

**Pandemic Compliance: A systematic review of influences on social distancing behaviour during
the first wave of the COVID-19 outbreak**

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Abstract

1 During the first wave of the COVID-19 pandemic, mitigation measures compelling people to keep a
2 safe social distance led to a massive, unprecedented behavioural change across the globe. The present
3 study seeks to understand what variables made people comply with such mitigation measures. It
4 systematically reviewed 45 studies with data about compliance behaviour during the first wave (found
5 in searches from March 1st till June 30th 2020). The review shows that a combination of variables shaped
6 compliance behaviour, including people's fear of the virus, psychosocial factors (including impulsivity,
7 negative emotions, self-efficacy, and social norms), institutional variables (including attitudes towards
8 the mitigation measures, belief in conspiracy theories and knowledge of the virus), and situational
9 variables (capacity to obey and opportunity to violate the rules). Notably, the reviewed studies did not
10 find a significant association between law enforcement (perceived deterrence) and compliance here.
11 The review assesses what these findings mean for behavioural theory and for policy makers seeking to
12 mitigate pandemics like COVID-19. Also, it reflects on the limitations of the reviewed body of work
13 and future directions for pandemic compliance research.

14 The outbreak of the COVID-19 pandemic has required billions of people to massively and
15 suddenly change their behaviour. In an effort to contain the pandemic, governments all over the world
16 have had to implement drastic measures that require people to maintain social (and physical) distance
17 from others. The global, large-scale behavioural responses to these mitigation measures adopted during
18 the first wave of the pandemic present a vital object of study for behavioural scientists. On the one hand,
19 this theoretically presents an example of policy-directed behavioural change happening despite
20 tremendous social and economic costs. As such, the data allow unique insight into what types of
21 theoretical variables are at play in such large shifts in human conduct, including variables incorporated
22 in rational choice theories (Becker, 1968; Cornish & Clarke, 2014; Posner, 1998), social norms theories
23 (Cialdini, 2003; Cialdini & Goldstein, 2004; Goldstein et al., 2008; Schultz et al., 2007), legitimacy
24 theories (Tyler, 1990; Walters & Bolger, 2019), situational theories (Birkbeck & LaFree, 1993; Clarke,
25 1995; Harland et al., 2007; Thaler & Sunstein, 2008), and theories that emphasize the importance of
26 attitudes and personal traits in compliance (Ajzen, 2005; Ajzen & Madden, 1986).

27 On the other hand, the first wave data on behavioural responses to mitigation measures present
28 vital information for policy makers wishing to model, plan, and decide on mitigation measures for future
29 outbreaks. By understanding what shaped behaviour during the first wave, such decision makers will
30 have a better chance of achieving effective behavioural change in the future.

31 For both purposes we can draw on a rich set of data scholars have collected and analysed about
32 why people complied with the social distancing and lockdown measures during the first wave of the
33 COVID-19 pandemic. Scholars have used different disciplinary and theoretical approaches in
34 operationalizing their research and testing hypotheses about what factors have shaped the behaviour
35 during the first wave. Moreover, the studies have been made public across a range of different online
36 platforms and journals, and use different measurements and measures. Therefore, they do not present
37 an easily accessible set of insights for policy makers, or for scholars who generally want to learn about
38 compliance with mitigation measures during the pandemic. This review compares findings about what
39 types of variables shape compliance across these different studies and critically assesses what key
40 lessons exist for policy, and what insights there are for further research.

41 Studies examining compliance with COVID-19 mitigation measures differ greatly in terms of
42 methodology used. Broadly, they can be divided in three categories: 1) survey studies measuring
43 individual self-reported compliance, 2) experimental studies measuring behavioural intentions, and 3)
44 studies measuring objective data (e.g., GPS data reporting at an aggregate level). The present review
45 seeks to understand which variables influence individual-level compliance. For that reason, it only
46 covers studies that have individual-level measures of both past compliance behaviour itself and the
47 factors that influence it.

48 Self-reported data on compliance, generally, may suffer from social desirability bias (Krumpal,
49 2013), resulting in underestimations or even overestimations (Hessing et al., 1988) of rule-breaking
50 behaviour. However, previous research has shown that in the study of compliance with health related
51 policies, self-reports may reflect objective compliance when using surveys (Dieljens et al., 2013;
52 Garber et al., 2004; Ridgers et al., 2012). This finding has been corroborated in research in relation to
53 compliance with COVID-19 measures. A Danish study found no evidence for social desirability bias in
54 survey results of compliance with COVID-19 mitigation measures (Larsen et al., 2020). Moreover, a
55 study in the US found that self-report measures of social distancing accurately reflect actual behaviour,
56 both at the individual and group level (Gollwitzer et al., 2020).

57 The reviewed studies cover two forms of behaviour: social distancing (including physical
58 distancing and stay-at-home measures), and hygiene practices. Some studies focus on one specific
59 measure, whereas others examine a composite measure that includes both social distancing and hygiene
60 practices. Moreover, some studies measure a spectrum of behaviours using only single-item measures
61 (e.g., Wolff et al., 2020) whereas others focus on specific behaviours using multiple items regarding
62 this behaviour (e.g., Reinders Folmer et al., 2020). Our current review focuses on social distancing, and
63 only takes hygiene measures into account if they were part of a social distancing study. Therefore, this
64 review includes all studies that measure social distancing behaviour, either separately or combined with
65 hygiene practices. Studies also differ in whether they study adherence with policy advisories and
66 recommendations (e.g., Díaz & Cova, 2020) or legal compliance with binding rules (e.g., Kooistra et
67 al., 2020). To give the most exhaustive view, we include both studies that measure guideline adherence
68 and legal compliance with the COVID-19 mitigation measures.

