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How the COVID-19 pandemic divides society: Towards a better understanding of differences between supporters and opponents of the COVID-19 pandemic lockdown in Germany

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ARTICLE INFO

Keywords:

COVID-19
Coronavirus
Lockdown
Mental health
Corona lockdown opponents

ABSTRACT

Implemented COVID-19 containment measures have been fiercely discussed in Germany and corona-related protests have emerged. We assessed mental health in response to the lockdown in Germany and aimed at detecting factors differentiating opponents and supporters of the COVID-19 containment measures. Using a cross-sectional online survey ($n = 1219$) with a mixed-methods approach, we found increased levels of anxiety and depressive symptoms (PHQ-4 and GAD-7), overall lower well-being (WHO-5), worsened sleep, increased prevalence of interpersonal violence (5.2%) as well as more pronounced irritability including anger and aggression compared to pre-COVID-19 times for all participants. Moreover, opponents demonstrated a more pronounced mental burden with more depression and anxiety, more anger and coping difficulties compared to supporters. In line with previous research, we found opponents to be well-educated, financially stable and strongly estranged by their political institutions. Additionally, applying regression analysis, we found anxiety and negative self-concept to differentiate between opponents and supporters of the COVID-19 pandemic lockdown. Qualitative data confirms an increase in mental burden. Taken together, we identify a more vulnerable group opposing COVID-19 containment measures. Our results inform the public about opponents' motives, concerns and needs and open another perspective on the effects of the COVID-19 pandemic and its related containment measures.

1. Introduction

The highly contagious corona virus SARS-CoV-2 (COVID-19), that was first reported in Wuhan, China, in early December 2019, has been spreading all over the world. Respiratory distress, fever, coughing and fatigue constitute the diseases' main symptoms. By now, due to severe courses, COVID-19 has led to many deaths. As of July 4, 2022, 549.184.038 cases of COVID-19 and 6.339.118 COVID-19 related deaths have been confirmed globally (data for Germany: 28.394.995 cases of COVID-19 and 141.295 COVID-19 related deaths) (Johns Hopkins University). Countries worldwide are trying to fight the pandemic with measures like enhanced hygiene concepts, wearing of a protective mask, social distancing and temporary lockdown in order to prevent health care systems from collapsing. Many countries increase their capacity to act and to respond quickly to the case development by decreasing deliberation and legitimation.

In response to the initially implemented COVID-19 containment measures in 2020 and throughout the year, the governments' line of action concerning the pandemic was fiercely discussed and corona-related protests emerged in Germany. They intensified with reinforcement of current measures and attracted critical comments by politics and the media (Grande et al., 2021). To date, there are very few studies concerned with these protest movements. Nachtwey et al. (2020) conducted one of the first surveys describing the opponents of COVID-19 containment measures. They found the group to be highly heterogeneous in terms of political views, values, gender and age. Moreover, they found the opponents to consist of educated middle class people, who felt strongly estranged by their political institutions. They seemed to have lost their trust in their government and were prone to conspiracy theories and hostility towards science. Grande et al. (2021) provided similar results: heterogeneous, from the political center, mistrust towards the government and proneness to conspiracy theories. They also

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<https://doi.org/10.1016/j.jpsychires.2022.09.001>

Received 8 February 2022; Received in revised form 31 August 2022; Accepted 1 September 2022

Available online 7 September 2022

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found opponents to strongly fear for their freedom. Equally in line with these results, [Koos \(2021\)](#) reported the findings from a study conducted with protesters. They found them to be highly educated people who had lost trust in their government and who were convinced that democracy was currently malfunctioning.

In November 2020, we reported effects of the corona virus pandemic and the containment measures on mental health and interpersonal violence (IPV) ([Jung et al., 2020](#)). Results indicated a substantial mental burden with lower well-being (including decreased sexual contentment, less healthy diet and worsened sleep) and increased levels of anxiety, depressive symptoms, irritability (anger/aggression), psychosocial distress and IPV. Moreover, pre-existing mental conditions were identified as a potential risk factor for severity of emotional distress.

The finding of a substantial mental burden gives reason to believe that not only personal values and beliefs lead to a rejection of and protest against COVID-19 containment measures, but that individual strain stemming from instated measures might be an additional reason for the opposition to COVID-19 containment measures. In order to test our hypotheses, we developed the presented survey in order to extend the current view on the opponents of COVID-19 containment measures by a psychological perspective. We agree that a deeper understanding of those opposed will be more valuable than rash pathologising ([Nachtwey et al., 2020](#)). Hence, we aimed at systematically assessing the differences between supporters and opponents of the COVID-19 containment measures in Germany and thereby contributing to a better understanding of current opposition to COVID-19 containment measures. In October 2020, the German government once again announced temporary lockdown measures due to rapidly increasing cases of COVID-19. From November 2020 to April 2021, lockdown and containment measures were continuously being reinforced as none of the previous measures had a sufficient impact on case numbers. Since in the past, opposition has grown to the same effect that COVID-19 containment measures had been put into effect ([Grande et al., 2021](#)), data presented here covers the time period from January 29th to February 21st 2021, a time of ongoing restrictions.

