Perceived vulnerability to disease and attitudes towards public health measures: COVID-19 in Flanders, Belgium

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A B S T R A C T

During the COVID-19 pandemic, governments installed measures to contain the disease. Information about these measures was disseminated through news media. Nonetheless, many individuals did not abide by these guidelines. We investigated how perceived vulnerability to disease and personality characteristics related to support for public health measures. We analyzed survey data of 1000 Flemish (Belgium) adults, collected between March 17, 2020 and March 22, 2020. Older age, low educational attainment, gender (female) and work situation (no telecommuting) were associated with greater perceived vulnerability. Greater expectations of loneliness and more solidarity with our fellow men were associated with gender (female), younger age and work situation (telecommuting). Greater perceived vulnerability to disease was related to a greater belief that public health measures protect the population, but also to a critical stance towards the Belgian government's handling of the crisis. High agreeableness and high emotional stability were associated with respectively greater belief that health measures protect the population, and greater support for the government's crisis management. Watching television news was related to a greater belief that public health measures are necessary, and specifically consuming public television news increased support for public health measures. We discuss the implications for handling the COVID-19 pandemic.

1. Introduction

Recently, the coronavirus disease 2019 (COVID-19) has been rapidly expanding in Europe, North America, Asia, and the Middle East. By March 22, 2020, the number of cases and deaths of COVID-19 outside China had increased drastically and the number of affected countries reporting infections to WHO was 149 (WHO, 2020a). Based on alarming levels of spread and severity, and by the alarming levels of inaction, on March 11, 2020, the Director-General of WHO characterized the COVID-19 situation as a pandemic (Bedford et al., 2020; WHO, 2020b). In order to respond to this pandemic, many countries – including Belgium – are combining containment and reduction activities aimed at delaying major surges of patients and leveling the demand for hospital beds, while protecting the most vulnerable from infection. Bedford et al. state that "activities to accomplish these goals vary and are based on national risk assessments that many times include estimated numbers of patients requiring hospitalization and availability of hospital beds and ventilation support. National response strategies include varying levels of contact tracing and self-isolation or quarantine; promotion of public health measures, including hand washing,

respiratory etiquette, and social distancing; and closing all non-essential establishments" (2020, p. 1016).

Information about these new public health measures is disseminated through news media's almost non-stop coverage of the COVID-19 crisis: traditional (television, radio, newspapers) and social media are the main platforms for disseminating information (De Coninck et al., 2020; Merchant & Lurie, 2020). Despite this, many instances have been reported of people not abiding by these guidelines. Some consider them to be excessive, others cite economic concerns and socio-psychological perceptions (especially among older people, the at-risk population of COVID-19) (Armitage & Nellums, 2020; Duan & Zhu, 2020; Smith, 2006). (Excessive) fear of COVID-19 may lead to negative consequences of disease control as shown by early recommendations for the current crisis from China (Dong & Bouey, 2020), but also from previous SARS and Ebola outbreaks (Cheung, 2015; Lin, 2020; Person et al., 2004). We aim to show how perceived vulnerability to disease, personality characteristics, opinion on news media coverage and consumption of news media, and socio-economic and socio-psychological perceptions are related to attitudes towards public health measures in the context of the COVID-19 pandemic. With this study, we inform on three gaps in

COVID-19 research identified by Bedford et al.: analysis of quarantine strategies and contexts for their social acceptability, determining best ways to apply knowledge about infection prevention and control, and enhance (or develop) an ethical framework for outbreak response (Bedford et al., 2020).

2. Data and methodology

2.1. Data

We collected data through an online survey among a sample of the adult population aged 18 to 70 in Flanders, the northern region of Belgium ($N = 1000$). The survey was fielded from March 17, 2020 to March 22, 2020. The first restrictive governmental measures in Belgium regarding social distancing and telecommuting were installed on March 14 and were tightened a few days later. On the day that fieldwork began, the Belgian government ordered the closing of all non-essential establishments, cancelling all (mass) events, and only allowing citizens to go outside for a limited number of reasons (to work, to buy groceries or medicine, to provide urgent care to family). These measures were in place throughout the data collection.

