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2 **Supplementary Information for**

3 **COVID-19 and mental health of individuals with different personalities**

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7 **This PDF file includes:**

- 8 Supplementary text
- 9 Figs. S1 to S2 (not allowed for Brief Reports)
- 10 Tables S1 to S23 (not allowed for Brief Reports)
- 11 SI References

12 Supporting Information Text

13 1. Definition of Key Variables

14 This section provides details on how these key variables are defined: twelve-item General Health Questionnaire (GHQ-12), Big
15 Five personality traits, and cognitive skills.

16 **GHQ-12 Questionnaire.** The GHQ module of the UK Household Longitudinal Study (UKHLS) contains the following questions:

- 17 1. scghqa [GHQ: concentration] The next questions are about how you have been feeling over the last few weeks. Have you
18 recently been able to concentrate on whatever you're doing? 1. Better than usual 2. Same as usual 3. Less than usual 4.
19 Much less than usual
- 20 2. scghqb [GHQ: loss of sleep] Have you recently lost much sleep over worry? 1. Not at all 2. No more than usual 3. Rather
21 more than usual 4. Much more than usual
- 22 3. scghqc [GHQ: playing a useful role] Have you recently felt that you were playing a useful part in things? 1. More so than
23 usual 2. Same as usual 3. Less so than usual 4. Much less than usual
- 24 4. scghqd [GHQ: capable of making decisions] Have you recently felt capable of making decisions about things? 1. More so
25 than usual 2. Same as usual 3. Less so than usual 4. Much less capable
- 26 5. scghqe [GHQ: constantly under strain] Have you recently felt constantly under strain? 1. Not at all 2. No more than
27 usual 3. Rather more than usual 4. Much more than usual
- 28 6. scghqf [GHQ: problem overcoming difficulties] Have you recently felt you couldn't overcome your difficulties? 1. Not at
29 all 2. No more than usual 3. Rather more than usual 4. Much more than usual
- 30 7. scghqg [GHQ: enjoy day-to-day activities] Have you recently been able to enjoy your normal day-to-day activities? 1.
31 More so than usual 2. Same as usual 3. Less so than usual 4. Much less than usual
- 32 8. scghqh [GHQ: ability to face problems] Have you recently been able to face up to problems? 1. More so than usual 2.
33 Same as usual 3. Less able than usual 4. Much less able
- 34 9. scghqi [GHQ: unhappy or depressed] Have you recently been feeling unhappy or depressed? 1. Not at all 2. No more
35 than usual 3. Rather more than usual 4. Much more than usual
- 36 10. scghqj [GHQ: losing confidence] Have you recently been losing confidence in yourself? 1. Not at all 2. No more than
37 usual 3. Rather more than usual 4. Much more than usual
- 38 11. scghqk [GHQ: believe worthless] Have you recently been thinking of yourself as a worthless person? 1. Not at all 2. No
39 more than usual 3. Rather more than usual 4. Much more than usual
- 40 12. scghql [GHQ: general happiness] Have you recently been feeling reasonably happy, all things considered? 1. More so than
41 usual 2. About the same as usual 3. Less so than usual 4. Much less than usual

42 Aggregating the responses to these 12 questions produces the GHQ-12 scale, ranging from 0 to 36, with higher values
43 indicating more distress (values in each question are re-coded from 1–4 to 0–3 in this process). Aggregating binary indicators
44 of the responses to each question, by recoding 1 and 2 values on individual questions to 0, and 3 and 4 values to 1, produces
45 the GHQ-12 caseness, which ranges from 0 to 12.

46 **The “Big Five” Personality Traits.** The Big Five personality traits are Agreeableness (A), Conscientiousness (C), Extraversion
47 (E), Neuroticism (N), Openness (O). They are assessed with the following questions in the UKHLS:

48 I see myself as someone who:

- 49 1. (A) Is sometimes rude to others (*reverse-scored*).
- 50 2. (C) Does a thorough job.
- 51 3. (E) Is talkative.
- 52 4. (N) Worries a lot.
- 53 5. (O) Is original, comes up with new ideas.
- 54 6. (A) Has a forgiving nature.
- 55 7. (C) Tends to be lazy (*reverse-scored*).
- 56 8. (E) Is outgoing, sociable.

- 57 9. (N) Gets nervous easily.
- 58 10. (O) Values artistic, aesthetic experiences.
- 59 11. (A) Is considerate and kind to almost everyone.
- 60 12. (C) Does things efficiently.
- 61 13. (E) Is reserved (*reverse-scored*).
- 62 14. (N) Is relaxed, handles stress well (*reverse-scored*).
- 63 15. (O) Has an active imagination.

64 **Cognitive Skills.** Cognitive Skills in the UKHLS are measured through the following components.

65 **Episodic Memory** or Memory: “The computer will now read a set of 10 words. I would like you to remember as many
66 as you can. We have purposely made the list long so it will be difficult for anyone to remember all the words. Most people
67 remember just a few. Please listen carefully to the set of words as they cannot be repeated. When it has finished, I will ask you
68 to recall aloud as many of the words as you can, in any order. Is this clear? Now please tell me the words you can remember.”
69 Respondents give the words in any order. The interviewer codes each correct response... For the delayed word recall test, after
70 the Number Series test, respondents were again asked to remember the words from the list. The interviewer codes each correct
71 response.

72 **Working Memory** or Serial 7 Subtraction: “Now let’s try some subtraction of numbers. One hundred minus 7 equals
73 what?’ [Interviewer records the number.] ‘And take 7 away from that?’ [records number] ‘And take 7 away from that.’ The
74 respondent gives numeric answers for successive trials, five in all.”

75 **Verbal Fluency:** “Now, I would like you to name as many animals as you can. You have one-minute, so name them as
76 quickly as possible. We will begin when you say the first animal. If you are unsure of anything please ask me now as I am
77 unable to answer questions once the minute starts.”

78 **Problem Solving** or Numerical Ability: “Next I would like to ask you some questions to understand how people use
79 numbers in everyday life. If CATI, the interviewer added, You might want to have a pencil and paper handy to help you
80 answer the following items The measure of numeric ability asks respondents up to five questions that are graded in complexity
81 (Table 2 at page 14 of 1, displays the questions and how they are administered)”

82 **Fluid Reasoning** or Number Series: Individuals are randomly assigned to Set 1 or Set 2 (of items) within households. For
83 this test, respondents use a pencil and paper to write down the number sequences as read by the interviewer. The number
84 series consists of several numbers with a blank number in the series. The respondent will be asked which number goes in the
85 blank (see page 11 of 1, for more details)

86 2. Sanity Check of the Data

87 The results reported in Table S4 represent a sanity check for our data. We will argue now that the results reported in this table
88 are consistent with the findings in the existing mental health literature. Table S4 presents the correlations between mental
89 health, as measured by GHQ-12 caseness, and some individual characteristics based on the pre-COVID-19 wave of data. We
90 consider 3 different specifications of the model. In the model reported in column 1, we include personality traits as the only
91 regressors. In column 2, we include controls for gender and cognitive skills. In column 3, we further add a number of control
92 variables that will be used for the estimation of our main model.

93 First of all, from columns 2 and 3, we note that female respondents report more symptoms than men. As it is well known,
94 women tend to report higher level of depression and anxiety.* For columns 2 and 3, we do not observe any significant correlation
95 between cognitive skills and mental health: to the best of our knowledge we do not know any systematic link between these
96 two variables. Considering now personality traits, the correlations reported in Table S4 are broadly consistent with the existing
97 literature on mental health and personality. There is a strong positive effect of Neuroticism on GHQ-12 (roughly, an increase
98 in one standard deviation in Neuroticism is associated with 0.7 more symptoms). Past studies also find negative effects of
99 Conscientiousness on mental health and, to a lower extent, of Extraversion; while Agreeableness is largely uncorrelated with
100 mental health. Table 4 in (3) report these effects on anxiety and depression (see also 4). From (3) we note that the effect of
101 Neuroticism is far stronger than Conscientiousness and Extraversion, and the effects of these two last traits are comparable in
102 magnitude, which is consistent with the results reported in Table S4, especially in the specification reported in column 3.

103 Correlations in Table S4 are also consistent with the links observed between personality traits and self-reported subjective
104 wellbeing (or happiness as it is frequently called) (5, 6), that Neuroticism strongly negatively correlates, while Conscientiousness
105 and Extraversion usually positively correlate with subjective wellbeing, and that the latter two come with similar magnitudes
106 which are much smaller in absolute terms compared to that of Neuroticism (see e.g. Table 5 of 7). The only exception in the
107 comparison with the existing literature on mental health is the significant correlation between GHQ-12 and Openness that we
108 can observe in Table S4. A possible explanation is that mental health studies as the ones reviewed in (3) consider serious
109 disorders, while GHQ-12 is better suited for detecting minor psychiatric disorders (which may signal the beginning of serious

*Men and women experience different types of mental health problems. Men exhibit more externalizing disorders such as substance abuse and antisocial behavior (see e.g 2).