We assume to be able to replicate initial results and to find opponents to be a heterogeneous group of mainly well-educated middle-aged subjects who are dissatisfied with the current state of democracy (higher scores for *deflation of democracy* for opponents). We suppose that rejection of and disappointment with the current political state might lead to opposition against a government's action – in this case the instatement of containment measures. In addition to that, we presume to find further differences between opponents and supporters of the COVID-19 containment measures. We expect opponents to show less well-being (lower *WHO-5* score) and to exhibit a stronger mental burden with more depression, anxiety and anger (higher *PHQ-4* score and higher *GAD-7* score). We believe that opposing against a perceived imposition and rejecting measures that cause us distress constitute a reasonable and natural human behavior. Moreover, we hypothesize opponents to display a more negative perception of themselves and others (higher *negative self and others*, lower *positive self and others* score in *BCSS*). We chose to include the evaluation of oneself and others as it constitutes a basic human mechanism for the perception of and adaption to the social world and helps us form emotional responses ([Fowler et al., 2006](#); [Gilbert, 1992](#); [Brown et al., 1995](#)). These evaluations are formed by current mood as well as previous experience ([Gilbert, 1992](#); [Beck, 1976](#); [Teasdale and Barnard, 1995](#)) and deliver an explanation for the way emotional reactions are developed. The way we perceive ourselves and others has an influence on the way we perceive and evaluate the world around us. A negative evaluation of ourselves and others leads to pronounced feelings of insufficient resources (coping abilities) and an anticipation of an absence of goodwill in others. We believe that such a mindset might lead to a stronger opposition against the COVID-19 containment measures as it might reflect feelings of helplessness and fear of threat. We also think that opponents and supporters might differ in classic personality traits (differences in *BFI-10* scores). The idea of

personality traits was academically developed in the 1980s and today, five broad dimensions of personality – also known as the OCEAN-model – have been identified and replicated multiple times: openness to experience, conscientiousness, extraversion, agreeableness and neuroticism ([Goldberg, 1993](#); [John et al., 2008](#)). Given that personality traits seem to influence our values and attitudes ([Fetvadjev and He, 2019](#)), we think it is conceivable that opponents and supporters of the COVID-19 containment measures show different OCEAN manifestations. In that respect, our hypotheses are non-directional (exploratory). As previous studies found that opponents show a proneness to conspiracy theories ([Grande et al., 2021](#); [Nachtwey et al., 2020](#)), we believe that opponents demonstrate differences in probabilistic reasoning (less information taken into account in an experimental *beads task*), revealing a “jumping to conclusions” reasoning style that has been associated with paranoid thinking ([Fowler et al., 2006](#)).

2. Material and methods

As the population was still advised to stay at home, we agreed upon conducting an online survey. Since we aimed at including a large number of opponents instead of investigating a representative sample, we deliberately accepted the limitations previously discussed at great length ([Jung et al., 2020](#)), most importantly on the matter of limited representativeness. The test battery mainly included the following quantitative measurements: the Patient Health Questionnaire-4 (*PHQ-4*), the WHO-5 Well-being Index (*WHO-5*), the General Anxiety Disorder 7 (*GAD-7*), the Big Five Inventory-10 (*BFI-10*), the Brief Core Schema Scale (*BCSS*) and the questionnaire for “deflation of democracy”.

Moreover, we asked participants to indicate changes to pre-lockdown times (feelings of aggression, sleep quality and experience of violence) using comparative questions on 3-point and 5-point Likert scales. Additionally, we asked participants about religious confession and satisfaction with education and child care. We also included five open-ended questions concerning involvement with opposing formations, personal opinion on current lockdown measures, comments on childrens' current situation, current mental occupation and their individual needs. We presented the comparative questions previously used and adopted the same multi-step procedure as described previously ([Jung et al., 2020](#)) for the development of additional questions.

2.1. Patient Health Questionnaire-4 (*PHQ-4*)

The *PHQ-4* briefly measures anxiety and depression. It consists of the first two items of the Generalized Anxiety Disorder-7 scale (*GAD-7*) and the Patient Health Questionnaire-8 (*PHQ-8*) and shows good reliability ([Kroenke et al., 2009](#)).

2.2. WHO-5 well-being index (*WHO-5*)

The *WHO-5* is a five-item scale measuring current mental well-being while referencing the previous two weeks. It shows high clinimetric validity ([Topp et al., 2015](#)).

2.3. General Anxiety Disorder 7 (*GAD-7*)

The *GAD-7* is part of the Patient Health Questionnaire (*PHQ*) and screens for anxiety disorders while referencing the previous two weeks. It shows excellent clinimetric validity and reliability ([Löwe et al., 2008](#)).

2.4. Big Five Inventory-10 (*BFI-10*)

The *BFI-10* is a short personality inventory based on the theoretical framework of the OCEAN model (also known as the Big Five personality traits), including openness, conscientiousness, extraversion, agreeableness and neuroticism. It allows for a rough assessment of personality

structure and exhibits good psychometric properties (Rammstedt et al., 2014).

2.5. Brief Core Schema Scale (BCSS)

The BCSS is a scale assessing four dimensions of individual perception of self and others: negative-self, positive-self, negative-other and positive-other. It is less affected by current mood than other measures connected to self-esteem and it shows good psychometric properties (Fowler et al., 2006).

2.6. Deflation of democracy scale

The deflation of democracy scale is a sociological measurement assessing subjective attitude towards development of democracy on a 5-point Likert scale. It comprises six dimensions: reduction of democracy, erosion of democracy, violation of democracy by elites, neglect of democracy, disbelief in democracy and increase of democracy (Heitmeyer, 2001). The reliability found in this sample was very high ($\alpha = 0,87$), thus reinforcing use of the scale.

2.7. Probabilistic reasoning task/jumping to conclusions

The probabilistic reasoning task (Garety et al., 1991) is used to assess an individuals' data-gathering reasoning style. Participants are presented with two jars including beads of two different colors (in our case orange and black beads) in the ratio 85:15. Participants are then asked to draw as many beads as they would like before deciding which container the beads were being drawn of. The outcome variable is the number of "Draws to Decision" (Huq et al., 1988). With two or less viewed beads, the participants' data-gathering reasoning style is defined as hasty decision making, or "jumping to conclusions" (Freeman et al., 2006; Moritz et al., 2007) that has been found to be present in individuals with delusion, paranoia and schizophrenia (Moritz and Woodward, 2005).

