reasoning and empirical studies showed a relationship between social trust and subjective perceptions of one's self-rated health [33,60]. Furthermore, feelings of fear and suspicion contrast with the perception of trust within the healthcare system [46]. Indeed, pandemic-related worry and a perceived health threat were associated with a decrease in institutional trust [61]. Risk perception of COVID-19 was negatively associated with trust in government [19]. Similarly, individuals' subjective perception of the pandemic's risk was able to explain their behavior during a pandemic through interpersonal trust [71]. *In sum, we expect individuals' COVID-19 perception to be associated both with lower institutional and interpersonal trust.*

#### 1.1. Objective shocks and trust

Individuals are exposed to different types of shocks during health crises, including health- and economy-related shocks [18]. A health shock can be defined as a sudden deterioration of health, largely unexpected major illness, new severe health event, illness or health event that changes the ability to perform activities of daily living to an uncertain extent, or an unscheduled hospitalization ([36], p. 2093). Deteriorating health only constitutes a health shock if the deterioration is sufficiently severe and impacts living standards [16,25]. Since a COVID-19 infection ticks multiple parameters of a substantial health shock and can have a different extent of gravity and long-term impact on health, we conceptualize a health shock as being personally infected or as a member of one's household being infected. The interrelation of health and employment shocks is well-established [36,48]. Economic shocks are traditionally measured as job loss and income loss due to unemployment [24,39].

A health shock during COVID-19 pandemic was associated with lower trust in information from authorities [49] and lower social trust [61]. An employment shock was associated with lower interpersonal and institutional trust during the acute phase of the pandemic [14]. However, these authors made no distinction between a job loss due to COVID-19 or one that was unrelated to the pandemic. Therefore, to better account for economic shocks, we differentiate loss of employment (1) due to COVID-19 and (2) not due to COVID-19. *We expect that economic shocks will be associated with lower institutional trust, while health shocks will be associated with both lower institutional and interpersonal trust.* Furthermore, we expect that shocks due to COVID-19 are more strongly related to trust levels during the pandemic than shocks not due to COVID-19. Finally, people who were affected by objective shocks (i.e., infection or reduced employment) may have a stronger response towards COVID-19. *Therefore, we expect an interaction effect between objective shocks and COVID-19 perception.*

## 2. Method

### 2.1. Procedure

Our data is from a cross-sectional survey carried out simultaneously

from April 18 to June 5, 2021 in Australia, France, Germany, and South Africa.<sup>1</sup> To ensure comparable data collection procedures, all respondents were recruited via a Qualtrics online panel. The questionnaire was available to all the participants of the Qualtrics panel to allow non-probability voluntary sampling. The respondents completed a questionnaire that included measures of institutional and interpersonal trust, their experiences during and perceptions of the COVID-19 pandemic, changes in their employment situation, and a range of socio-demographics. The respondents gave their informed consent when starting to answer the questionnaire and were paid according to standard Qualtrics conditions.

## 2.2. Participants

Participants were 494 respondents from Australia, 549 from France, 510 from Germany, and 547 from South Africa, for a total of 2100 respondents. The sample is described in Table 1. To minimize coverage bias and improve representativeness of our data, we have integrated quotas related to socio-demographics so that the country samples were close to the national average in terms of gender, age, income, and ethnicity. Furthermore, among the respondents, 28% experienced COVID-19 in their household (i.e., the respondent or a household member was diagnosed with the virus, had symptoms, or suspected having contracted it). Within the sample, 12% of respondents suffered reduced or lost employment due to COVID-19, whereas 9% experienced reduced or lost employment, but not due to the COVID-19 pandemic.

## 2.3. Measures

**Trust.** Trust was measured with four items, each on a 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). The institutional trust dimension was calculated as the average of the trust in government and trust in health authorities items. The interpersonal trust dimension was calculated as the average of the trust in hospital and emergency doctors and trust in one's medical practitioner items. The distribution of trust dimensions among the countries is in Appendix A. As trust levels are different in the four countries, we applied standardization by country.

While there is an ongoing debate of what trust is and how to measure it [8], single-item measures are widely used to measure interpersonal and institutional trust and are judged appropriate by extant literature [30,68,71]. The longer scales do not seem to sufficiently outperform the single-item question from the World Values Survey, which also allows inter-country and longitudinal comparison [64]. Importantly, however, trust measurement depends on its theorization [69]: while generalized trust is a trait and a psychological predisposition to trust other people, which could or should be assessed with more elaborate psychological measurements, particularized trust is a state of an outcome of a certain relationship or experience [42] and should be adapted to the particular trustees and studied situations [8].

