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# Lockdown support, trust and COVID-19 conspiracy beliefs: Insights from the second national lockdown in France

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## ABSTRACT

Due to the COVID-19 pandemic, restrictive sanitary measures such as lockdowns have been implemented all around the world. Based on a representative sample of the population collected through an online cross-sectional survey, the goal of the study was to investigate the factors associated with lockdown agreement in France during the second general lockdown of fall 2020. More specifically, we aimed to investigate how trust in the government and COVID-19 conspiracy beliefs influenced lockdown agreement. Trust in the authorities and low adherence to conspiracy beliefs appeared as strong predictors of lockdown acceptance among our sample. Using a mediation analysis, we highlighted a significant indirect effect of trust in the authorities on lockdown agreement through the adherence to conspiracy beliefs: low level of trust translated into higher odds to believe in COVID-19 misinformation which in turn decreased lockdown support. The double effect of trust on lockdown agreement, both directly and indirectly, underlines the importance of careful communication from the government around decisions related to COVID-19 mitigation measures in order not to deteriorate even more the low level of trust in the health action of the government. The fight against false information also appears of the utmost importance to increase the population adherence to public authorities' recommendations.

## 1. Introduction

The COVID-19 pandemic that started at the beginning of 2020 is still ongoing. No virus has had such repercussions at a global level in the recent years, previous epidemics such as the 2014 Ebola outbreak being confined to some areas of the world. With 6,5 million worldwide COVID-19 related deaths by September 2022, the diffusion of the COVID-19 virus and its rapid spread at a large scale is a striking example of a public health problem shared by all countries. Despite the existence of debates around the degree of governments' response to the pandemic, and more especially the question of strict lockdown vs more gradual steps [1], it has been shown that lockdown is effective in reducing the diffusion of COVID-19 [2]. Thus, lockdown restrictions were implemented in most of European countries during the second COVID-19 wave. In France, the second general lockdown was implemented from October 30th to December 15th 2020. As during the first lockdown, a form had to be filled before leaving the place of residence, and going outside or exercising was possible in the limit of one hour and within a one-kilometer perimeter. However, the rules of this second lockdown differed from those of the first lockdown on several dimensions. First,

school stayed open during the second lockdown. Second, a larger number of production sectors (e.g. construction) and public services remained open in fall 2020 compared to spring 2020. Third, although remote work was widely encouraged by the government it was less applied than in spring 2020 as demonstrated by mobility data [3]. Finally, contrary to the first lockdown, parks and gardens remained open and visits to nursing home were allowed.

In a globalized world, especially within the European Union, comparisons between countries' COVID-19 containment policies are unavoidable. As no European harmonization regarding lockdown restrictions was implemented, the press largely reviewed differences in countries' policies and compared which country was handling the epidemic best. This pointed lack of coordination among the EU member states might have increased mistrust of citizens in their national containment strategies. Yet, trust in the health action of public authorities in epidemic time appears crucial for the success of containment strategies as it influences the general public' adherence to mitigation measures. During previous outbreaks of infectious diseases, such as Ebola, low trust in health authorities or the government was indeed found to be associated with a reduced likelihood of following public

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health recommendations [4–5]. Since the beginning of the COVID-19 pandemic, trust was also documented as a strong predictor of the willingness to engage in COVID-19 protective behaviors [6]. Low trust in the government, or in information regarding COVID-19, were moreover found as important barriers to social distancing adherence in several studies [7–10] while in Germany, political trust translated into a lower epidemic growth through increased mobility reduction [11].

Conspiracy beliefs tend to gain momentum in crisis situations such as pandemics [12]. Since the outbreak of the COVID-19 pandemic, false information has circulated on traditional media and social networks [13], accentuated by the recent discovery of the disease and the initial low level of knowledge about its transmission modes, prevention means or treatments. In a study conducted in Greece, uncertainty and stress were found to be associated with an increased probability of believing in COVID-19 conspiracy theories [14]. To fight the spread of COVID-19 misinformation, both the World Health Organization and the European Commission launched specific communication campaigns, ‘#ThinkBeforeSharing’ and ‘Stop the Spread’. Indeed, several studies highlighted that beliefs in conspiracy theories reduce social distancing or self-isolation behaviors [10,15–17]. A study conducted on a representative sample of the English population also showed that a higher level of COVID-19 conspiracy thinking was associated with less adherence to all government guidelines [15]. In North America and Europe, general conspiracy beliefs were also shown to be negatively associated with the adherence to social distancing recommendations [16]. Moreover, a study conducted on a representative sample of the population in Poland found that COVID-19 conspiracy beliefs were negatively associated with the adherence to safety guidelines [10].