Groups "opponents" and "supporters" were generated by pooling those who agreed or strongly agreed with the measures currently adopted in order to contain the corona virus and those who disagreed or strongly disagreed according to their response. We chose an artificial dichotomization (extreme group approach; EGA) for several reasons: First of all, EGA seemed reasonable since our research question was binary. Also, we dismissed a statistical analysis treating the item as a continuous variable due to different sample sizes and very small sample sizes for the group strongly opposing to the measures ($N = 32$) (Bland and Altman, 2009). Moreover, by deciding against comparing groups with highly different group sizes, we were aiming at avoiding potential confounding (Maxwell and Delaney, 2003). We were aware of the cost of dichotomization and accepted the concomitant loss of variance, reduction in statistical power and influence on effect sizes (Cohen, 1983; Preacher et al., 2005) as potential limitations to our approach. Participants who were indecisive ("neither nor" or "I cannot tell"; $N = 111$) were excluded from further analysis. The excluded group did not differ from the remaining sample in terms of demographics (mean age ($M = 44.25$, $SD = 12.97$), sex (75.7% female, 23.4% male) and education (69.4% AVCE, mean educational years $M = 16.02$, $SD = 3.85$)).

Recruitment strategies included spreading through mailing lists, the Hannover Medical Schools' website, social media (Instagram, Facebook) and classic media (print, daily newspapers). We invited everyone from 18 years up to participate. There were no further inclusion and exclusion criteria as we sought out to reach as many citizens as possible. We deliberately dismissed recruitment at public demonstrations by opponents for several reasons. For one, we decided to avoid a sample bias but also in order to prevent assaults, that previously had been reported at these events.

2.8. Statistical analysis

Using SPSS Statistics 26 (IBM® Corporation, Amonk, NY, USA), data was analyzed and tested for normal distribution and non-violence of assumptions where applicable prior to further analysis. We mainly report group comparisons (using non-parametric testing with Bonferroni-Holm adjustment), frequencies (in percent), means + standard deviations as well as results from regression analysis.

2.9. Regression analysis

In order to examine variables differentiating between opponents and supporters of the COVID-19 containment measures, we conducted binary logistic regression analysis with opposition and support as the dichotomous dependent variable. Logistic regression is a commonly used method for modeling binary outcomes. Independent variables were selected mainly on the basis of the existence of group differences rather than theoretical assumptions, as the examined phenomenon presented itself as highly recent and very little theoretical assumptions existed. The number of independent variables included in the analyses was based on the recommendation by Agresti (2007), in order to ensure sufficient power. Variables which did not account for sufficient between-group variance were excluded from the regression models stepwise, in an iteration-driven analysis. This procedure led to multiple models, which were compared against each other in a next evaluative step, until the model with the best values for fit, classification rate and explained variance was found.

2.10. Analysis of qualitative data

Qualitative data was analyzed in accordance with qualitative content analysis (Mayring, 2010). This research method is used for the interpretation of text data content through systematic classification of coding and pattern identification. First, raw data was sighted, then filler words (e.g. and, the, in ...) were excluded from further analysis. After data cleansing was completed, we applied the summary method. It aims at reducing the material in a way that essential content is retained. We build a corpus that represents the raw material and clustered keywords into contentual theme blocks using abstraction. Using inductive coding, categories were derived from raw data.

The survey was approved by the local ethics committee at Hannover Medical School, Germany and subjects' informed consent was obtained prior to participation.

3. Results

Results will be reported separately for opponents, supporters and the total sample.

Demographics A total of 1219 volunteers took part in this cross-sectional survey. $N = 195$ (16.0%) were categorized as opponents, $N = 897$ (73.6%) as supporters, and $N = 127$ (10.4%) were indecisive. The item used to categorize participants was: "What do you make of the measures currently taken in order to contain the COVID-19 pandemic?" Response options ranged from "absolutely pointless and unreasonable" to "absolutely useful and reasonable" on a 5-point-Likert-scale. An additional response option was "I cannot judge". Participants that were indecisive or felt unable to judge were excluded from subsequent analysis.

Mean age was 44.31 years ($SD = 12.98$) for the total sample, 42.33 years ($SD = 11.96$) for opponents and 44.65 years ($SD = 13.28$) for supporters. Gender was distributed unequally for the total sample (79.2% female, 20.0% male) as well as for opponents (72.3% female, 27.2% male) and supporters (81.6% female, 17.8% male). Mean educational years was $M = 16.38$ ($SD = 4.30$) for the total sample, $M = 15.72$ ($SD = 4.68$) for opponents and $M = 16.57$ ($SD = 4.25$) for supporters. Mean living space in square meters was $M = 106.50$ ($SD =$

72.16) for the total sample, $M = 111.43$ ($SD = 97.48$) for opponents and $M = 106.18$ ($SD = 68.73$) for supporters. Mean duration for completion of the survey was at $M = 1301,23$ s (21,7 min) ($SD = 727,29$; 12,1 min). For further demographics see Table 1a, for further variables of interest see Table 1b.