The polling agency gathered 1000 responses (response rate: 32%) from an opt-in online panel that used quotas by gender, age, education, and province to ensure the data were representative for these characteristics in Flanders. Respondents were contacted by e-mail, and the survey was distributed via the polling agency's own survey tool. The survey language was Dutch, the official language of Flanders. Respondents were unable to skip questions, but some questions did have a 'no answer'-option. Each question in the survey was presented on a different page, and there was no option to return to previous questions and change any answers. All respondents who recorded partial data were removed by the survey agency prior to delivering the final, fully anonymized, dataset.

2.2. Measures

2.2.1. Perceived vulnerability to disease

We used a 15-item self-report instrument to assess perceived vulnerability to disease. Approximately half the items were reversely scored. Participants responded to each item on a 7-point scale with endpoints labeled 'strongly disagree' and 'strongly agree'. This instrument was developed and validated by Duncan et al. (2009) and has two subscales: one assesses beliefs about one's own susceptibility to infectious diseases (perceived infectability; eight items; Cronbach's alpha = 0.85), the other emotional discomfort in contexts that connote an especially high potential for pathogen transmission (germ aversion; seven items; Cronbach's alpha = 0.70).[1] After conducting a principal component analysis, the factor scores of both subscales were saved to be used in the analyses.[2] The factor scores that were produced have a mean of zero.

2.2.2. Big five personality characteristics

We used a brief measure of the Big Five personality characteristics containing 10 items. Each item contained a personality characteristic, and people were asked to indicate to what extent it applied to them (1 = does not apply at all, 5 = fully apply). The 10 items covered both poles of each personality dimension of the Big Five: extraversion, conscientiousness, agreeableness, openness to experiences, and emotional stability. We used a Dutch translation of the version originally developed by Gosling, Rentfrow and Swann Jr. which "reached adequate levels in terms of: (a) convergence with widely used Big Five measures in self, observer, and peer reports, (b) test–retest reliability, (c) patterns of predicted external correlates, and (d) convergence between self and observer ratings" (Gosling et al., 2003, p. 504; Hofmans et al., 2008). Five of the ten items on the opposite pole of each personality dimension were reversely coded to obtain accurate scores for all dimensions.

2.2.3. Socio-economic and socio-psychological perceptions

We assessed the public's socio-economic and socio-psychological perceptions regarding the COVID-19 pandemic through three items: if respondents believe that the measures will result in an economic crisis (perception of economic crisis), whether they believe they will be lonely in the coming weeks (loneliness), and whether they will self-quarantine if they feel unwell (solidarity). Participants responded to each item on a 5-point scale with endpoints labeled 'strongly disagree' and 'strongly agree'.

2.2.4. Attitudes towards public health measures

We assessed the public's attitudes towards public health measures installed by the Belgian government through two items, asking if they believe the measures are necessary to protect the population and if they believe that the Belgian government is handling the current crisis well. Again, participants responded to each item on a 5-point scale with endpoints labeled 'strongly disagree' and 'strongly agree'.

2.2.5. Consumption of and opinion on news media

The frequency with which respondents gathered information in the news (public television, commercial television, quality newspapers, tabloids) about the COVID-19 pandemic over the past week was assessed using 5-point scales with endpoints labeled 'never' and 'multiple times a day'. Opinion on news media coverage was assessed by asking respondents' opinion of the media's coverage of the crisis (1 = media coverage underestimates dangers, 2 = media coverage is accurate, 3 = media coverage overestimates dangers).

2.2.6. Socio-demographic characteristics

Respondents were asked to indicate birth year (recoded to age categories: 18–34, 35–54, 55–70), gender (1 = male, 2 = female), educational attainment (1 = higher secondary education or lower, 2 = higher non-university education or higher), whether their place of work had closed down due to public health measures (1 = no, 2 = yes), and if they were asked or forced to telecommute or work from home (1 = no, 2 = yes).

2.3. Analytic plan

In order to highlight individual sociodemographic differences (age, gender, educational attainment, work situation) in perceived vulnerability to disease and attitudes towards public health measures, we used independent samples *t*-tests and one-way ANOVA. Subsequently, we conducted stepwise linear regressions to investigate associations of perceived vulnerability to disease, personality characteristics, consumption of and opinion on news media, and socio-economic and socio-psychological perceptions, with attitudes towards public health measures during the COVID-19 pandemic in Flanders, Belgium. In these regressions, we controlled for relevant socio-demographic characteristics.

