

**Supplementary materials**

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**Awareness, Attitudes and Actions (AAA) survey**

<b>Survey questions</b>	<b>Response categories/instruction</b>
<b>Section A: demographics</b>	
Does any of the following apply to you? (select all that apply)	Diabetes (Type 1 or 2) A body mass index (BMI) of 40 or above Chronic (long-term) respiratory diseases, such as asthma, chronic obstructive pulmonary disease (COPD), emphysema or bronchitis Chronic heart disease, such as heart failure Chronic kidney disease Chronic liver disease, such as hepatitis Chronic neurological conditions, such as Parkinson's disease, motor neurone disease, multiple sclerosis (MS), a learning disability or cerebral palsy Problems with your spleen – for example, sickle cell disease or if you have had your spleen removed A weakened immune system as the result of conditions such as HIV and AIDS, or medicines such as steroid tablets or chemotherapy None of these apply to me I have a different long term health condition not listed above (please specify in the text box provided)
Please state your age	Textbox
Gender	Male Female Other (textbox) Prefer not to say
What is your ethnicity?	White – British, Irish, other Asian/Asian British – Indian, Pakistani, Bangladeshi, other Chinese/Chinese British Black/Black British – Caribbean, African, other Middle Eastern/Middle Eastern British – Arab, Turkish, other Mixed race – White and Black/Black British Mixed race – other Other ethnic groups (please specify in the text box provided) Prefer not to say
What is your height in feet and inches, or centimetres?	Text box provided for each
What is your weight in pounds or kilograms?	Text box provided for each

Do you work in health or social care?	Yes (please provide your job title in the text box) No
Does your job require you to be in direct contact with coronavirus (COVID-19) patients?	Yes No
Please provide the first half of your postcode (e.g. NG1)	Textbox provided
Please provide your email address	Textbox provided
<b>Section B: awareness, attitudes and actions relating to COVID-19</b>	
Have you had coronavirus?	Yes – I have been diagnosed and am still ill Yes – I have and I have recovered Yes - I have been diagnosed, but had no symptoms No
Have you experienced coronavirus symptoms?	Yes - and I was diagnosed Yes – but I have not been diagnosed No I don't know what the symptoms
Which of the below are symptoms of coronavirus? (Select all that is relevant)	Persistent cough Feeling confused Loss of appetite Loss of smell Loss of taste Tightness in chest Diarrhoea Fatigue Shortness of breath Fever Sore throat None of the above
Have you taken any of the actions below in response to the coronavirus (COVID-19) outbreak? (select all that apply)	Social distancing Self-isolation Worn protective apparel (e.g. gloves, mask etc.) Used online shopping or food delivery service Shielding due as my health status means I am defined as 'extremely vulnerable' All of the above Other (Textbox)
Do you believe you are at higher risk of severe illness from coronavirus (COVID-19)?	Yes No
Why do you believe you are at a higher risk of severe illness from coronavirus (COVID-19)? (only for those who answered yes)	Textbox
Why do you believe you are not at a higher risk of severe illness from coronavirus (COVID-19)? (only for those who answered no)	Textbox

Describe how being identified as being at a higher risk of severe illness from coronavirus (COVID-19) by the UK Government, has made you feel?	Textbox
What sources have informed you that you are at a higher risk from coronavirus (COVID-19)? (select all that apply)	Traditional media (TV, Newspapers, Radio) Social media (Twitter, Facebook, Instagram, Snapchat) National or Local Government Employer Healthcare organisations Community groups Charity Friends and Family Schools and education centres Other (please specify in the text box provided)
Do you feel like you have enough information specific to your higher risk of severe illness from coronavirus (COVID-19)?	Yes No
Why do you believe you have received enough information specific to your higher risk of severe illness from coronavirus (COVID-19), and what more do you want to know? (only for those who answered yes)	Textbox
Why do you believe you have not received enough information specific to your higher risk of severe illness from coronavirus (COVID-19), and what else do you want to know? (only for those who answered no)	Textbox
Have you used other forms of information (i.e. nonprofessional/social media “experts”/other people/patients) since the COVID-19 outbreak?	Yes No
Please specify what information you have used relating to your higher risk status since the coronavirus (COVID19) outbreak	Textbox
How concerned are you about each of the statements below <ul style="list-style-type: none"> <li>• Becoming infected with coronavirus (COVID-19)</li> <li>• Severe illness and possibly death from coronavirus (COVID-19)</li> <li>• Spreading coronavirus (COVID-19) to others including family and friends</li> <li>• Access to healthcare support (e.g. advice, medication)</li> <li>• If you become infected, that you would receive appropriate care/support</li> <li>• That your higher risk of severe illness from coronavirus (COVID-19) means you may not</li> </ul>	Likert scale from 0 (Not concerned at all) to 10 (Very concerned)

receive healthcare support compared with people who do not have a higher risk status	
<b><i>Section C: impact of COVID-19 on management of health conditions and use of technology</i></b>	
Has your management of your health condition changed compared to before the coronavirus (COVID-19) outbreak?	Yes No Not applicable (70 years or over or pregnant without a health condition)
How and why has it changed?	Textbox
How do you feel about changing your management of your health condition due to the coronavirus (COVID-19) outbreak?	Textbox
Has COVID-19 changed your regular healthcare support? (this could type or frequency of support e.g. appointments, service, medications, communication consultant)	Appointments (please specify in the text box) Medication (please specify in the text box) Elective surgery (please specify in the text box) Communication platform (please specify in the text box) Clinician caring for me (please specify in the text box) Other (please specify in the text box) There has been no change
Have you received care through any of the following platforms?	Social media (please specify in the text box) Mobile phone app (please specify in the text box) Email Telephone Virtual consultation e.g. Zoom, Microsoft Teams (please specify in the text box) Other (please specify in the text box) No platforms have been used I am still receiving face to face care
How satisfied are you with using the platforms that you are receiving care through?	Extremely dissatisfied Somewhat dissatisfied Neither satisfied nor dissatisfied Somewhat satisfied Extremely satisfied
How satisfied are you with using the information/resources provided through the platforms that you are receiving care through?	Extremely dissatisfied Somewhat dissatisfied Neither satisfied nor dissatisfied Somewhat satisfied Extremely satisfied
Would you welcome the continued use of these platforms in the future, after the coronavirus (COVID-19) outbreak?	Yes No, but would welcome other platforms (please specify in the text box) No Not sure, I need more time to use them