**COVID-19 perception.** We relied on seven dimensions of the Brief Illness Perception Questionnaire to assess individuals' attitude towards the virus and pandemic (IPQ-R [44]) validated in different illness settings (e.g., [45]). The illness perception was assessed with a 7-point Likert scale, where higher values indicate a more negative perception of COVID-19 (cf. Table 1). The questionnaire included three dimensions with cognitive representation of illness (i.e., *Consequences*, *Duration*, and *Control*); two dimensions with negative emotional representation of illness (i.e., *Concern* and *Emotions*); and additional items for treatment

<sup>1</sup> The choice of countries was the result of a grant-funded international collaboration and thus constitutes a convenience sample. However, the choice of countries does allow us to obtain insights about four completely different ways of dealing with COVID-19 and adopted policies in terms of the diversity between the four countries (<https://ourworldindata.org/>).

**Table 1**  
Descriptive statistics of independent variables.

Variable	Mean	SD	Distribution		
			Min	Median	Max
<i>Socio-demographics</i>					
Gender (Female)	0.50	0.50	0	0.50	1
Age	45.91	17.24	18.00	45.00	90.00
Marital status (Married)	0.58	0.49	0	1	1
Dependents	1.05	1.41	0.00	0.00	11.00
Residence area (Rural)	0.21	0.41	0	0	1
Ethnicity (Minority)	0.13	0.33	0	0	1
Education (Highly educated)	0.55	0.50	0	1	1
Income	2.08	2.38	0.00	1.29	13.69
<i>Personal experiences during the pandemic</i>					
COVID-19 infection	0.28	0.45	0	0	1
Reduced or lost employment due to COVID-19	0.12	0.33	0	0	1
Reduced or lost employment not due to COVID-19	0.09	0.28	0	0	1
<i>COVID-19 perception</i>					
Concern: "How concerned are you about COVID-19?"	4.20	1.97	1.00	4.00	7.00
Consequences: "How much does COVID-19 affect your life?"	4.23	1.80	1.00	4.00	7.00
Duration: "How long do you think the pandemic will continue?"	5.32	1.45	1.00	5.00	7.00
Control*: "How much control do you feel you have over COVID-19?"	3.09	1.54	1.00	3.00	7.00
Emotions: "How much does the COVID-19 pandemic affect you emotionally? (e.g., does it make you angry, scared, upset or depressed?)"	3.88	1.86	1.00	4.00	7.00
Treatment*: "How much do you think treatment can help COVID-19?"	2.98	1.58	1.00	3.00	7.00
Vaccination*: "How much do you think vaccination can help COVID-19?"	2.72	1.80	1.00	2.00	7.00
Understanding*: "How well do you feel you understand COVID-19?"	2.47	1.37	1.00	2.00	7.00

This table shows descriptive statistics for the sample of 2100 respondents. Continuous variables are shown in their original scales and are not standardized.

\* This dimension has been inverted when included in our COVID-19\_IPQ index.

control with two items (i.e., *Treatment* and *Vaccination*), as well as overall *Understanding*.

**Objective shocks.** To account for individual shocks during the COVID-19 pandemic, we coded health shock as 1 if the respondent or a household member had a confirmed or suspected COVID-19 infection or COVID-19 symptom and 0 if not. Economic shocks are differentiated between job loss or reduction, whether voluntary or involuntary: (1) due to COVID-19 and (2) not due to COVID-19. The variables are coded as 1 if one lost a job or resigned or reduced salary/working hours and 0 if not.

**Socio-demographics.** We controlled for socio-demographics known to be related to interpersonal and institutional trust, such as age, gender, education, income, marital status, and area of residence (i.e., urban vs. rural) [27,61]. We also considered the number of dependents and whether the respondents are part of the country's ethnic minority or majority [2]. We took the natural log of continuous variables such as age in years and number of dependents, while income was taken as a continuous variable, winsorized at the 1% level relative to the country average. All continuous variables were standardized by country to have a mean of 0 and standard deviation of 1.

## 2.4. Statistical procedure

We excluded 89 incomplete or implausible responses (e.g., straight-

lining or implausible answers to socio-demographics, such as having a €6 monthly income or 30 dependents). A linear regression analysis with robust standard errors was carried out. By standardizing the continuous independent variables by country, we have comparable effects, so we are able to aggregate the data from the four countries. Descriptive statistics of non-standardized variables are in Tables 1 and 2, and a correlation table including all standardized variables is in Appendix B.