Mental health Depression and anxiety as assessed by PHQ-4 was at $M = 4.19$ ($SD = 3.27$) for the total sample, $M = 6.16$ ($SD = 3.51$) for opponents and at $M = 3.67$ ($SD = 3.01$) for supporters, thus opponents showed a significantly higher manifestation of depression and anxiety ($U = 49822$, $p < .001$). The effect, however, is rather small with $r = 0.28$. Reference samples show PHQ-4 mean scores of $M = 1.51$ ($SD = 2.04$) (Kroenke et al., 2007). The mean well-being score (WHO-5) was at $M = 41.44$ ($SD = 22.78$) for the total sample, $M = 30.88$ ($SD = 20.88$) for

Table 1a
Demographics.

Variable	Total Sample (in %)	Opponents (in %)	Supporters (in %)
Relationship status			
Single	27.4	28.2	27.4
Widowed	1.7	1.0	1.7
In a partnership	26.1	27.7	25.3
Married	44.1	43.1	44.9
Number of people in household			
1	27.5	27.7	27.2
2	36.3	28.7	38.1
3	16.3	20.0	15.6
4	14.5	17.9	13.7
5	3.4	3.1	3.7
6 or more	1.3	0.5	1.6
Number of children in household			
None	66.7	59.0	67.8
1	14.7	16.9	14.7
2	13.6	19.5	12.4
3	3.6	2.6	4.0
4 or more	0.6	0.5	0.7
Household income			
<1300€	7.9	6.2	7.8
1300-1700€	8.9	8.2	8.8
1700-2600€	23.1	25.6	23.0
2500-3600€	19.4	16.9	19.8
3600-5000€	23.2	27.7	23.9
5000-8000€	12.6	9.2	12.8
Form of housing			
Alone	27.7	29.7	27.4
With partner/family	65.5	67.2	65.8
With parents	1.6	1.0	1.8
Flat share	3.0	1.0	3.3
Residential home	0.4	—/—	0.1
Working condition			
Full-time	45.9	51.8	45.6
Part-time	26.6	23.6	27.8
Self-employed	4.7	9.2	3.7
Unemployed	4.5	4.1	4.2
Short-time	1.7	2.1	1.6
Mini-job	1.4	0.5	1.4
Pensioned	10.1	6.2	10.5
Studying	3.2	2.1	3.3
School qualification			
Without	0.2	—/—	0.2
Secondary modern school	2.9	3.6	2.7
Middle school	20.7	23.1	19.7
High school/AVCE	75.4	73.3	77.0
Academic qualification			
Apprenticeship	33.9	40.0	32.8
Proficient	1.9	2.6	2.0
College	17.9	22.6	16.9
BA	9.2	10.8	9.0
MA/diploma	26.2	16.4	28.5
Doctorate/habilitation	5.0	5.6	5.0
Still in training	2.8	—/—	3.2
Without	2.2	1.5	1.9

Notes. Total Sample $N = 1219$, Opponents $N = 195$, Supporters $N = 897$. Log-linear modelling was illegitimate due to violation of assumptions.

Table 1b
Further variables of interest.

Variable	Total Sample (in %)	Opponents (in %)	Supporters (in %)	Statistics
Perceived financial security				
Indicated	79.4	68.7	83.1	$\chi^2(1) = 17.17$, $p = .00$
Pre-existing physical disease				
Indicated	32.5	30.8	33.7	<i>n.s.</i>
Pre-existing mental disease				
Indicated	17.1	24.1	15.6	$\chi^2(1) = 8.46$, $p = .00$
Worsened sleep				
Indicated	28.6	37.9	25.5	$\chi^2(1) = 12.32$, $p = .00$

Notes. Total Sample $N = 1219$, Opponents $N = 195$, Supporters $N = 897$. Statistics refer to differences between opponents and supporters.

opponents and at $M = 44.68$ ($SD = 22.30$) for supporters (range 0–100). Opponents demonstrate significantly less well-being than supporters ($U = 54724.5$, $p < .001$), with a small effect size of $r = 0.24$. Healthy individuals usually score at $M = 75.00$ and subjects with major depression score at $M = 37.50$ (Wellbeing Measures in Primary Health Care, 1998). Anxiety as assessed by GAD-7 was at $M = 7.32$ ($SD = 5.22$) for the total sample, $M = 10.16$ ($SD = 5.64$) for opponents and at $M = 6.62$ ($SD = 4.88$) for supporters. Again, opponents showed significantly higher anxiety values with $U = 536885.5$, $p < .001$ and a small effect size of $r = 0.24$. Reference samples show mean scores of $M = 2.95$ ($SD = 3.41$) (Löwe et al., 2008). Also see Fig. 1.

Personality Results for the Big Five Inventory (BFI-10) are displayed in Table 2, Table 3 contains the results for the Brief Core Schema Scale (BCSS).

Reference values for BFI-10 are $M = 3.47$ ($SD = 0.95$) for extraversion, $M = 2.42$ ($SD = 0.88$) for neuroticism, $M = 3.41$ ($SD = 0.93$) for openness, $M = 4.15$ ($SD = 0.79$) for conscientiousness and $M = 3.45$ ($SD = 0.80$) for agreeableness (Rammstedt et al., 2014), thus opponents as well as supporters are slightly less extravert, slightly more neurotic, slightly more open, slightly less conscientious and slightly less agreeable than the reference. Moreover, opponents demonstrate significantly smaller values for agreeableness ($U = 72706.5$, $p < .001$), although the effect size is very small ($r = 0.11$).

