Impact of attitudes and beliefs about COVID-19 on adherence to rules and guidance about personal protective behaviours (PPBs) and social distancing

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# Executive summary

* We compared use of personal protective behaviours, going out behaviours, and requesting a test to confirm the presence of the virus if symptomatic between those who had more positive attitudes towards coronavirus and those who had more negative attitudes. We then controlled for 6 possible confounders: age, clinical risk, region, IMD quartile of postcode, health and social care worker status, and wave of data collection.
* Those who think the risks of coronavirus have been exaggerated were more likely to report going out of the home for various activities more often and also coming into close physical distance with others. A similar association was true of people who responded that they would worry what others would think if they tested positive (“moral condemnation”), which is contrary to what we hypothesised. In contrast, those who agreed that coronavirus is a serious illness and those who agreed that they have made big sacrifices to stop the spread of the virus in the community reported leaving the home less often and keeping a physical distance when outside the home.
* Those who believed that the risks of the virus have been exaggerated were also less likely to report using personal protective behaviours and wearing face masks when going outside the home. Those who agreed that coronavirus is a serious illness, that they have made big sacrifices to stop the spread of the virus and that they would worry what others would think if they tested positive were more likely to use personal protective behaviours. Interestingly, moral condemnation was also associated with not requesting a test to confirm whether they have the virus or not.
* Overall, these results confirm that attitudes and beliefs towards the virus play an important role in determining the degree of adherence to social distancing rules and use of personal protective behaviours.

# Attitudes and beliefs about COVID-19 and compliance to rules and guidance

We are using the CORSAIR study (see Smith et al., 2020, 2021, for details). This involves approximately 2000 respondents per wave of polling. Questions relating to key attitudinal variables have varied across different waves. In this set of analyses, we have focused on waves 27-47. Dates of the most recent waves are given below:

|  |  |  |  |
| --- | --- | --- | --- |
| **Calendar week** | **Polling wave** | **Data collected** | **Notes** |
| 50 (2020) | 36 | 7 – 9 December 2020 | UK vaccination programme began 8 Dec 2020 |
| 51 (2020) | 37 | 14 – 16 December 2020 |  |
| 52 (2020) | 38 | 21 – 23 December 2020 |  |
| 53 (2020) | 39 | 28 – 29 December 2020 |  |
| 1 (2021) | 40 | 4 – 6 January 2021 |  |
| 2 (2021) | 41 | 11 – 13 January 2021 |  |
| 3 (2021) | No poll |  | Roll-out of vaccinations to over 70 year olds and those defined as clinically extremely vulnerable from 18 Jan 2021 |
| 4 (2021) | 42 | 25 – 27 January 2021 | “Have you received a coronavirus vaccine?” recorded from hereon |
| 5 (2021) | No poll |  |  |
| 6 (2021) | 43 | 8 – 9 February 2021 |  |
| 7 (2021) | No poll |  |  |
| 8 (2021) | 44 | 22 – 23 February 2021 |  |
| 9 (2021) | No poll |  |  |
| 10 (2021) | 45 | 8 – 9 March 2021 | Roll-out of vaccinations for over 50 years of age  |
| 11 (2021) | No poll |  |  |
| 12 (2021) | 46 | 22 – 23 March 2021 |  |
| 13 (2021) | No poll |  |  |
| 14 (2021) | 47 | 6 – 7 April 2021 |  |

We are trying to answer whether individuals with different attitudes towards the COVID-19 pandemic report different behaviour in relation to rules and guidance about personal protective behaviours (PPBs) and social distancing in comparison to those who have more negative attitudes. In particular, we examine whether those who perceive that the risks of coronavirus as being exaggerated leave the home more often, are more likely to come into close contact with others and less likely to wear a face covering when outside the home, are less likely to perform PPBs such as frequent handwashing, and are less likely to get a test if symptomatic. Likewise, we are interested in examining whether those who believe that coronavirus is a serious illness, that they have made big sacrifices to help prevent community transmission, and that they would worry about what others would think if they tested positive for coronavirus, would leave the home less often, are less likely to come into close contact with others and more likely to wear a face covering when outside the home, are more likely to perform PPBs such as frequent handwashing, and are more likely to get a test if symptomatic.

**Participant characteristics (sample)**

For waves 27-45, we have 42,667 responses in total in our sample with approx. (slightly over) 2,000 responses per wave. Sample descriptive characteristics are provided in Table 1. Some individuals will have responded in more than one wave. We have not corrected for that in these analyses, but expect the impact of this to be minimal. We will correct for this in future analyses.

**Table 1**. Participants’ demographic characteristics.

|  |  |
| --- | --- |
| Participant characteristics | N (%) |
| **Gender**- Male - Female- Other- Prefer not to say | 19,560 (45.84)22,979 (53.86)93 (0.22)35 (0.08)  |
| **Age** - 16-17- 18-24- 25-34- 35-44- 45-54- 55-64- 65-74- 75+ | 462 (1.08)3,734 (8.75)6,570 (15.40)7,079 (16.59)8,100 (18.98)7,470 (17.51)6,479 (15.19)2,773 (6.50) |
| **IMD quartile**- 1st quartile- 2nd quartile- 3rd quartile- 4th quartile | 9,108 (21.35)10,279 (24.09) 11,409 (26.74) 11,871 (27.82)  |
| **Chronic illness**- Present- Not present | 8,591 (21.25)31,836 (78.75) |
| **Health and social care worker**- Yes- No (including not working) | 3,792 (8.89)38,875 (91.11) |

# Main analysis

We wanted to examine the likely impact of a number of attitudinal variables on going out behaviours and personal protective behaviours. Below are the attitudinal factors that we examined:

* Perception that risks of coronavirus are exaggerated, as indicated by responses to “I think the risks of coronavirus are being exaggerated”.
* Perception that coronavirus is a serious illness. This factor represented an average of three items (“Coronavirus would be a serious illness for me”; “Someone could spread coronavirus to other people, even if they do not have symptoms”; “My personal behaviour has an impact on how coronavirus spreads”; Cronbach’s α = 0.56).
* Belief that they have made an effort to stop the spread of the virus in the community, as indicated by responses to “I feel I have made big sacrifices to help prevent the spread of coronavirus”.
* Perception of moral condemnation, as indicated by responses to “I would worry about what others would think of me if I tested positive for coronavirus”.

These items were measured on 5-point Likert scale (strongly agree to disagree strongly). We selected these items based on a factor analysis of a larger group of attitudinal variables: see Appendix 1.