### 3. Results

In regression analyses, we first tested the association between individuals' COVID-19 perception and institutional and interpersonal trust and then tested the association between different personal experiences during the pandemic in terms of health and economic shocks and the two types of trust.

#### 3.1. COVID-19 perception and trust

Table 3 reports OLS regression results for the relationship between COVID-19 perception and trust. In line with our expectation,<sup>2</sup> a more negative COVID-19 perception is significantly associated with lower institutional ( $\beta = -0.251, p < 0.001$ ) and interpersonal trust ( $\beta = -0.237, p < 0.001$ ). Furthermore, this association is similarly negative and significant for every separate trustee. In terms of the socio-demographic control variables, income is positively associated with all measured trust dimensions, while rural residence area is associated with lower institutional trust and trust in hospital and emergency doctors. Age is related to higher trust in one's medical practitioner, while number of dependents and education are associated with higher trust in health authorities. Table 4 shows the association between the different dimensions of COVID-19 perception and trust. We find that two dimensions of perception have a stable significant association with trust: Concern is positively associated with all trustees, while disbelief in the effectiveness of vaccination is negatively associated with all trustees. Furthermore, perception of negative consequences for oneself is negatively associated with trust in government and perception of the length of the pandemic is negatively associated with both trustees of institutional trust. At the same time, misunderstanding of COVID-19 is associated with lower trust in health authorities, hospital and emergency doctors, as well as trust in one's medical practitioner, whereas negative emotional impact of the pandemic is associated with lower trust in health authorities and trust in one's medical practitioner, but positively with trust in hospital and emergency doctors.

#### 3.2. Personal shocks during COVID-19 and trust

We focus on the specific COVID-19 experiences of having an infection within one's household and experiencing reduced or lost employment either due to or not due to the pandemic (Table 5). First, when accounting for personal experience, the COVID-19 perception is still significantly associated with lower institutional ( $\beta = -0.250, p < 0.001$ ) and interpersonal trust ( $\beta = -0.241, p < 0.001$ ). Furthermore, this association is significant for every separate trustee. In line with our expectations based on [14], employment shocks are associated with trust in government. Interestingly, lost or reduced employment due to COVID-19 is associated with lower trust in government ( $\beta = -0.151, p < 0.010$ ), while economic shocks not due to COVID-19 are associated with higher trust in government ( $\beta = 0.137, p < 0.001$ ). Contrary to our expectations, personal health shocks are only associated with interpersonal trust ( $\beta = 0.111, p < 0.050$  for trust in hospital and emergency

doctors;  $\beta = 0.125, p < 0.050$  for trust in one's medical practitioner) but not institutional trust.

Next, Appendices C add interaction effects to differentiate individuals' trust toward medical institutions and medical practitioners depending on their personal shocks during COVID-19. While a direct COVID-19 experience (i.e., having had an infection) is associated with higher personal trust toward medical practitioners ( $\beta = 0.122, p < 0.001$ ), including emergency doctors ( $\beta = 0.102, p < 0.050$ ) and one's own doctor ( $\beta = 0.120, p < 0.050$ ), there is no interaction between a COVID-19 case in one's household and general COVID-19 perception (Appendix C.1).

Furthermore, job loss due to COVID-19 is associated with lower institutional trust ( $\beta = -0.160, p < 0.050$ ), both for trust in government ( $\beta = -0.174, p < 0.001$ ) and in health authorities ( $\beta = -0.119, p < 0.001$ ) (Appendix C.2). Moreover, the interaction between COVID-19 perception and COVID-19 related job loss is positive and significant with regard to trust in government ( $\beta = 0.117, p < 0.001$ ). This indicates that the negative perception of COVID-19 has a stronger association with trust in government for people who lost their job due to the pandemic. Finally, we find that job loss that did not result from the pandemic is associated with higher trust in government ( $\beta = 0.148, p < 0.100$ ), and the interaction with COVID-19 perception is not significant (Appendix C.3).