Reference values for BCSS are $M = 3.5$ ($SD = 3.5$) for negative-self, $M = 10.2$ ($SD = 4.2$) for positive-self, $M = 4.0$ ($SD = 4.0$) for negative-other and $M = 10.4$ ($SD = 4.5$) for positive-other (Fowler et al., 2006). Thus, opponents display a stronger negative-self and opponents as well as supporters display a stronger positive-self, a stronger negative-other and a stronger positive-other than the reference. Furthermore, opponents show significantly higher values for negative-other ($U = 59734$, $p < .01$, $r = 0.017$) and significantly lower values for positive-other ($U = 61114.5$, $p < .01$, $r = 0.018$) than supporters. These effects, however, are small. Initially detected differences for negative-self and positive-self missed the significance-level after Bonferroni-Holm correction.

Coping Opponents and supporters of the current COVID-19 containment measures also differed with respect to coping ($U = 44342$, $p = .00$, $r = 0.34$), with opponents experiencing more difficulties. While 70.8% of opponents indicated coping badly or very badly with the current situation, only 29.6% of supporters felt they were coping badly or very badly. Moreover, opponents experienced themselves to be more irritable and angry/aggressive compared to pre-corona times ($U = 55158$, $p = .00$, $r = 0.26$ and $U = 52143.5$, $p = .00$, $r = 0.30$, resp.) than supporters. While 87.2% of opponents experienced more or way more irritability, only 61.2% of supporters experienced more or way more irritability. Regarding anger, 66.2% of opponents but only 34% of supporters experienced more or way more anger/aggression compared to pre-corona times. Furthermore, opponents indicated more pronounced worsened sleep compared to pre-corona times than did

Anxiety (GAD-7)

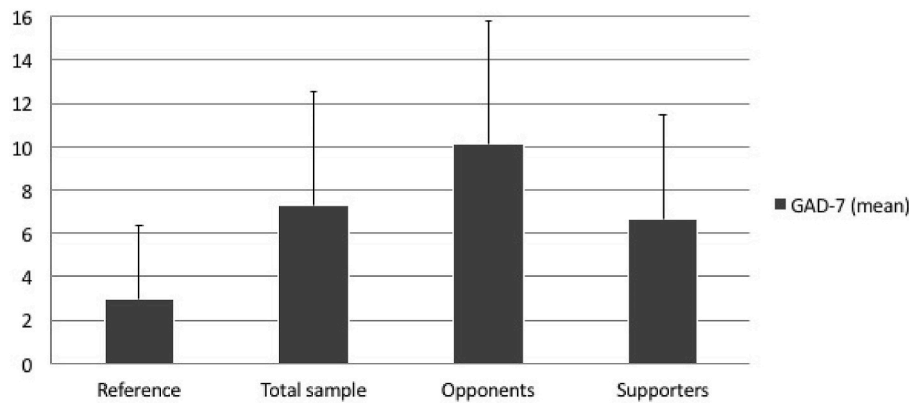


Fig. 1. Anxiety (GAD-7): Means and standard deviation of GAD-7 score for anxiety for total sample, opponents, supporters and reference.

Table 2
Big Five Inventory (BFI-10) results.

Variable	Total Sample		Opponents		Supporters		Test statistics <i>Opponents vs. supporters</i>
	M	SD	M	SD	M	SD	
Extraversion	3.33	0.99	3.36	0.97	3.35	1.00	n.s.
Neuroticism	3.01	0.95	3.09	0.94	2.99	0.97	n.s.
Openness	3.63	0.93	3.51	0.95	3.67	0.93	n.s.
Conscientiousness	3.82	0.77	3.91	0.73	3.81	0.79	n.s.
Agreeableness	3.28	0.76	3.11	0.78	3.34	0.75	U = 72706.5, p < .001, r = 0.11

Notes. Total Sample N = 1219, Opponents N = 195, Supporters N = 897.

Table 3
Brief Core Schema Scale (BCSS) results.

Variable	Total Sample		Opponents		Supporters		Test statistics <i>Opponents vs. supporters</i>
	M	SD	M	SD	M	SD	
Negative-self	3.66	4.05	4.30	4.64	3.48	3.87	n.s.
Positive-self	14.53	5.39	13.74	5.61	14.83	5.27	n.s.
Negative-others	5.48	4.17	7.19	4.69	5.04	3.98	U = 59734, p < .01, r = 0.017
Positive-others	13.32	4.39	11.74	4.77	13.73	4.19	U = 61114.5, p < .01, r = 0.018

Notes. Total Sample N = 1219, Opponents N = 195, Supporters N = 897.

supporters (U = 76596, p = .00, r = 0.11).

Probabilistic reasoning In order to test for differences in probabilistic reasoning between opponents and supporters of the current COVID-19 containment measures, we conducted a χ^2 -Test with “opposition” (yes/no) and “jumping to conclusions” (yes/no) as variables. There was no significant difference between opponents and supporters with regards to probabilistic reasoning as measured with the beads task ($\chi^2 = 3.137, p = .21$).

Childrens’ well-being Concerning changes in childrens’ well-being, opponents felt more strongly than supporters that their childrens’ well-being has worsened compared to pre-corona times (U = 16935.5, p = .00, r = 0.22). While 77.7% of opponents felt that their children were worse or way worse, only 56.5% of supporters stated that their children were worse or way worse. 71.3% of opponents were largely or very dissatisfied with their childrens’ educational situation, but only 30.7% of supporters indicated dissatisfaction with their childrens’ education

(U = 13195, p = .00, r = 0.31). Lastly, opponents were significantly more dissatisfied with current child care (kindergarten, school or other caregiver) (U = 10479, p = .00, r = 0.29). While 52.7% of opponents were largely or very dissatisfied with child care, only 23.3% of supporters indicated dissatisfaction with child care.