110 disorders). This explanation is supported by the frequently observed negative associations between Openness and subjective
111 wellbeing (see e.g. Table 5 of 7).

112 It is also important to note that the coefficients reported in Table S4 on Openness, albeit statistically significant, are much
113 smaller than the one we find on Neuroticism. In Table S5, we present similar estimations for each wave we use in this study; In
114 Table S6, we present similar estimations for GHQ-36 instead of GHQ-12; and in Table S7, we run the same regressions by
115 excluding all respondents older than 60 and younger than 27.

116 **3. Additional Results**

117 This section provides additional tables and figures that are not included in the main text.

Table S1. Sample size and key characteristics at different stages of sample selection

	(1) Balance panel based on COVID-19 Study 1–7 N = 8947		(2) With previous information from Wave 3 N = 6928		(3) With previous information from Wave 9 N = 6727		(4) Selected sample after dropping missing values N = 5583		(5) Difference = (1)–(4)		(6) Difference = (3)–(4)	
	N	Mean (SD)	N	Mean (SD)	N	Mean (SD)	N	Mean (SD)	Diff. (SE)	p-value	Diff. (SE)	p-value
<i>Personality traits</i>												
Agreeableness	7086	5.614 (0.978)	6928	5.611 (0.974)	6727	5.611 (0.973)	5583	5.598 (0.971)	0.016 (0.017)	0.353	0.013 (0.018)	0.475
Conscientiousness	7087	5.594 (0.993)	6928	5.591 (0.992)	6727	5.590 (0.990)	5583	5.589 (0.997)	0.005 (0.018)	0.764	0.001 (0.018)	0.973
Extraversion	7087	4.518 (1.310)	6928	4.516 (1.306)	6727	4.516 (1.305)	5583	4.499 (1.302)	0.018 (0.023)	0.436	0.016 (0.024)	0.489
Neuroticism	7087	3.558 (1.396)	6928	3.556 (1.394)	6727	3.553 (1.395)	5583	3.539 (1.392)	0.019 (0.025)	0.450	0.014 (0.025)	0.580
Openness	7086	4.610 (1.204)	6928	4.617 (1.197)	6727	4.618 (1.197)	5583	4.614 (1.198)	−0.004 (0.021)	0.859	0.004 (0.022)	0.867
<i>Mental health</i>												
GHQ12 (Case) ^a	8871	2.588 (3.164)	6882	2.515 (3.110)	6682	2.494 (3.095)	5583	2.420 (3.045)	0.168*** (0.053)	0.001	0.074 (0.056)	0.185
GHQ12 (Scale) ^a	8871	12.138 (5.870)	6882	11.968 (5.786)	6682	11.931 (5.761)	5583	11.793 (5.663)	0.345*** (0.098)	0.000	0.138 (0.103)	0.183
<i>Socio-economic characteristics</i>												
Female	8947	0.585 (0.493)	6928	0.589 (0.492)	6727	0.589 (0.492)	5583	0.577 (0.494)	0.008 (0.008)	0.353	0.012 (0.009)	0.191
Year of birth ^b	8944	1964.051 (15.622)	6928	1961.496 (13.715)	6727	1961.319 (13.667)	5583	1960.394 (13.323)	3.656*** (0.243)	0.000	0.925*** (0.244)	0.000
BAME ^c	8772	0.117 (0.322)	6885	0.087 (0.282)	6688	0.086 (0.280)	5583	0.081 (0.273)	0.036*** (0.005)	0.000	0.005 (0.005)	0.331
Qualification: degree	8593	0.366 (0.482)	6784	0.370 (0.483)	6727	0.371 (0.483)	5583	0.371 (0.483)	−0.006 (0.008)	0.473	0.000 (0.009)	0.973
Qualification: other higher degree	8593	0.144 (0.351)	6784	0.150 (0.357)	6727	0.150 (0.357)	5583	0.151 (0.358)	−0.007 (0.006)	0.245	−0.001 (0.006)	0.881
Qualification: A-levels	8593	0.199 (0.399)	6784	0.192 (0.394)	6727	0.192 (0.394)	5583	0.185 (0.388)	0.014** (0.007)	0.037	0.007 (0.007)	0.341
Qualification: GCSE	8593	0.179 (0.383)	6784	0.181 (0.385)	6727	0.181 (0.385)	5583	0.181 (0.385)	−0.003 (0.007)	0.704	−0.001 (0.007)	0.943
Qualification: other	8593	0.066 (0.249)	6784	0.067 (0.250)	6727	0.067 (0.250)	5583	0.071 (0.256)	−0.005 (0.004)	0.298	−0.004 (0.005)	0.419
Qualification: none	8593	0.041 (0.199)	6784	0.039 (0.194)	6727	0.039 (0.193)	5583	0.040 (0.196)	0.001 (0.003)	0.751	−0.001 (0.004)	0.708
Qualification: missing	8593	0.005 (0.074)	6784	0.001 (0.024)	6727	0.001 (0.024)	5583	0.001 (0.023)	0.005*** (0.001)	0.000	0.000 (0.000)	0.894
Self-employed	8593	0.076 (0.264)	6784	0.079 (0.270)	6727	0.079 (0.270)	5583	0.079 (0.270)	−0.003 (0.005)	0.452	0.000 (0.005)	0.936
Employee	8593	0.504 (0.500)	6784	0.500 (0.500)	6727	0.499 (0.500)	5583	0.482 (0.500)	0.022*** (0.009)	0.009	0.017* (0.009)	0.063
Unemployed	8593	0.021 (0.144)	6784	0.018 (0.131)	6727	0.017 (0.131)	5583	0.015 (0.122)	0.006*** (0.002)	0.010	0.002 (0.002)	0.343
Retired	8593	0.311 (0.463)	6784	0.340 (0.474)	6727	0.341 (0.474)	5583	0.364 (0.481)	−0.053*** (0.008)	0.000	−0.023*** (0.009)	0.008
Student	8593	0.023 (0.149)	6784	0.003 (0.058)	6727	0.003 (0.058)	5583	0.003 (0.050)	0.020*** (0.002)	0.000	0.001 (0.001)	0.351
Other employment	8593	0.065 (0.246)	6784	0.060 (0.237)	6727	0.059 (0.237)	5583	0.057 (0.232)	0.008* (0.004)	0.062	0.003 (0.004)	0.555
Employment missing	8593	0.001 (0.024)	6784	0.000 (0.017)	6727	0.000 (0.012)	5583	0.000 (0.013)	0.000 (0.000)	0.202	0.000 (0.000)	0.896

Notes This table presents the sample size and key characteristics for different stages of sample selection. Columns (1)–(4) report the number of observations, mean and standard deviation (SD) for each stage. Columns (5) and (6) report the difference in means between two stages, the standard errors, and the p-value for a t-test of mean comparison. ***, **, and * denote statistical significance at 0.01, 0.05, and 0.1 levels respectively.

^a As measured in April 2020.

^b Respondents are aged 16+ in column (1), and 23+ in columns (2)–(4).

^c BAME refers to a binary indicator of black, Asian and minority ethnicity. The reference group is British white.

Table S2. Summary statistics

	Mean	SD	Min.	Max
<i>Mental health</i>				
GHQ 12 (Case)	2.028	3.113	0.0	12.0
GHQ 12 (Scale)	11.614	5.529	0.0	36.0
<i>Personality and Cognitive Skills (standardised)</i>				
Agreeableness	0.001	0.994	-4.7	1.4
Conscientiousness	0.002	0.998	-4.6	1.4
Extraversion	-0.005	0.997	-2.7	1.9
Neuroticism	-0.004	0.999	-1.8	2.5
Openness	0.007	0.994	-3.0	2.0
Cognitive ability	0.003	0.996	-5.9	2.8
<i>Socio-economic characteristics</i>				
Female	0.580	0.494	0.0	1.0
Age (years)	58.989	13.479	23.0	93.0
Age squared/100	36.614	15.390	5.3	86.5
White British	0.919	0.273	0.0	1.0
Non-BIP (Other white, Mixed, Black, Chinese, Arab)	0.064	0.244	0.0	1.0
Bangladeshi, Indian and Pakistani (South Asian)	0.017	0.131	0.0	1.0
Qualification: degree	0.373	0.484	0.0	1.0
Qualification: higher degree	0.149	0.356	0.0	1.0
Qualification: A-levels	0.188	0.391	0.0	1.0
Qualification: GCSE	0.181	0.385	0.0	1.0
Qualification: other	0.068	0.252	0.0	1.0
Qualification: none	0.040	0.196	0.0	1.0
Qualification: missing	0.001	0.026	0.0	1.0
Never married (2019)	0.106	0.308	0.0	1.0
Married/cohabiting (2019)	0.749	0.434	0.0	1.0
London	0.067	0.250	0.0	1.0
Wales	0.056	0.229	0.0	1.0
Scotland	0.095	0.294	0.0	1.0
Northern Ireland	0.036	0.187	0.0	1.0
England (excluding London)	0.746	0.435	0.0	1.0
Month FE: Jan	0.088	0.284	0.0	1.0
Month FE: Feb	0.079	0.270	0.0	1.0
Month FE: Mar	0.087	0.281	0.0	1.0
Month FE: Apr	0.078	0.268	0.0	1.0
Month FE: May	0.086	0.280	0.0	1.0
Month FE: Jun	0.075	0.264	0.0	1.0
Month FE: Jul	0.079	0.270	0.0	1.0
Month FE: Aug	0.094	0.291	0.0	1.0
Month FE: Sep	0.078	0.268	0.0	1.0
Month FE: Oct	0.098	0.297	0.0	1.0
Month FE: Nov	0.087	0.282	0.0	1.0
Month FE: Dec	0.072	0.258	0.0	1.0
Any long-term condition	0.580	0.494	0.0	1.0
Employment: not working	0.468	0.499	0.0	1.0
Employment: employee	0.429	0.495	0.0	1.0
Employment: self-employed	0.074	0.262	0.0	1.0
Employment: both	0.016	0.126	0.0	1.0
Employment: furlough	0.012	0.111	0.0	1.0
Employment: retired	0.351	0.477	0.0	1.0
Employment: student	0.003	0.054	0.0	1.0
Household size	2.380	1.084	1.0	11.0
Has children	0.183	0.386	0.0	1.0
Log HH income per capita	5.934	2.766	0.0	11.1
Income missing	0.144	0.351	0.0	1.0
<i>N</i>	49,168			