69 The present paper aims to systematically review and summarize findings from available self-
70 report studies about compliance with COVID-19 mitigation measures, including both published and
71 unpublished studies. As the public health crisis required rapid and easily accessible research, many
72 scholars posted their findings as working papers, papers that have not yet been peer-reviewed and
73 published, in online repositories. These repositories aim to promote transparency and open-science, and
74 simultaneously can be used to identify and thereby mitigate publication bias (Mahood et al., 2014). A
75 limitation of this is that it means that most studies have not been peer reviewed, a process that normally
76 gives some indication of the quality of a study. Moreover, the databases for working papers often do
77 not have the same functionality as databases for publications to rapidly assemble all relevant literature,
78 which impedes the process of fully systematic literature searching. As such, the present study seeks to
79 use the systematic review method to the extent that this is possible under the conditions of analysing
80 preprints published in repositories with sub-optimal search and selection functionality.

81 This paper is organized as follows. First it discusses its search strategy amongst the different
82 databases. Next, it reviews the characteristics of the included studies and which variables they measure.
83 Finally, it reviews the findings separately per factor that might influence compliance.

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Methods

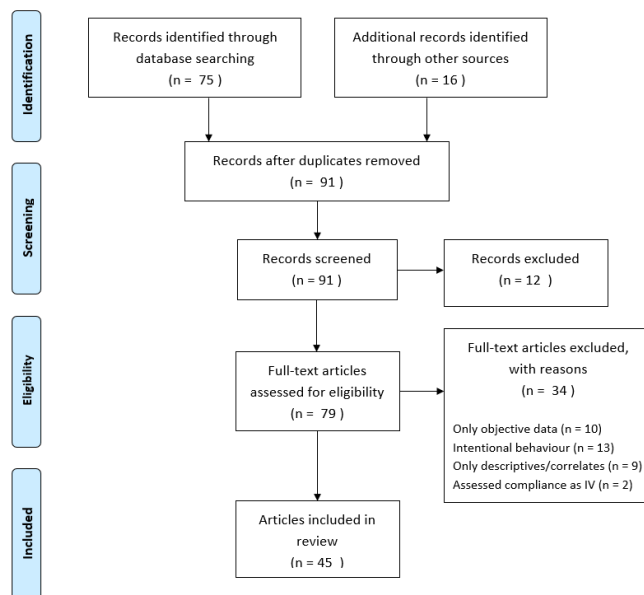
Search strategy

87 The present review includes studies conducted during the first wave of the COVID-19
88 pandemic, in the period that most countries first started to adopt social distancing measures. Therefore,
89 we conducted regular searches over the span of four months, from March 1st to June 30th, including all
90 studies that had been conducted up until then. Initial searches were conducted in Google Scholar and
91 the Lit COVID database of NCBI. Moreover, as most research had not been published, we searched the
92 most often cited repositories for working papers on this subject, PsyArXiv and SSRN. As the databases
93 for working papers could not accommodate a systematic search strategy, we conducted free searches
94 using different combinations of the keywords *compliance*, *adherence*, *COVID-19*, *coronavirus*,
95 *measures*, and *guidelines*. Other articles were found using newsfeeds and listservs or by screening
96 reference lists of included articles.

97 Our inclusion criteria were studies that report how 1) a number of independent variables, affect
 98 2) self-reported, individual-level, past compliance with COVID-19 social distancing measures. To be
 99 included, studies must present results from statistical analyses that can show how an independent
 100 variable predicts compliance (e.g., regression analysis). Our initial search yielded $N = 91$ studies, of
 101 which $N = 79$ studies measured compliance with COVID-19 social-distancing measures. Next, we
 102 excluded studies that 1) only report objective data on compliance (e.g., GPS or mobility data) at an
 103 aggregated level, 2) only report behavioural intentions, 3) only describe descriptive statistics or
 104 correlates of compliance, or 4) assessed compliance as an independent variable, rather than the main
 105 outcome variable of interest. $N = 45$ articles met our inclusion criteria (see Figure 1).

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Figure 1. PRISMA flow diagram



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110 Coding and inclusion of independent variables

111 As some articles reported results from multiple, independently conducted survey studies, this
 112 yielded $N = 64$ independent samples that could be coded. Included studies were coded on study
 113 characteristics (sample size and characteristics; country; date data collection) and how compliance was
 114 measured (N items; whether items represented physical distancing, social distancing, stay-at-home, or
 115 hygiene measures). Some studies reported results separately for multiple compliance outcomes (e.g.,

144 $M_{age} = 37.37$ (range 16.34 – 52.53) and $N = 37$ studies (66.1%) reported that more than 50.0% of their
145 sample was female (range 40.5 – 87.3%_{female}). Calculations are based on the studies that provided this
146 information (*Mean age: $N = 47$, Proportion female: $N = 56$*).