Trust in the public authorities and conspiracy beliefs furthermore might be connected to each other, and some studies already investigated the combined effect of these two variables on preventive behaviors in the COVID-19 context [6,17–18] or in different disease contexts such as AIDS [19]. Following this literature, we aimed to study the combined effect of trust and COVID-19 conspiracy beliefs on lockdown support. However, unlike Pummerer et al. [18] who predicted that believing in COVID-19 political conspiracy theories lowered institutional trust, our hypothesis was that, with the ongoing trust crisis setting in over time, low trust of the population in the government to handle the crisis can constitute a fertile ground for the diffusion of COVID-19 conspiracy beliefs which could in turn decrease the general support to containment measures such as lockdowns. Indeed, conspiracy theories started to spread in France at a time some failures of the government to handle the crisis (e.g., for mask provision) were publicly discussed.

Thus, the objective of this paper was to investigate how trust in the government and COVID-19 conspiracy beliefs influence lockdown agreement while controlling for other factors previously found to be associated with COVID-19 preventive behaviors. Using a mediation model, we also aimed to investigate whether low trust indirectly affects lockdown agreement through the development of COVID-19 conspiracy beliefs.

## 2. Data and methods

### 2.1. Recruitment of participants and sample

Between November 20th and 23rd 2020, a cross-sectional study was conducted in France among a representative sample of 1268 French-speaking respondents. The questionnaire was administered during the second general lockdown. The survey questionnaire was designed by the authors and tested in a convenience sample during a pilot phase. The recruitment of the final sample was undertaken by an independent panelist (<http://www.mypanellab.com>) using quota sampling to ensure representativeness of the French mainland population by gender, age, Socio Professional Categories (SPCs) and regions. For age, the following categories were used to ensure representativity: 20–24, 25–34, 35–44, 45–54, 55–64, more than 65. SPCs were divided into independent

workers, higher SPCs (executives, higher intellectual professions...), intermediate SPCs (e.g., teachers, nurses...), lower SPCs (employees and manual workers), retired, and other inactive. Sampling for regions used the UDA5 classification which divides mainland France into 5 zones: North-West, North-East, Ile-de-France, South-West, South-East.

An information letter was presented to all respondents stating the eligibility criteria (being over 18 and living in France). This study did not need the CNIL (national information science and liberties commission) authorization as the survey was entirely anonymous. Before conducting the regression analyses, quality tests were performed to discard incoherent responses. After deleting the observations failing the quality checks, the sample was slightly reweighted to be representative of the mainland French population aged over 18 based on gender, age, region, educational level, and the size of the city of residency.

### 2.2. Variables of interest

The survey questionnaire was created for this study with the objective of investigating the link between trust in the authorities, conspiracy beliefs and lockdown agreement. The questionnaire was also designed to include the necessary control variables and other explanatory variables previously found to be associated with lockdown agreement. A literature review was undertaken before designing the survey questionnaire in order to identify and include the factors that were previously found to be significantly associated with lockdown agreement or social distancing compliance. As a result, variables related to perceived lockdown efficacy and cost [20–23], health literacy [16,24] and time and risk preferences [25–26] were included in the survey questionnaire. Whenever it was possible, validated scales were used to measure those variables. The full survey questionnaire included seven sections relevant for this study: 1) *Socioeconomic factors*, 2) *Health literacy*, 3) *Attitudes towards and perceptions regarding lockdown*, 4) *COVID-19 perceptions*, 5) *Time preferences*, 6) *Risk preferences* and 7) *Conspiracy beliefs*.

The dependent variable, the level of agreement with the fall 2020 lockdown, was measured on a Likert-type scale ranging from 1 (‘strongly disagree’) to 5 (‘strongly agree’). This variable was recoded to create a dummy variable equal to 1 if respondents rather or strongly agreed with lockdown measures and 0 otherwise.