#### 3.3. Additional analysis regarding country-specific effects

Country-specific results are presented in Appendices D. Regarding the main relationships, the direct effect of COVID-19 perception is similar across the four countries (Appendix D.1) in the sense that a (negative) perception of COVID-19 is always associated with lower trust levels. All coefficients are the weakest for South Africa (for example,  $\beta = -0.106, p < 0.050$  for institutional trust,  $\beta = -0.141, p < 0.001$  for personal trust) and the strongest France (for example,  $\beta = -0.364, p < 0.001$  for institutional trust; specifically  $\beta = -0.335, p < 0.001$  for health authorities trust) and Australia (for example,  $\beta = -0.335, p < 0.001$  for personal trust and  $\beta = -0.334, p < 0.001$  for health authorities trust).

Regarding the role of socio-demographics, there is no relationship between income and the trust dimensions in Australia, while the negative association between a rural residence area and institutional trust is driven by France (Appendix D.1). The relationship of age with trust in one's medical practitioner is absent in South Africa, and so is the relationship between number of dependents and trust in health authorities in Australia and Germany. The positive association of education with trust in health authorities is only present on the aggregated level, when assessing all countries jointly.

Regarding the components of the COVID-19 perception, interpretations in the individual country sub-samples are similar in terms of the main interpretation for all components (Appendix D.2). Concern has stronger coefficients in South Africa and Germany; perception of negative consequences has stronger coefficients in France and Germany; and understanding has stronger coefficients in Australia and France. For the dimensions of perception of the length of the pandemic, and disbelief in the effectiveness of vaccination and treatment, the coefficients are comparable across countries. Finally, the importance of the perception of control regarding the risk of infection is mainly driven by South Africa for institutional trust, especially for trust in government.

With regard to the personal experience during COVID-19, the country-specific results show that for institutional trust, the relationship with lost or reduced employment is mainly driven by South Africa, for the two components (trust in government and trust in health authorities) (Appendix D.3). For personal trust, the relationships of lost or reduced employment are not significant across the studied countries, except for a positive association in France for job loss due to COVID-19.

Finally, in terms of interactions of personal experience and COVID-19 perception, the difference between the countries is minor, with few

<sup>2</sup> Due to our standardization by country, the coefficients reflect the relationship between trust and a one-standard deviation change in Covid-19 perception. The same applies to the coefficients of all other standardized, continuous, independent variables.

Table 2

Descriptive statistics of dependent variables.

Variable	Full sample (N = 2100)					Sub-samples							
	Distribution					Australia (N = 494)		France (N = 549)		Germany (N = 510)		South Africa (N = 547)	
	Mean	SD	Min	Median	Max	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Institutional trust	4.04	1.60	1.00	4.00	7.00	4.78	1.39	3.72	1.60	4.13	1.61	3.63	1.61
Trust in government	3.57	1.85	1.00	4.00	7.00	4.31	1.71	3.28	1.78	3.79	1.80	2.99	1.83
Trust in health authorities	4.51	1.67	1.00	5.00	7.00	5.25	1.39	4.16	1.70	4.47	1.64	4.26	1.69
Interpersonal trust	5.45	1.31	1.00	6.00	7.00	5.68	1.21	5.47	1.28	5.50	1.33	5.19	1.69
Trust in hospital and emergency doctors	5.28	1.51	1.00	6.00	7.00	5.66	1.24	5.33	1.48	5.37	1.43	4.78	1.69
Trust in my medical practitioner	5.63	1.36	1.00	6.00	7.00	5.70	1.32	5.61	1.33	5.63	1.40	5.59	1.39

Continuous variables are shown in their original scales and are not standardized.

exceptions: There is a positive interaction of infection detection on trust on emergency and hospital doctors in South Africa and on one's own medical practitioner in Germany, with no other interactions being significant. The negative relationship of institutional trust with job loss due to COVID-19 and the positive relationship with the job loss not due to COVID-19 is driven by South Africa. A positive interaction of job loss due to Covid-19 on interpersonal trust is coming from France.

The role of trust is also evident in all the studied countries. Supplementary results show a strong positive relationship between institutional and interpersonal trust and intention to vaccinate oneself, one's spouse, younger and older members of the household. Thus, institutional trust is positively and significantly associated with the intention to vaccinate oneself ( $\beta = 0.355, p < 0.001$ ), one's spouse ( $\beta = 0.212, p < 0.001$ ), elderly members of the household ( $\beta = 0.197, p < 0.001$ ), as well as children ( $\beta = 0.205, p < 0.001$ ). Interpersonal trust is also positively and significantly associated with the intention to vaccinate oneself ( $\beta = 0.303, p < 0.001$ ), one's spouse ( $\beta = 0.166, p < 0.001$ ), elderly members of the household ( $\beta = 0.187, p < 0.001$ ), as well as children ( $\beta = 0.149, p < 0.001$ ). The results are comparable and significant across all four studied countries.