147 With regard to the dependent variable, $N = 37$ surveys (57.8%) measured compliance with a
148 composite variable that, next to social distancing, also included items measuring hygiene practices. The
149 remaining surveys ($N = 27$) only measured social distancing compliance. Concerning the independent
150 variables, institutional variables were most often included in the surveys (50 times), followed by
151 psychosocial variables (43 times) and incentives (34 times). Situational variables (11 times) were least
152 studied. Here it should be noted that the numbers can paint a slightly distorted picture, as there are more
153 variables that fall in the categories institutional and psychosocial variables (nine variables each), than
154 in incentives and situational variables (four variables each). Furthermore, on average, surveys reported
155 the effect on compliance for 4.45 independent variables (range 0 – 17; only counting independent
156 variables included in this review, that were measured in at least three surveys (see Supplementary Table
157 S2)). These numbers do not include the number of demographic variables measured.

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159 **Significant predictors of social distancing compliance**

160 Table 1 shows the variables that significantly predicted compliance, either positively or
161 negatively, in at least 50.0% of the surveys. We chose this threshold as results between studies differ
162 greatly, and this gives a concise image of the variables that significantly shape compliance according
163 to the majority of studies. An overview of results for all independent variables can be found in
164 Supplementary Table S2.

165 **Demographics.** Both age and gender are associated with compliance. Gender is the most
166 consistent predictor; where a significant result is found ($N = 18$ studies, 60.0%), women are more likely
167 to comply than men. For age, the study results are more mixed; most studies ($N = 17$, 54.8%) find that
168 older people are more likely to comply. $N = 3$ studies found a negative relationship with age, of these
169 three studies one study had a sample of adolescents (Oosterhoff & Palmer, 2020), and one study
170 observed a non-linear relationship, in which at first, age was positively related to compliance, but this
171 relationship levelled off around 40 to 44 years (Zickfeld et al., 2020).

172 **Incentives.** Perceived threat of COVID-19 was found to be a significant predictor of
173 compliance. The results are quite consistent, most studies ($N = 22$, 64.7%) found a positive relationship,
174 indicating that a greater perceived threat results in increased compliance. However, it should be noted
175 that there is also a substantial number of studies ($N = 12$) that did not find a significant relationship with
176 compliance. None of the other independent variables grouped under incentives was found to be
177 associated with compliance.

178 **Psychosocial variables.** For personality, amongst the Big 5 personality traits, $N = 6$ studies
179 (66.7%) found that conscientiousness could be positively linked to compliance. Other Big 5 personality
180 traits could not be consistently linked to compliance. Furthermore, impulsivity was significantly, and
181 negatively, linked to compliance in $N = 7$ studies (77.8%), which indicates that more impulsive people
182 are less likely to comply with social distancing measures. Negative emotions can also be linked to
183 compliance: for depression results are mixed, but most studies ($N = 3$, 60.0%) report a negative
184 relationship with compliance. Shame is negatively linked with compliance in all reports ($N = 3$), but it
185 should be noted that all these originate from the same article (Travaglio & Moon, 2020).

186 Self-efficacy was also consistently significantly related to compliance; people that score higher
187 on self-efficacy are more likely to comply with social distancing measures in $N = 7$ studies (87.5%).
188 Moral foundations were linked to compliance as well; specifically, the moral foundation “care” was
189 positively linked to compliance in two out of three studies. Other moral foundations were not significant
190 predictors. Furthermore, obligation to obey the law was linked to compliance. In $N = 4$ studies (66.7%)
191 it was found that people that were more rule oriented were more likely to comply with social distancing
192 measures. Lastly, having social norms that are more aligned with compliance, either by seeing others
193 comply (descriptive norms) or thinking other people believe you should comply (injunctive norms), is
194 related to increased compliance in $N = 8$ studies (66.7%).

Table 1. Variables that significantly predict compliance with social distancing measures.

IVs	Total Effect			
	Reported	Total +	Total -	Total NS
Demographics				
Age	31	17	3	11
Gender	30	18	0	12
Incentives				
Perceived threat virus	34	22	0	12
Psychosocial variables				
Impulsivity	9	0	7	2
Moral foundations	3	2	0	1
Negative emotions				
<i>Depression</i>	5	1	3	1
<i>Shame</i>	3	0	3	0
Obligation to obey the law				
<i>Rule orientation</i>	6	4	0	2
Personality				
<i>Conscientiousness</i>	9	6	0	3
Self-efficacy	8	7	0	1
Social norms	12	8	0	4
Institutional variables				
Attitudes towards the measure	16	12	0	4
Conspiracy theories				
<i>COVID</i>	12	0	11	1
Knowledge COVID	8	4	1	3
Situational variables				
Capacity	10	8	0	2
Opportunity	6	0	4	2

+ – positively related to compliance; - – negatively related to compliance; NS – nonsignificant.