You indicated that you have more than one of the high risk indicator for severe illness from coronavirus (COVID19). Please describe how this makes you feel, and why?	Textbox
<b>Section D: Mental Health and Wellbeing</b>	
Since the coronavirus (COVID-19) outbreak, my mental health is	Yes No
<p>Warwick-Edinburgh Mental Well-being Scale (WEMWBS)</p> <p>During the past two weeks...</p> <ul style="list-style-type: none"> <li>• I've been feeling optimistic about the future</li> <li>• I've been feeling useful</li> <li>• I've been feeling relaxed</li> <li>• I've been feeling interested in other people</li> <li>• I've had energy to spare</li> <li>• I've been dealing with problems well</li> <li>• I've been thinking clearly</li> <li>• I've been feeling good about myself</li> <li>• I've been feeling close to other people</li> <li>• I've been feeling confident</li> <li>• I've been able to make up my own mind about things</li> <li>• I've been feeling loved</li> <li>• I've been interested in new things</li> <li>• I've been feeling cheerful</li> </ul>	<p>Not at all</p> <p>Rarely</p> <p>Some of the time</p> <p>Often</p> <p>All of the time</p>
<p>Patient Health Questionnaire (PHQ-9)</p> <p>Over the last two weeks, how often have you been bothered by any of the following problems</p> <ul style="list-style-type: none"> <li>• Little interest or pleasure in doing things?</li> <li>• Feeling down, depressed, or hopeless?</li> <li>• Trouble falling or staying asleep, or sleeping too much?</li> <li>• Feeling tired or having little energy?</li> <li>• Poor appetite or overeating?</li> <li>• Feeling bad about yourself - or that you are a failure or have let yourself or your family down?</li> <li>• Trouble concentrating on things, such as reading the newspaper or watching television?</li> <li>• Moving or speaking so slowly that other people could have noticed? Or the opposite - being so fidgety or restless that you have been moving around a lot more than usual?</li> <li>• Thoughts that you would be better off dead, or of hurting yourself in some way?</li> </ul>	<p>Not at all</p> <p>Several days</p> <p>More than half the days</p> <p>Nearly every day</p>
<b>Section D: lifestyle related behaviours</b>	

Has your shopping changed since the coronavirus (COVID-19) outbreak?	A great deal A lot A moderate amount A little Not at all
Describe how your shopping has changed since the coronavirus (COVID-19) outbreak	Textbox
Has your diet changed since the coronavirus (COVID-19) outbreak?	A great deal A lot A moderate amount A little Not at all
Describe how your diet has changed since the coronavirus (COVID-19) outbreak	Textbox
Has your alcohol consumption changed since the coronavirus outbreak?	I have consumed much less alcohol than usual I have consumed less alcohol than usual It hasn't changed I have consumed more alcohol than usual I have consumed much more alcohol than usual
Why has your alcohol consumption changed since the coronavirus (COVID-19) outbreak?	Textbox
Has the amount of physical activity you usually engage in changed since the coronavirus outbreak?	I am much less active I am less active It hasn't changed I am more active I am much more active
Has the type of physical activity you usually engage in changed since the coronavirus outbreak?	Yes No
Describe how and why your physical activity has changed since the coronavirus outbreak	Textbox
Has the amount or quality of your sleep changed since the coronavirus outbreak?	A great deal A lot A moderate amount A little Not at all
Describe how and why the amount or quality of your sleep has changed since the coronavirus outbreak	Textbox
Do you smoke tobacco?	Yes No
Has the amount of tobacco you smoke changed compared to before the coronavirus (COVID-19) outbreak?	Much more Somewhat more About the same Somewhat less Much less
Do you use e-cigarettes?	Yes No

Has the amount of e-cigarettes you use changed compared to before the coronavirus (COVID19) outbreak?	Much more Somewhat more About the same Somewhat less Much less
Other than alcohol or tobacco, do you use any recreational drugs?	Yes No
Has the amount of recreational drugs you use changed compared to before the coronavirus (COVID19) outbreak?	Much more Somewhat more About the same Somewhat less Much less
<b>Section E: Interaction with others</b>	
For the following questions, please respond with your health condition or higher risk status (70 years old or over or pregnant regardless of medical conditions) in mind. Since the coronavirus (COVID-19) outbreak...	
Other people have behaved differently towards you?	Yes No
Describe how and why people have behaved differently towards you since the COVID-19 outbreak?	Textbox
You felt stigmatised or discriminated against?	Yes No
Describe the stigmatising and/or discriminatory experience(s) you have had since the COVID-19 outbreak, and how this has made you feel?	Textbox
<b>Final section</b>	
Is there anything that you haven't had chance to say about the coronavirus outbreak that you would like to share?	Textbox

## Supplementary Data analysis

### *Text Data*

Text data was collected across 17 open-ended questions which were distributed throughout the survey sections. All responses to open-ended questions were concatenated, yielding a language sample for each survey participant, which was then tokenised using spaCy's large English web model<sup>1</sup>. The length of the concatenated responses (i.e. the number of tokens, including words, digits, and punctuation) varied from 1 to 2125 tokens (mean=184, median=135). The language sample for each participant was further processed to derive sentiment scores and personality scores. VADER Sentiment Analysis tool (Hutto & Gilbert, 2014) was used to obtain sentiment scores (positive, neutral, negative, and compound sentiment). Personality scores were obtained using proprietary software by Scaled Insights. The software takes as input a language sample and produces 114 personality features. Following this, the 118 features (114 personality, 4 sentiment) were used as input into the multiple machine learning models described below. As the reliability of the personality modelling software depends on the number of words provided in the language sample, the following analysis was restricted to participants (N=636) whose combined text response consisted of at least 100 tokens. The machine learning was used in two settings: unsupervised (clustering) and supervised (classification or regression).