Source: Authors' calculation based on data from the UKHLS.

Table S3. Correlation matrix

	Variable						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Agreeableness	Conscientiousness	Extraversion	Openness	Neuroticism	Female	Cognitive ability
(1)							
Agreeableness	1						
Conscientiousness	0.305***	1					
Extraversion	0.172***	0.192***	1				
Openness	0.188***	0.167***	0.231***	1			
Neuroticism	-0.0932***	-0.146***	-0.213***	-0.104***	1		
Female	0.163***	0.134***	0.121***	-0.0755***	0.187***	1	
Cognitive ability	-0.0849***	-0.0223	-0.0214	0.130***	-0.0590***	-0.117***	1

Notes ***, **, and * denote statistical significance at 0.01, 0.05, and 0.1 levels respectively.

Table S4. Personality and mental health in the pre-COVID-19 wave

	Dep. var. = GHQ12 (0 to 12)		
	(1)	(2)	(3)
	Wave 9 2017–19	Wave 9 2017–19	Wave 9 2017–19
Female		0.312*** (0.074)	0.133* (0.074)
Agreeableness	0.047 (0.040)	0.021 (0.041)	0.025 (0.039)
Conscientiousness	-0.108*** (0.040)	-0.126*** (0.040)	-0.073* (0.039)
Extraversion	-0.036 (0.038)	-0.062 (0.038)	-0.066* (0.037)
Neuroticism	0.748*** (0.039)	0.709*** (0.041)	0.610*** (0.040)
Openness	0.082** (0.039)	0.108*** (0.040)	0.083** (0.039)
Cognitive ability		-0.036 (0.036)	-0.002 (0.039)
<i>N</i>	6,146	6,146	6,146

Notes Personality and cognitive skills variables are standardized. In the model estimated in column 3, control variables for job status, household income, any long term condition, month of the interview, age, region, marital status, household size and presence of children are included in the estimation but omitted from reporting. Robust standard errors are in parentheses. ***, **, and * denote statistical significance at 0.01, 0.05, and 0.1 levels respectively.

Table S5. Personality and mental health in each wave

	Dep. var. = GHQ12 (from 0 to 12)							
	(1) 2017–19	(2) Apr 2020	(3) May 2020	(4) Jun 2020	(5) Jul 2020	(6) Sep 2020	(7) Nov 2020	(8) Jan 2021
Female	0.133* (0.074)	0.863*** (0.079)	0.691*** (0.080)	0.548*** (0.085)	0.392*** (0.079)	0.562*** (0.080)	0.643*** (0.087)	0.691*** (0.086)
Agreeableness	0.025 (0.039)	0.004 (0.042)	-0.043 (0.043)	-0.040 (0.045)	0.024 (0.042)	0.034 (0.043)	-0.029 (0.045)	-0.066 (0.045)
Conscientiousness	-0.073* (0.039)	-0.071* (0.041)	-0.095** (0.042)	-0.120*** (0.044)	-0.108*** (0.041)	-0.169*** (0.042)	-0.147*** (0.044)	-0.107** (0.045)
Extraversion	-0.066* (0.037)	-0.024 (0.041)	0.012 (0.041)	-0.027 (0.042)	-0.072* (0.040)	-0.032 (0.041)	-0.050 (0.044)	-0.072* (0.043)
Neuroticism	0.610*** (0.040)	0.632*** (0.042)	0.642*** (0.043)	0.703*** (0.045)	0.600*** (0.042)	0.621*** (0.042)	0.637*** (0.045)	0.689*** (0.046)
Openness	0.083** (0.039)	0.108*** (0.042)	0.165*** (0.042)	0.227*** (0.045)	0.170*** (0.042)	0.193*** (0.042)	0.201*** (0.044)	0.219*** (0.045)
Cognitive ability	-0.002 (0.039)	0.008 (0.042)	0.032 (0.042)	0.024 (0.045)	0.031 (0.041)	0.015 (0.043)	0.023 (0.045)	-0.005 (0.046)
<i>N</i>	6,146	6,146	6,146	6,146	6,146	6,146	6,146	6,146

Notes Personality and cognitive skills variables are standardized. All models control for job status, household income, any long term condition, month of the interview, age, region, marital status, household size and presence of children. Robust standard errors are in parentheses. ***, **, and * denote statistical significance at 0.01, 0.05, and 0.1 levels respectively.

Table S6. Personality and mental health (GHQ-12 scale) in each wave

	Dep. var. = GHQ12 scale (from 0 to 36)							
	(1) 2017–19	(2) Apr 2020	(3) May 2020	(4) Jun 2020	(5) Jul 2020	(6) Sep 2020	(7) Nov 2020	(8) Jan 2021
Female	0.303** (0.129)	1.485*** (0.145)	1.090*** (0.143)	0.900*** (0.148)	0.802*** (0.135)	0.935*** (0.137)	1.071*** (0.145)	1.169*** (0.146)
Agreeableness	0.029 (0.071)	-0.006 (0.079)	-0.037 (0.078)	-0.069 (0.081)	-0.003 (0.072)	0.050 (0.074)	-0.015 (0.075)	-0.107 (0.079)
Conscientiousness	-0.209*** (0.067)	-0.217*** (0.075)	-0.276*** (0.074)	-0.268*** (0.077)	-0.250*** (0.070)	-0.357*** (0.071)	-0.320*** (0.074)	-0.266*** (0.076)
Extraversion	-0.161** (0.064)	-0.114 (0.076)	-0.009 (0.075)	-0.099 (0.074)	-0.174** (0.070)	-0.147** (0.069)	-0.159** (0.074)	-0.173** (0.074)
Neuroticism	1.446*** (0.067)	1.467*** (0.077)	1.483*** (0.077)	1.583*** (0.078)	1.421*** (0.072)	1.431*** (0.072)	1.516*** (0.076)	1.537*** (0.078)
Openness	0.044 (0.069)	0.100 (0.078)	0.181** (0.076)	0.282*** (0.078)	0.195*** (0.072)	0.263*** (0.073)	0.264*** (0.077)	0.282*** (0.078)
Cognitive ability	-0.026 (0.069)	-0.104 (0.078)	-0.032 (0.076)	-0.044 (0.080)	0.061 (0.072)	-0.023 (0.073)	-0.017 (0.077)	-0.088 (0.079)
<i>N</i>	6,146	6,146	6,146	6,146	6,146	6,146	6,146	6,146

Notes Personality and cognitive skills variables are standardized. All models control for job status, household income, any long term condition, month of the interview, age, region, marital status, household size and presence of children. Robust standard errors are in parentheses. ***, **, and * denote statistical significance at 0.01, 0.05, and 0.1 levels respectively.