Regarding independent variables, we defined a set of socioeconomic and demographic control variables to be included in all regression analyses so as to limit the omitted variable bias. Those control variables are presented in Appendix 1 and include gender, being over 65 years old, localization of lockdown residency, COVID-19 incidence in the region of residence, educational level, health worker status and loss of income during the COVID-19 crisis. Beyond trust and COVID-19 conspiracy beliefs which were at the core of the tested model, our model includes the ‘‘appraisal of health information’’ subscale of the Health Literacy Questionnaire (HLQ), the perceived efficacy of lockdown, the perceived cost of lockdown as well as the control variables.

Regarding the measurement of independent variables, respondents’ trust in the government was evaluated by the level of agreement with the statement ‘In order to fight the COVID-19 epidemic and to limit its negative effects, I trust the government’ on a scale from 1 (‘completely disagree’) to 5 (‘completely agree’). A dummy variable was created and coded as 1 if respondents rather or completely agreed with this statement and 0 otherwise.

COVID-19 conspiracy beliefs were measured using 5 items. On scale from 1 (‘completely disagree’) to 5 (‘completely agree’), respondents were asked whether they agreed with the 5 assertions chosen according to the literature [27–28] and to include the most popular COVID-19 conspiracy theories in France at the time of the study (identified with the help of the conspiracy watch observatory website: [www.conspiracywatch.info](http://www.conspiracywatch.info)). A mean conspiracy score was calculated after reverse coding of appropriate items ( $\alpha = 0.6495$ ). Details on items used to measure conspiracy beliefs can be found in Appendix 2.

The appraisal of health information evaluates the ability of

respondents to identify good information and reliable sources of information and to resolve conflicting information by themselves or with help from others. The “appraisal of health information” dimension of health literacy was assessed using the French-validated [29] Health Literacy Questionnaire [30] and was measured through the mean level of agreement level with 5 items available in Appendix 3 ( $\alpha = 0.7654$ ).

To measure the perceived benefits of the lockdown, respondents were asked if they “agree that the current lockdown is effective to reduce the spread of the COVID-19 epidemic in France” on a scale from 1 (‘completely disagree’) to 5 (‘completely agree’). The perceived cost of lockdown was measured by asking respondents if “lockdown measures currently implemented in France are too costly from an economic point of view” on a scale from 1 (‘completely disagree’) to 5 (‘completely agree’). These two variables were recoded as dummy variables equal to 1 if respondents rather or completely agreed and 0 otherwise.

### 2.3. Methods

The level of agreement with lockdown restrictions implemented at the time of the study was first estimated using a logistic regression. A mediation analysis was then conducted to investigate how trust in the government influences lockdown agreement both directly and indirectly through COVID-19 conspiracy beliefs. Before reaching the final model, whose explanatory variables are described in Subsection 2.2, a set of candidate explanatory variables were considered. Due to a lack of significance across tested models, and to ensure parsimony of the final model, some explanatory variables were excluded from the analysis, namely perceived probability of infection by COVID-19, perceived individual consequences in case of COVID-19 infection, perceived health impact of COVID-19 in France and time/risk preferences. All regression analyses were conducted using a set of control variables described in Subsection 2.2 to limit the omitted variable bias. VIF were calculated to test for multicollinearity in the final model. Mean VIF was 1.13 and all VIF were lower than 1.5. The study follows the Strengthening the Reporting of Observational studies in Epidemiology guidelines [31] (supplementary material).

Mediation analysis was originally developed by Barron and Kenny [32] but suffered from some limitations such as the mandatory use of a linear model. The original model was then extended to allow identification of causal mediation effects and the use of binary dependent variable [33]. The goal of causal mediation is to decompose the total effect of an exposure (independent) variable on an outcome (dependent) variable into a direct effect of the exposure on the outcome and an indirect effect that acts through a mediator variable of interest.

Fig. 1 illustrates the mediation model investigated in our study. The objective was to quantify and to decompose the effect of trust on lockdown agreement into a direct effect and an indirect effect through the adherence to COVID-19 conspiracy beliefs. In order to do so, two regression analyses were performed using successively the mediator (i.e., conspiracy beliefs) and the outcome variable (i.e., lockdown agreement) as a dependent variable. The mediator regression was estimated using an Ordinary Least Square (OLS) model while the outcome regression was estimated using a logistic model. Both regression analyses included the aforementioned control and explanatory variables.