In addition to the clustering, we investigated to what extent features obtained from a language sample could be used for predicting concerns, mitigating actions, impact on lifestyle behaviours, and wellbeing and depression scores in the context of COVID-19. A model which predicts these attitudes and behaviours and requires only a language sample could potentially be used within a digital environment to better identify people who might be more likely to be negatively impacted and offer them preventative support.

For each attitude or behaviour we trained a separate binary or multi-class classifier. We first explored a range of different classifiers (logistic regression, support vector machine, stochastic gradient descent classifier, and Random Forest). Across all classifiers we found that Random Forest achieved the best results, and we tuned the parameters for each classifier separately. The tuned parameters were then used to train the final classifiers using 10-fold cross-validation. As there were only sufficient language samples for 636 participants, we also trained classifiers using GloVe word vectors obtained from the same language model as the tokens. By using word vectors, we were able to train prediction models using all participants' data.

All classification problems were evaluated using the Area Under the Receiver Operating Characteristics (AUROC) metric, while regression problems were evaluated using Mean Absolute Error (MAE) and explained variance.

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<sup>1</sup> [https://spacy.io/models/en#en\\_core\\_web\\_lg](https://spacy.io/models/en#en_core_web_lg)

## Prediction models

### *Concerns about COVID-19*

The responses relating to concerns were all expressed on a [1,10] scale. To form classes, the values were split into 'slight' (1-3), 'some' (4-7) and 'great' (8-10). Word vectors achieved the best performance with AUROC ranging from 0.71 to 0.78; see Supplementary Table 3.

### *Mitigating COVID-19*

The mitigating actions each formed a binary class (i.e. someone either used particular mitigation action or not). Best performance was achieved by word vectors with AUROC ranging between 0.67 and 0.82. In the case of a more unbalanced class (predicting someone taking all possible mitigating actions), the best AUROC score (0.68) was achieved by personality and sentiment features; see Supplementary Table 2.

### *Impact of COVID-19 on Health and Lifestyle Related Behaviours*

The responses on the impact of COVID-19 on lifestyle behaviours, used scales which were converted to classes as follows. Scale [-2,2] (used for alcohol consumption, physical activity, smoking, e-cigarettes, and recreational drug use) was converted to 'Decrease' [-2,-1], 'No Change' [0], 'Increase' [1,2]. Scale [0,4] (used for shopping, diet and sleep) was converted to 'No or little impact' [0,1], 'Some impact' [2], 'Great impact' [3,4]. For the lifestyle behaviours which were not well represented in the survey cohort (smoking, e-cigarettes, and recreational drug use) the results are very low (AUROC slightly better than random at 0.53 for recreational drug use). The best classifiers for other lifestyle behaviours had AUROC scores between 0.72 and 0.81; see Supplementary Table 4.

### *Impact of COVID-19 on Wellbeing*

The scores for WEMWBS and PHQ-9 for both measures were used directly as target variables in the regression models. Unlike the prediction models reported previously, for both wellbeing and depression scores the best performing models used personality and sentiment scores. The model for depression achieved MAE = 4.25 and explained variance of 0.15, while the wellbeing model achieved MAE=7.97 and explained variance of 0.17; see Supplementary Table 5.

**Supplementary Table 1.** Prediction results for mitigating actions using three feature groups and evaluated using AUROC. The best performing feature group is in bold.

	Social distancing	Self-isolation	PPE	Online shopping	Shielding	All above
# positive class	491	306	208	304	173	77
# negative class	145	330	428	332	463	559
Personality and sentiment features	0.66	0.55	0.51	0.49	0.62	<b>0.68</b>
Word vectors	<b>0.82</b>	<b>0.7</b>	<b>0.67</b>	<b>0.68</b>	<b>0.73</b>	0.54
All features	0.71	0.58	0.51	0.52	0.69	0.67

**Supplementary Table 2.** Prediction results for concerns using three feature groups and evaluated using AUROC. The best performing feature group is in bold.

	Becoming infected	Severe illness or death	Spreading to others	Access to healthcare	Enough support	Less care compared to low risk
# Slight concern	60	71	114	197	156	236
# Some concern	214	164	190	229	185	160
# Great concern	362	401	332	210	295	240
Personality and sentiment features	0.63	0.6	0.54	0.58	0.58	0.58
Word vectors	<b>0.78</b>	<b>0.78</b>	<b>0.73</b>	<b>0.71</b>	<b>0.71</b>	<b>0.71</b>
All features	0.64	0.62	0.52	0.58	0.58	0.58

**Supplementary Table 3.** Prediction results for lifestyle behaviours using three feature groups and evaluated using AUROC. The best performing feature group is in bold.

	Shopping	Diet	Alcohol	Amount of physical activity	Sleep	Smoking	E-cigarettes	Recreational drugs
# Decrease / Little impact	47	302	96	385	293	5	2	3
# No change / Some impact	90	205	372	99	157	623	624	628
# Increase / Great impact	499	129	168	152	186	8	10	5
Personality and sentiment features	0.56	0.62	0.61	0.65	0.65	0.44	0.55	0.36
Word vectors	<b>0.81</b>	<b>0.74</b>	<b>0.72</b>	<b>0.8</b>	<b>0.75</b>	<b>0.6</b>	<b>0.67</b>	0.45
All features	0.55	0.6	0.56	0.61	0.65	0.58	0.58	<b>0.53</b>

**Supplementary Table 4.** Prediction results for depression (Patient Health Questionnaire, PHQ-9) and wellbeing score (Warwick-Edinburgh Mental Well-being Scale, WEMWBS) using three feature groups and evaluated using mean absolute error and explained variance. The best performing feature group is in bold.