Table S7. Personality and mental health in each wave, excluding over 60s and under 27s

	Dep. var. = GHQ12 (from 0 to 12)							
	(1) 2018/19	(2) Apr 2020	(3) May 2020	(4) Jun 2020	(5) Jul 2020	(6) Sep 2020	(7) Nov 2020	
Female	0.132 (0.118)	1.044*** (0.122)	0.768*** (0.127)	0.656*** (0.136)	0.334** (0.130)	0.642*** (0.129)	0.792*** (0.137)	0.743*** (0.136)
Agreeableness	0.013 (0.059)	-0.015 (0.062)	-0.082 (0.064)	-0.075 (0.067)	0.029 (0.063)	0.052 (0.064)	-0.077 (0.067)	-0.121* (0.066)
Conscientiousness	-0.136** (0.063)	-0.068 (0.063)	-0.156** (0.068)	-0.181** (0.071)	-0.119* (0.068)	-0.256*** (0.068)	-0.231*** (0.069)	-0.132* (0.071)
Extraversion	-0.102* (0.060)	0.010 (0.062)	0.059 (0.067)	-0.037 (0.067)	-0.058 (0.065)	-0.032 (0.066)	-0.087 (0.071)	-0.075 (0.069)
Neuroticism	0.677*** (0.061)	0.617*** (0.063)	0.657*** (0.067)	0.715*** (0.068)	0.649*** (0.067)	0.687*** (0.066)	0.665*** (0.070)	0.708*** (0.070)
Openness	0.106* (0.063)	0.181*** (0.062)	0.267*** (0.067)	0.380*** (0.070)	0.240*** (0.066)	0.305*** (0.067)	0.331*** (0.067)	0.290*** (0.070)
Cognitive ability	0.049 (0.060)	0.073 (0.064)	0.041 (0.066)	0.054 (0.069)	0.064 (0.065)	0.008 (0.066)	0.076 (0.069)	0.038 (0.070)
<i>N</i>	3,185	3,040	3,040	3,040	3,040	3,040	3,040	3,040

Notes Personality and cognitive skills variables are standardized. All models control for job status, household income, any long term condition, month of the interview, age, region, marital status, household size and presence of children. Robust standard errors are in parentheses. ***, **, and * denote statistical significance at 0.01, 0.05, and 0.1 levels respectively.

Table S8. Results for personality and mental health deterioration during the COVID-19 period, excluding control variables

	Dep. var. = GHQ12 (0 to 12)						
	(1) 2019 and Apr 2020	(2) 2019 and May 2020	(3) 2019 and Jun 2020	(4) 2019 and Jul 2020	(5) 2019 and Sep 2020	(6) 2019 and Nov 2020	(7) 2019 and Jan 2021
During COVID-19 period	0.501*** (0.089)	0.513*** (0.115)	0.463*** (0.097)	0.207* (0.116)	0.047 (0.114)	0.469*** (0.115)	0.541*** (0.118)
Female × during	0.843*** (0.139)	0.527*** (0.155)	0.412*** (0.139)	0.131 (0.157)	0.495*** (0.153)	0.428*** (0.160)	0.597*** (0.157)
Agreeableness × during	-0.107 (0.080)	-0.210*** (0.073)	-0.105 (0.074)	-0.055 (0.082)	-0.170** (0.075)	-0.121* (0.073)	-0.155** (0.074)
Conscientious × during	-0.144* (0.084)	-0.097 (0.079)	-0.112 (0.078)	-0.138* (0.081)	-0.078 (0.073)	-0.090 (0.075)	-0.005 (0.074)
Extraversion × during	0.129* (0.077)	0.144* (0.075)	0.088 (0.070)	0.028 (0.070)	0.099 (0.066)	-0.019 (0.075)	-0.058 (0.072)
Neuroticism × during	-0.041 (0.067)	-0.028 (0.067)	0.050 (0.064)	-0.047 (0.066)	-0.063 (0.068)	-0.056 (0.071)	-0.017 (0.070)
Openness × during	0.038 (0.071)	0.130* (0.075)	0.156** (0.073)	0.070 (0.075)	0.152** (0.075)	0.196*** (0.075)	0.213*** (0.077)
Cognitive Skills × during	0.107 (0.066)	0.082 (0.092)	0.096 (0.076)	0.054 (0.089)	0.014 (0.076)	0.095 (0.085)	0.031 (0.086)
<i>N</i>	11,166	11,166	11,166	11,166	11,166	11,166	11,166

Notes Personality and cognitive skills variables are standardized. All models control for individual fixed effects. Clustered standard errors at the individual level are in parentheses. ***, **, and * denote statistical significance at 0.01, 0.05, and 0.1 levels respectively.

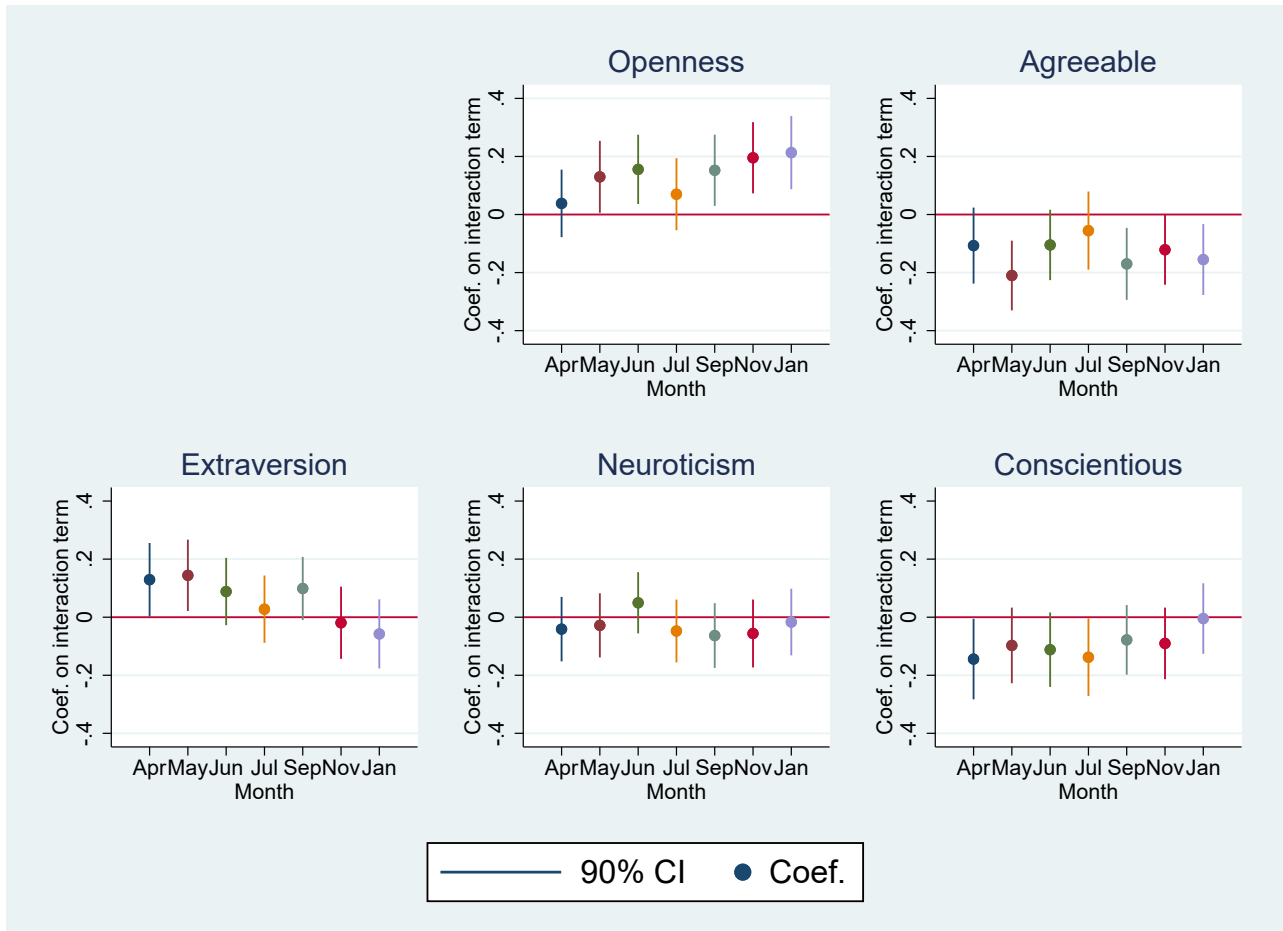


Fig. S1. Coefficient (coef.) plots of the effects of COVID-19 on mental health by personality traits, based on main specification excluding control variables This figure plots the main coefficients of interest, estimated using Equation 1 excluding control variables, for each pair of a period during COVID-19 and the pre-COVID-19 baseline period. The dependent variable is GHQ-12 caseness (range 0–12). Each dot represents the coefficient for an interaction terms between “During COVID-19 period” and a personality trait variable, and the spike plots the 90% confidence interval (CI). Personality traits include openness (Upper Center), agreeableness (Upper Right), extraversion (Lower Left), neuroticism (Lower Center), and conscientiousness (Lower Right).