In complementary analyses, we tested the robustness of our

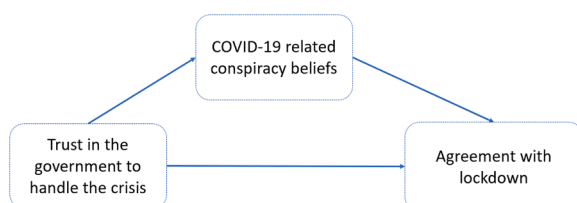


Fig. 1. Mediation model.

regression and mediation results. In the main analysis, lockdown agreement was dummy coded, and the factors associated with lockdown agreement were investigated using a logistic model. We tested the robustness of the results obtained in the main analysis by alternatively performing an ordered logit regression analysis using the original coding of lockdown agreement which ranges from 1 (‘completely disagree’) to 5 (‘completely agree’). For the mediation analysis, we investigated the robustness of the mediation effect (i.e., the indirect effect of trust on lockdown agreement through conspiracy beliefs) to the presence of potential cofounders that could have affected both the outcome (lockdown agreement) and the mediator (COVID-19 conspiracy beliefs).

All analyses were run using Stata®, version 15. The mediation and its sensitivity analyses were performed using the ‘medeff’ and ‘medsens’ commands, respectively [34].

### 3. Results

Participation was voluntary and some participants stopped the survey before the end. Of the 1322 respondents who started the survey, 1268 completed it, corresponding to a completion rate of 95.92%. Quality tests were conducted to remove low quality data from the sample. Quality tests consisted in testing the coherence of participants’ responses, for example consistency between age and the self-declaration of being at risk of a severe form of COVID-19 due to being over 65. Moreover, respondents who completed the survey in less than 6 min were also excluded as it was considered that answering faster was not possible if each question was properly read. After data quality tests, a total of 126 observations were removed from the sample. A total of 1142 observations were then used in regressions analyses. After deleting the observations failing the quality checks, the sample was slightly reweighted to be representative of the mainland French population aged over 18 based on gender, age, region, educational level, and the size of the city of residency. Details on observations excluded and on reweighting can be found in Appendix 4.

#### 3.1. Descriptive statistics

Table 1 provides the key summary statistics, before reweighting, for variables used in the regression analyses.

About 30% of the respondents (28.8%) lived in regions highly impacted by COVID-19 (incidence rate over 400 per 100,000 inhabitants at the time of the study), while 20.1% lived in regions lightly impacted by COVID-19 (incidence rate up to 250). Almost half (47.6%) of the respondents agreed with lockdown measures. Among the respondents, only 29.6% trusted the government to fight the COVID-19 epidemics and to limit its negative effects. The mean COVID-19 conspiracy score was equal to 2.41, which indicates that the endorsement of at least some COVID-19 conspiracy beliefs was high among our sample. Lockdown measures were perceived as effective by 53.1% of the respondents and too costly by 67.51% of the respondents. Table S1 in Appendix 5 displays the correlations for all dependent, independent and control variables.

#### 3.2. Regressions analysis

The results of the regression analysis on lockdown agreement are presented in Table 2.

None of the control variables, except for education, were significantly associated with lockdown agreement. No correlation was found between gender and lockdown agreement. Being under 65, and thus being less at risk of a severe form of COVID-19, was not significantly associated with a lower support to the lockdown as could be expected.

Investigating the link between health literacy and support to lockdown showed that the appraisal of health information was positively associated with lockdown agreement. Moreover, a positive correlation was found between the perceived efficacy of the lockdown and lockdown agreement. On the contrary, regression results pointed to a

**Table 1**  
Descriptive statistics.

	Mean (SD)	N (%)
<b>Gender</b>		
Female		634 (55.5%)
Male		508 (44.5%)
<b>Over 65 years old</b>		
No		852 (74.6%)
Yes		290 (25.4%)
<b>Incidence of COVID-19 in the region</b>		
Low (<200)		230 (20.1%)
Medium (250-400)		583 (51.1%)
High (>400)		329 (28.8%)
<b>localization of lockdown residency</b>		
Urban area		504 (44.1%)
Peri-urban area		253 (22.2%)
Rural area		385 (33.7%)
<b>Educational level</b>		
< A level		275 (24.1%)
A level		278 (24.3%)
Two-year university diploma		241 (21.1%)
> Two-year university diploma		348 (30.5%)
<b>Health worker</b>		
No		1069 (93.6%)
Yes		73 (6.4%)
<b>Income loss</b>		
No		1021 (89.4%)
Yes		121 (10.6%)
<b>Lockdown agreement</b>		
No		598 (52.4%)
Yes		544 (47.6%)
<b>Trust in the government</b>		
No		802 (70.2%)
Yes		340 (29.8%)
<b>Conspiracy score</b>		
	2.41 (0.76)	
<b>Effectiveness of lockdown</b>		
No		536 (46.9%)
Yes		606 (53.1%)
<b>Cost of lockdown too high</b>		
No		371 (32.49%)
Yes		771 (67.51%)
<b>Appraisal of health information score</b>		
	2.93 (0.54)	
<b>Observation</b>	1142	1142