3. Results

Women reported significantly higher germ aversion (GA: $M = 4.73$) and perceived infectability (PI: $M = 3.87$) than men (GA: $M = 4.39$; PI: $M = 3.57$). Age differences were found for germ aversion only: older age categories ($M = 4.81$) reported significantly higher germ aversion

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[1] [1]Items were translated from English to Dutch by the authors. Reported reliabilities refer to the Dutch items and are in line with those from the English-language scale (PI = 0.87; GA = 0.74) (Duncan et al., 2009).

[2] [2]For ease of interpretation, we used sum scores in Tables 1 and 2. Factor scores and sum scores for GA and PI have a correlation coefficient of 0.97.

Table 1
Independent samples *t*-tests (gender, educational attainment, telecommuting, and employment situation) and one-way ANOVA (age) on *germ aversion* and *perceived infectability* scores.

		t-Test statistic/*F*-scores	*p*-Value	Mean (sd)
Germ aversion	Gender	−3.71	0.00	
	Male			4.39 (0.93)
	Female			4.76 (1.04)
	Age[a]	24.84	0.00	
	18–34			4.35 (1.01)
	35–54			4.57 (1.02)
	55–70			4.81 (0.93)
	Educational attainment	2.59	0.01	
	Secondary education or lower			4.69 (0.99)
	Tertiary education			4.43 (1.01)
	Telecommuting	3.23	0.00	
	No			4.67 (0.98)
	Yes			4.36 (1.03)
	Workplace closed	−0.15	0.89	
	No			4.52 (1.02)
	Yes			4.51 (1.02)
Perceived infectability	Gender	−5.44	0.00	
	Male			3.57 (1.06)
	Female			3.87 (1.20)
	Age[a]	2.69	0.07	
	18–34			3.79 (1.07)
	35–54			3.68 (1.24)
	55–70			3.70 (1.07)
	Educational attainment	3.67	0.00	
	Secondary education or lower			3.82 (1.19)
	Tertiary education			3.60 (1.06)
	Telecommuting	3.73	0.00	
	No			3.88 (1.22)
	Yes			3.55 (1.09)
	Workplace closed	0.24	0.81	
	No			3.71 (1.17)
	Yes			3.73 (1.17)

Note. GA and PI measured on 7-point scale (1: strongly disagree, 7: strongly agree). df between 712 and 998.
[a] F-scores presented for age.

than younger ones (*M* = 4.35). For both GA and PI, the highly educated reported significantly lower scores than the lower educated. People who were asked or forced to telecommute during the COVID-19 crisis experienced significantly less GA and PI than those who were not asked to do so. Respondents whose place of work closed, did not report significantly different scores for either GA or PI than respondents whose place of work did not close (Table 1).

Women reported significantly higher belief of a (future) economic crisis (*M* = 4.11 versus *M* = 3.98 for men) and loneliness (*M* = 2.96 versus *M* = 2.71 for men), and higher solidarity (*M* = 4.16 versus *M* = 4.05 for men) than men. Age differences were found for perceptions of loneliness and solidarity: older age categories (respondents aged 55 to 70) reported significantly less perceived loneliness (*M* = 2.64 versus *M* = 3.10 for respondents aged 18–34) and higher solidarity (*M* = 4.21 versus *M* = 4.05 for respondents aged 18–34) than younger age categories. People telecommuting during the COVID-19 crisis reported significantly more solidarity (*M* = 4.14) than those who were not asked to do so (*M* = 4.00). Respondents whose place of work closed reported significantly higher perceived loneliness (*M* = 3.11) and higher solidarity (*M* = 4.26) than those whose place of work did not close. No significant differences were found by educational attainment (Table 2).

To answer our main research question, we conducted two stepwise linear regressions to investigate associations between on the one hand perceived vulnerability to disease (GA and PI), personality characteristics, opinion on and consumption of news media, socio-psychological and economic perceptions (independent variables), and on the other hand the belief that the current measures are necessary to protect the Belgian population (dependent variable; Table 3) and that the Belgian government is handling the COVID-19 crisis well (dependent variable; Table 4).