Below is the list of going out behaviours and personal protective behaviours examined:

* Going-out behaviours: going out for essential shopping, going out for non-essential shopping, going out for exercise, going outdoors for recreational activity, going out for a medical need, going out to care for a vulnerable person, and going out to meet family and friends (who do not live in the same household). Responses to these questions were frequency counts (i.e., number of times they have been outside their home).
* Physical distancing when outside the home: if people came into close contact with others outside their household when going out. Responses to these questions were categorical (Yes, direct physical contact; Yes, less than 1m; Yes, within 1-2m; No, not at all; Don’t know).
* Wearing a face covering when out and about performing a number of activities similarly to the activities measured for the going out behaviours: going out for essential shopping, going out for non-essential shopping, going out for exercise, going outdoors for recreational activity, going out for a medical need, going out to care for a vulnerable person, and going out to meet family and friends (who do not live in the same household) and when being on public transport. Responses to these questions were measured on 3-point scale (1=yes, on all occasions, 2=yes, on some occasions, 3=not at all).
* Personal protective behaviours including frequent hand washing, wearing a face covering, opening windows to improve ventilation, and cleaning or disinfecting surfaces. These questions were measured on 5-point Likert scale (1 = very frequently to 5 = never).
* Requesting a test to check if one has coronavirus measured as a binary outcome (“No” compared to “Request a test”).

We then also control for possible confounding factors: age, clinical risk, region, IMD quartile of postcode, health and social care worker status (only asked to those people who indicated they were currently working or studying/training), and wave of data collection. We have not sought to control for job, which may be valuable for future analyses.

We generated a binary variable for the following variables:

* Physical distancing: three categories (direct physical contact, less than 1m, within 1-2m) were merged as a single outcome: ‘Yes, in close contact’ (1) and compared to ‘No, not at all’ (0).
* Wearing a face covering when out and about for going out for essential shopping, going out for non-essential shopping, going out for exercise, going outdoors for recreational activity, going out for a medical need, going out to care for a vulnerable person, and going out to meet family and friends (who do not live in the same household) and when being on public transport. Responses to these questions were merged into a single outcome ‘Yes, wore a mask (1)’ compared to ‘0=Not at all’ (0).
* Personal protective behaviours: frequent hand washing, wearing a face covering, opening windows to improve ventilation, and cleaning or disinfecting surfaces (“Frequently” (1) vs “Not frequently” (0)).
* Health and social care worker status: health and social care worker (1) vs not working/studying or working in a different sector/role (0).

**Results**

Summary statistics for the attitudinal and belief variables are displayed in Table 2.

|  |
| --- |
| **Table 2***.* Descriptive statistics for attitudinal variables (responses on a 5-point Likert scale, 1: strongly agree - 5: strongly disagree) |
|  | N | Mean | *SD* |
| **Coronavirus is a serious illness** | 42,667 | 2.08 | 0.79 |
| Coronavirus would be a serious illness for me | 42,667 | 2.54 | 1.27 |
| Someone could spread coronavirus to other people, even if they do not have symptoms yet | 42,667 | 1.69 | 0.91 |
| My personal behaviour has an impact on how coronavirus spreads | 42,667 | 2.02 | 1.08 |
| **I feel I have made big sacrifices to help prevent the spread of coronavirus** | 34,586 | 2.16 | 0.99 |
| **I would worry about what others would think of me if I tested positive for coronavirus** | 42,667 | 3.43 | 1.23 |
| **I think the risks of coronavirus are being exaggerated** | 42,667 | 3.68 | 1.25 |

Overall compliance to the rules and official guidance was high. Table 2 displays the proportion of people who left their house over the 7 days prior to completing the survey. Table 3 displays the proportion of people who came into close contact (<2m distance) with another person and who wore a face covering when they left the house. Table 4 displays the level of compliance with personal protective behaviours such as wearing a face covering, hand washing, ventilation and disinfecting surfaces.

**Table 3**. Number (and proportion) of people who left their house for a specified activity and requesting a test to confirm whether they have the virus or not (N = 42,667).

|  |  |  |
| --- | --- | --- |
| Behaviour | No | Yes |
| Going out for essential shopping  | 8,506 (19.94)  | 34,161 (80.06) |
| Going out for non-essential shopping  | 26,565 (62.26)  | 16,102 (37.74) |
| Going out for exercise  | 14,202 (33.29) | 28,465 (66.71) |
| Going outdoors for recreational activity (inc. sitting in the park) | 27,312 (64.01)  | 15,355 (35.99) |
| Going out for a medical need / donate blood | 34,992 (82.01) | 7,675 (17.9) |
| Going out to care for a vulnerable person | 35,513 (83.23) | 7,154 (16.77) |
| Going out to meet friends / family (not in same household) | 30,406 (71.26) | 12,261 (28.74) |
| Requesting a test to confirm whether they have the virus or not  | 15, 409 (38.3)  | 24,819 (61.7)  |

**Table 4**. Number (and proportion) of people who did and did not come into close contact with others outside their household and wear a face covering, when going out for a specified activity.

|  |  |  |  |
| --- | --- | --- | --- |
| Activity | Close contact with others |  | Wearing a face covering |
| N | No | Yes |  | N | No | Yes |
| Out for essential shopping | 33,427 | 10,849(32.5%) | 22,578(67.5%) |  | 34,161 | 2,861(8.4%) | 31,300(91.6%) |
| Out for non-essential shopping | 15,743 | 4,877(31.0%) | 10,866 (69.0%) |  | 16,102 | 1,700 (10.6%) | 14,402 (89.4%) |
| Out for exercise | 27,973 | 16,997(60.8%) | 10,976(39.2%) |  | 28,465  | 16,040 (56.3%) | 12,425 (43.7%) |
| Traveling to and from work | 12,746 | 7,298(57.3%) | 5,448(42.7%) |  | 12,979 | 6,387 (49.2) | 6,592 (50.8%) |
| At work  | 12,757 | 3,321(26.0%) | 9,436(74.0%) |  | 12,979  | 2,714 (20.9%) | 10,265 (79.1%) |
| Out for a medical need | 7,487 | 2,515 (33.6%) | 4,972(66.4%) |  | 7,675 | 964 (12.6%) | 6,711 (87.4%) |
| Out to care for vulnerable persons | 7,027 | 2,000(28.5%) | 5,027(71.5%) |  | 7,154 | 1,694 (23.7%) | 5,460(76.3%) |
| Meeting friends / family  | 12,090 | 2,779(23.0%) | 9,311(77.0%) |  | 12,261  | 5,139 (41.9%) | 7,122 (58.1%) |
| Outdoors for recreational activity | 15,106 | 8,237(54.5%) | 6,869(45.5%) |  | 15,355 | 7,970 (51.9%) | 7,385 (48.1%) |
| On public transport | 5,691 | 1,869(32.8%) | 3,822(67.2%) |  | 5,829  | 490 (8.4%) | 5,339(91.6%) |

**Table 5**. Levels of compliance with personal protective behaviours, measured on a 5-point Likert scale (1 = very frequently, 5 = never).