negative association between the perceived cost of lockdown and lockdown agreement.

Respondents who trusted the government to fight the epidemic expressed more support toward the lockdown. We also found a negative association between the belief in COVID-19 conspiracy theories score and lockdown agreement, indicating that the more people adhered to conspiracy beliefs, the less they supported lockdown.

Table 3 presents the results of the mediation analysis investigating the relationship between trust and COVID-19 conspiracy beliefs.

The mediation analysis indicated that trust in the government influenced lockdown support both directly and indirectly through the propensity to adhere to COVID-19 conspiracy theories. A significant amount of the total effect of trust on lockdown agreement was indirect (20.15%). Results of the mediation analysis highlighted the importance of restoring trust among the French population for two reasons. First, for its direct effect on increasing acceptance of, and thus compliance to, public authorities' recommendations. Second, for its effect on the reduced adherence to COVID-19 conspiracy theories in the population which in turn can enhance restrictions' acceptance.

### 3.3. Robustness analyses

Results of robustness analyses are presented in Appendix 6. Similar results were obtained when estimating the factors associated with lockdown agreement using an ordered logit model. Indeed, perceived efficacy of lockdown and trust in the government were positively and

**Table 2**  
Results of regression analysis.

		Lockdown agreement
<b>Gender</b>	Male	0.849 (0.374)
(ref: Female)		
<b>Over 65 years old</b>	Yes	0.934 (0.752)
(ref: No)		
<b>Incidence region</b>	Medium	0.888 (0.638)
(ref: Low)		
	High	0.766 (0.326)
<b>localization of lockdown residency</b>	Peri-urban area	0.864 (0.507)
(ref: Urban area)		
	Rural area	1.104 (0.643)
<b>Educational level</b>	A level	1.720** (0.023)
(ref: < A level)		
	Two-year university diploma	1.439 (0.139)
	> Two-year university diploma	1.279 (0.292)
<b>Health worker</b>	Yes	1.725 (0.115)
(ref: No)		
<b>Income loss</b>	Yes	0.703 (0.200)
(ref: No)		
<b>Effectiveness of lockdown</b>	Yes	11.45*** (0.000)
(ref: No)		
<b>Cost of lockdown too high</b>	Yes	0.611** (0.014)
(ref: No)		
<b>Trust in the government</b>	Yes	2.607*** (0.000)
(ref: No)		
<b>Conspiracy score</b>		0.520*** (0.000)
<b>Appraisal of health information score</b>		1.329* (0.075)
<b>Observations</b>		1142
<b>Pseudo R-squared</b>		0.364

\*  $p < 0.10$ .

\*\*  $p < 0.05$ .

\*\*\*  $p < 0.01$

p-values in parentheses.

**Table 3**  
Results of mediation analysis.

	Mean	95% CI
Average mediation	0.0385	[0.0212;0.0585]
Average direct effect	0.1528	[0.0874;0.2223]
Total effect	0.1914	[0.1256;0.2629]
% of total effect mediated	20.15	[14,66;30,68]

strongly associated with lockdown support whereas perceived cost and conspiracy beliefs were negatively associated with lockdown support. Among explanatory variables of interest, the only difference between the logit and ordered logit regressions concerns the "appraisal of health information" subscale (subscale 5 of the HLQ) which was no longer significantly associated with lockdown agreement in the ordered logit model.