The full models in Tables 3 and 4 indicate that perceived vulnerability to disease plays a significant role: people with high germ aversion (β = 0.07, *p* < 0.05) are more convinced that the public measures are necessary to protect the health of the Belgian population. However, respondents with high perceived infectability are more critical of the Belgian government's handling of the COVID-19 situation so far (β = −0.07, p < 0.05). As for personality characteristics, people with high agreeableness are more convinced that public measures are necessary to protect the population's health (β = 0.10, *p* < 0.01), while those with high emotional stability are more supportive of public health measures (β = 0.06, *p* < 0.10).

Watching news about the COVID-19 crisis is mostly related to attitudes through *television* news consumption: public television news consumption is positively related to the belief that the measures are necessary to protect the population (β = 0.09, p < 0.01) and that the Belgian government is handling the crisis well (β = 0.08, p < 0.01). Commercial television news consumption also relates positively to the idea that the measures are necessary (β = 0.06, p < 0.10), albeit with a smaller effect size than that of public television consumption. Reading so-called 'quality' newspapers is related to more negative attitudes about the necessity of the measures (β = −0.12, *p* < 0.001). People's opinion on the media's coverage of the crisis is strongly associated with public health attitudes: respondents who believe that the media overestimate the dangers of the COVID-19 believe less than respondents who consider media coverage to be accurate that the measures are necessary to protect the population (β = −0.31, *p* < 0.001), and that the government is doing a good job handling the crisis (β = −0.17, p < 0.001). Furthermore, respondents who believe the media underestimate the crisis also believe less than respondents who consider coverage to be accurate, that the government is handling the crisis well (β = −0.28, *p* < 0.001).

Table 2

Independent samples *t*-tests (gender, educational attainment, telecommuting, and employment situation) and one-way ANOVA (age) on *perceptions of economic crisis*, *perceptions of loneliness*, and *solidarity* scores.

		t-Test statistic/*F*-scores	*p*-Value	Mean (sd)
Perception of economic crisis	Gender	−2.25	0.03	
	Male			3.98 (0.93)
	Female			4.11 (0.85)
	Age[a]	0.15	0.86	
	18–34			4.04 (0.87)
	35–54			4.06 (0.89)
	55–70			4.02 (0.92)
	Educational attainment	−0.48	0.63	
	Secondary education or lower			4.03 (0.95)
	Tertiary education			4.06 (0.81)
	Telecommuting	1.44	0.15	
	No			4.12 (0.87)
	Yes			4.03 (0.89)
	Workplace closed	−0.83	0.41	
	No			4.06 (0.87)
	Yes			4.12 (0.90)
Perception of loneliness	Gender	−3.05	0.00	
	Male			2.71 (1.26)
	Female			2.96 (1.26)
	Age[a]	10.44	0.00	
	18–34			3.10 (1.27)
	35–54			2.78 (1.27)
	55–70			2.64 (1.22)
	Educational attainment	−1.29	0.20	
	Secondary education or lower			2.79 (1.26)
	Tertiary education			2.89 (1.27)
	Telecommuting	−0.50	0.62	
	No			2.82 (1.27)
	Yes			2.87 (1.29)
	Workplace closed	−3.56	0.00	
	No			2.74 (1.27)
	Yes			3.11 (1.27)
Solidarity	Gender	−1.95	0.05	
	Male			4.05 (0.87)
	Female			4.16 (0.85)
	Age[a]	3.62	0.03	
	18–34			4.05 (0.90)
	34–54			4.06 (0.85)
	55–70			4.21 (0.82)
	Educational attainment	−1.23	0.22	
	Secondary education or lower			4.07 (0.87)
	Tertiary education			4.14 (0.84)
	Telecommuting	−2.15	0.03	
	No			4.00 (0.90)
	Yes			4.14 (0.83)
	Workplace closed	−3.69	0.00	
	No			4.00 (0.88)
	Yes			4.26 (0.79)

Note. Perceptions measured on 5-point scale (1: strongly disagree, 5: strongly agree). df between 712 and 998.

[a] F-scores presented for age.

In terms of socio-economic or socio-psychological perceptions, we find that solidarity is strongly associated with attitudes towards the public health measures. Respondents who indicate they will quarantine themselves when they feel unwell hold more positive attitudes towards the necessity of the measures ($\beta = 0.20$, $p < 0.001$) and are more convinced that the Belgian government is handling the crisis well ($\beta = 0.06$, $p < 0.05$). Perceptions of loneliness are positively associated with the idea that the Belgian government is doing a good job in handling the crisis ($\beta = 0.07$, $p < 0.05$). Perceptions of an economic crisis is not related to attitudes about public health measures.