|  |  |  |  |
| --- | --- | --- | --- |
| Participant behaviours  | N  | Mean (SD) |  |
| Washing hands frequently  | 42.667 | 1.58 (0.83) |  |
| Wearing a mask  | 34,526  | 1.88 (1.33) |  |
| Disinfecting surfaces  | 42,267 | 2.16 (1.19) |  |
| Ventilating home | 34,526 | 2.41 (1.28) |  |

**DIFFERENCES IN GOING OUT BEHAVIOUR BASED ON DIFFERING ATTITUDES TOWARDS CORONAVIRUS**

In order to investigate associations between various attitudinal variables and going out behaviours, physical distancing, and personal protective behaviours (hand washing, wearing a face covering, disinfecting surfaces, ventilating spaces) while controlling for potentially confounding factors, including age, medical condition, region, level of area deprivation, health and social care worker status, and wave of data collection, we conducted a combination of negative binomial regressions (count data) and logistic regressions (binary outcomes). First, we ran these models with each of the four attitudinal variables separately. Then, we conducted a multivariable analysis with all four variables. Due to the large sample size and multiple testing, we will focus the below discussion on those associations that are significant at *p* < 0.001. It is important to note that the nature of this analysis presents a number of confounders, some of which cannot be controlled.

**Going out behaviours**

We carried out seven negative binomial regressions to investigate associations between the perception that the risks of coronavirus are exaggerated, that coronavirus is a serious illness, they have made big sacrifices to help prevent community transmission, and moral condemnation; and going out behaviours on a sample of 30,885 people. Results are reported for each attitudinal variable combined (see Table 6) and separately (see Table 10 in Appendix 2). Overall, in the multivariable analyses, those who agreed more strongly that the risks of coronavirus are exaggerated were significantly more likely to go out for essential and non-essential shopping (adjusted incident rate ratio, aIRR = 1.07 and 1.17, respectively), to exercise (aIRR = 1.03), for a medical need (aIRR = 1.14), to care for vulnerable persons (aIRR = 1.09), to meet with family or friends they don’t live with (aIRR = 1.20), and for outdoor recreation activity (aIRR = 1.10). Contrary to our hypothesis, respondents who agreed more strongly that they would worry about what others would think of them if they tested positive for coronavirus, were significantly more likely to go out for for non-essential shopping (aIRR = 1.14), a medical need (aIRR = 1.19), to care for vulnerable persons (aIRR = 1.09), and to meet with family or friends they don’t live with (aIRR = 1.05). Consistent with our hypothesis, those who agreed more strongly that coronavirus is a serious illness and that they have made big sacrifices to help prevent the spread of coronavirus, were significantly less likely to go out for essential (aIRR = 0.90 and 0.97, respectively) and non-essential shopping (aIRR = 0.80 and 0.94, respectively) and to meet with friends or family who they don’t live with (aIRR = 0.80 and 0.92, respectively). Those who agreed more strongly that coronavirus is a serious illness were also significantly less likely to go out for outdoor recreation activity (aIRR = 0.88). All models were highly significant (p < 0.001). Pseudo-R2 values ranged from 0.3% to 4.4%.

NB. Going to work behaviour has been excluded from this analysis as it is being analysed separately.

**Physical distancing**

We carried out 10 logistic regression models to investigate associations between the perception that the risks of coronavirus are exaggerated, that coronavirus is a serious illness, they have made big sacrifices to help prevent community transmission, and moral condemnation; and physical distancing outside the house, both combined (see Table 7) and separately (see Table 11 in Appendix 2). Sample sizes varied from 4,136 to 24,170, reflective of the overall number of people who left the home for various activities. Overall, in the multivariable analyses, greater agreement that the risks of coronavirus are exaggerated was significantly associated with close contact with others when: going to essential and non-essential shops (adjusted odds ratio, aOR = 1.10 and 1.14, respectively), exercising (aOR = 1.22), traveling to and from work (aOR = 1.28), when going out for a medical need or to care for a vulnerable person (aOR = 1.15 and 1.25, respectively), meeting family or friends they don’t live with (aOR = 1.20), and out for outdoor recreational activity (aOR = 1.30). In contrast with our hypothesis, those who agreed more strongly that they would worry about what others would think of them if they tested positive for coronavirus, were also significantly more likely to come into close contact with others when at non-essential shops (aOR = 1.06), exercising (aOR = 1.18), traveling to and from work (aOR = 1.25), and when doing outdoor recreational activity (aOR = 1.25). Conversely, those who agreed more strongly that coronavirus is a serious illness and that they have made big sacrifices to help prevent the spread of coronavirus, were significantly less likely to come into close contact with others when exercising (aOR = 0.86 and 0.91, respectively) and when doing outdoor recreational activity (aOR = 0.84 and 0.91, respectively). Those who agreed more strongly that they have made big sacrifices to help prevent the spread of coronavirus were also significantly less likely to come into close contact with others when traveling to and from work (aOR = 0.90). All models were highly significant (p < 0.001). Pseudo-R2 values ranged from 2.2% to 11.5%.

**Table 6**. Negative binomial regression estimates for number of times left the house, displaying adjusted incidence rate ratios [95% CIs] for associations with attitudes towards Covid-19 in multivariable models (N = 30,885).

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Variable**  | **Essential shops** | **Non-essential shops** | **Exercise** | **Medical need** | **Care to vulnerable persons** | **Meet friends / family** | **Outdoor recreation activity** |
| Risks are exaggerated | 1.071\*\*\* | 1.168\*\*\* | 1.027\*\*\* | 1.135\*\*\* | 1.094\*\*\* | 1.199\*\*\* | 1.102\*\*\* |
| [1.060,1.081] | [1.147,1.190] | [1.013,1.041] | [1.105,1.165] | [1.059,1.130] | [1.174,1.224] | [1.078,1.126] |
|  |  |  |  |  |  |  |  |
| Covid is serious | 0.901\*\*\* | 0.799\*\*\* | 0.970\* | 0.971 | 0.938\* | 0.804\*\*\* | 0.884\*\*\* |
|  | [0.885,0.917] | [0.773,0.825] | [0.946,0.993] | [0.926,1.017] | [0.886,0.993] | [0.775,0.834] | [0.850,0.920] |
|  |  |  |  |  |  |  |  |
| Efforts to stop virus transmission | 0.967\*\*\* | 0.941\*\*\* | 1.002 | 0.972 | 1.037 | 0.915\*\*\* | 0.994 |
| [0.956,0.979] | [0.920,0.963] | [0.986,1.018] | [0.940,1.005] | [0.996,1.079] | [0.893,0.939] | [0.968,1.021] |
|  |  |  |  |  |  |  |  |
| Moral condemnation | 1.010\* | 1.139\*\*\* | 0.974\*\*\* | 1.186\*\*\* | 1.090\*\*\* | 1.048\*\*\* | 1.012 |
| [1.001,1.019] | [1.119,1.159] | [0.962,0.986] | [1.156,1.216] | [1.057,1.123] | [1.027,1.069] | [0.992,1.033] |
|  |  |  |  |  |  |  |  |
| *pseudo R2* | 0.014 | 0.028 | 0.003 | 0.033 | 0.016 | 0.044 | 0.007 |

Exponentiated coefficients; 95% confidence intervals in brackets

\* *p* < 0.05, \*\* *p* < 0.01, \*\*\* *p* < 0.001

**Table 7**. Logistic regression estimates for coming into close contact with others when outside the house, displaying adjusted odds ratios [95% CIs] for associations with attitudes towards Covid-19 in multivariable models.