	Depression score (PHQ-9)	Wellbeing score (WEMWBS)
# participants	584	636
Personality and sentiment features, MAE	<b>4.25</b>	<b>7.97</b>
Personality and sentiment features, Exp. Var.	<b>0.15</b>	<b>0.17</b>
Word vectors, MAE	4.52	8.6
Word vectors, Exp. Var.	0.07	0.1
All features, MAE	4.33	8.15
All features, Exp. Var.	0.12	0.13

**Supplementary Table 5.** Impact of COVID-19 on Lifestyle Related Behaviours

			<b>OR (95% CI)</b>
<b>Changes to shopping behaviour</b>			
Chronic kidney disease	Yes		1.62 (1.01, 2.60)
	No		1.00
Gender	Female		1.18 (1.02, 1.38)
	Male		1.00
<b>Changes to diet</b>			
Gender	Female		1.19 (1.02, 1.39)
	Male		1.00
Age			0.99 (0.98, 1.00)
BMI			1.02 (1.00, 1.03)
<b>Change to activity amount</b>			
Chronic respiratory disease	Yes		0.70 (0.50, 0.97)
	No		1.00
Chronic kidney disease	Yes		0.65 (0.44, 0.96)
	No		1.00
Weakened immune system	Yes		0.54 (0.37, 0.78)
	No		1.00
BMI			0.98 (0.97, 1.00)
<b>Changes to activity type</b>			
Chronic neurological conditions	Yes		0.23 (0.06, 1.00)
	No		1.00

**Supplementary Table 6** Median wellbeing (Warwick-Edinburgh Mental Well-being Scale, WEMWBS) and depression (Patient Health Questionnaire, PHQ-9) scores based on high risk group.

	<b>Wellbeing</b>	<b>Depression</b>
	<b>Median [Min, Max]</b>	<b>Median [Min, Max]</b>
<b>Diabetes</b>		
Yes	45.0 [14.0, 70.0]	6.00 [0, 26.0]
No	46.0 [14.0, 70.0]	7.00 [0, 26.0]
<b>BMI <math>\geq</math> 40 kg/m<sup>2</sup></b>		
Yes	40.6 [15.0, 70.0]	10.00 [0, 26.0]
No	46.0 [14.0, 70.0]	6.00 [0, 26.0]
<b>Chronic Respiratory Disease</b>		
Yes	43.5 [14.0, 70.0]	9.00 [0, 26.0]
No	46.0 [14.0, 70.0]	6.00 [0, 26.0]
<b>Chronic Heart Disease</b>		
Yes	47.4 [14.0, 70.0]	7.00 [0, 26.0]
No	45.0 [14.0, 70.0]	6.00 [0, 26.0]
<b>Chronic Kidney Disease</b>		
Yes	47.0 [14.0, 70.0]	6.00 [0, 26.0]
No	45.0 [14.0, 70.0]	6.00 [0, 26.0]
<b>Chronic Liver Disease</b>		
Yes	43.0 [15.0, 62.0]	7.00 [0, 22.0]
No	46.0 [14.0, 70.0]	6.00 [0, 26.0]
<b>Chronic Neurological Conditions</b>		
Yes	46.2 [19.0, 66.0]	8.00 [0, 22.0]
No	45.0 [14.0, 70.0]	6.00 [0, 26.0]
<b>Spleen problems</b>		
Yes	46.0 [26.0, 66.0]	5.00 [2.0, 13.0]
No	45.0 [14.0, 70.0]	6.00 [0, 26.0]
<b>Weakened immune system</b>		
Yes	46.0 [14.0, 68.0]	6.00 [0, 26.0]
No	45.0 [14.0, 70.0]	6.00 [0, 26.0]

**Aged > 70 years**

Yes	51.0 [14.0, 70.0]	3.00 [0, 26.0]
No	44.0 [14.0, 70.0]	7.00 [0, 26.0]

**Pregnant**

Yes	42.0 [29.0, 61.0]	6.00 [0, 17.0]
No	46.0 [14.0, 70.0]	6.00 [0, 26.0]

**Other risk factors \***

Yes	44.0 [14.0, 70.0]	8.00 [0, 26.0]
No	46.0 [14.0, 70.0]	6.00 [0, 26.0]

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\* *Changed type or frequency of support*

**Supplementary Table 7.** Impact on Management of Health Conditions and Use of Technology

			<b>OR (95% CI)</b>
<b>Changes to management of health conditions</b>			
	Chronic liver disease	Yes	3.15 (1.29, 8.01)
		No	1.00
<b>Changes to appointments</b>			
	Diabetes	Yes	2.40 (1.11, 5.75)
		No	1.00
	Chronic liver disease	Yes	3.48 (1.16, 12.16)
		No	1.00
	Weakened immune system	Yes	2.90 (1.18, 7.93)
		No	1.00
<b>Changes to medication</b>			
	Spleen problems	Yes	7.10 (1.45, 53.03)
		No	1.00
<b>Changes to elective surgery</b>			
	Age		1.03 (1.01, 1.06)
<b>Clinician</b>			
	Age		1.03 (1.01, 1.05)
<b>Other changes</b>			
	Aged > 70 years	Yes	0.24 (0.05, 0.88)
		No	1.00
<b>Platforms used to receive care</b>			
<b>Social media</b>			
	Chronic liver disease	Yes	5.91 (1.62, 20.84)
		No	1.00
<b>Email</b>			
	Age		0.98 (0.96, 1.00)
<b>Telephone</b>			
	Aged > 70 years	Yes	0.46 (0.21, 0.99)
		No	1.00
<b>Virtual consultation</b>			
	Chronic liver disease	Yes	4.39 (1.41, 13.20)

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	No	1.00
Chronic neurological conditions	Yes	3.56 (1.06, 10.98)
	No	1.00
Gender	Yes	0.56 (0.32, 0.98)
	No	1.00