Potential risk and protective factors for mental health Opponents and supporters of the current COVID-19 containment measures also differ regarding potential risk and protective factors for mental health. 10.8% of opponents and 3.8% of supporters indicated experience of interpersonal violence (IPV) (U = 80747, p = .00, r = 0.13). Perceived financial security was indicated by 70.2% of opponents and 83.1% of supporters ($\chi^2 = 17.169, p = .00, r = 0.13$). Moreover, 41.2% of opponents and 55.2% of supporters ($\chi^2 = 12.478, p = .00, r = 0.11$) reported being religious.

Political aspects The most distinct difference between opponents and supporters of the current COVID-19 containment measures, however, was found for “deflation of democracy” (U = 17711, p = .00, r = 0.51) with opponents displaying a significantly worse evaluation of democracy. Items included statements like “The state continuously limits citizens’ freedom.”, “Politicians circumvent established law when it benefits their own advantage.” or “Back in the day, journalists wouldn’t shrink from a fight with a politician.”. Also see Fig. 2.

Regression analysis In order to detect factors most explanatory for differences between opponents and supporters of the current COVID-19 containment measures, we performed binary logistic regression analysis. Predictors included were BCSS negative-self, BCSS negative-others, coping, anxiety (GAD-7) and deflation of democracy. Variables differentiating best between opponents and supporters were negative self-image, anxiety (GAD-7) and deflation of democracy. The specified regression model had a good fit with $\chi^2(3) = 362.96, p = .00$ and explained about 51% of the variance between the two groups. Mean classification accuracy was at 88.1% (50.6% specificity, 96.5% sensitivity). All predictors are significant at least on a 5%-level (also see

Deflation of democracy

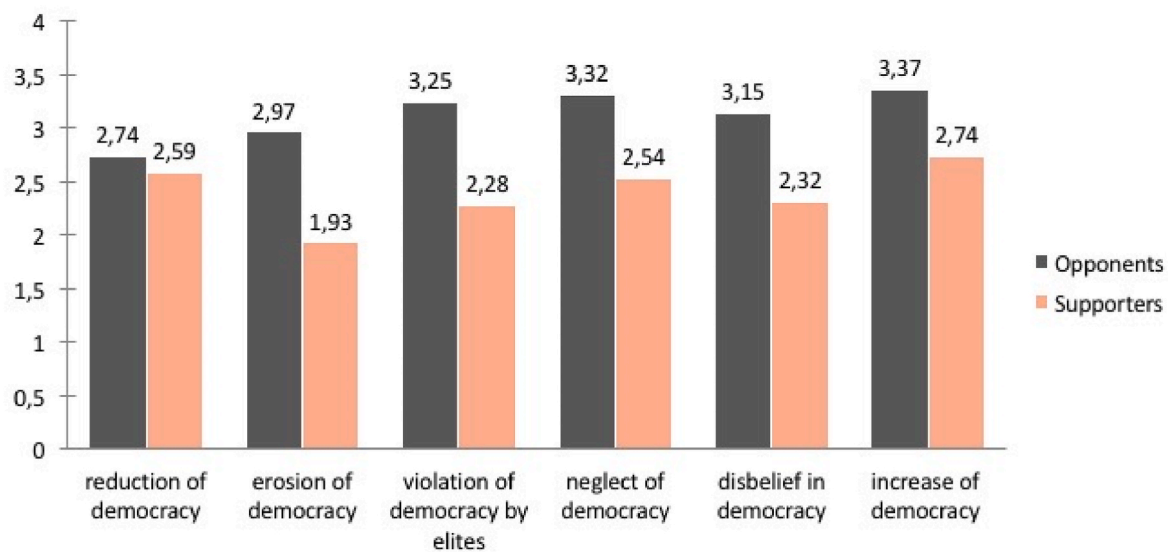


Fig. 2. Deflation of democracy: Means for dimensional deflation of democracy for opponents and supporters.

Table 4
Summary of Binary Logistic Regression Analysis.

Predictor	B	SE	e ^β	df	WALD χ ²	95% CI
BCSS negative-self	.069*	.03	1.07	1	5.55	1.01–1.13
GAD-7	-.069**	.02	.93	1	8.42	.89–.98
Deflation of democracy	-.272***	.02	.76	1	171.82	.73–.79
Constant	13.31	.91	601474.0	1	215.15	–

Notes. Dashes (–) indicate the confidence interval was not estimated. Model χ²(3) = 362.96. p = .00. CI, confidence interval. e^β = exponentiated β. *p < .05. **p < .01. ***p < .001. Nagelkerke R² = 0.51.

Table 4). A Homer-Lemeshow-Test confirms goodness-of-fit with χ²(8) = 14.08, p = .80. A more pronounced negative self-image, stronger anxiety and higher deflation of democracy appear to be predictive for opposing of the current COVID-19 containment measures.

3.1. Qualitative data

What do you make of the measures currently taken in order to contain the COVID-19 pandemic? With 31.8%, participants mainly evaluated the measures as reasonable. In each case, approximately 20% thought of “poorly conceived concepts”, perceived the measures as “mentally burdening”, “poorly implemented” and “undifferentiated”. 14.8% spoke out for a rigorous lockdown. For further statements see Table 5.

What do you currently think about a lot? With 22.7%, participants were mainly mentally occupied with going back to normal. 21.8% thought about work. The course of the COVID-19 pandemic, “the future” in general and “children” were a relevant topic for 21.1%, 18.0% and 17.8% respectively. For further statements see Table 6.

What do you need? When asked what people thought they currently needed, a majority of 47.7% answered “social contact” including seeing and talking to friends and family as well as physical contact. 18% wrote they needed an outlook, certainty, clear messages & transparency (also: from their government). More abilities to exercise was indicated by

Table 5
What do you make of the measures currently taken in order to contain the COVID-19 pandemic?