We find that older people – who, as indicated in Table 1, have a high germ aversion – believe more than young people that the measures taken are necessary to protect the Belgian population ($\beta = 0.05$, $p < 0.10$). In line with this, they are also more positive than young people about the way the Belgian government has handled the crisis so far ($\beta = 0.13$, $p < 0.001$). Finally, those with a tertiary or higher degree believe more than those with a secondary or lower degree that the Belgian government is handling the crisis well ($\beta = 0.08$,

$p < 0.01$).

4. Discussion

This cross-sectional study identified several determinants for perceived vulnerability to disease, socio-economic and psychological perceptions, and attitudes towards public health measures. Older age, low educational attainment, gender (female) and not telecommuting during the COVID-19 crisis were associated with greater perceived disease vulnerability. Additionally, greater perceived loneliness and more solidarity with our fellow men were associated with gender (female), younger age and individuals whose place of work has closed during the COVID-19 crisis. Women also reported greater perceptions of an economic crisis than men. Person et al. (2004) found "that during serious disease outbreaks, when the general public requires immediate information, a subgroup of the population that is at potentially greater risk of experiencing fear… will need special attention from public health professionals" (2004, p. 358). The current COVID-19 pandemic,

Table 3
Stepwise linear regression with belief that public health measures are necessary to protect Belgian population as outcome variable, and standardized betas (β) of predictors.

	Model 0	Model 1	Model 2	Model 3	Full model
Age	0.09** (2.91)	0.07* (2.12)	0.04 (1.28)	0.08* (2.51)	0.02 (0.54)
Gender (ref: male)					
Female	0.05 (1.55)	0.02 (0.68)	0.05 (1.49)	0.04 (1.22)	0.02 (0.77)
Education level (ref: secondary education or lower)					
Tertiary education	0.05 (1.49)	0.06* (2.03)	0.06+ (1.89)	0.04 (1.14)	0.06+ (1.89)
Personality characteristics					
Emotional stability	−0.00 (−0.12)	0.02 (0.65)	0.02 (0.57)	−0.01 (−0.39)	0.02 (0.62)
Agreeableness	0.17*** (5.01)	0.16*** (4.67)	0.12*** (3.84)	0.15*** (4.48)	0.10** (3.26)
Openness to experience	0.04 (1.05)	0.03 (0.96)	0.06+ (1.78)	0.02 (0.66)	0.05 (1.48)
Extraversion	0.03 (0.77)	0.04 (1.06)	0.04 (1.18)	0.03 (1.07)	0.05 (1.58)
Conscientiousness	0.09** (2.67)	0.07* (2.14)	0.05+ (1.74)	0.07* (2.36)	0.03 (1.14)
Perceived vulnerability to disease					
Germ aversion		0.14*** (4.18)			0.07* (2.26)
Perceived infectability		0.09** (2.86)			0.05 (1.61)
News media consumption					
Public television news			0.10** (3.07)		0.09** (3.00)
Commercial television news			0.06* (2.08)		0.05 (1.63)
Quality newspapers			−0.08** (−2.71)		−0.10** (−3.15)
Tabloids			0.01 (0.37)		0.01 (0.39)
Perceived news media accuracy (ref: media portray crisis accurately)					
Media overestimate dangers			−0.33*** (−11.25)		−0.31*** (−10.53)
Media underestimate dangers			0.02 (0.81)		0.01 (0.18)
Socio-economic/psychological perceptions					
Perception of economic crisis				−0.00 (−0.05)	0.02 (0.58)
Perception of loneliness				−0.01 (−0.18)	−0.03 (−0.93)
Solidarity				0.23*** (7.66)	0.18*** (6.26)
R^2	0.07	0.09	0.19	0.12	0.23

+ $p < 0.10$.
* $p < 0.05$.
** $p < 0.01$.
*** $p < 0.001$.

Table 4
Stepwise linear regression with belief that Belgian government is handling the COVID-19 crisis well as outcome variable, and standardized betas (β) of predictors.