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Variable** | **Essential shops** | **Non-essential shops** | **Exercise** | **Travel to/from work** | **At work** | **Medical need** | **Care to vulnerable persons** | **Meet friends / family** | **Outdoor recreational activity** | **Public transport** |
| Risks are exaggerated | 1.101\*\*\* | 1.138\*\*\* | 1.223\*\*\* | 1.282\*\*\* | 1.071\*\* | 1.148\*\*\* | 1.246\*\*\* | 1.196\*\*\* | 1.302\*\*\* | 1.076\* |
| [1.072,1.131] | [1.097,1.180] | [1.190,1.257] | [1.233,1.334] | [1.026,1.118] | [1.088,1.212] | [1.175,1.321] | [1.139,1.254] | [1.255,1.350] | [1.012,1.143] |
|  |  |  |  |  |  |  |  |  |  |  |
| Covid is serious | 0.948\* | 0.908\*\* | 0.859\*\*\* | 0.890\*\* | 0.988 | 1.081 | 1.061 | 0.904\* | 0.843\*\*\* | 0.909 |
| [0.903,0.995] | [0.849,0.972] | [0.816,0.903] | [0.827,0.958] | [0.912,1.069] | [0.983,1.189] | [0.956,1.178] | [0.828,0.987] | [0.788,0.902] | [0.814,1.015] |
|  |  |  |  |  |  |  |  |  |  |  |
| Efforts to stop virus transmission | 0.955\*\* | 0.948\* | 0.907\*\*\* | 0.899\*\*\* | 0.972 | 0.899\*\* | 0.886\*\* | 0.921\*\* | 0.908\*\*\* | 0.965 |
| [0.926,0.985] | [0.905,0.993] | [0.877,0.938] | [0.854,0.946] | [0.920,1.027] | [0.842,0.961] | [0.822,0.956] | [0.869,0.975] | [0.868,0.951] | [0.897,1.039] |
|  |  |  |  |  |  |  |  |  |  |  |
| Moral condemnation | 1.017 | 1.064\*\*\* | 1.183\*\*\* | 1.249\*\*\* | 1.012 | 1.042 | 1.059\* | 1.043 | 1.254\*\*\* | 1.011 |
| [0.993,1.041] | [1.028,1.101] | [1.153,1.213] | [1.203,1.298] | [0.972,1.054] | [0.991,1.095] | [1.004,1.118] | [0.998,1.091] | [1.211,1.299] | [0.956,1.069] |
|  |  |  |  |  |  |  |  |  |  |
| pseudo *R*2 | 0.022 | 0.035 | 0.060 | 0.115 | 0.028 | 0.030 | 0.057 | 0.047 | 0.088 | 0.032 |
| *N* | 24,170 | 11,489 | 19,982 | 9,270 | 9,273 | 5,359 | 5,095 | 8,806 | 10,701 | 4,136 |

Exponentiated coefficients; 95% confidence intervals in brackets

\* *p* < 0.05, \*\* *p* < 0.01, \*\*\* *p* < 0.001

**Personal Protective Behaviours (PPBs) and Requesting a test**

We carried out 4 logistic regression models to investigate associations between the risks of coronavirus are exaggerated, that coronavirus is a serious illness, they have made big sacrifices to help prevent community transmission, and moral condemnation and the use of personal protective behaviours, such as hand washing, wearing a face cover, disinfecting surfaces, ventilating the home. Similarly, we carried out 1 logistic regression model for requesting a test for coronavirus if symptomatic. Results are reported as a multivariate model (see Table 8 below) and for each attitudinal variable separately (see Table 12 in the Appendix). Sample sizes varied from 23,278 to 31,772. Overall, in the multivariable analyses, greater agreement that the risks of coronavirus are exaggerated was significantly associated with not performing the behaviour of washing hands (aOR = 0.719), wearing a face mask (aOR = 0.727), disinfecting surfaces (aOR = 0.851) and requesting a test (aOR = 0.783). Conversely, those who reported greater agreement that Covid is a serious illness and that they have made big sacrifices to stop virus transmission were more likely to perform the behaviour of hand washing (aOR= 1.761 and aOR=1.514 for each factor), to wear a face mask (aOR=1.678 and aOR=1.349, respectively), to disinfect surfaces (aOR=1.198 and OR=1.409), to ventilate their home (aOR=1.281 and aOR=1.174) and to request a test (aOR=1.379 and OR=1.140). Similarly, those who agreed more strongly that they would worry what others would think if they tested positive for coronavirus (“moral condemnation”) were significantly more likely to wear a face mask (aOR= 1.060), to disinfect surfaces (aOR= 1.186) and to ventilate the home (aOR=1.122) but less likely to request a test and wash their hands frequently (aOR= 0.824 and aOR=0.943, respectively).

**Table 8**. Logistic regression estimates for personal protective behaviours, displaying adjusted odds ratios [95% CIs] for associations with attitudes towards Covid-19 in multivariable models.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Variable**  | **Washing hands** | **Wearing face cover** | **Disinfecting surfaces**  | **Ventilating home** | **Requesting test**  |
| Risks are exaggerated | 0.719\*\*\* | 0.727\*\*\* | 0.851\*\*\* | 0.996 | 0.783\*\*\* |
| [0.696,0.743] | [0.704,0.751] | [0.831,0.871] | [0.971,1.021] | [0.765,0.801] |
|  |  |  |  |  |  |
| Covid is serious | 1.761\*\*\* | 1.678\*\*\* | 1.198\*\*\* | 1.282\*\*\* | 1.379\*\*\* |
|  | [1.665,1.861] | [1.587,1.775] | [1.341,1.456] | [1.226,1.341] | [1.324,1.437] |
|  |  |  |  |  |  |
| Efforts to stop virus transmission | 1.514\*\*\* | 1.349\*\*\* | 1.409\*\*\* | 1.174\*\*\* | 1.140\*\*\* |
| [1.457,1.573] | [1.300,1.401] | [1.372,1.447] | [0.940,1.005] | [1.110,1.171] |
|  |  |  |  |  |  |
| Moral condemnation | 0.943\*\*\* | 1.060\*\*\* | 1.186\*\*\* | 1.122\*\*\* | 0.824\*\*\* |
| [0.913,0.974] | [1.027,1.093] | [1.161,1.212] | [1.097,1.147] | [0.807,0.841] |
|  |  |  |  |  |  |
| *pseudo R2* | 0.15731,772 | 0.12523,278 | 0.09831,634 | 0.04523,868 | 0.09230,115 |