The results of the mediation robustness analysis showed that the correlation between the error terms of the two regressions used for the mediation analysis (i.e., the one with the mediator - conspiracy beliefs - as the dependent variable and the one with the outcome - lockdown agreement - as the dependent variable) should have been as high as -0.20 for the average causal mediation effect (ACME) to be zero. Alternatively, this means that the indirect effect of trust on lockdown agreement through conspiracy beliefs would have been zero only if confounders of the mediator-response relationship explained together 40% or more of the residual variance. For example, an omitted confounder should have explained 20% of the remaining variance in the mediator and 20% of the remaining variance in the outcome,  $0.20 \times$

$0.20 \approx 0.04$ , for the ACME to be zero.

#### 4. Discussion

In our sample, only 47.6% of the respondents agreed with lockdown measures taken by the French government in fall 2020. This level of support is much lower than what was observed in France during the first lockdown of spring 2020 [20]. The decreased support for lockdown observed over time in France, consistent with observations made in other countries [35], may be linked to the evolution of the general public's knowledge about COVID-19. Indeed, at the beginning of the first wave in spring 2020, little information was available about the virus and no vaccine or treatment were foreseeable while a few months later, in fall 2020, the disease was better known, and the first COVID-19 vaccines were in the process of market access agreement. This decreased support can also be linked to the emergence of the debate around the negative impact of lockdown restrictions on mental health. Indeed, while lockdown measures are powerful in reducing the spread of the disease they can deteriorate mental health of some people due to isolation or due to the economic crisis resulting from the pandemic [36–37]. As mental health consequences of lockdown measures are not immediate, this issue was weakly discussed during the first lockdown in France. However, with the renewals of lockdown measures over time, negative side effects of lockdown have appeared more clearly. In addition to the mental health consequences of lockdown, debates on the impact of lockdown measures on the increase of socioeconomic inequalities became more vivid at the time of the second lockdown in France. Then, lockdown acceptance might also have decreased over time in face of the increased socioeconomic inequalities linked to restrictive sanitary measures [38].

Young people were particularly affected by lockdown restrictions as they experienced discontinuities in their education and suffered the most from difficulties in labor market access [39] whereas the benefits of these restrictive measures were higher for populations more at risk of a severe COVID-19 form such as the elderly. Given the disproportional burden of lockdown measures on the younger, selective isolation of high-risk groups was widely discussed in the media, or in the literature [40–41], as an alternative to general restrictions. Indeed, in many European countries, general lockdown measures were justified based on overwhelmed health systems due to COVID-19 cases while young and healthy people are less likely to be admitted to the hospital if infected. Selective lockdown based on criteria other than age was also discussed since the beginning of the pandemic. As some regions were much more impacted than others in France, regional or other local scales measures were for example debated in the media. Our results nevertheless indicated that respondents' support to the lockdown was correlated neither with age nor with the level of COVID-19 incidence in their region of residence.

In line with previous results, our regression results confirmed the importance of health literacy [16,24, 42] and lockdown perceived efficacy on lockdown support [20–22]. Our regression results also highlighted that low trust in the authorities and adherence to COVID-19 conspiracy beliefs are strong predictors of lockdown rejection. Those results are in line with previous studies investigating separately the relationship between lockdown support and trust [7–9, 25] or between lockdown support and conspiracy beliefs [10, 15–16]. As only 29.8% of our respondents declared trusting the French government to fight the COVID-19 epidemic, and given the negative association we found between trust and lockdown support, the low level of trust of French citizens in their government constitutes a strong barrier for the acceptability of COVID-19 containment measures. Whatever the roots of the French defiance, it appears crucial for trust of the population in the health action of the government to be restored so as to increase compliance with the measures taken by the authorities. In order to do so, the government could communicate in a more straightforward way on the indicators and factors considered in the decisions taken regarding

the strengthening of health restrictions. Such communication could increase the understanding, the foreseeability and ultimately the acceptance of restrictive sanitary measures by the population. In addition, the result regarding conspiracy beliefs indicates that multifaceted public communication campaigns on what is known (and not known yet) on COVID-19 are of crucial importance to limit the spread of COVID-19 conspiracy beliefs and to enhance adherence to social distancing restrictions, especially in the context of COVID-19 where numerous false information on the disease have circulated on both traditional and social media. Indeed, transparency has been shown to be vital in COVID-19 crisis management [43].