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Institutional variables. Of the institutional variables, belief in COVID-19-related conspiracy theories is most consistently, and negatively linked to compliance ($N = 11$ studies, 91.7%). People that, for example, believe COVID-19 was created in a laboratory or is linked to the 5G network, are less likely to comply with the social distancing measures. Furthermore, more positive attitudes towards the mitigation measures are linked to better compliance in $N = 12$ studies, which comprises 75.0% of the studies that report this variable. Lastly, studies that reported on knowledge of COVID-19 find mixed results. 50.0% of studies ($N = 4$) found a positive relationship with compliance, indicating that people that have more knowledge or perceive to be better informed about COVID-19, are more likely to comply with the measures.

Situational variables. Capacity to obey and opportunity to break the rules are both consistently related to compliance. For capacity, the literature shows a positive relationship in 80.0% of the studies

208 ($N = 8$), indicating that people that have a better ability to follow the measures, are more likely to do
209 so. For opportunity, 66.7% of studies ($N = 4$) show a negative relationship, indicating that the more
210 opportunity people have to violate the measures, the more likely they will.

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Discussion

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This review of 45 articles (yielding 64 survey samples) examined which variables predicted compliance with social distancing measures during the first wave of the COVID-19 pandemic. In this body of work, next to demographic factors age and gender, 14 independent variables have been significantly linked to compliance across studies (Table 2).

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When examining which variables have been measured most often, this body of work shows the theoretical choices scholars make when designing their surveys. Most studies include variables that measure incentives, in particular perceived threat of the virus. This connects with rational choice theories that assume that people make cost-benefit analyses that guide their behavioural decisions (Becker, 1968; Cornish & Clarke, 2014; Posner, 1998). However, it is noteworthy that the deterrent effect of punishment, a core aspect of rational choice and a main theory of deviance in of its own (Apel, 2013; Bar-Gill & Harel, 2001; Becker, 1968; Casey & Scholz, 1991; Grasmick & Bursik, 1990; Kahan, 1997; Nagin, 2013; Schaub, 2004), featured in far less of the research reviewed, and only in studies conducted by one research group (i.e., van Rooij et al., 2020). Surveys also often focused on the institutional variable political orientation (which did not significantly predict compliance), responding to the highly politicized nature of the pandemic (e.g., Rothgerber et al., 2020). Also, many surveys included measures to capture the effect of support for authorities (nonsignificant) and attitudes towards the mitigation measures, analysing compliance as rooted in theories related to attitudes (Ajzen, 2005; Ajzen & Madden, 1986) and legitimacy (Tyler, 1990; Walters & Bolger, 2019). Notably, few studies incorporate situational theories, which are among the largest theories on deviance rule breaking in criminology (e.g., Birkbeck & LaFree, 1993; Clarke, 1995; Harland et al., 2007; Thaler & Sunstein, 2008) and behavioural ethics (Feldman, 2018).

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The reviewed studies provide clear insights into what factors play a role in COVID-19 compliance behaviour. First, of the incentives studied, only people's fear of the virus is a significant

236 predictor of compliance. People thus comply because they see a benefit in doing so: it keeps themselves,
237 friends and family and possibly society at large safe from the disease. For authorities, this means that
238 they should keep informing the public of the risk of the disease, and especially in between peaks when
239 fear of disease may reduce temporarily.

240 The second insight is that psychosocial factors play a role in compliance. Different people
241 respond differently to the measures. Impulsivity is a clear example here; people with less impulse
242 control are more likely to violate the measures. This is in line with the body of work about self-control
243 and deviant behaviour (Gottfredson & Hirschi, 1990; Grasmick et al., 1993; Wikström & Treiber, 2007).
244 The reviewed studies also show that the negative emotions of depression and shame negatively predict
245 compliance. The finding that people with feelings of depression are more likely to violate the rules
246 should be a warning for policymakers that they should not disregard mental health in their attempt at
247 preserving physical health. A recent study by Ettman et al. (2020) in a nationally representative U.S.
248 sample found that the prevalence of depressive symptoms was three times higher during the COVID-
249 19 pandemic, compared to before the pandemic. Whilst preserving mental health should in itself be a
250 goal, the present review thus also suggest it may benefit compliance. Moreover, it is particularly
251 important as depression is linked with reduced judgments of self-efficacy (Kavanagh, 1992), and high
252 self-efficacy is positively linked to compliance with the COVID-19 mitigation measures.

253 Authorities may also take advantage of social norms with regard to the measures, as people
254 who believe that others follow the rules, are more likely follow the rules themselves. Accordingly, they
255 may benefit from emphasizing the group of people that do follow the measures, as opposed to the group
256 that does not. Here policy makers can benefit from the massive body of academic work about how best
257 to enhance the effects of social norms (Nolan & Wallen, in press).

258 Third, institutional factors matter for compliance. People with positive attitudes towards the
259 measures - who believe the measures are effective in preventing the spread of the virus, or believe the
260 measure should be implemented - are less likely to violate them. Policymakers should therefore focus
261 on gaining, increasing, and maintaining support and acceptance for their interventions. The reviewed
262 studies also show that people who believe in COVID-19 related conspiracy theories are less likely to
263 comply with the mitigation measures. Moreover, people with better knowledge of COVID-19 comply

264 better. This shows the importance of addressing the development of echo chambers on social media that
265 play a vital role in misleading or incorrect news or stories explaining the news (Choi et al., 2020;
266 Quattrocioni, 2017).