#### 4. Discussion

**Perception of COVID-19.** We found that (negative) perception of the COVID-19 virus is associated with lower trust of individuals toward the government, health authorities, emergency doctors and one's own medical practitioner, confirming that one's subjective perception of COVID-19 is related to many aspects of medical trust. This finding reinforces that it is important to have a comprehensive account of citizens' perceptions of a pandemic based on its appropriate measurement (e.g., with IPQ-R) and to account for such perceptions among the overall population, and not only among infected patients. Interestingly, being generally worried about COVID-19 is related both to higher institutional and interpersonal trust. This is not counterintuitive, since government trust usually increases during the early phase of crises as citizens first react by putting aside their dissatisfaction with the government and by increasing patriotism, a phenomenon known as "rally effects" [47]. Similarly, worried individuals might be comforted by social interactions with their own doctors and other medical practitioners [26]. Additionally, belief in vaccination has a positive association with trust in health authorities but a negative one with trust in hospital and emergency doctors. Finally, authorities should be careful to communicate in a way that does not jeopardize trust [35] so that concern about the pandemic contributes to individuals' overall understanding of what is happening and how it can be managed [23], avoiding negative emotions such as fear and ignorance, which instead are all associated with lower institutional and interpersonal trust.

**Personal experiences during the pandemic.** Detrimental experiences by individuals during the pandemic show associations with trust only when the experiences are due to COVID-19, such as a COVID-19 infection or reduced or lost employment. Besides, the relationship

between the shocks differs for the different types of trust: Interpersonal trust is related to the health shock and institutional trust to the economic shock. However, a COVID-19 personal health shock by individuals is found to be associated with higher interpersonal trust. Indeed, although low levels of trust are often associated with poor health [52], this is not necessarily true in the context of public health crises such as pandemics ([1] for the Spanish flu). Furthermore, the effects of health shocks are similar as a function of whether individuals directly experienced COVID-19 or not, confirming that the pandemic represents a stressful health situation to everyone regardless of their actual infection experience. The differentiated relationships of shocks on institutional and interpersonal trust reinforces the necessity to distinguish the correlates of the different types of trust.

In line with Putnam [50], who showed that unequal distribution of income and wealth is associated with lower general trust, we confirm the expected negative association of economic shocks as due to the pandemic with trust. Yet, this association is only significant for trust in government and does not extend to trust in medical authorities or representatives. We also find a positive effect of economic shocks that are unrelated to the pandemic on individuals' trust in government. This finding might be in line with increased institutional trust in times of "uncertain circumstances, where individuals do not possess the necessary knowledge to make decisions (i.e., during a public health crisis)" ([15], p. 954). Nevertheless, the finding that losing one's job for other reasons than the pandemic is related to higher institutional trust remains counter-intuitive.

**Trust across socio-demographic groups.** In line with prior literature [61], we find that age, region of residence, and income are significantly associated with levels of trust, with older individuals with higher income and those living in urban areas having higher levels of trust. Additionally, we document a positive association between education and institutional trust. Hence, despite the initial stage of the pandemic not yielding this result in Groeniger et al. [29] and Thoresen et al. [61], individuals with higher levels of education displayed greater level of trust towards health authorities during later stages of the pandemic as evidenced by our study. Importantly, we find no evidence of an association between trust, gender, and ethnic minority status. These findings suggest that some vulnerable individuals (e.g., women or individuals belonging to an ethnic minority) do not feel especially ostracized during the pandemic. However, individuals living in rural areas exhibit lower trust in health authorities and representatives, potentially due to the lower accessibility of medical assistance in these particular areas. These results are consistent with findings on government and medical trust following the COVID-19 pandemic [41,49].

**Trust across countries.** Our results highlight the importance of financial governmental support during health crises, while pointing to some interesting differences across countries. In particular, institutional trust is negatively related to COVID-19 related employment shocks only