Theme	n	%
Reasonable	290	31.8
Poorly conceived concepts	188	20.6
Mentally burdening	177	19.4
Poorly implemented	172	18.9
Undifferentiated	163	17.9
Demand for rigorous lockdown	135	14.8
Partially reasonable	75	8.2
Partially excessive	54	5.9
Excessive	50	5.5
Poor benefit-cost ratio	50	5.5
Economic inequality	35	3.8
Inconsistent	27	3.0

Note. We report data up to 3%. n = 1219 with n = 307 not stated, percentage related to remaining n = 912.

11.2% of participants and 9% wrote they needed time to themselves, a break and rest. 6.6% expressed their need of support and relief. For further statements see Table 7.

Would you like to give details on your children’s current situation? When asked about their children’s current situation, 38.3% mentioned their children’s lack of social contact. 22.0% indicated psychological distress, 20.1% insufficient education and 13.3% negative developmental consequences. Insufficient care was criticized by 9.8% and 8.3% felt that (their) children were unnoticed and ignored by the government. For further statements see Table 8.

4. Discussion

This is one of the first surveys investigating the differences between opponents and supporters of the COVID-19 pandemic lockdown in Germany. First of all, we were able to replicate our previous findings (Jung et al., 2020), illustrating once again a substantial mental burden with increased levels of anxiety and depressive symptoms, overall lower well-being, worsened sleep, increased prevalence of IPV (interpersonal violence) as well as more pronounced irritability including anger and aggression compared to pre-COVID-19 times.

Table 6
What do you currently think about a lot?

Theme	n	%
Normality	229	22.7
Work	220	21.8
Course of the COVID-19 pandemic	213	21.1
Future	182	18.0
Children	180	17.8
My own health	129	12.8
Politics	122	12.1
Loved ones' health	120	11.9
Development of society	108	10.7
Lack of social contact	87	8.6
Personal issues	80	7.9
Economy	71	7.0
Finances	63	6.2
Family	43	4.3
Education	40	4.0
Partnership	40	4.0
Social inequality	38	3.8
Organization of leisure time	35	3.5
Climate change	34	3.4
The elderly and people in need of care	33	3.3

Note. We report data up to 3%. n = 1219 with n = 209 not stated, percentage related to remaining n = 1010.

Table 7
What do you need?

Theme	n	%
Social contact (friends/family)	471	47.7
Outlook, certainty, clear messages & transparency (government)	178	18.0
Exercise	111	11.2
Rest, break, time to oneself	89	9.0
Nature, fresh air, sun, animals	77	7.8
Support, relief	65	6.6
Appeals (various) to the political authorities	49	5.0
Hope, confidence	46	4.7
Money, financial security	45	4.6
Leisure, hobbies, cultural activities	44	4.5
Vaccination	41	4.2
Easing or ending of COVID-19 measures, normality	38	3.9
Protection, security (also: safe workplace)	36	3.6

Note. We report data up to 3%. n = 1219 with n = 231 not stated, percentage related to remaining n = 988. Further mentions (<3%) include: appreciation (being heard), patience, serenity, routine, information, distraction, therapeutic support.

Table 8
Would you like to give details on your children's current situation?

Theme	n	%
Lack of social contact	101	38.3
Psychological distress	58	22.0
Insufficient education	55	20.1
Negative developmental consequences	35	13.3
Lack of leisure activities	32	12.1
Insufficient care	26	9.8
Unnoticed/ignored by the government	22	8.3
Lack of exercise	20	7.6
Family stress	13	4.9
Lack of outlook/perspective	12	4.5
Too much media consumption	11	4.2
Lack of routines	8	3.0

Note. We report data up to 3%. n = 1219 with n = 955 not stated, percentage related to remaining n = 264.

Noticeably, opponents demonstrated a more pronounced burden compared to supporters. Opponents showed more symptoms of depression and anxiety and lower well-being. They stated coping worse, sleeping worse and being more irritated and aggressive, but they also experienced more IPV. Opponents exhibited a more negative conception

of themselves and others, were less religious and scored less on personality parameters "openness" and "agreeableness". Moreover, they perceived their situation as less financially stable. Most strikingly, opponents delivered a significantly worse evaluation of their current democracy. Opponents who had children felt more strongly that their children were doing worse and they stated that they were more dissatisfied with their children's current care and education. Additional factors possibly contributing to the higher mental burden found for opponents may be social exclusion and perceived stigma. Unfortunately, we did not collect data on this matter. Still, as we cover a time period before the nationwide availability of a COVID-19 vaccine, that led to an increase in divergent opinions concerning containment measures, these factors may not yet have had a substantial impact on the mental burden of opponents.

We could not detect differences in probabilistic reasoning between opponents and supporters of the COVID-19 containment measures. Although reasoning biases cannot be equated with conspiracy beliefs, this finding still supports the notion that it might be too easy to mark opponents as paranoid, as conspiracy theorists or as generally pathologic (Nachtwey et al., 2020). It shows that the reasons for opposition to COVID-19 containment measures seem to be more complex, going beyond hasty decision making or proneness to conspiracy theories.

Differences between opponents and supporters are unlikely to be explained by education or wealth as demographics are comparable for both groups. Most participants were married or in a relationship, lived in a 1 or 2-people-household without children, were full or part-time employed and had a high-school diploma. When interpreting the differences found for opponents and supporters of the COVID-19 containment measures, it is important to discuss a chicken-and-egg problem: Do opponents reject containment measures because they are more strongly affected by them or are opponents off worse because they have to live with restrictions they strongly object to?