267 Fourth, behavioural responses to the mitigation measures depend on the situation people are in.
268 People that have the practical capacity to control their behaviour and comply with the social-distancing
269 measures are also more likely to do so. Therefore, it is imperative that authorities increase people's
270 capacity to keep a safe distance, for instance by reshaping the physical environment, or by facilitating
271 working from home. Moreover, by reducing people's opportunities to violate the measures, the research
272 shows that compliance will likely increase. Measures doing so may include closing venues or borders.
273 This may simultaneously have the advantage of reducing the amount of times people have to
274 consciously decide to comply, especially benefitting more impulsive people, as impulsivity is linked to
275 noncompliance. The situational nature of compliance here shows that behavioural change is not merely
276 about changing intrinsic and extrinsic motivations, but also the preconditions people have before they
277 even get to make a choice in how to behave.

278 The review of the study is also noteworthy in that some key variables, that are either of major
279 importance theoretically or as practical interventions, were not found to be significant. Foremost, within
280 the category incentives, which consists of variables that are often cited as motivators for compliance,
281 only perceived threat of the virus is significantly linked to social distancing. Deterrence, for example,
282 in the form of both punishment severity and punishment certainty, is not linked to compliance in the
283 majority of studies. This indicates that fining people for not following the COVID-19 social distancing
284 measures, the major intervention for authorities to increase compliance, will most likely not result in
285 more compliance. Although this nonsignificant result is found across countries (Kooistra et al., 2020;
286 Kuiper et al., 2020; van Rooij et al., 2020) and over time (Reinders Folmer et al., 2020), all studies
287 reporting on deterrence are from the same research group using the same survey (van Rooij et al., 2020).
288 To rule out that this result is due to the specific items used in this survey, it would be desirable that
289 other research groups include a measure for deterrence in their surveys.

290 Furthermore, many scholars have focused on institutional variables such as political orientation.
291 Although the pandemic is highly politicized and many politicians have utilized it as an opportunity to

292 strike at their opponents, people's political orientation does not seem to influence compliance.
293 Moreover, another factor that seemed important to many scholars, support for authorities, also does not
294 predict compliance, whilst support for the measures themselves does. Therefore, it seems that, to
295 mitigate the virus, authorities should focus on increasing support for the measures amongst the general
296 population, and suspend their political agenda to increase support for themselves.

297 The review also points to future directions for social distancing research, as some variables
298 have received little attention in the reviewed literature, but may be of importance in reinforcing
299 compliance. Foremost, as mentioned earlier, few studies included situational variables, although these
300 are incorporated in some of the most important theories for crime causation (e.g., Birkbeck & LaFree,
301 1993; Clarke, 1995; Harland et al., 2007; Thaler & Sunstein, 2008). Studies that did include these
302 variables, such as capacity and opportunity, generally found them to be significant predictors of
303 compliance. Broader research into how people's personal situation affects compliance in a pandemic is
304 a vital source of information for decision-makers to be able to tailor interventions.

305 Another factor that may be of importance to investigate is uncertainty intolerance (Carleton et
306 al., 2016). One study found that people who had higher levels of intolerance of uncertainty, reported
307 stronger intentions of leaving their house (Farias & Pilati, 2020). The COVID-19 pandemic is
308 particularly uncertain in nature. Especially now, during the second wave of infections (October 2020),
309 it becomes clear that the course and duration of the pandemic, and therefore the duration of the necessary
310 measures of social distancing, cannot be predicted. Therefore, it seems desirable to further investigate
311 how uncertainty intolerance shapes compliance with social distancing, as policy-makers may be able to
312 respond to this accordingly.

313 The present review has several limitations. First, with regard to study quality; all included
314 studies have limitations in their sample, as participation is on a voluntary basis and self-selection bias
315 plays a large role here. This is corroborated by the dominance of female and more liberal/progressive
316 participants in most studies.

317 Moreover, it is well possible that there are between-study differences in the quality of the
318 calculated models. We decided not to focus on results from correlation analysis, as correlations can only
319 reflect the strength of an association between two variables, and we aimed to review which independent

320 variables predict social distancing compliance. However, including results from regression analyses has
321 its own limitation. Namely, some studies report singular, direct effects (e.g., simple regressions),
322 whereas others calculate large models that include multiple independent variables and covariates (e.g.,
323 multiple regression or structural equation modelling). Also, the studies that controlled for multiple
324 variables in their outcomes all included different variables and covariates in their models. This review
325 combined all outcomes and only reported on (non)significance, as our aim was to give the most
326 exhaustive view of all effects. By choosing to for example only assemble direct effects, we would have
327 had to exclude many studies that did not report this data. Because of this method, some variables show
328 mixed results, as variables that are significant in a simple regression or smaller model in one study, may
329 no longer be significant in another study that includes a larger model explaining more variance (e.g.,
330 with other variables that better predict compliance).

331 Third, there were limitations in the search strategy used. As most included studies had only
332 been published in the wide range of working paper repositories, we chose to routinely search the two
333 databases we most often encounter in the fields of behaviour and compliance, PsyArXiv and SSRN.
334 We acknowledge that this method is not exhaustive and it is well possible that there is additional grey
335 literature that has been missed, for example in other repositories. As grey literature is essential for
336 providing a comprehensive view of the available research (Mahood et al., 2014), and highly
337 recommended in protocols for systematic reviews (e.g., Cochrane Library; Lefebvre et al., 2019),
338 scholars would greatly benefit from repositories having the same functionality for searching and
339 extracting articles as search engines from existing databases for published research, such as PubMed or
340 Web of Science.