Exponentiated coefficients; 95% confidence intervals in brackets

\* *p* < 0.05, \*\* *p* < 0.01, \*\*\* *p* < 0.001

Responses to some of these questions may be affected by other behaviours. We are interested in further investigating the behaviour of wearing a face cover when outside the home. If one is going into shops more, one should be wearing a face covering more. Therefore, we also examined questions relating to wearing a face cover by adjusting for when participants go out for a specific type of activity. We carried out 10 logistic regression models to investigate associations between the risks of coronavirus are exaggerated, that coronavirus is a serious illness, they have made big sacrifices to help prevent community transmission, and moral condemnation and wearing a face cover for the type of activities examined as in the going-out behaviours. Results are reported both combined (see Table 9 below) and as separate analyses (Table 13 in the Appendix). Sample sizes varied from 4,381 to 25,524, reflecting the number of people leaving the home for a certain activity, as also noted in the previous section examining going-out behaviours. Results indicated that there was an association between agreement that the risk is exaggerated and not performing the behaviour (i.e. not wearing the mask) while shopping for essentials and on-essentials (aOR=0.838 and aOR= 0.871 respectively), at work (aOR = 0.930), when using public transport (aOR=0.774). However, there was a positive association between agreement that the risks of coronavirus are exaggerated and wearing a face cover when traveling to and from work (aOR=1.086).

In relation to wearing a face mask when performing a number of activities when outside the home, those who agreed more strongly that coronavirus is a serious illness were more likely to wear a mask when at essential (aOR = 1.565) and non-essential shops (aOR = 1.615), when exercising/walking (aOR=1.177), when traveling to work (aOR=1.202) when at work (aOR=1.339), when going for a medical need and caring for the vulnerable (aOR=1.474 and aOR=1.262, respectively), when meeting with friends and when outside for outdoor recreational activity (aOR = 1.20 and aOR=1.16, respectively), and when using public transport (aOR = 1.51). All models were highly significant (p < 0.001). Pseudo-R2 (Nagelkerke) values ranged from 1.9% to 12.8%.

Those who agreed that they have made big sacrifices to stop the spread of the virus were more likely to wear a mask when at work (aOR=1.108), while those who agreed more strongly that they worry about what the others thought about them if they tested positive (moral condemnation) were also more likely to wear a face mask when traveling to/from work and when at work (aOR=1.359 and aOR=1.159, respectively), when caring for the vulnerable (aOR=1.328), meeting friends and family (aOR=1.344) and when outside for recreational activities (aOR=1.397).

**Table 9**. Logistic regression estimates for wearing a face cover when outside the house, displaying adjusted odds ratios [95% CIs] for associations with attitudes towards Covid-19 in multivariable models.

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Variable** | **Essential shops** | **Non-essential shops** | **Exercise/****walking**  | **Travel to/from work** | **At work** | **Medical need** | **Care to vulnerable persons** | **Meet friends / family** | **Outdoor recreational activity** | **Public transport** |
| Risks are exaggerated | 0.838\*\*\* | 0.871\*\*\* | 1.033\* | 1.086\*\*\* | 0.930\*\* | 0.975 | 0.956 | 0.973 | 1.036\* | 0.774\*\*\* |
| [0.804,0.872] | [0.827,0.917] | [1.005,1.061] | [1.045,1.127] | [0.889,0.973] | [0.909,1.047] | [0.90,1.014] | [0.936,1.012] | [1.00,1.074] | [0.705,0.850] |
|  |  |  |  |  |  |  |  |  |  |  |
| Covid is serious | 1.565\*\*\* | 1.615\*\*\* | 1.177\*\*\* | 1.202\*\*\* | 1.339\*\*\* | 1.474\*\*\* | 1.262\*\*\* | 1.200\*\*\* | 1.163\*\*\* | 1.507\*\*\* |
| [1.459,1.679] | [1.478, 1.765] | [1.121,1.236] | [0.827,0.958] | [1.238,1.449] | [1.307,1.661] | [0.956,1.178] | [1.119,1.286] | [1.09,1.24] | [1.287,1.765] |
|  |  |  |  |  |  |  |  |  |  |  |
| Efforts to stop virus transmission | 1.034 | 1.060 | 1.018 | 0.945\* | 1.108\*\*\* | 0.999 | 1.106\*\* | 1.049\* | 1.018 | 1.094 |
| [0.984,1.086] | [0.993,1.13] | [0.985,1.051] | [0.901,0.992] | [1.049,1.170] | [0.915,1.09] | [1.027,1.191] | [1.001,1.100] | [0.975,1.064] | [0.977,1.224] |
|  |  |  |  |  |  |  |  |  |  |  |
| Moral condemnation | 0.975 | 0.985 | 1.346\*\*\* | 1.359\*\*\* | 1.159\*\*\* | 0.988 | 1.328\*\*\* | 1.344\*\*\* | 1.397\*\*\* | 1.001 |
| [0.938,1.014] | [0.936,1.037] | [1.314,1.380] | [1.311,1.409] | [1.11,1.210] | [0.922,1.059] | [1.254,1.407] | [1.294,1.395] | [1.351,1.445] | [0.913,1.097] |
|  |  |  |  |  |  |  |  |  |  |
| pseudo *R*2 | 0.045 | 0.035 | 0.094 | 0.140 | 0.083 | 0.019 | 0.112 | 0.100 | 0.128 | 0.063 |
| *N* | 25,524 | 12,081 | 20,985 | 9,756 | 9,756 | 5,603 | 5,318 | 9,221 | 11,197 | 4,381 |

Exponentiated coefficients; 95% confidence intervals in brackets

\* *p* < 0.05, \*\* *p* < 0.01, \*\*\* *p* < 0.001

**Conclusion**

Overall, the association between attitudes towards the virus and reported adherence to rules and guidance for social distancing and use of personal protective behaviours is high. Those who thought that COVID was a serious illness and that they have made big sacrifices to help prevent community transmission report going outside the home to perform various activities less often and keeping a physical distance during these activities (e.g. essential shopping). They also report using personal protective behaviours such as wearing a face mask when going outside the home.

Those who reported feeling moral condemnation towards contracting the disease reported leaving the home more often for various activities, however, they also seem to report greater use of personal protective behaviours, with the exception of requesting a test to confirm whether they have COVID or not.