Table S9. Personality and mental health deterioration during the COVID-19 period

	Dep. var. = GHQ12 (0 to 12)						
	(1) 2019 and Apr 2020	(2) 2019 and May 2020	(3) 2019 and Jun 2020	(4) 2019 and Jul 2020	(5) 2019 and Sep 2020	(6) 2019 and Nov 2020	(7) 2019 and Jan 2021
During COVID-19 period	1.159*** (0.348)	1.022*** (0.358)	0.555 (0.344)	0.164 (0.359)	-0.253 (0.328)	0.308 (0.369)	0.458 (0.365)
Female × during	0.803*** (0.139)	0.513*** (0.154)	0.379*** (0.137)	0.123 (0.154)	0.501*** (0.154)	0.437*** (0.161)	0.592*** (0.155)
Agreeableness × during	-0.092 (0.079)	-0.192*** (0.070)	-0.101 (0.073)	-0.056 (0.078)	-0.176** (0.073)	-0.124* (0.073)	-0.149** (0.074)
Conscientious × during	-0.120 (0.081)	-0.083 (0.076)	-0.095 (0.076)	-0.142* (0.078)	-0.096 (0.071)	-0.112 (0.072)	-0.013 (0.071)
Extraversion × during	0.114 (0.075)	0.133* (0.073)	0.079 (0.069)	0.021 (0.069)	0.108 (0.066)	-0.021 (0.075)	-0.054 (0.072)
Neuroticism × during	-0.052 (0.066)	-0.045 (0.066)	0.054 (0.064)	-0.046 (0.064)	-0.056 (0.065)	-0.066 (0.068)	-0.017 (0.069)
Openness × during	0.049 (0.070)	0.145** (0.073)	0.159** (0.071)	0.087 (0.074)	0.162** (0.074)	0.209*** (0.075)	0.228*** (0.076)
Cognitive Skills × during	0.090 (0.064)	0.057 (0.088)	0.095 (0.076)	0.058 (0.085)	0.020 (0.073)	0.101 (0.082)	0.044 (0.083)
<i>N</i>	11,166	11,166	11,166	11,166	11,166	11,166	11,166

Notes Personality and cognitive skills variables are standardized. All models control for individual fixed effects, job status, household income, any long term condition, month of the interview, age, region, marital status, household size and presence of children. Clustered standard errors at the individual level are in parentheses. ***, **, and * denote statistical significance at 0.01, 0.05, and 0.1 levels respectively.

Table S10. Personality and mental health (GHQ-12 scale) deterioration during the COVID-19 period

	Dep. var. = GHQ36 (0 to 36)						
	(1) 2019 and Apr 2020	(2) 2019 and May 2020	(3) 2019 and Jun 2020	(4) 2019 and Jul 2020	(5) 2019 and Sep 2020	(6) 2019 and Nov 2020	(7) 2019 and Jan 2021
During COVID-19 period	1.561*** (0.598)	1.726*** (0.634)	1.662*** (0.579)	0.951 (0.578)	0.342 (0.547)	1.925*** (0.649)	1.950*** (0.603)
Female × during	1.399*** (0.249)	0.746*** (0.273)	0.671*** (0.232)	0.380 (0.239)	0.726*** (0.241)	0.668*** (0.251)	0.956*** (0.241)
Agreeableness × during	-0.337** (0.148)	-0.319** (0.133)	-0.316** (0.137)	-0.187 (0.135)	-0.265** (0.131)	-0.288** (0.133)	-0.326** (0.138)
Conscientious × during	-0.216 (0.134)	-0.146 (0.124)	-0.118 (0.126)	-0.173 (0.130)	-0.177 (0.128)	-0.172 (0.123)	-0.011 (0.124)
Extraversion × during	0.261* (0.134)	0.281** (0.118)	0.192* (0.110)	0.045 (0.113)	0.124 (0.113)	0.086 (0.132)	0.034 (0.128)
Neuroticism × during	-0.088 (0.122)	-0.053 (0.114)	0.056 (0.119)	-0.085 (0.108)	-0.102 (0.118)	-0.038 (0.116)	-0.056 (0.121)
Openness × during	0.022 (0.127)	0.204 (0.126)	0.236** (0.115)	0.117 (0.113)	0.241* (0.123)	0.296** (0.123)	0.279** (0.141)
Cognitive Skills × during	-0.041 (0.125)	-0.010 (0.156)	-0.046 (0.117)	0.128 (0.131)	0.036 (0.111)	0.007 (0.128)	0.028 (0.127)
<i>N</i>	11,166	11,166	11,166	11,166	11,166	11,166	11,166

Notes Personality and cognitive skills variables are standardized. All models control for individual fixed effects, job status, household income, any long term condition, month of the interview, age, region, marital status, household size and presence of children. Clustered standard errors at the individual level are in parentheses. ***, **, and * denote statistical significance at 0.01, 0.05, and 0.1 levels respectively.

Table S11. Mental health deterioration during the COVID-19 period among the top and bottom 25% in Neuroticism

	Dep. var. = GHQ12 (0 to 12)					
	(1) 2019 and Jun 2020	(2) 2019 and Jun 2020	(3) 2019 and Jun 2020	(4) 2019 and Jan 2021	(5) 2019 and Jan 2021	(6) 2019 and Jan 2021
During COVID-19 period		0.557*** (0.090)	0.364*** (0.121)		0.755*** (0.102)	0.455*** (0.134)
Female × during			0.493*** (0.179)			0.765*** (0.197)
Top 25% Neuroticism × during	0.829*** (0.152)	0.272 (0.178)	0.158 (0.173)	1.011*** (0.173)	0.257 (0.200)	0.080 (0.193)
Cognitive Skills × during	0.084 (0.078)	0.085 (0.077)	0.110 (0.079)	0.059 (0.089)	0.061 (0.087)	0.100 (0.086)
<i>N</i>	8,365	8,365	8,365	8,365	8,365	8,365

Notes Only respondents scoring top and bottom 25% in Neuroticism are included. All models control for individual fixed effects, job status, household income, any long term condition, month of the interview, age, region, marital status, household size and presence of children. Clustered standard errors at the individual level are in parentheses. ***, **, and * denote statistical significance at 0.01, 0.05, and 0.1 levels respectively.

Table S12. Interactional effects between Big-5 personality traits

	Dep. var. = GHQ12 (0 to 12)						
	(1) 2019 and Apr 2020	(2) 2019 and May 2020	(3) 2019 and Jun 2020	(4) 2019 and Jul 2020	(5) 2019 and Sep 2020	(6) 2019 and Nov 2020	(7) 2019 and Jan 2021
During COVID-19 period	1.173*** (0.347)	1.010*** (0.359)	0.543 (0.345)	0.159 (0.361)	-0.248 (0.328)	0.303 (0.370)	0.451 (0.364)
Female × during	0.801*** (0.137)	0.511*** (0.154)	0.373*** (0.137)	0.129 (0.154)	0.496*** (0.153)	0.428*** (0.162)	0.586*** (0.155)
Agreeableness × during	-0.092 (0.074)	-0.188*** (0.067)	-0.089 (0.068)	-0.062 (0.074)	-0.170** (0.070)	-0.111 (0.070)	-0.141* (0.073)
Conscientious × during	-0.121 (0.079)	-0.089 (0.076)	-0.089 (0.074)	-0.136* (0.076)	-0.093 (0.068)	-0.112 (0.069)	-0.019 (0.070)
Extraversion × during	0.113 (0.074)	0.140* (0.073)	0.082 (0.068)	0.016 (0.067)	0.109* (0.065)	-0.019 (0.074)	-0.041 (0.072)
Neuroticism × during	-0.050 (0.065)	-0.046 (0.066)	0.057 (0.064)	-0.047 (0.064)	-0.053 (0.065)	-0.063 (0.068)	-0.016 (0.068)
Openness × during	0.050 (0.066)	0.138** (0.070)	0.145** (0.067)	0.093 (0.071)	0.153** (0.070)	0.201*** (0.072)	0.211*** (0.074)
Cognitive Skills × during	0.089 (0.063)	0.057 (0.088)	0.097 (0.076)	0.058 (0.085)	0.020 (0.073)	0.102 (0.082)	0.044 (0.082)
Neuroticism × Agreeableness × during	-0.002 (0.074)	-0.021 (0.064)	-0.052 (0.066)	0.032 (0.069)	-0.017 (0.070)	-0.070 (0.064)	-0.027 (0.065)
Neuroticism × Conscientious × during	0.026 (0.077)	0.032 (0.080)	-0.033 (0.068)	-0.052 (0.069)	0.008 (0.072)	0.009 (0.071)	0.047 (0.073)
Neuroticism × Extraversion × during	0.030 (0.081)	-0.046 (0.070)	-0.010 (0.063)	0.007 (0.065)	0.031 (0.058)	-0.005 (0.063)	-0.049 (0.059)
Neuroticism × Openness × during	0.007 (0.062)	0.027 (0.063)	0.054 (0.066)	-0.030 (0.059)	0.058 (0.075)	0.018 (0.066)	0.094 (0.064)
<i>N</i>	11,166	11,166	11,166	11,166	11,166	11,166	11,166

Notes Personality and cognitive skills variables are standardized. All models control for individual fixed effects, job status, household income, any long term condition, month of the interview, age, region, marital status, household size and presence of children. Clustered standard errors at the individual level are in parentheses. ***, **, and * denote statistical significance at 0.01, 0.05, and 0.1 levels respectively.