341 To conclude, this review may give vital insights into what factors affect compliance with
342 mitigation measures during the initial stages of a pandemic. These insights provide vital theoretical
343 lessons about crisis-induced behavioural change and compliance with policy measures. Practically,
344 the analysis of this body of work aids policymakers in modelling and deciding on measures to achieve
345 swift behavioural change in future outbreaks. It also shows clear directions for future research, as
346 studies were skewed towards attitudinal and institutional factors, and lacked sufficient focus on
347 understanding the influences of situational variables as well as the deterrent effects of law

348 enforcement. We therefore recommend researchers to conduct more comprehensive research into how
349 people's personal situation affects their behaviour in times of a pandemic.

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Author contributions

B.v.R. and E.B.K. contributed equally to conceptualization and study design. E.B.K. performed the literature search and screening, data extraction and coding. Both authors contributed to the interpretation of the findings and writing of the final manuscript.

Data availability statement

Data are available from the corresponding author upon request. Our review used data from studies of different authors. No original and individual-level data from these studies was used.

Competing interests

The authors declare no competing interests.

Literature†

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† Studies with an asterisk (*) are included in the review.

Supplementary materials.

Table S1. Study characteristics.

	Country	<i>N</i>	Mean age	% female	Date collected	DVs	<i>N</i> IVs	Type of IVs
Abdelrahman	QA	405	38.51	56.2	March 15 - April 24	PD,SD,SH	2	Incentives, psychosocial
Abu-Akel et al.	CH	705	34.35	77.7	March 22-27	PD	3	Incentives, psychosocial, institutional
Allington & Dhavan	UK	949	36.35	68.3	April 3-7	PD,SH,HM	2	Institutional
Allington et al.	UK	2250	45.47	51.3	April 1-3	PD,SD,SH,HM	2	Institutional
Allington et al. (2)	UK	2254	43.93	49.9	May 20-22	PD,SD,SH,HM	2	Institutional
Alper et al.	TR	1088	31.02	72.6	NR	PD,SD,SH,HM	5	Incentives, psychosocial, institutional
Blagov	US	502	41.00	49.0	March 20-23	PD,SD,SH	2	Psychosocial
Bogg & Milad	US	501	45.38	51.3	March 24-26	PD,SD,SH,HM	7	Incentives, psychosocial, institutional, situational
Brouard et al.	FR	1010	NR	NR	March 16-17	PD,SD,SH,HM	6	Incentives, psychosocial, institutional
Chan et al.	Global	113.083*	38.85	55.9	March 20 - April 16	SD,SH	1	Psychosocial
de Bruijn et al.	IL	411	40.36	52.1	April 7-9	PD,SD,SH	15	Incentives, psychosocial, institutional, situational
Diaz & Cova	US	228	39.47	42.5	March 20	PD,SH,HM	4	Incentives, psychosocial, institutional
Diaz & Cova (2)	US	273	46.57	50.2	March 30	PD,SH,HM	4	Incentives, psychosocial, institutional
Erceg et al.	HR	996	34.8	74.1	March 21-29	PD,SH,HM	6	Incentives, psychosocial, institutional
Fetzer et al.	Global	107.565	NR	NR	March 20 - April 5	PD,SD,SH,HM	2	Psychosocial, institutional
Han et al.	Global	23.733	NR	51.0	April 10 - May 11	SD,SH,HM	3	Institutional, situational
Harper et al.	UK (73%)	324	34.32	50.0	March 27-28	SD,SH,HM	4	Incentives, psychosocial, institutional
Imhoff & Lamberty	US	220	40.18	44.1	March 20-23	SD,SH,HM	2	Institutional
Imhoff & Lamberty (2)	US	288	36.60	40.6	March 25	SD,SH,HM	4	Incentives, psychosocial, institutional
Imhoff & Lamberty (3)	UK	298	37.29	57.7	March 25	SD,SH,HM	4	Incentives, psychosocial, institutional
Imhoff & Lamberty (4)	DE	299	50.06	52.2	NR	PD,SD,SH,HM	2	Institutional
Jorgensen et al.	Global	26.508	NR [†]	NR [†]	March 19 - April 3	PD,SD,HM	4	Incentives, psychosocial, institutional
Jorgensen et al. (2)	Global	11.429	NR [†]	NR [†]	March 13 - May 16	PD,SD,HM	1	Psychosocial
Kachanoff et al.	US	537	41.51	51.8	March 26	SD,SH,HM	1	Incentives
Kachanoff et al. (2)	US	259	41.51	52.9	March 27-28	SD,SH,HM	1	Incentives

DV – dependent variable; IV – independent variable; PD – physical distancing; SD – social distancing; SH – stay-at-home; HM – hygiene measures; NR – not reported; † – study performed a weighted regression based on age and/or gender proportion; ‡ – study reported median instead of mean; * – study only reported on relationship gender and compliance; ** – study used data collected by Fetzer et al. (2020), but analysed different variables.