**Table 3**  
Relationship between illness perception of COVID-19 and trust dimensions.

	Institutional trust	Trust in government	Trust in health authorities	Interpersonal trust	Trust in hospital and emergency doctors	Trust in my medical practitioner
<b>COVID-19_IPQ</b>	<b>-0.251*** (0.022)</b>	<b>-0.220*** (0.022)</b>	<b>-0.243*** (0.022)</b>	<b>-0.237*** (0.022)</b>	<b>-0.227*** (0.022)</b>	<b>-0.212*** (0.022)</b>
Gender (Female)	0.025 (9.043)	0.057 (0.043)	-0.015 (0.043)	-0.038 (0.043)	-0.065 (0.043)	-0.006 (0.043)
Age (ln)	0.006 (0.023)	-0.004 (0.023)	0.014 (0.023)	0.075*** (0.023)	0.039 (0.023)	0.105*** (0.023)
Marital status (Married)	0.057 (0.048)	0.071 (0.049)	0.031 (0.048)	0.084 (0.048)	0.060 (0.048)	0.096 (0.048)
Dependents (ln)	0.045* (0.023)	0.035 (0.023)	0.047* (0.023)	0.001 (0.023)	0.002 (0.023)	0.002 (0.023)
Residence area (Rural)	-0.142** (0.052)	-0.132* (0.053)	-0.131* (0.053)	-0.108* (0.052)	-0.118* (0.053)	-0.081 (0.053)
Ethnicity (Minority)	-0.001 (0.065)	0.031 (0.065)	-0.042 (0.065)	-0.073 (0.065)	-0.079 (0.065)	-0.056 (0.065)
Education (Highly educated)	0.086* (0.044)	0.071 (0.044)	0.088* (0.044)	-0.015 (0.044)	0.009 (0.044)	-0.042 (0.044)
Income	0.097*** (0.023)	0.103*** (0.023)	0.076*** (0.023)	0.087*** (0.023)	0.085*** (0.023)	0.072** (0.023)
Intercept	-0.062 (0.051)	-0.062 (0.051)	-0.026 (0.051)	0.011 (0.051)	0.028 (0.051)	-0.005 (0.051)
R <sup>2</sup>	8.3%	6.7%	7.5%	8.5%	7.3%	7.5%

**Notes:** N = 2100; Results reported as beta coefficient (robust standard error); COVID-19\_IPQ stands for brief illness perception questionnaire adapted to measure COVID-19 illness perception; Results in bold are significant; Age (ln) and Dependents (ln) are taken in natural logarithm.

\*\*\* p < 0.001.

\*\* p < 0.010.

\* p < 0.050.

**Table 4**  
Relationship between the dimensions of illness perception of COVID-19 and trust dimensions.

	Institutional trust	Trust in government	Trust in health authorities	Interpersonal trust	Trust in hospital and emergency doctors	Trust in my medical practitioner
<b>Concern</b>	<b>0.089*** (0.025)</b>	<b>0.081*** (0.025)</b>	<b>0.083*** (0.025)</b>	<b>0.064*** (0.025)</b>	<b>0.067*** (0.026)</b>	<b>0.048*** (0.026)</b>
Consequences	-0.071*** (0.025)	-0.084*** (0.025)	-0.045* (0.026)	-0.009 (0.026)	-0.022 (0.027)	0.006 (0.027)
Duration	-0.089*** (0.023)	-0.116*** (0.023)	-0.045* (0.023)	0.014 (0.024)	0.008 (0.025)	0.016 (0.025)
Control	-0.069*** (0.022)	-0.062 (0.022)	-0.065*** (0.023)	-0.093*** (0.024)	-0.070*** (0.023)	-0.104*** (0.024)
Emotions	-0.066 (0.025)	-0.036 (0.025)	-0.088*** (0.026)	-0.135*** (0.026)	-0.128*** (0.026)	-0.119*** (0.026)
Treatment	0.000 (0.023)	0.007 (0.025)	-0.005 (0.024)	-0.015 (0.024)	-0.020 (0.025)	-0.008 (0.025)
Vaccination	-0.420*** (0.023)	-0.359*** (0.024)	-0.419*** (0.025)	-0.326*** (0.027)	-0.343*** (0.028)	-0.254*** (0.028)
Understanding	-0.033 (0.024)	-0.012 (0.024)	-0.050* (0.024)	-0.097*** (0.027)	-0.065*** (0.026)	-0.120*** (0.028)
Gender (Female)	0.055 (0.040)	0.088*** (0.041)	0.010 (0.040)	-0.032 (0.041)	-0.051 (0.041)	-0.008 (0.042)
Age (ln)	-0.047* (0.022)	-0.041* (0.022)	-0.046* (0.022)	0.013 (0.022)	-0.023 (0.023)	0.054* (0.024)
Marital status (Married)	0.067 (0.044)	0.083 (0.045)	0.037 (0.044)	0.083* (0.046)	0.062 (0.046)	0.093* (0.049)
Dependents (ln)	0.046*** (0.021)	0.035 (0.022)	0.050*** (0.021)	0.007 (0.021)	0.007 (0.021)	0.007 (0.022)
Residence area (Rural)	-0.103*** (0.047)	-0.098*** (0.049)	-0.093* (0.048)	-0.078 (0.050)	-0.089* (0.051)	-0.054 (0.050)
Ethnicity (Minority)	-0.006 (0.057)	0.027 (0.057)	-0.048 (0.060)	-0.082 (0.061)	-0.086 (0.063)	-0.065 (0.064)
Education (Highly educated)	0.026 (0.040)	0.025 (0.042)	0.022 (0.040)	-0.071* (0.041)	-0.046 (0.041)	-0.091*** (0.042)
Income	0.074*** (0.021)	0.082*** (0.022)	0.054*** (0.020)	0.070*** (0.020)	0.068*** (0.021)	0.058*** (0.020)
Intercept	-0.058 (0.047)	-0.088* (0.048)	-0.013 (0.047)	0.034 (0.048)	0.045 (0.048)	0.021 (0.049)
R <sup>2</sup>	22.6%	16.8%	22.7%	20.5%	18.9%	16.7%