As part of the mediation analysis we investigated the relationship between trust in the government and conspiracy beliefs. We found that trust in the government to handle the COVID-19 crisis was negatively associated with the tendency to believe in conspiracy theories. This result is consistent with previous studies that showed that a low level of trust in official information sources was associated with beliefs in vaccine-related conspiracy in Germany [44] or that trust in the government negatively impacted conspiratorial beliefs in South-Korea [45]. However, our study is the first investigation this relationship during the COVID-19 pandemic in France. Yet, it should be kept in mind that, as of today, the direction of the causal relationship between trust in government and conspiracy thinking is not established and that the causality is most likely to be circular [46].

The main contribution of this study is to investigate the combined effect of trust and conspiracy beliefs on lockdown agreement. The mediation analysis conducted emphasizes that trust in the government to handle the health crisis influences lockdown agreement both directly and indirectly through the propensity to believe in COVID-19 conspiracy theories. Our initial hypothesis that the low level of trust in the government to handle the health crisis can translate into higher odds to adhere to disinformation campaigns, which could in turn decrease support to containment measures such as lockdowns, is then confirmed. The relation between trust in the authorities and COVID-19 conspiracy beliefs, and their combined role on lockdown acceptance, illustrates the need for a global vision in public authorities' response to the health crisis. As different factors can synergistically influence lockdown acceptance, understanding the link between those factors is important to design more appropriate public containment policies and actions.

The results of this study might also be useful to help to prepare for new health crises and pandemics that might arise in the future and for which France is on some aspects ill-prepared. The Global Health Security (GHS) Index provides an assessment and benchmarking of health security and related capabilities in 195 countries [47]. In 2021, France ranked 14 over 195 with a global score of 61.9. However, despite this good overall ranking, France appeared to lack capabilities in the health crises response domain with particularly low scores for the “emergency preparedness and response planning” (score of 29.2, 79/195) and “risk communication” (score of 66.7, 54/195) subdomains. The risk communication subscale of the GHS Index gathers information about the existence of “a strategy and platform to expediently provide the general public with appropriate messages and quell potential rumors or mis- and dis-information” in case of a health emergency or pandemic. Our results, by underlining the crucial role of trust in the government and of misinformation on the general public adherence to - and thus efficacy of - pandemic containment measures, reinforces the messages conveyed by the GHIs report on the need for France to develop pandemic preparedness plans that are trusted by the population and on the necessity to better fight the diffusion of conspiracy beliefs in a very proactive way.

Since trust and conspiracy beliefs are global issues for the management of the pandemic, this study not only contributes to the literature on the links between trust, conspiracy beliefs and lockdown agreement in France but also provides results that can be useful at a larger scale. However, several limitations of this study can be underlined. First, regardless of our effort to control for a number of socioeconomic and demographic characteristics, we cannot exclude an omitted variable

bias. Second, the cross-sectional nature of this study makes causal interpretation of our results not possible. Furthermore, our results only reflect opinions at a given point in time as there is no evidence of stability in the determinants of lockdown support over time. Finally, reverse causality could also be at stake for some results and panel studies should be conducted in the future to confirm our results.

## 5. Conclusion

Due to the emergence of new variants and to the virus seasonal pattern, the COVID-19 epidemic could rise again and become cyclic. Other viruses could also emerge leading to new pandemics in the future. Given the relationships we find between trust, conspiracy beliefs and the support to containment measures among the population, it appears of crucial importance for the French government to work on sustaining trust in its action during a health crisis. This trust could be fostered by the development of preparedness plans upstream of the emergence of a new health crisis or pandemic and by designing effective strategies to quickly provide appropriate information to the population in the occurrence of such events. The fight against misinformation, including on social media, should also be integrated into a broader risk communication strategy in time of health crisis. Monitoring trends on Twitter could for example be useful to help identify dominant topics of interest and design appropriate answers [48].

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## Declaration of Competing Interest

The authors declare that they have no conflict of interest.

## Ethics approval

No ethical approval was required for this study in accordance with the policies of the authors' institution. Informed consent was obtained from all individual participants included in the study.

## Availability of data and material

Data can be made available upon request.

## Code availability

All analyses were performed using Stata® version 15.

## CRediT authorship contribution statement

**Pauline Kergall:** Conceptualization, Methodology, Formal analysis, Investigation, Writing – original draft, Writing – review & editing, Funding acquisition, Supervision. **Marlène Guillon:** Conceptualization, Methodology, Formal analysis, Investigation, Writing – original draft, Writing – review & editing, Funding acquisition, Supervision.

## Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.healthpol.2022.09.004.

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