Regression analysis revealed three factors that seem to partially explain the variance between opponents and supporters of the COVID-19 pandemic lockdown: deflation of democracy, anxiety and negative self-concept. First, the most powerful factor seems to be dissatisfaction with and mistrust in the political system. To us, it represents a comprehensible and reasonable factor contributing to the rejection and disapproval of political decisions, especially when standard procedures are interrupted in order to achieve faster decision making and implementation as occurred in Germany. Also, during the lockdown, individuals were more directly affected by political actions and were more dependent on their political representatives which may have led to an increase in powerlessness and subsequent attempts to restore empowerment by open and clear opposition. A negative self-concept may include and represent an individual's appraisal of one's coping abilities, thus potentially contributing to feelings of powerlessness. Lastly, anxiety is a natural human response to uncertainty. It serves anticipatory purposes on affective, cognitive and behavioral levels that enable us to moderate the impact of a potential threat (Grupe and Nitschke, 2013), as such the limitation of freedom of movement may have been perceived. Anxiety may contribute to the opposition against containment measures as a means of averting an anticipated or perceived threat. Taken together, we feel that the results of regression analysis hold certain plausibility in explaining an individual's attitude towards the measures taken in order to contain the COVID-19 pandemic.

Moreover, we found that opponents of the COVID-19 measures had more pre-existing mental disorders than supporters. They also perceived their situation as less financially stable and indicated sleeping worse. These findings further give reason to hypothesize that opponents might be a more vulnerable group that is more strongly burdened by the containment measures, thus opposing against them.

When given the opportunity to answer using their own words, one third of all participants evaluated the COVID-19 measures as reasonable. They also said that they experienced the measures as burdening and rated them as poorly implemented. One fifth mainly thought about

going back to normal, which again underlines participants' burden. "The future" and "children" were also a relevant topic for about one fifth respectively. We think that these topics mainly represent a way of worrying, which easily translates to the high rates of anxiety we found. When asked what they needed, almost half of all participants said they needed more social contact. Almost one fifth wished for a positive outlook and certainty about the end of the pandemic. This finding shows how participants struggled with uncertainty, which also easily translates to anxiety. Participants also expressed their need for support and relief, once more demonstrating a strong burden. Participants with children stated that they worried about psychological distress, insufficient education and negative developmental consequences for their children. Taken all together, participants seemed to have various reasons to be anxious and to suffer. Results from qualitative data go well in hand with results from quantitative data, thus strengthening the evidence.

Interestingly, with 66.7% for the total sample, the amount of child-free households was markedly lower than for the general population (80.24%) (Haushalte und Familien; Bundeszentrale für politische Bildung, 2021). It is conceivable that parents may have experienced the lockdown situation as more burdening and thus were more likely to take part in a survey asking them to speak their mind.

Concerning the characterization of opponents, all in all our results are in line with previous findings (Grande et al., 2021; Nachtwey et al., 2020; Koos, 2021). We found opponents to be well-educated, financially stable and strongly estranged by their political institutions. Additionally, we found anxiety and negative self-concept to differentiate between opponents and supporters of the COVID-19 pandemic lockdown.

The study presented offers several strengths and limitations. First, again we found a large gender imbalance. Gender imbalance, however, has been observed in other recent COVID-19 online surveys (Di Renzo et al., 2020; Hsing-Ying et al., 2020). Potential explanations have been previously discussed (Jung et al., 2020) and include more proneness to use social media, higher interest in participation in psychological surveys and increased time spent at home during lockdown in women. Second, group sizes for opponents and supporters of the COVID-19 containment measures were imbalanced. Most likely, this imbalance represents the actual population as most citizens have been shown to support COVID-19 containment measures (Infratest dimap, 2021). Moreover, the population of opponents is yet unknown (Nachtwey et al., 2020). Third, our sample was yet again well educated. Still, at this point we cannot tell whether we missed to include opponents less educated or whether this group specifically consists of well-educated individuals, as previously discussed (Grande et al., 2021; Nachtwey et al., 2020; Koos, 2021). Taken together, the aspects discussed restrict representativeness, which represents the studies' main limitation. Thus, we cannot present data for more diversified groups, nor give insight into the response rate.

Yet, using a mixed-methods approach, combining a psychological and a sociological perspective, we present comprehensive mid-European data that gives a valuable insight into potential underlying factors for differing attitudes towards the COVID-19 pandemic lockdown in Germany. Opponents overall seem to be a more vulnerable group. Their worry and hardship should be considered when discussing COVID-19 containment measures and the people that oppose to them. We think it is of vital importance to further observe mental health and political estrangement in the German population as long as the global COVID-19 pandemic has not been overcome.

Author contributions

All authors have contributed to the scientific work and have read and agreed to the published version of the manuscript. Conceptualization, S. J. and T.K.; methodology, S.J. and T.K.; software, S.J. and T.K.; validation, S.J. and T.K.; formal analysis, S.J.; investigation, S.J. and T.K.; resources, T.K.; data curation, S.J.; writing—original draft preparation, S.J.; writing—review and editing, T.K.; visualization, S.J.; supervision, T.K.; project administration, S.J. All authors have read and agreed to the

published version of the manuscript.

Funding

This research received no external funding.

Institutional review board statement

The study was conducted according to the guidelines of the Declaration of Helsinki, and approved by the Ethics Committee of HANNOVER MEDICAL SCHOOL, GERMANY (protocol code: 9002_BO_K_2020, date of approval: December 18, 2020).

Informed consent statement

Informed consent was obtained from all subjects involved in the study.

Declaration of competing interest

The authors declare no conflict of interest.

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