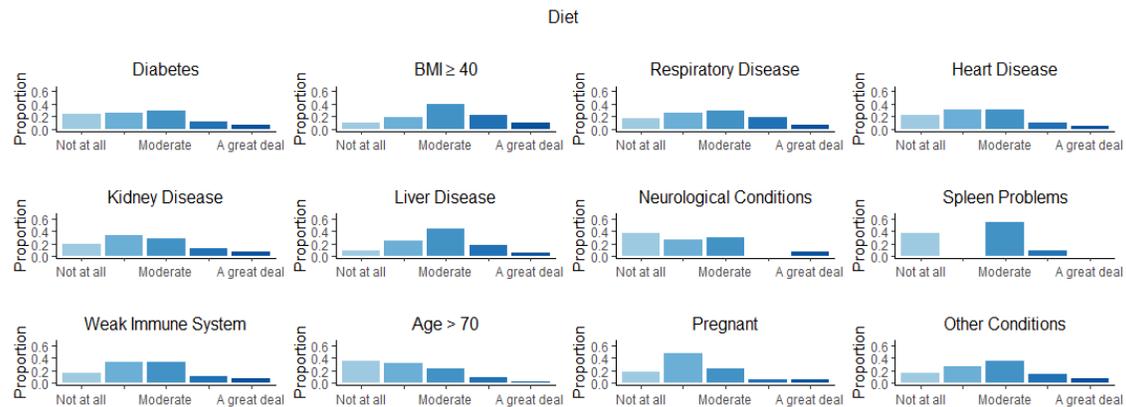
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**Supplementary Table 8.** Mitigating actions taken in response to the coronavirus outbreak.

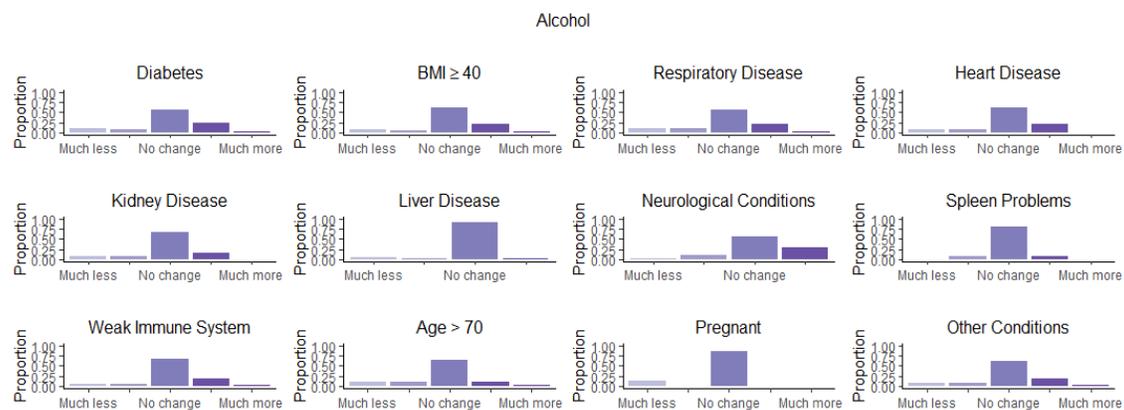
	Diabetes (N=538)	BMI ≥ 40 kg/m <sup>2</sup> (N=142)	Chronic Respiratory Disease (N=179)	Chronic Heart Disease (N=132)	Chronic Kidney Disease (N=147)	Chronic Liver Disease (N=49)	Chronic Neurological Disease (N=35)	Spleen Problems (N=16)	Weakened Immune System (N=159)	Aged > 70 years (N=178)	Pregnant (N=21)	Other Risk Factors (N=303)
<b>Social distancing n (%)</b>												
Yes	446 (82.9%)	105 (73.9%)	125 (69.8%)	90 (68.2%)	82 (55.8%)	32 (65.3%)	26 (74.3%)	9 (56.2%)	71 (44.7%)	135 (75.8%)	18 (85.7%)	212 (70.0%)
No	92 (17.1%)	37 (26.1%)	54 (30.2%)	42 (31.8%)	65 (44.2%)	17 (34.7%)	9 (25.7%)	7 (43.8%)	88 (55.3%)	43 (24.2%)	3 (14.3%)	91 (30.0%)
<b>Self-isolation n (%)</b>												
Yes	263 (48.9%)	68 (47.9%)	83 (46.4%)	58 (43.9%)	66 (44.9%)	19 (38.8%)	21 (60.0%)	7 (43.8%)	61 (38.4%)	102 (57.3%)	10 (47.6%)	148 (48.8%)
No	275 (51.1%)	74 (52.1%)	96 (53.6%)	74 (56.1%)	81 (55.1%)	30 (61.2%)	14 (40.0%)	9 (56.2%)	98 (61.6%)	76 (42.7%)	11 (52.4%)	155 (51.2%)
<b>Worn protective apparel n (%)</b>												
Yes	201 (37.4%)	47 (33.1%)	59 (33.0%)	44 (33.3%)	30 (20.4%)	17 (34.7%)	13 (37.1%)	1 (6.2%)	22 (13.8%)	57 (32.0%)	6 (28.6%)	106 (35.0%)
No	337 (62.6%)	95 (66.9%)	120 (67.0%)	88 (66.7%)	117 (79.6%)	32 (65.3%)	22 (62.9%)	15 (93.8%)	137 (86.2%)	121 (68.0%)	15 (71.4%)	197 (65.0%)
<b>Used online shopping or food delivery n (%)</b>												
Yes	258 (48.0%)	67 (47.2%)	77 (43.0%)	66 (50.0%)	60 (40.8%)	28 (57.1%)	18 (51.4%)	7 (43.8%)	55 (34.6%)	96 (53.9%)	10 (47.6%)	125 (41.3%)
No	280 (52.0%)	75 (52.8%)	102 (57.0%)	66 (50.0%)	87 (59.2%)	21 (42.9%)	17 (48.6%)	9 (56.2%)	104 (65.4%)	82 (46.1%)	11 (52.4%)	178 (58.7%)
<b>Shielding n (%)</b>												
Yes	100 (18.6%)	33 (23.2%)	65 (36.3%)	38 (28.8%)	68 (46.3%)	22 (44.9%)	6 (17.1%)	11 (68.8%)	85 (53.5%)	38 (21.3%)	2 (9.5%)	80 (26.4%)
No	438 (81.4%)	109 (76.8%)	114 (63.7%)	94 (71.2%)	79 (53.7%)	27 (55.1%)	29 (82.9%)	5 (31.2%)	74 (46.5%)	140 (78.7%)	19 (90.5%)	223 (73.6%)
<b>All of the above n (%)</b>												
Yes	55 (10.2%)	19 (13.4%)	22 (12.3%)	23 (17.4%)	31 (21.1%)	7 (14.3%)	4 (11.4%)	2 (12.5%)	40 (25.2%)	29 (16.3%)	2 (9.5%)	46 (15.2%)
No	483 (89.8%)	123 (86.6%)	157 (87.7%)	109 (82.6%)	116 (78.9%)	42 (85.7%)	31 (88.6%)	14 (87.5%)	119 (74.8%)	149 (83.7%)	19 (90.5%)	257 (84.8%)