	Model 0	Model 1	Model 2	Model 3	Full model
Age	0.16*** (4.88)	0.16*** (4.87)	0.12*** (3.72)	0.16*** (4.96)	0.13*** (3.96)
Gender (ref: male)					
Female	0.03 (0.86)	0.04 (1.12)	0.03 (0.69)	0.03 (0.77)	0.03 (0.79)
Education level (ref: secondary education or lower)					
Tertiary education	0.11*** (3.58)	0.11** (3.35)	0.09** (2.89)	0.11** (3.47)	0.08* (2.54)
Personality characteristics					
Emotional stability	0.07* (2.06)	0.05 (1.54)	0.06* (1.97)	0.08* (2.20)	0.06+ (1.69)
Agreeableness	0.03 (0.89)	0.04 (1.07)	0.01 (0.21)	0.02 (0.67)	0.00 (0.13)
Openness to experience	−0.05 (−1.53) (1.05)	−0.05 (−1.50)	−0.03 (−0.83)	−0.06 (−1.64)	−0.03 (−0.93)
Extraversion	−0.05 (−1.61)	−0.05 (−1.66)	−0.05 (−1.53)	−0.05 (−1.52)	−0.05 (−1.48)
Conscientiousness	−0.03 (−0.76)	−0.02 (−0.73)	−0.04 (−1.26)	−0.02 (−0.74)	−0.04 (−1.19)
Perceived vulnerability to disease					
Germ aversion		−0.02 (−0.71)			−0.03 (−0.73)
Perceived infectability		−0.07* (−2.23)			−0.07* (−2.21)
News media consumption					
Public television news			0.09** (2.66)		0.08* (2.51)
Commercial television news			0.00 (0.07)		0.01 (0.18)
Quality newspapers			−0.05 (−1.58)		−0.05 (−1.55)
Tabloids			−0.01 (−0.40)		−0.01 (−0.45)
Perceived news media accuracy (ref: media portray crisis accurately)					
Media overestimate dangers			−0.17*** (−5.55)		−0.17*** (−5.41)
Media underestimate dangers			−0.28*** (−9.20)		−0.28*** (−9.20)
Socio-economic/psychological perceptions					
Perception of economic crisis				−0.04 (−1.41)	−0.05 (−1.59)
Perception of loneliness				0.06+ (1.69)	0.07* (2.34)
Solidarity				0.05 (1.54)	0.06* (1.97)
R^2	0.04	0.04	0.13	0.04	0.14

+ $p < 0.10$.
* $p < 0.05$.
** $p < 0.01$.
*** $p < 0.001$.

but also recent SARS or Ebola outbreaks, are classic examples of such an outbreak (Person et al., 2004; Weiss & Ramakrishna, 2001). This special attention for fearful subgroups and individuals is vital, since "exclusionary practices based upon the best available scientific evidence may be scientifically and ethically sound for one population, those same practices may not be sound for all populations" (Person et al., 2004, p. 358; Weiss & Ramakrishna, 2001). It may be because of this attention that we found that older respondents are less concerned about loneliness than younger respondents. In the weeks prior to the study, media frequently stressed the need to care for the elderly, as they were at risk for both COVID-19 and loneliness. This increased attention may compensate for this concern among older respondents, while many younger

respondents – an increasing number of whom are single and lost most of their daily face-to-face interactions by telecommuting – received no special attention at this stage of the pandemic, which may have alleviated concerns regarding loneliness among this group.

Research indicates that older age groups experience higher mortality than younger age groups from COVID-19, which has been widely reported and may explain why older age groups perceive themselves as more vulnerable to disease (Zhou et al., 2020). Furthermore, telecommuting – which has been highly encouraged by many governments to reduce the probability of disease transmission – is not possible for many lower educated individuals who work in low-skilled and 'essential' jobs, which may in turn increase their perceived vulnerability to disease. The fact that women report higher perceived vulnerability to disease than men is in line with previous research which found that women report higher fear of pathogens than men (Díaz et al., 2016; Duncan et al., 2009). These findings are also supported by preliminary cross-country research regarding fear of COVID-19 (Perrotta et al., 2020).