Table S13. Placebo test using Wave 8 Main Survey as baseline and Wave 9 Main Survey as intervention year

Dep. var. = GHQ12 (0 to 12), baseline = Wave 8 main survey, intervention = Wave 9 main survey	
Wave 9	0.093 (0.144)
Female × during Wave 9	-0.091 (0.132)
Agreeableness × during	-0.053 (0.064)
Conscientious × during	0.057 (0.067)
Extraversion × during	0.035 (0.062)
Neuroticism × during	0.021 (0.066)
Openness × during	0.003 (0.060)
Cognitive Skills × during	0.009 (0.061)
<i>N</i>	11,301

Notes Personality and cognitive skills variables are standardized. All models control for individual fixed effects, job status, household income, any long term condition, month of the interview, age, region, marital status, household size and presence of children. Clustered standard errors at the individual level are in parentheses. ***, **, and * denote statistical significance at 0.01, 0.05, and 0.1 levels respectively.

Table S14. Robustness check on other psychological factors

	Dep. var. = GHQ12 (0 to 12)						
	(1) 2019 and Apr 2020	(2) 2019 and May 2020	(3) 2019 and Jun 2020	(4) 2019 and Jul 2020	(5) 2019 and Sep 2020	(6) 2019 and Nov 2020	(7) 2019 and Jan 2021
During COVID-19 period	0.536 (0.625)	1.375* (0.706)	0.818 (0.594)	0.693 (0.723)	0.166 (0.720)	0.793 (0.760)	1.380* (0.750)
Female × during	0.714*** (0.171)	0.224 (0.207)	0.258 (0.173)	0.002 (0.209)	0.507** (0.201)	0.456** (0.214)	0.466** (0.209)
Agreeableness × during	-0.031 (0.101)	-0.128 (0.087)	-0.053 (0.094)	-0.055 (0.105)	-0.204** (0.086)	-0.112 (0.088)	-0.098 (0.094)
Conscientious × during	-0.118 (0.109)	-0.103 (0.096)	-0.091 (0.096)	-0.136 (0.098)	-0.146* (0.080)	-0.205*** (0.077)	-0.064 (0.089)
Extraversion × during	0.085 (0.093)	0.143 (0.093)	0.145 (0.090)	0.034 (0.089)	0.146* (0.075)	-0.017 (0.088)	-0.060 (0.089)
Neuroticism × during	0.013 (0.087)	0.000 (0.082)	0.048 (0.081)	-0.025 (0.084)	-0.045 (0.076)	-0.091 (0.082)	-0.061 (0.085)
Openness × during	0.064 (0.089)	0.215** (0.095)	0.172* (0.089)	0.201* (0.105)	0.209** (0.098)	0.271*** (0.099)	0.309*** (0.102)
Cognitive Skills × during	0.065 (0.084)	0.005 (0.129)	0.129 (0.110)	0.009 (0.121)	-0.063 (0.097)	0.116 (0.113)	0.088 (0.115)
Optimism × during	0.017 (0.100)	0.016 (0.093)	0.007 (0.100)	-0.005 (0.100)	-0.003 (0.095)	-0.026 (0.102)	-0.095 (0.101)
Risk attitude × during	-0.026 (0.036)	-0.033 (0.038)	-0.025 (0.038)	-0.048 (0.036)	-0.054 (0.035)	-0.028 (0.033)	-0.045 (0.036)
Locus of control × during	0.140** (0.065)	0.035 (0.069)	0.038 (0.068)	0.023 (0.075)	-0.016 (0.059)	-0.015 (0.064)	-0.020 (0.063)
<i>N</i>	6,754	6,754	6,754	6,754	6,754	6,754	6,754

Notes Personality and cognitive skills variables are standardized. All models control for individual fixed effects, job status, household income, any long term condition, month of the interview, age, region, marital status, household size and presence of children. Clustered standard errors at the individual level are in parentheses. ***, **, and * denote statistical significance at 0.01, 0.05, and 0.1 levels respectively.

Table S15. Personality and mental health deterioration during the COVID-19 period, without sampling weights

	Dep. var. = GHQ12 (0 to 12)						
	(1) 2019 and Apr 2020	(2) 2019 and May 2020	(3) 2019 and Jun 2020	(4) 2019 and Jul 2020	(5) 2019 and Sep 2020	(6) 2019 and Nov 2020	(7) 2019 and Jan 2021
During COVID-19 period	0.952*** (0.215)	0.432** (0.214)	0.194 (0.215)	-0.246 (0.211)	-0.370* (0.217)	-0.078 (0.226)	0.205 (0.231)
Female × during	0.685*** (0.088)	0.515*** (0.088)	0.397*** (0.091)	0.215** (0.087)	0.393*** (0.088)	0.468*** (0.092)	0.511*** (0.092)
Agreeableness × during	-0.028 (0.048)	-0.083* (0.048)	-0.075 (0.049)	-0.014 (0.046)	-0.008 (0.047)	-0.079 (0.049)	-0.102** (0.049)
Conscientious × during	0.004 (0.048)	-0.009 (0.048)	-0.034 (0.049)	-0.023 (0.047)	-0.093* (0.048)	-0.079 (0.048)	-0.024 (0.049)
Extraversion × during	0.045 (0.047)	0.085* (0.047)	0.041 (0.047)	-0.008 (0.045)	0.034 (0.045)	0.019 (0.048)	0.007 (0.047)
Neuroticism × during	-0.006 (0.047)	0.006 (0.048)	0.076 (0.049)	-0.029 (0.046)	-0.014 (0.048)	0.000 (0.049)	0.056 (0.050)
Openness × during	0.037 (0.046)	0.095** (0.047)	0.157*** (0.049)	0.106** (0.047)	0.132*** (0.047)	0.150*** (0.049)	0.147*** (0.049)
Cognitive Skills × during	0.096** (0.043)	0.109** (0.043)	0.115*** (0.044)	0.117*** (0.041)	0.095** (0.042)	0.117*** (0.045)	0.073* (0.044)
<i>N</i>	12,292	12,292	12,292	12,292	12,292	12,292	12,292

Notes Personality and cognitive skills variables are standardized. All models control for individual fixed effects, job status, household income, any long term condition, month of the interview, age, region, marital status, household size and presence of children. Clustered standard errors at the individual level are in parentheses. ***, **, and * denote statistical significance at 0.01, 0.05, and 0.1 levels respectively.

Table S16. Results with inverse probability weighting

	Dep. var. = GHQ12 (0 to 12)						
	(1) 2019 and Apr 2020	(2) 2019 and May 2020	(3) 2019 and Jun 2020	(4) 2019 and Jul 2020	(5) 2019 and Sep 2020	(6) 2019 and Nov 2020	(7) 2019 and Jan 2021
During COVID-19 period	0.855** (0.397)	0.331 (0.378)	0.233 (0.234)	-0.652* (0.378)	-0.460 (0.354)	-0.171 (0.307)	0.067 (0.410)
Female × during	0.634*** (0.122)	0.467*** (0.119)	0.420*** (0.096)	0.157 (0.115)	0.330*** (0.118)	0.460*** (0.127)	0.492*** (0.125)
Agreeableness × during	-0.053 (0.066)	-0.090 (0.065)	-0.041 (0.053)	0.003 (0.062)	-0.006 (0.064)	-0.093 (0.064)	-0.112* (0.066)
Conscientious × during	0.056 (0.077)	0.024 (0.074)	-0.045 (0.053)	0.000 (0.072)	-0.075 (0.073)	-0.021 (0.076)	0.013 (0.075)
Extraversion × during	0.142 (0.094)	0.154* (0.089)	0.033 (0.052)	0.030 (0.085)	0.072 (0.087)	0.097 (0.089)	0.063 (0.091)
Neuroticism × during	-0.004 (0.060)	0.012 (0.060)	0.037 (0.052)	-0.031 (0.058)	-0.019 (0.060)	0.009 (0.062)	0.050 (0.063)
Openness × during	0.059 (0.053)	0.141** (0.058)	0.188*** (0.054)	0.153*** (0.057)	0.186*** (0.057)	0.181*** (0.055)	0.175*** (0.055)
Cognitive Skills × during	0.085* (0.046)	0.080* (0.048)	0.106** (0.046)	0.116*** (0.045)	0.108** (0.046)	0.102** (0.048)	0.073 (0.047)
<i>N</i>	12,292	12,292	12,292	12,292	12,292	12,292	12,292

Notes Non-attrition probability are estimated based on demographic and socio-economics characteristics including sex, age, age squared, ethnicity, educational qualifications, and job status at baseline, based on the full panel of UKHLS COVID Studies. Personality and cognitive skills variables are standardized. All models control for individual fixed effects, job status, household income, any long term condition, month of the interview, age, region, marital status, household size and presence of children. Clustered standard errors at the individual level are in parentheses. ***, **, and * denote statistical significance at 0.01, 0.05, and 0.1 levels respectively.