**Supplementary Table 9.** Mitigating COVID-19

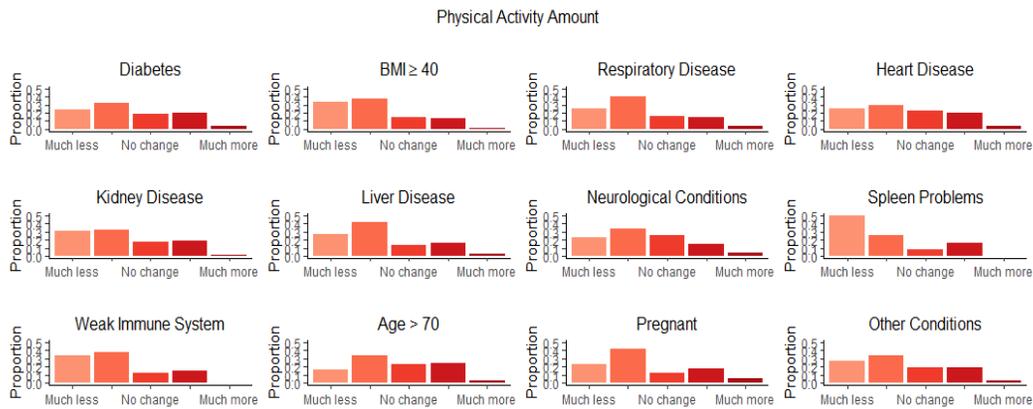
			<b>OR (95% CI)</b>
<b>Social distancing</b>	Weakened immune system	Yes	0.34 (0.16, 0.73)
		No	1.00
	Diabetes	Yes	2.44 (1.25, 4.90)
		No	1.00
<b>Protective apparel</b>	Diabetes	Yes	2.17 (1.13, 4.14)
		No	1.00
<b>Shop online</b>	Aged > 70 years	Yes	2.66 (1.24, 5.88)
		No	1.00
	Chronic liver disease	Yes	3.34 (1.42, 8.14)
		No	1.00
<b>Shielding</b>	Chronic kidney disease	Yes	2.76 (1.21, 6.31)
		No	1.00
	Weakened immune system	Yes	3.33 (1.55, 7.22)
		No	1.00
	Spleen problems	Yes	5.33 (1.15, 28.78)
		No	1.00
<b>All mitigating risk actions</b>	Weakened immune system	Yes	2.61 (1.01, 6.41)
		No	1.00



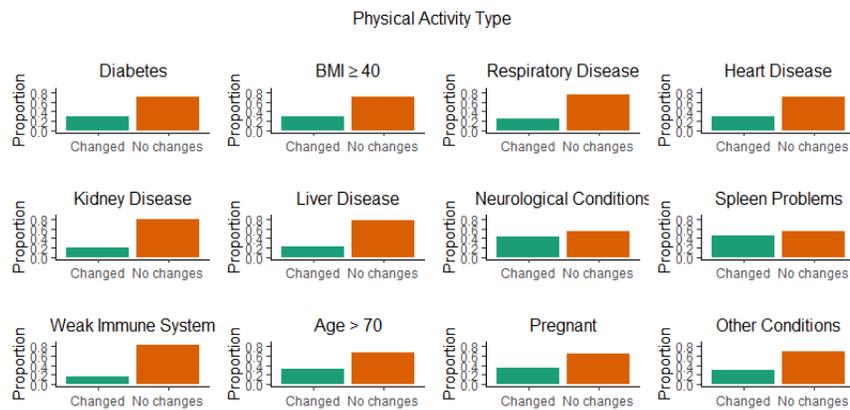
**Supplementary Figure 1.** Change in diet compared to pre-COVID-19 for each high-risk indicator of severe illness from COVID-19 as identified by the UK Government, or based on individual perception due to an acute or chronic health condition.