Table S1. Study characteristics.

	Country	N	Mean age	% female	Date collected	DVs	N IVs	Type of IVs
Kooistra et al.	UK	555	46.22	51.0	April 6-8	PD	17	Incentives, psychosocial, institutional, situational
Kuiper et al.	NL	568	27.55	44.2	April 7-14	PD,SD,SH	17	Incentives, psychosocial, institutional, situational
Kushner Gadarian et al.	US	3.000	NR	NR	March 20-23	PD,SD,SH,HM	1	Institutional
Leary et al.	US	442	36.43	80.5	April 13 - May 3	PD,SD,HM	3	Incentives, institutional
Lee & You	KR	973	46.41	50.1	February 25-28	SD	3	Incentives, institutional
Lim et al.	CN	1089	29.9‡	54.1	February 10-15	SD,SH,HM	5	Psychosocial, institutional
Lim et al. (2)	SG	1529	42.00‡	66.6	February 6-11	SD,SH,HM	6	Psychosocial, institutional
Lim et al. (3)	SG	1269	44.00‡	57.4	February 6-18	SD,SH,HM	6	Psychosocial, institutional
Lim et al. (4)	IT	617	46.00‡	70.2	March 14-18	SD,SH,HM	6	Psychosocial, institutional
Marinthe et al.	FR	762	23.89	87.3	March 9	PD,SD	3	Incentives, institutional
Marinthe et al. (2)	FR	229	26.91	77.3	March 18-23	SH	2	Incentives, institutional
Muto et al.	JP	11342	NR	49.4	March 26-28	SD	1	Psychosocial
Nelson et al.	Global	2065	34.40	69.2	March 19 - April 10	SH	2	Incentives, psychosocial
O'Connell	US	131	36.30	40.5	April 8	PD	1	Psychosocial
Olcaysoy Okten et al.	US	770	30.70	57.4	April 8	PD,SD,SH,HM	0*	-
Oosterhof & Palmer	US	770	16.34	72.0	March 20-22	SD	2	Incentives, institutional
Oosterhof et al.	US	657	16.35	75.3	March 29-30	SD	3	Incentives, psychosocial
Pickup et al.	US	1009	NR	NR	March 31	PD,SD,HM	1	Institutional
Pickup et al. (2)	CA	9889	NR †	NR †	March 20 - April 7	PD,SD,HM	1	Institutional
Plohl & Musil	Global	525	32.53	49.3	NR	PD,SD,SH,HM	5	Incentives, psychosocial, institutional
Pummerer et al.	DK	425	52.53	50.8	March 30 - April 5	PD	1	Institutional
Pummerer et al. (2)	DK	134	24.18	83.6	NR	PD,SD	1	Institutional
Raude et al.	FR	2000	49.00‡	52.0	March 23-25	PD,SD,SH,HM	8	Incentives, psychosocial, institutional, situational
Raude et al (2)	FR	2003	49.00‡	52.0	March 30 - April 1	PD,SD,SH,HM	8	Incentives, psychosocial, institutional, situational
Reinders Folmer et al.	NL	984	45.10	56.9	May 8-14	PD	17	Incentives, psychosocial, institutional, situational
Reinders Folmer et al. (2)	NL	1021	43.93	58.7	May 22-26	PD	17	Incentives, psychosocial, institutional, situational
Rothgerber et al.	US	573	39.43	41.0	April 1	PD,SD	7	Incentives, psychosocial, institutional

DV – dependent variable; IV – independent variable; PD – physical distancing; SD – social distancing; SH – stay-at-home; HM – hygiene measures; NR – not reported; † – study performed a weighted regression based on age and/or gender proportion; ‡ – study reported median instead of mean; * – study only reported on relationship gender and compliance; ** – study used data collected by Fetzer et al. (2020), but analysed different variables.

Table S1. Study characteristics.

	Country	N	Mean age	% female	Date collected	DVs	N IVs	Type of IVs
Rothgerber et al. (2)	US	580	39.12	46.6	April 4	PD,SD	7	Incentives, psychosocial, institutional
Swami & Barron	UK	520	45.85	48.7	April 9-10	PD,SD,SH,HM	2	Psychosocial, institutional
Teovanovic et al.	RS	407	34.88	76.9	April 10-22	PD,SD,SH,HM	2	Institutional
Travaglino & Moon	US	597	39.35	48.7	April	PD,SD,SH,HM	3	Psychosocial, institutional
Travaglino & Moon (2)	IT	606	26.94	48.5	April	PD,SD,SH,HM	3	Psychosocial, institutional
Travaglino & Moon (3)	KR	693	44.46	49.9	April	PD,SD,SH,HM	3	Psychosocial, institutional
van Rooij et al.	US	570	34.46	51.6	April 3	PD,SD,SH	16	Incentives, psychosocial, institutional, situational
Wise et al.	US	1591	30 [†]	NR	March 11-16	SH	2	Incentives
Wolff et al.	US	895	38.1	41.4	April 9-10	SD	3	Psychosocial, situational
Xie et al.	US	397	39.08	49.9	March 13-26	SD	1	Psychosocial
Xie et al. (2)	US	453	37.51	46.8	March 13-26	SD	3	Psychosocial, institutional
Zickfeld et al.	NO	8676	35-39 [‡]	72.5	March 12-26	PD,SD,SH	7	Incentives, psychosocial, institutional

DV – dependent variable; IV – independent variable; PD – physical distancing; SD – social distancing; SH – stay-at-home; HM – hygiene measures; NR – not reported; † – study performed a weighted regression based on age and/or gender proportion; ‡ – study reported median instead of mean; * – study only reported on relationship gender and compliance; ‡ – study used data collected by Fetzer et al. (2020), but analysed different variables.