Those who believe that the risks of the virus are exaggerated report lower levels of adherence to rules and guidance for social distancing when outside the home and for using personal protective behaviours, including requesting a test if symptomatic.

Therefore, we conclude that attitudes and beliefs towards the virus play an important role in determining adherence to the rules and use of personal protective behaviours. However, it is also important to highlight that these models only explain a very small proportion of the overall variance, so caution should be used when interpreting these estimates. It may be that attitudinal items based on psychological theory may be better predictors and/or show different results.

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Dataset used:

* Department of Health and Social Care tracker
	+ Tracking DHSC marketing, coronavirus attitudes, beliefs, knowledge, reported behaviour, satisfaction with Government response, credibility of Government.
	+ Data collected weekly (Monday to Wednesday) since late January 2020.
	+ N~2000 per wave.
	+ Market research company commissioned: BMG Research.

*Please note that this work has been conducted rapidly, and has not been peer reviewed or subject to normal quality control measures.*

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**Appendix 1**

Question 7 in the survey covers a number of items about COVID-19 relating to knowledge, beliefs and more. These items have evolved in an *ad hoc* manner in response to developments in the pandemic and DHSC priorities. For example, in wave 42, the items were:

**Q7. To what extent do you agree or disagree with the following statements:**

SCALE:

* Strongly agree
* Agree
* Neither agree nor disagree
* Disagree
* Strongly disagree
* Don’t know

STATEMENTS:

1. Someone could spread coronavirus to other people, even if they do not have symptoms yet
2. Not all people who have coronavirus develop symptoms or feel unwell
3. Everyone should act as if they have got the virus, even if they do not show any symptoms
4. Coronavirus would be a serious illness for me
5. I could catch coronavirus from touching my mouth, nose or eyes
6. I could catch coronavirus from surfaces that other people with coronavirus may have touched
7. I could catch coronavirus from invisible droplets floating in the air hours after someone has breathed them out
8. My personal behaviour has an impact on how coronavirus spreads
9. I would worry about what others would think of me if I tested positive for coronavirus
10. I think the risks of coronavirus are being exaggerated
11. Coronavirus numbers are growing because testing has increased
12. I feel I have made big sacrifices to help prevent the spread of coronavirus
13. When it comes to the coronavirus outbreak, I want to do my bit to help
14. I am desperate for life to get back to normal
15. Coronavirus can have long lasting effects, even if the original symptoms weren’t very serious
16. Now that coronavirus vaccination is available, the elderly and vulnerable are protected from coronavirus
17. Social distancing remains important, even now coronavirus vaccination is available

Given the lack of a prior theory around the question design, we carried out exploratory factor analysis to investigate relationships between items. We used data from waves 38-42 as these covered a consistent set of items.

Kaiser’s criterion and a scree plot suggest three factors explaining 51% of the variance. Weightings < 0.3 not shown.

|  |  |  |  |
| --- | --- | --- | --- |
| **Item** | COVID is serious | Making big sacrifices | Moral condemnation |
| Coronavirus would be a serious illness for me | 0.54 |  | 0.40 |
| I could catch coronavirus from touching my mouth, nose or eyes | 0.68 |  |  |
| I could catch coronavirus from surfaces that other people with coronavirus may have touched | 0.71 |  |  |
| Someone could spread coronavirus to other people, even if they do not have symptoms yet | 0.75 |  |  |
| My personal behaviour has an impact on how coronavirus spreads | 0.63 |  |  |
| I feel I have made big sacrifices to help prevent the spread of coronavirus | 0.33 | 0.51 |  |
| I am desperate for life to get back to normal |  | 0.70 |  |
| I would worry about what others would think of me if I tested positive for coronavirus |  |  | 0.74 |
| I think the risks of coronavirus are being exaggerated | -0.65 | 0.37 |  |
| I could catch coronavirus from invisible droplets floating in the air hours after someone has breathed them out | 0.47 |  | 0.35 |
| Coronavirus numbers are growing because testing has increased |  | 0.60 |  |
| Coronavirus can have long lasting effects, even if the original symptoms weren’t very serious | 0.76 |  |  |
| Now that coronavirus vaccination is available, the elderly and vulnerable are protected from coronavirus |  |  | 0.61 |
| Social distancing remains important, even now coronavirus vaccination is available | 0.80 |  |  |
| Not all people who have coronavirus develop symptoms or feel unwell | 0.57 | 0.36 | -0.32 |
| Everyone should act as if they have got the virus, even if they do not show any symptoms  | 0.73 |  |  |

There is a broad factor with high weightings on most items that reflects a belief that COVID is serious and includes being correct on knowledge items around transmission. We have labelled this “COVID is serious”.

A second factor loads strongly on the items “I feel I have made big sacrifices to help prevent the spread of coronavirus” and “I am desperate for life to get back to normal”, and we have labelled it based on that first item. It also loads strongly on “Coronavirus numbers are growing because testing has increased”, which appears to be wishful thinking in this group. It loads weakly on “I think the risks of coronavirus are being exaggerated”. It also loads weakly on “Not all people who have coronavirus develop symptoms or feel unwell”, which may be cognitive dissonance leading people to believe that asymptomatic individuals are not actually infected.

The third factor is difficult to interpret here in isolation. However, a factor analysis of data from earlier waves suggests the label of “Moral condemnation”. It loads strongly on “I would worry about what others would think of me if I tested positive for coronavirus” and “Now that coronavirus vaccination is available, the elderly and vulnerable are protected from coronavirus”. It loads weakly on “Coronavirus would be a serious illness for me”, “I could catch coronavirus from invisible droplets floating in the air hours after someone has breathed them out” and (reversed) “Not all people who have coronavirus develop symptoms or feel unwell”.