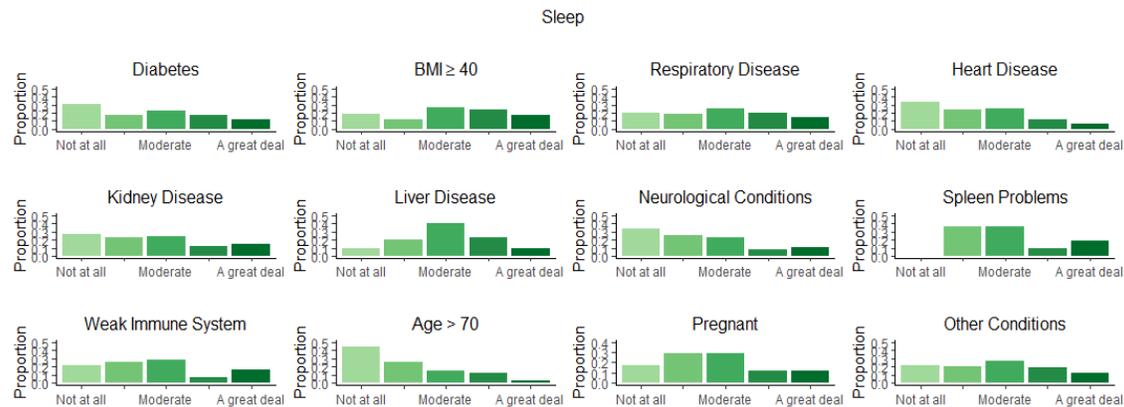
**Supplementary Figure 2.** Change in alcohol consumption compared to pre-COVID-19 for each high-risk indicator of severe illness from COVID-19 as identified by the UK Government, or based on individual perception due to an acute or chronic health condition.



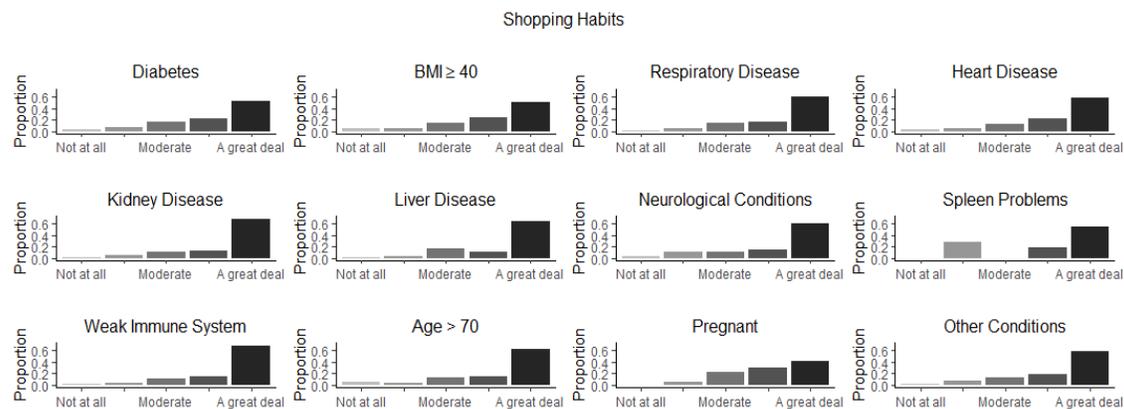
**Supplementary Figure 3.** Change in amount of physical activity compared to pre-COVID-19 for each high-risk indicator of severe illness from COVID-19 as identified by the UK Government, or based on individual perception due to an acute or chronic health condition.



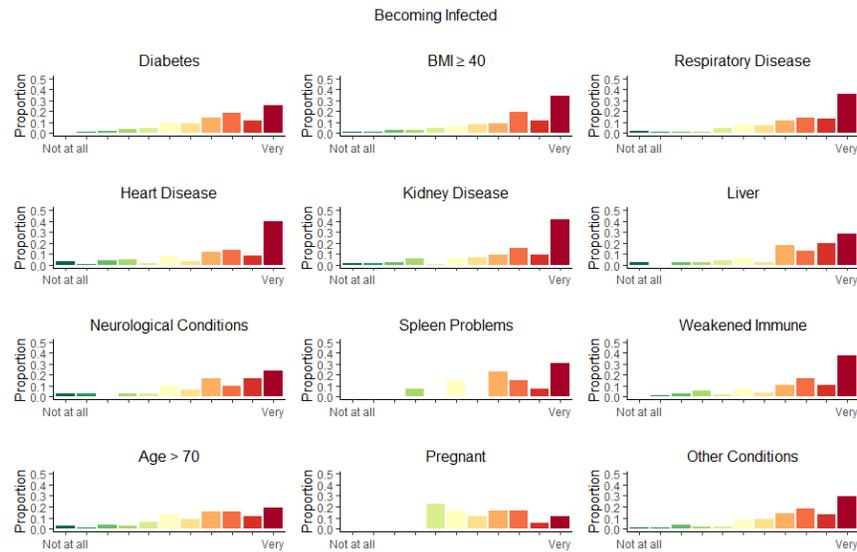
**Supplementary Figure 4.** Change in type of physical activity compared to pre-COVID-19 for each high-risk indicator of severe illness from COVID-19 as identified by the UK Government, or based on individual perception due to an acute or chronic health condition.



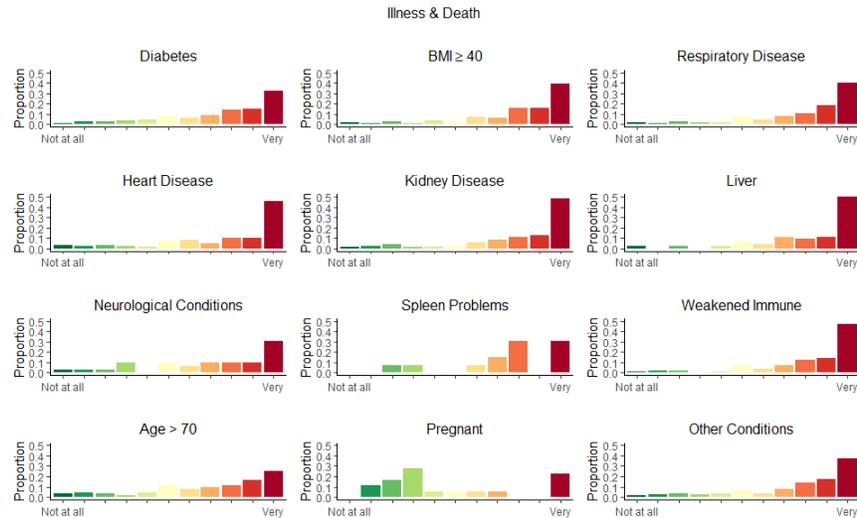
**Supplementary Figure 5.** Change in amount or quality of sleep compared to pre-COVID-19 for each high-risk indicator of severe illness from COVID-19 as identified by the UK Government, or based on individual perception due to an acute or chronic health condition.