**Notes:** N = 2100; Results reported as beta coefficient (robust standard error); COVID\_IPQ stands for brief illness perception questionnaire adapted to measure COVID-19 illness perception; Results in bold are significant; Age (ln) and Dependents (ln) are taken in natural logarithm.

\*\*\* p < 0.001.

\*\* p < 0.010.

\* p < 0.050.

**Table 5**  
Relationship between illness perception of COVID-19 and trust dimensions considering personal experiences during the pandemic.

	Institutional trust	Trust in government	Trust in health authorities	Interpersonal trust	Trust in hospital and emergency doctors	Trust in my medical practitioner
COVID-19 infection in household	0.037 (0.049)	0.026 (0.049)	0.042 (0.050)	0.130*** (0.049)	0.111** (0.049)	0.125** (0.050)
Lost or reduced employment	-0.143** (0.065)	-0.151** (0.062)	-0.110 (0.067)	-0.029 (0.069)	-0.065 (0.067)	0.023 (0.070)
Due to COVID-19	0.134* (0.080)	0.137* (0.083)	0.107 (0.075)	-0.008 (0.081)	-0.021 (0.080)	-0.002 (0.081)
Not due to COVID-19	-0.250*** (0.022)	-0.219*** (0.022)	-0.243*** (0.023)	-0.241*** (0.023)	-0.229*** (0.023)	-0.216*** (0.024)
COVID-19 IPQ	0.018 (0.043)	0.050 (0.043)	-0.020 (0.044)	-0.037 (0.043)	-0.063 (0.044)	-0.004 (0.044)
Gender (Female)	0.005 (0.023)	-0.006 (0.023)	0.015 (0.023)	0.086*** (0.024)	0.048** (0.024)	0.117*** (0.024)
Age (ln)	0.056 (0.048)	0.069 (0.048)	0.031 (0.048)	0.085* (0.049)	0.061 (0.049)	0.098* (0.050)
Marital status (Married)	0.042 (0.022)	0.033 (0.023)	0.045** (0.022)	-0.001 (0.023)	0.000 (0.023)	0.000 (0.023)
Dependents (ln)	-0.146*** (0.052)	-0.137*** (0.052)	-0.134* (0.053)	-0.106** (0.053)	-0.117*** (0.054)	-0.077 (0.052)
Residence area (Rural)	0.004 (0.062)	0.036 (0.060)	-0.039 (0.065)	-0.077 (0.064)	-0.082 (0.065)	-0.060 (0.067)
Ethnicity (Minority)	0.085* (0.044)	0.071 (0.044)	0.086* (0.044)	-0.023 (0.044)	0.003 (0.044)	-0.050 (0.044)
Education (Highly educated)	0.094*** (0.023)	0.099*** (0.023)	0.073** (0.022)	0.086*** (0.021)	0.084*** (0.022)	0.072** (0.022)
Income	-0.062 (0.053)	-0.080 (0.053)	-0.029 (0.054)	-0.019 (0.055)	0.008 (0.056)	-0.041 (0.054)
Intercept	8.6%	7%	7.7%	8.7%	7.5%	7.7%
R <sup>2</sup>						

**Notes:** N = 2100; Results reported as beta coefficient (robust standard error); COVID-19\_IPQ stands for brief illness perception questionnaire adapted to measure COVID-19 illness perception; Results in bold are significant; Age (ln) and Dependents (ln) are taken in natural logarithm.