**Appendix 2**

**Table 10**. Negative binomial regression estimates for number of times left the house, displaying adjusted incidence rate ratios [95% CIs] for associations with attitudes towards Covid-19.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Variable**  | **Essential shops** | **Non-essential shops** | **Exercise** | **Medical need** | **Care to vulnerable persons** | **Meet friends / family** | **Outdoor recreation activity** |
| **Risks are exaggerated** | 1.103\*\*\* | 1.254\*\*\* | 1.031\*\*\* | 1.176\*\*\* | 1.129\*\*\* | 1.277\*\*\* | 1.148\*\*\* |
| [1.094,1.111] | [1.235,1.273] | [1.020,1.042] | [1.151,1.202] | [1.099,1.159] | [1.256,1.299] | [1.128,1.168] |
|  |  |  |  |  |  |  |  |
| pseudo *R*2 | 0.012 | 0.023 | 0.003 | 0.029 | 0.015 | 0.034 | 0.005 |
| *N* | 40,070 | 40,070 | 40,070 | 40,070 | 40,070 | 40,070 | 40,070 |
| **Covid is serious** | 0.849\*\*\* | 0.729\*\*\* | 0.943\*\*\* | 0.941\*\* | 0.934\*\* | 0.693\*\*\* | 0.820\*\*\* |
|  | [0.837,0.860] | [0.711,0.749] | [0.927,0.960] | [0.907,0.976] | [0.893,0.976] | [0.673,0.713] | [0.796,0.844] |
|  |  |  |  |  |  |  |  |
| pseudo *R*2 | 0.012 | 0.021 | 0.003 | 0.024 | 0.014 | 0.032 | 0.004 |
| *N* | 38,908 | 38,908 | 38,908 | 38,908 | 38,908 | 38,908 | 38,908 |
| **Efforts to stop virus transmission** | 0.942\*\*\* | 0.904\*\*\* | 0.990 | 0.979 | 1.029 | 0.863\*\*\* | 0.955\*\*\* |
| [0.932,0.952] | [0.885,0.923] | [0.976,1.005] | [0.949,1.009] | [0.992,1.068] | [0.843,0.883] | [0.932,0.979] |
|  |  |  |  |  |  |  |  |
| pseudo *R*2 | 0.009 | 0.016 | 0.003 | 0.026 | 0.014 | 0.032 | 0.004 |
| *N* | 32,355 | 32,355 | 32,355 | 32,355 | 32,355 | 32,355 | 32,355 |
| **Moral condemnation** | 1.006 | 1.132\*\*\* | 0.978\*\*\* | 1.206\*\*\* | 1.107\*\*\* | 1.029\*\* | 1.009 |
| [0.998,1.014] | [1.115,1.149] | [0.967,0.988] | [1.180,1.232] | [1.079,1.136] | [1.011,1.047] | [0.991,1.026] |
|  |  |  |  |  |  |  |  |
| pseudo *R*2 | 0.008 | 0.017 | 0.003 | 0.030 | 0.015 | 0.024 | 0.003 |
| *N* | 40,157 | 40,157 | 40,157 | 40,157 | 40,157 | 40,157 | 40,157 |

Exponentiated coefficients; 95% confidence intervals in brackets

\* *p* < 0.05, \*\* *p* < 0.01, \*\*\* *p* < 0.001

**Table 11.** Logistic regression estimates for coming into close contact with others when outside the house, displaying adjusted odds ratios [95% CIs] for associations with attitudes towards Covid-19.

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Participant** **characteristics**  | **Essential shops** | **Non-essential shops** | **Exercise** | **Travel to/from work** | **At work** | **Medical need** | **Care to vulnerable persons** | **Meet friends / family** | **Outdoor recreational activity** | **Public transport** |
| **Risks are exaggerated** | 1.131\*\*\* | 1.185\*\*\* | 1.304\*\*\* | 1.372\*\*\* | 1.099\*\*\* | 1.155\*\*\* | 1.254\*\*\* | 1.244\*\*\* | 1.383\*\*\* | 1.097\*\*\* |
| [1.107,1.155] | [1.150,1.221] | [1.276,1.333] | [1.328,1.416] | [1.062,1.138] | [1.105,1.207] | [1.196,1.315] | [1.197,1.292] | [1.344,1.424] | [1.045,1.152] |
|  |  |  |  |  |  |  |  |  |  |
| pseudo *R*2 | 0.020 | 0.035 | 0.053 | 0.106 | 0.027 | 0.027 | 0.053 | 0.046 | 0.076 | 0.030 |
| *N* | 31,502 | 14,685 | 26,389 | 11,979 | 11,991 | 7,084 | 6,626 | 11,310 | 14,171 | 5,242 |
| **Covid is serious** | 0.861\*\*\* | 0.824\*\*\* | 0.735\*\*\* | 0.779\*\*\* | 0.921\*\* | 0.969 | 0.884\*\* | 0.792\*\*\* | 0.716\*\*\* | 0.883\*\* |
| [0.830,0.893] | [0.782,0.868] | [0.708,0.764] | [0.737,0.824] | [0.867,0.979] | [0.900,1.044] | [0.816,0.959] | [0.741,0.847] | [0.681,0.753] | [0.811,0.961] |
|  |  |  |  |  |  |  |  |  |  |  |
| pseudo *R*2 | 0.019 | 0.030 | 0.045 | 0.088 | 0.026 | 0.023 | 0.043 | 0.040 | 0.060 | 0.031 |
| *N* | 30,588 | 14,316 | 25,679 | 11,649 | 11,661 | 6,947 | 6,490 | 10,988 | 13,821 | 5,086 |
| **Efforts to stop virus transmission** | 0.942\*\*\* | 0.930\*\*\* | 0.888\*\*\* | 0.901\*\*\* | 0.966 | 0.908\*\* | 0.904\*\* | 0.896\*\*\* | 0.892\*\*\* | 0.935 |
| [0.915,0.970] | [0.891,0.970] | [0.861,0.916] | [0.860,0.943] | [0.918,1.016] | [0.855,0.966] | [0.844,0.969] | [0.849,0.946] | [0.856,0.929] | [0.873,1.001] |
|  |  |  |  |  |  |  |  |  |  |  |
| pseudo *R*2 | 0.019 | 0.028 | 0.038 | 0.083 | 0.028 | 0.025 | 0.044 | 0.037 | 0.051 | 0.027 |
| *N* | 25,314 | 12,015 | 20,887 | 9,710 | 9,718 | 5,560 | 5,303 | 9,227 | 11,181 | 4,347 |
| **Moral condemnation** | 1.012 | 1.063\*\*\* | 1.183\*\*\* | 1.274\*\*\* | 1.025 | 1.062\*\* | 1.077\*\* | 1.038 | 1.233\*\*\* | 1.010 |
| [0.992,1.033] | [1.032,1.095] | [1.158,1.208] | [1.234,1.315] | [0.991,1.061] | [1.018,1.108] | [1.029,1.127] | [0.999,1.078] | [1.198,1.269] | [0.962,1.060] |
|  |  |  |  |  |  |  |  |  |  |  |
| pseudo *R*2 | 0.017 | 0.028 | 0.043 | 0.096 | 0.025 | 0.023 | 0.042 | 0.036 | 0.060 | 0.029 |
| *N* | 31,567 | 14,720 | 26,438 | 12,020 | 12,030 | 7,104 | 6,654 | 11,344 | 14,201 | 5,264 |