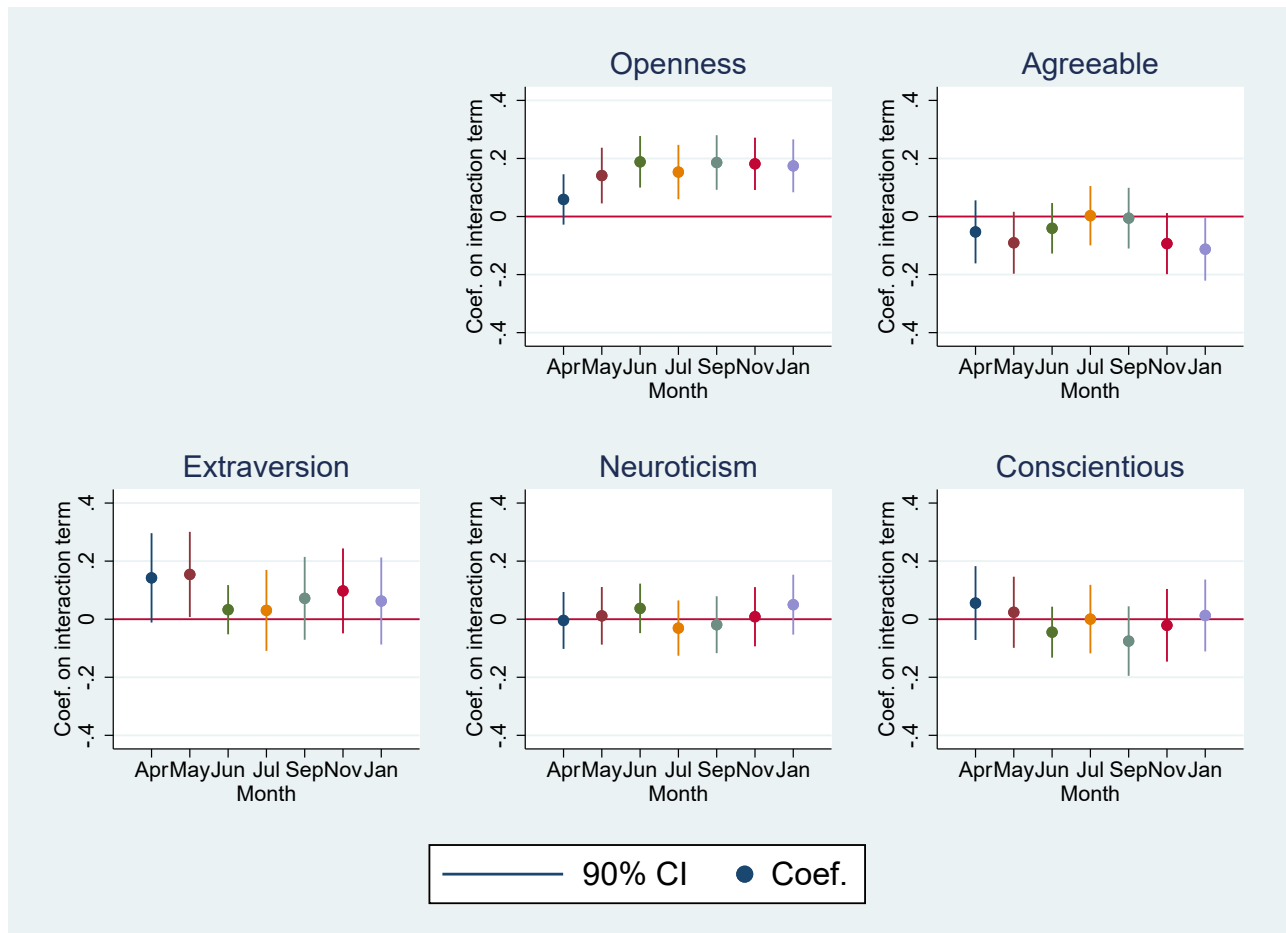


Fig. S2. Coefficient (coef.) plots of the effects of COVID-19 on mental health by personality traits, based on main specification with inverse probability weighting This figure plots the main coefficients of interest, estimated using Equation 1 with inverse probability weighting, for each pair of a period during COVID-19 and the pre-COVID-19 baseline period. The dependent variable is GHQ-12 caseness. Each dot represents the coefficient for an interaction term between “During COVID-19 period” and a personality trait variable, and the spike plots the 90% confidence interval. Personality traits include openness (Upper Center), agreeableness (Upper Right), extraversion (Lower Left), neuroticism (Lower Center), and conscientiousness (Lower Right).

Table S17. Personality and mental health deterioration during the COVID-19 period, excluding over 60s and under 27s

	Dep. var. = GHQ12 (0 to 12)						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	2019 and Apr 2020	2019 and May 2020	2019 and Jun 2020	2019 and Jul 2020	2019 and Sep 2020	2019 and Nov 2020	2019 and Jan 2021
During COVID-19 period	1.142** (0.562)	1.036* (0.598)	0.799 (0.612)	-0.215 (0.609)	-0.704 (0.526)	0.907 (0.627)	1.397** (0.671)
Female × during	1.118*** (0.192)	0.627*** (0.226)	0.458** (0.201)	0.105 (0.228)	0.620*** (0.233)	0.540** (0.236)	0.674*** (0.239)
Agreeableness × during	-0.082 (0.109)	-0.223** (0.097)	-0.093 (0.104)	-0.032 (0.112)	-0.182* (0.104)	-0.122 (0.103)	-0.180 (0.110)
Conscientious × during	-0.028 (0.116)	-0.012 (0.101)	-0.039 (0.111)	-0.104 (0.117)	-0.036 (0.104)	-0.072 (0.107)	0.036 (0.104)
Extraversion × during	0.098 (0.105)	0.170 (0.104)	0.117 (0.104)	0.065 (0.104)	0.114 (0.099)	-0.092 (0.111)	-0.071 (0.109)
Neuroticism × during	-0.130 (0.096)	-0.122 (0.094)	-0.005 (0.096)	-0.053 (0.099)	-0.056 (0.100)	-0.105 (0.101)	-0.065 (0.104)
Openness × during	0.133 (0.103)	0.225** (0.108)	0.274*** (0.106)	0.153 (0.114)	0.288** (0.112)	0.378*** (0.112)	0.377*** (0.114)
Cognitive Skills × during	-0.006 (0.087)	-0.076 (0.135)	-0.016 (0.119)	-0.069 (0.130)	-0.145 (0.110)	-0.011 (0.119)	-0.014 (0.128)
<i>N</i>	8,263	8,263	8,263	8,263	8,263	8,263	8,263

Notes Personality and cognitive skills variables are standardized. All models control for individual fixed effects, job status, household income, any long term condition, month of the interview, age, region, marital status, household size and presence of children. Clustered standard errors at the individual level are in parentheses. ***, **, and * denote statistical significance at 0.01, 0.05, and 0.1 levels respectively.

Table S18. Specification checks: personality and mental health deterioration between baseline and June 2020

	Dep. var. = GHQ12 (0 to 12)		
	(1) 2019 and Jun 2020	(2) 2019 and Jun 2020	(3) 2019 and Jun 2020
During COVID-19 period	0.511*** (0.116)	0.513*** (0.115)	1.022*** (0.358)
Female × during	0.514*** (0.151)	0.527*** (0.155)	0.513*** (0.154)
Agreeableness × during	-0.216*** (0.072)	-0.210*** (0.073)	-0.192*** (0.070)
Conscientious × during	-0.099 (0.079)	-0.097 (0.079)	-0.083 (0.076)
Extraversion × during	0.140* (0.076)	0.144* (0.075)	0.133* (0.073)
Neuroticism × during	-0.032 (0.067)	-0.028 (0.067)	-0.045 (0.066)
Openness × during	0.148* (0.076)	0.130* (0.075)	0.145** (0.073)
Cognitive Skills × during		0.082 (0.092)	0.057 (0.088)
Controls	No	No	Yes
<i>N</i>	11,166	11,166	11,166

Notes Personality and cognitive skills variables are standardized. Column (3) controls for individual fixed effects, job status, household income, any long term condition, month of the interview, age, region, marital status, household size and presence of children. Clustered standard errors at the individual level are in parentheses. ***, **, and * denote statistical significance at 0.01, 0.05, and 0.1 levels respectively.