Table S2. Overview independent variables.[^]

	Total N surveys	N Effect Reported	Total +	Total -	Total NS
Demographics					
<u>Age</u>	60	31	17	3	11
<u>Gender</u>	59	30	18	0	12
Income	20	9	2	1	6
Education	45	22	4	2	16
Employment	15	8	1	2	5
N Household	10	7	1	0	6
Children	11	9	2	1	6
Health self	18	11	0	0	11
Health others	13	6	0	0	6
Religion	8	4	0	1	3
Socio-economic status	9	9	0	1	8
Incentives					
Chance of infection	10	8	2	2	4
Costs of compliance	9	7	1	0	6
Deterrence	6	6	1	0	5
<u>Perceived threat virus</u>	43	34	22	0	12
Psychosocial variables					
Cognitive reflection	3	3	1	0	2
Collectivism	3	3	0	0	3
<u>Impulsivity</u>	9	9	0	7	2
<u>Moral foundations</u>	3	3	2	0	1
Negative emotions					
<i>Anxiety</i>	17	14	5	0	9
<u>Depression</u>	6	5	1	3	1
<i>Composite</i>	6	6	1	0	5
<u>Shame</u>	3	3	0	3	0
Obligation to obey the law					
<u>Rule orientation</u>	6	6	4	0	2
<i>Non-normative obligation to obey the law</i>	6	6	0	1	5
Personality					
<i>Openness</i>	11	9	1	0	8
<u>Conscientiousness</u>	11	9	6	0	3
<i>Extraversion</i>	11	9	0	4	5
<i>Agreeableness</i>	11	9	4	0	5
<i>Neuroticism</i>	11	9	0	1	8
<u>Self-efficacy</u>	8	8	7	0	1
<u>Social norms</u>	12	12	8	0	4
Institutional variables					
<u>Attitudes towards the measures</u>	21	16	12	0	4
Conspiracy theories					
<u>COVID-19</u>	13	12	0	11	1
<i>General</i>	7	7	2	1	4
<u>Knowledge COVID-19</u>	13	8	4	1	3

[^] – Underlined variables are discussed in paper; + – positively related to compliance; - – negatively related to compliance; NS – nonsignificant.

Table S2. Overview independent variables.[^]

	Total N surveys	N Effect Reported	Total +	Total -	Total NS
Political orientation	30	22	2	6	14
Procedural justice	6	6	0	0	6
Social media use	11	3	0	1	2
Support for authorities	22	19	5	3	11
Trust in media					
<i>Social media</i>	5	4	1	0	3
<i>Traditional media</i>	12	12	4	0	8
Trust in science	11	11	2	0	9
Situational variables					
<u>Capacity</u>	10	10	8	0	2
Clarity measures	6	6	2	0	4
Knowledge measures	4	4	1	0	3
<u>Opportunity</u>	6	6	0	4	2

[^] – Underlined variables are discussed in paper; + – positively related to compliance; - – negatively related to compliance; NS – nonsignificant.

Note Table 2 - Overview independent variables

Demographics. Included variables are age, gender, income, education, employment, number of people in the household, number of children, personal health, health of close friends/family, religion, and socioeconomic status.

Incentives. Represents variables relating to the costs and benefits of compliance. Included variables are perceived chance of getting infected with the virus, costs of compliance (financial strain (e.g., job loss) resulting from the measures specifically), deterrence (including severity and certainty of punishment), and perceived threat (including items that measure people’s fear of the virus, and perception of severity or threat of the virus towards both themselves and others).

Psychosocial variables. Represents variables that measure the psychological characteristics and social processes that may influence individual’s mental states. The psychosocial variables that are included are collectivism, cognitive reflection (analytical thinking), impulsivity (including disinhibition and low self-control), moral foundations, negative emotions (separately reporting anxiety, depression, shame, and composite measures), rule orientation (normative obligation to obey the law), non-normative obligation to obey the law, personality (Big 5), self-efficacy, and social norms (both descriptive and injunctive).

Institutional variables. Category represents all variables related to institutions, such as the (news)media, government or scientists. These variables include attitudes towards the measures (including items measuring perceived efficacy of the measures, and whether people believe the measures should be implemented and followed), belief in conspiracy theories (both COVID related and general), knowledge about COVID, political orientation, perceived procedural justice, support for authorities (including trust in the authorities), media use (e.g., social vs. broadcast media), trust in the media, and trust in science.

Situational variables. Represent variables that measure the personal situation people are in. Variables include capacity (including items that measure the ability to comply with the COVID-19 measures and the perceived control over one's behaviour regarding the measures), the perceived clarity of the measures, the knowledge about the measures, and the opportunity to violate the measures.