Exponentiated coefficients; 95% confidence intervals in brackets

\* *p* < 0.05, \*\* *p* < 0.01, \*\*\* *p* < 0.001

**Table 12**. Logistic regression estimates for use of personal protective behaviours (washing hands, wearing a face cover, disinfecting home, ventilating spaces and requesting a test) displaying adjusted odds ratios [95% CIs] for associations with attitudes towards Covid-19.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Variable**  | Washing hands | Wearing face cover | Disinfecting spaces  | Ventilating room | Requesting test  |
| **Risks are exaggerated** | 0.632\*\*\* | 0.643\*\*\* | 0.792\*\*\* | 0.923\*\*\* | 0.695\*\*\* |
| [0.616,0.648] | [0.628,0.659] | [0.778,0.806] | [0.906,0.941] | [0.682,0.708] |
|  |  |  |  |  |  |
| pseudo *R*2 | 0.090 | 0.069 | 0.031 | 0.015 | 0.072 |
| *N* | 39,841 | 31,073 | 39,672 | 31,843 | 37,766 |
| **Covid is serious** | 1.340\*\*\* | 1.393\*\*\* | 1.440\*\*\* | 1.268\*\*\* | 1.010 |
|  | [1.301,1.380] | [1.354,1.433] | [1.409,1.471] | [1.239,1.297] | [0.989,1.031] |
|  |  |  |  |  |  |
| pseudo *R*2 | 0.048 | 0.031 | 0.049 | 0.030 | 0.019 |
| *N* | 39,162 | 30,540 | 38,997 | 31,296 | 37,097 |
| **Efforts to stop virus** **transmission** | 1.668\*\*\* | 1.502\*\*\* | 1.527\*\*\* | 1.284\*\*\* | 1.196\*\*\* |
| [1.612,1.727] | [1.452,1.555] | [1.489,1.566] | [1.249,1.319] | [1.167,1.226] |
|  |  |  |  |  |  |
| pseudo *R*2 | 0.076 | 0.040 | 0.056 | 0.019 | 0.025 |
| *N* | 32,155 | 23,544 | 32,015 | 24,146 | 30,484 |
| **Moral condemnation** | 1.015 | 1.086\*\*\* | 1.199\*\*\* | 1.141\*\*\* | 0.825\*\*\* |
| [0.949,1.010] | [1.060,1.113] | [1.177,1.221] | [1.119,1.163] | [0.810,0.840] |
|  |  |  |  |  |  |
| pseudo *R*2 | 0.028 | 0.005 | 0.022 | 0.019 | 0.034 |
| *N* | 39,924 | 31,131 | 39,754 | 31,895 | 37,838 |

Exponentiated coefficients; 95% confidence intervals in brackets

**Table 13**. Logistic regression estimates for participants reporting wearing a face cover when outside the house, displaying adjusted odds ratios [95% CIs] for associations with attitudes towards Covid-19.

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Participant** **characteristics**  | **Essential shops** | **Non-essential shops** | **Exercise** | **Travel to/from work** | **At work** | **Medical need** | **Care to vulnerable persons** | **Meet friends / family** | **Outdoor recreational activity** | **Public transport** |
| **Risks are exaggerated** | 0.756\*\*\* | 0.787\*\*\* | 1.028\* | 1.079\*\*\* | 0.878\*\*\* | 0.902\*\*\* | 0.955 | 0.961\* | 1.027\*\*\* | 0.725\*\*\* |
| [0.732,0.781] | [0.754,0.821] | [1.006,1.050] | [1.046,1.113] | [0.846,0.911] | [0.850,0.956] | [0.910,1.002] | [0.931,0.991] | [0.998,1.056] | [0.671,0.782] |
|  |  |  |  |  |  |  |  |  |  |
| pseudo *R*2 | 0.028 | 0.028 | 0.069 | 0.141 | 0.082 | 0.009 | 0.073 | 0.072 | 0.094 | 0.042 |
| *N* | 32,129 | 14,970 | 26,802 | 12,174 | 12,174 | 7,231 | 6,730 | 11,443 | 14,377 | 5,352 |
| **Covid is serious** | 1.122\*\*\* | 1.160\*\*\* | 1.427\*\*\* | 1.430\*\*\* | 1.289\*\*\* | 1.146\*\*\* | 1.326\*\*\* | 1.434\*\*\* | 1.448\*\*\* | 1.176\*\*\* |
| [1.079,1.166] | [1.104,1.218] | [1.391,1.464] | [1.378,1.483] | [1.236,1.346] | [1.070,1.228] | [1.253,1.403] | [1.381,1.488] | [1.399,1.498] | [1.075,1.287] |
|  |  |  |  |  |  |  |  |  |  |  |
| pseudo *R*2 | 0.011 | 0.015 | 0.106 | 0.177 | 0.093 | 0.010 | 0.093 | 0.113 | 0.135 | 0.020 |
| *N* | 31,560 | 14,767 | 26,350 | 11,968 | 11,968 | 7,164 | 6,652 | 11,264 | 14,168 | 5,271 |
| **Efforts to stop virus transmission** | 1.152\*\*\* | 1.204\*\*\* | 1.082\*\*\* | 1.022\*\*\* | 1.197\*\*\* | 1.103\* | 1.222\*\*\* | 1.122\*\*\* | 1.090\*\*\* | 1.229\*\*\* |
| [1.101,1.206] | [1.134,1.277] | [0.861,0.916] | [0.977,1.070] | [1.136,1.260] | [1.018,1.196] | [1.140,1.310] | [1.074,1.172] | [1.047,1.136] | [1.106,1.366] |
|  |  |  |  |  |  |  |  |  |  |  |
| pseudo *R*2 | 0.012 | 0.019 | 0.069 | 0.138 | 0.084 | 0.008 | 0.085 | 0.073 | 0.094 | 0.024 |
| *N* | 25,831 | 12,249 | 21,237 | 9,874 | 9,874 | 5,677 | 5,388 | 9,339 | 11,341 | 4,436 |
| **Moral condemnation** | 0.996 | 1.052\*\*\* | 1.371\*\*\* | 1.380\*\*\* | 1.201\*\*\* | 0.991 | 1.304\*\*\* | 1.374\*\*\* | 1.417\*\*\* | 1.044 |
| [0.963,1.030] | [1.007,1.098] | [1.341,1.400] | [1.337,1.425] | [1.156,1.248] | [0.935,1.052] | [1.241,1.370] | [1.329,1.420] | [1.376,1.459] | [0.964,1.131] |
|  |  |  |  |  |  |  |  |  |  |  |
| pseudo *R*2 | 0.008 | 0.012 | 0.109 | 0.178 | 0.087 | 0.006 | 0.096 | 0.110 | 0.142 | 0.016 |
| *N* | 32,200 | 15,013 | 26,859 | 12,216 | 12,216 | 7,253 | 6,758 | 11,481 | 14,406 | 5,374 |

Exponentiated coefficients; 95% confidence intervals in brackets

\* *p* < 0.05, \*\* *p* < 0.01, \*\*\* *p* < 0.001