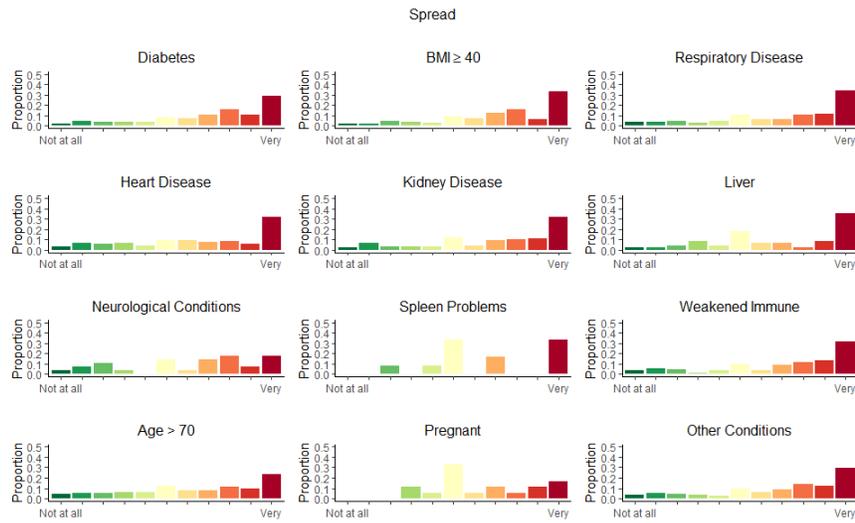
**Supplementary Figure 6.** Change in shopping compared to pre-COVID-19 for each high-risk indicator of severe illness from COVID-19 as identified by the UK Government, or based on individual perception due to an acute or chronic health condition.



**Supplementary Figure 7:** Concern about becoming infected with COVID-19 for each high-risk indicator as identified by the UK Government, or based on individual perception due to an acute or chronic health condition.



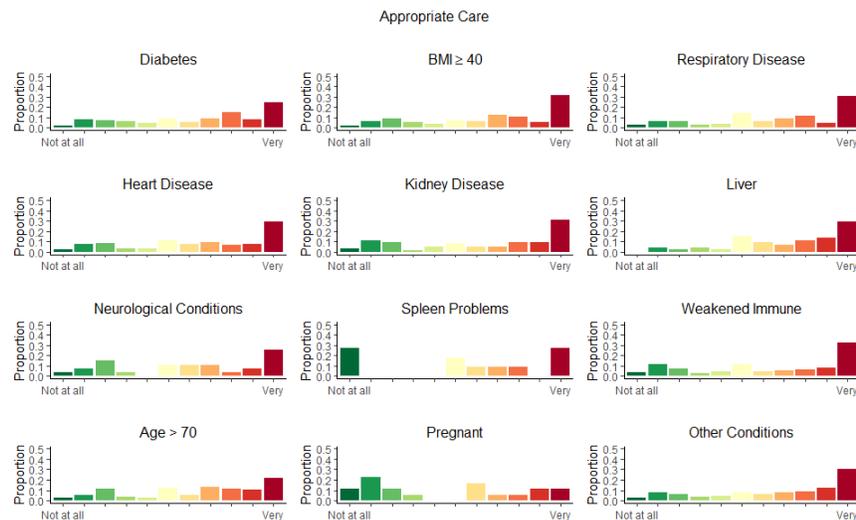
**Supplementary Figure 8:** Concern about severe illness and possible death from COVID-19 for each high-risk indicator as identified by the UK Government, or based on individual perception due to an acute or chronic health condition.



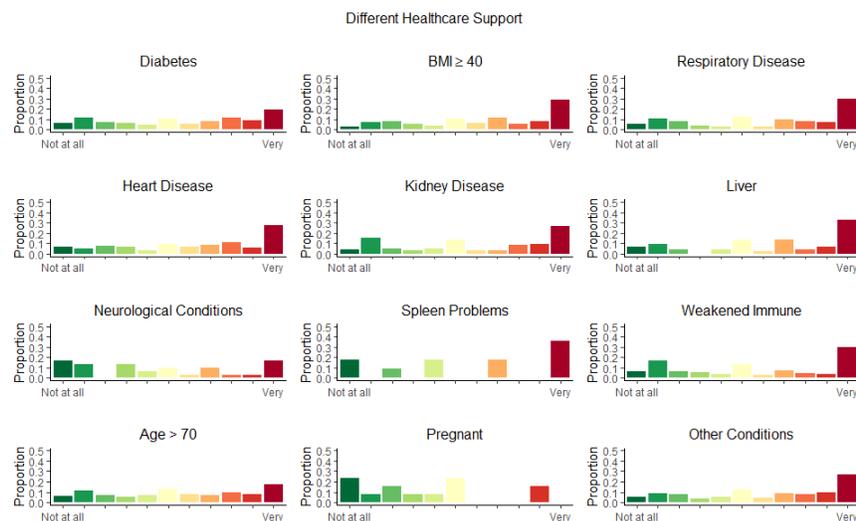
**Supplementary Figure 9:** Concern about spreading COVID-19 to others including family and friends for each high-risk indicator as identified by the UK Government, or based on individual perception due to an acute or chronic health condition.



**Supplementary Figure 10:** Concern about access to healthcare support for each high-risk indicator as identified by the UK Government, or based on individual perception due to an acute or chronic health condition.



**Supplementary Figure 11:** Concern about access to appropriate care if infected with COVID-19 for each high-risk indicator as identified by the UK Government, or based on individual perception due to an acute or chronic health condition.



**Supplementary Figure 12:** Concern about disparate care as a result of high-risk status for each indicator as identified by the UK Government, or based on individual perception due to an acute or chronic health condition.