In addition, when we relate these indicators – along with opinion on and consumption of news media – to attitudes towards public health measures, we find that perceived vulnerability is related to greater belief that these measures protect the Belgian population, but at the same time also to a more critical stance towards the Belgian government's handling of the crisis. This indicates that those who perceive themselves as vulnerable to disease find that the current measures of (self-)quarantine, social distancing, and closing all non-essential establishments, are not far-reaching enough to combat this pandemic – and support stricter public health measures. This assumption is strengthened by the finding that people who believe that media coverage underestimates the current crisis, are more critical of the Belgian government's handling of the crisis than those who believe media coverage overestimate the crisis.

We found that high agreeableness and emotional stability (or low neuroticism) are related to higher support for public health measures, or more positively evaluate governmental efforts to combat the disease. It is not surprising that these two personality characteristics came to the fore, since previous research has found that both are significantly correlated with some measures of underlying general health (Hengartner et al., 2016). In line with their recommendations, we further advocate that a short Big Five inventory provides much valuable information for health practise and research. An "integration of personality in public health policy offers many benefits at almost no costs. A short personality assessment may easily and cost-effectively screen entire populations for increased risk for probable health-impairing behaviours" (Hengartner et al., 2016, p. 49).

At the same time, watching television news (on commercial and public media) is related to a greater belief that public health measures are necessary to combat the pandemic, and specifically consuming public television news increases approval of the government's handling of the pandemic. This may be related to the public's trust in these media. Eurobarometer data from 2018 indicate that radio and television – and in Belgium, particularly public television (De Coninck et al., 2018) – are the most highly trusted news sources, with trust in social media being the lowest (Eurobarometer, 2018). In such uncertain times, with a plethora of real and fake information being disseminated by media, it is likely that individuals will trust the information coming from their most trusted news source (in this case, public television news) and be more sceptical of alternative news sources. The knowledge that public television is the most 'important' medium (from the public's perspective) may be useful for policymakers and medical professionals when determining where and how to disseminate important information about infection prevention and control to the public (Bedford et al., 2020).

Feelings of solidarity (i.e. quarantining yourself right away if you feel unwell) are also related to higher support for governmental measures. After all, to self-quarantine is an act of solidarity. As Ulrich Beck

stated, "it is the coincidence, the coexistence of not knowing and global risks which characterizes the existential moments of decision not only in politics and science but also in everyday life situations" (Beck, 2016, p. 104). To stay at home is to reduce the risk of spreading COVID-19. Stimulating solidarity is therefore stimulating support for public health measures. These findings indicate that feelings of solidarity can function as a cornerstone of possible ethical frameworks for outbreak response – in Flanders –, as it proves to be an important predictor for support for public health measures (Bedford et al., 2020). (Quarantine) strategies that emphasize solidarity between people will likely receive more support and be more socially acceptable than measures that would, for example, address perceptions of an economic crisis. This is illustrated by recent attempts at increasing opening hours of grocery stores in Belgium, which was met with much resistance.

This study has some limitations. First, due to the cross-sectional study design, we are unable to make causal claims, but are limited to reporting (sometimes small) associations between variables. It is also possible that some associations regarding support for public health measures may be mediated by factors not included in the analyses (e.g., personal opinion regarding the crisis). In order to better inform the scientific community of causal effects, longitudinal studies measuring perceived vulnerability, personality, and attitudes are required. Second, we cannot generalize these results to other populations. Although Flemish social life has been significantly affected by the public health measures to combat the COVID-19 pandemic, support for public health measures may evolve differently among other populations due to, for example, the communication strategy of the government, socio-demographic characteristics of the population, or the (perceived) preparedness of the country's health care services. We therefore encourage other scholars to build on our findings and provide more insights about this multifaceted but highly relevant facet of the current COVID-19 pandemic, as it continues to spread. Learning from this pandemic may inform future communication and governmental strategies to combat such pandemics in the future by discouraging panic, hoarding, and increase support for public health measures.

CRediT authorship contribution statement

David De Coninck: Conceptualization, Methodology, Investigation, Formal analysis, Writing - original draft, Writing - review & editing. **Leen d'Haenens:** Conceptualization, Investigation, Writing - original draft, Writing - review & editing. **Koen Matthijs:** Conceptualization, Investigation, Writing - original draft, Writing - review & editing.

Declaration of competing interest

The authors declare no conflict of interest.

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