\*\*\* p < 0.001.

\*\* p < 0.010.

\* p < 0.050.

in South Africa (which offered the least governmental financial support among the countries in the sample<sup>3</sup>), while personal trust is even positively related to employment lost due to COVID-19 in France (which offered most responsive governmental financial support among the countries in the sample<sup>4</sup>). Furthermore, supporting the importance of financial stability for trust, income is not related to trust at all in Australia (which has the highest income per capita in the sample<sup>5</sup>). Overall, however, main effects are present both on the country and the aggregated level and are quite similar across the four studied countries, thereby confirming the potential generalization of our findings.

### 5. Conclusions, policy implications, and limitations

Our study examines the relationships between COVID-19 perception and objective shocks of a pandemic, including objective health and economic shocks, and trust toward government, health authorities, and health practitioners. To the best of our knowledge, this is the first attempt to relate COVID-19 perception with the illness perception questionnaire and the levels of interpersonal and institutional trust in the medical domain. We show that considering illness perception is particularly relevant during a pandemic, since all individuals are impacted by the illness through restricting sanitary and economic measures, regardless of whether they get infected or not. Moreover, illness perception is strongly associated with all trust dimensions. We contribute to the understanding of how personal experience is associated with institutional and interpersonal medical trust and show that economic shocks are more important than health shocks for explaining variation institutional trust, while health shocks are related to interpersonal trust.

Based on our findings, we suggest that governments focus on the economic implications of health-related policies as much as on health and security outcomes. Our findings are theoretically and socially relevant, as we show that while actual health and economic shocks (i.e., job loss due to COVID-19) relate to individuals' institutional and interpersonal trust, subjective perceptions of the pandemic remain the predominant explaining factor of trust [40]. We therefore suggest that public policymakers invest in communication campaigns that target perceptions of the virus in such a way that people feel concerned about it, but also believe that they can control the risk of infection through their own actions.

Importantly, most existing studies addressed the early stages of the COVID-19 pandemic (i.e., March 2020 in [5]; March to May 2020 in [14]; April 2020 in [49]; and May 2020 in [61]). Our data were collected in the middle of the pandemic, when general knowledge of the virus had increased, and people started getting access to vaccination, thereby providing a much-needed mid-term perspective of the effect of the COVID-19 crisis on trust. Moreover, our data illuminates the interrelationship of objective health and economic shocks. Furthermore, we find that trust levels are very different across the four studied countries [65, 72], consistent with prior literature highlighting the importance of investigating trust during the COVID-19 pandemic in multiple countries (e.g., [29,41]) and demonstrating the value of our multi-country survey.

In terms of limitations, we did not consider gender or other individual characteristics of individual trustees (one's own medical practitioner, for example), although trust could also be driven by perceived similarities between individuals (e.g., women having more trust in a female medical practitioner). Furthermore, trust could be measured differently, referring explicitly to a certain behavior and context (e.g., "I believe that governmental measures will reduce the negative impact of the virus and help end the pandemic") instead of asking directly about trust [8]. The culture impact on the perception of trust could also be

<sup>3</sup> <https://ourworldindata.org/>.

<sup>4</sup> <https://ourworldindata.org/>.

<sup>5</sup> <https://www.worldometers.info/>.



considered in future research [34].

As data were collected at one point in time, we did not examine the possibility of a reverse causal relationship between trust and perception of COVID-19 [57]. That is, trust could also be driving one's COVID-19 perception. Further, online data collection is related to certain limitations [4]. The levels on internet penetration<sup>6</sup> and digital literacy<sup>7</sup> are very high in Australia, France, and Germany, but are lower in South-Africa. Yet, combined with representativeness quotas, our mobile-friendly online survey should not have led to access or coverage bias. Given the objective of the study, sampling bias, including self-selection bias, is not a serious concern for our study either [4]. Finally, our study shows differences in factors related to trust towards different health care actors, including emergency and hospital doctors, and one's own medical practitioner. This suggests that there is a difference in medical interactions and trust towards medical representatives of different levels and functions, which should be further investigated.

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### Declaration of competing interest

None.

### Supplementary materials

Supplementary material associated with this article can be found, in the online version, at [doi:10.1016/j.healthpol.2024.105178](https://doi.org/10.1016/j.healthpol.2024.105178).

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