Table S19. Specification checks: personality and mental health deterioration between baseline and January 2021

	Dep. var. = GHQ12 (0 to 12)		
	(1) 2019 and Jan 2021	(2) 2019 and Jan 2021	(3) 2019 and Jan 2021
During COVID-19 period	0.540*** (0.119)	0.541*** (0.118)	0.458 (0.365)
Female × during	0.592*** (0.155)	0.597*** (0.157)	0.592*** (0.155)
Agreeableness × during	-0.157** (0.073)	-0.155** (0.074)	-0.149** (0.074)
Conscientious × during	-0.005 (0.074)	-0.005 (0.074)	-0.013 (0.071)
Extraversion × during	-0.059 (0.073)	-0.058 (0.072)	-0.054 (0.072)
Neuroticism × during	-0.018 (0.070)	-0.017 (0.070)	-0.017 (0.069)
Openness × during	0.220*** (0.073)	0.213*** (0.077)	0.228*** (0.076)
Cognitive Skills × during		0.031 (0.086)	0.044 (0.083)
Controls	No	No	Yes
<i>N</i>	11,166	11,166	11,166

Notes Personality and cognitive skills variables are standardized. Column (3) controls for individual fixed effects, job status, household income, any long term condition, month of the interview, age, region, marital status, household size and presence of children. Clustered standard errors at the individual level are in parentheses. ***, **, and * denote statistical significance at 0.01, 0.05, and 0.1 levels respectively.

Table S20. Personality and mental health deterioration during the COVID-19 Period, females only

	Dep. var. = GHQ12 (0 to 12)						
	(1) 2019 and Apr 2020	(2) 2019 and May 2020	(3) 2019 and Jun 2020	(4) 2019 and Jul 2020	(5) 2019 and Sep 2020	(6) 2019 and Nov 2020	(7) 2019 and Jan 2021
During COVID-19 period	2.606*** (0.482)	1.656*** (0.391)	0.861** (0.419)	-0.121 (0.444)	0.189 (0.445)	0.470 (0.493)	1.198** (0.505)
Agreeableness × during	-0.131 (0.128)	-0.182* (0.103)	-0.224** (0.113)	-0.101 (0.126)	-0.250** (0.112)	-0.146 (0.113)	-0.134 (0.101)
Conscientious × during	-0.161 (0.125)	-0.056 (0.099)	-0.113 (0.107)	-0.152 (0.119)	-0.056 (0.101)	-0.094 (0.107)	-0.008 (0.096)
Extraversion × during	0.138 (0.109)	0.187* (0.100)	0.064 (0.100)	0.102 (0.099)	0.147 (0.092)	-0.023 (0.108)	-0.152 (0.103)
Neuroticism × during	-0.041 (0.094)	-0.019 (0.089)	0.039 (0.088)	-0.030 (0.087)	-0.014 (0.095)	-0.018 (0.095)	0.013 (0.093)
Openness × during	0.116 (0.099)	0.132 (0.094)	0.252*** (0.098)	0.050 (0.096)	0.182* (0.094)	0.250*** (0.089)	0.284*** (0.091)
Cognitive Skills × during	0.134 (0.086)	0.198** (0.084)	0.159* (0.093)	0.233*** (0.084)	0.111 (0.078)	0.220*** (0.084)	0.136 (0.085)
<i>N</i>	8,806	8,806	8,806	8,806	8,806	8,806	8,806

Notes Personality and cognitive skills variables are standardized. All models control for individual fixed effects, job status, household income, any long term condition, month of the interview, age, region, marital status, household size and presence of children. Clustered standard errors at the individual level are in parentheses. ***, **, and * denote statistical significance at 0.01, 0.05, and 0.1 levels respectively.

Table S21. Personality and mental health deterioration during the COVID-19 period, males only

	Dep. var. = GHQ12 (0 to 12)						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	2019 and Apr 2020	2019 and May 2020	2019 and Jun 2020	2019 and Jul 2020	2019 and Sep 2020	2019 and Nov 2020	2019 and Jan 2021
During COVID-19 period	0.507 (0.421)	0.863 (0.530)	0.728 (0.495)	0.672 (0.480)	-0.281 (0.393)	0.517 (0.449)	0.259 (0.471)
Agreeableness × during	-0.029 (0.086)	-0.199** (0.090)	0.033 (0.089)	-0.028 (0.092)	-0.088 (0.095)	-0.082 (0.092)	-0.149 (0.107)
Conscientious × during	-0.088 (0.093)	-0.135 (0.116)	-0.074 (0.108)	-0.118 (0.096)	-0.172* (0.096)	-0.163* (0.090)	-0.051 (0.105)
Extraversion × during	0.095 (0.097)	0.082 (0.100)	0.103 (0.092)	-0.056 (0.086)	0.083 (0.094)	-0.024 (0.098)	0.063 (0.097)
Neuroticism × during	-0.077 (0.088)	-0.080 (0.101)	0.085 (0.093)	-0.040 (0.093)	-0.082 (0.092)	-0.084 (0.094)	-0.022 (0.102)
Openness × during	-0.049 (0.094)	0.158 (0.115)	0.033 (0.103)	0.129 (0.111)	0.138 (0.114)	0.167 (0.121)	0.162 (0.126)
Cognitive Skills × during	0.020 (0.094)	-0.130 (0.158)	0.012 (0.120)	-0.171 (0.152)	-0.101 (0.132)	-0.039 (0.143)	-0.074 (0.135)
<i>N</i>	7,943	7,943	7,943	7,943	7,943	7,943	7,943

Notes Personality and cognitive skills variables are standardized. All models control for individual fixed effects, job status, household income, any long term condition, month of the interview, age, region, marital status, household size and presence of children. Clustered standard errors at the individual level are in parentheses. ***, **, and * denote statistical significance at 0.01, 0.05, and 0.1 levels respectively.

Table S22. Heterogeneity by ethnicity

	Dep. var. = GHQ12 (0 to 12)						
	(1) 2019 and Apr 2020	(2) 2019 and May 2020	(3) 2019 and Jun 2020	(4) 2019 and Jul 2020	(5) 2019 and Sep 2020	(6) 2019 and Nov 2020	(7) 2019 and Jan 2021
During COVID-19 period	1.173*** (0.352)	0.996*** (0.367)	0.545 (0.351)	0.177 (0.367)	-0.232 (0.336)	0.318 (0.371)	0.459 (0.373)
Female × during	0.811*** (0.138)	0.529*** (0.155)	0.377*** (0.139)	0.132 (0.155)	0.521*** (0.154)	0.436*** (0.161)	0.600*** (0.156)
BAME × during	-0.251 (0.258)	0.013 (0.249)	-0.183 (0.222)	-0.180 (0.238)	-0.237 (0.234)	-0.071 (0.254)	0.076 (0.245)
Agreeableness × during	-0.096 (0.079)	-0.211*** (0.074)	-0.110 (0.077)	-0.066 (0.082)	-0.188** (0.076)	-0.141* (0.077)	-0.150* (0.079)
Conscientious × during	-0.150* (0.084)	-0.090 (0.080)	-0.117 (0.080)	-0.165** (0.082)	-0.100 (0.074)	-0.140* (0.075)	-0.024 (0.074)
Extraversion × during	0.064 (0.077)	0.105 (0.076)	0.065 (0.073)	-0.009 (0.071)	0.067 (0.069)	-0.029 (0.079)	-0.079 (0.077)
Neuroticism × during	-0.052 (0.070)	-0.062 (0.070)	0.054 (0.068)	-0.057 (0.068)	-0.073 (0.070)	-0.079 (0.073)	-0.047 (0.073)
Openness × during	0.011 (0.072)	0.109 (0.077)	0.106 (0.074)	0.061 (0.078)	0.142* (0.079)	0.182** (0.078)	0.210*** (0.080)
Cognitive Skills × during	0.110 (0.070)	0.059 (0.099)	0.106 (0.086)	0.068 (0.096)	0.020 (0.083)	0.094 (0.091)	0.028 (0.094)
BAME × Agreeableness × during	0.005 (0.308)	0.196 (0.264)	0.148 (0.250)	0.098 (0.260)	0.059 (0.253)	0.214 (0.242)	-0.039 (0.248)
BAME × Conscientious × during	0.387 (0.301)	0.078 (0.268)	0.249 (0.269)	0.299 (0.266)	0.034 (0.261)	0.385 (0.280)	0.162 (0.264)
BAME × Extraversion × during	0.701** (0.305)	0.313 (0.290)	0.176 (0.256)	0.374 (0.270)	0.483* (0.275)	0.048 (0.286)	0.274 (0.256)
BAME × Neuroticism × during	0.037 (0.221)	0.201 (0.209)	0.079 (0.216)	0.146 (0.216)	0.188 (0.204)	0.192 (0.207)	0.348* (0.205)
BAME × Openness × during	0.529* (0.273)	0.499* (0.278)	0.736*** (0.252)	0.400 (0.273)	0.370 (0.269)	0.391 (0.289)	0.243 (0.283)
BAME × Cognitive Skills × during	-0.341* (0.193)	-0.079 (0.185)	-0.202 (0.166)	-0.198 (0.170)	-0.116 (0.163)	-0.010 (0.203)	0.135 (0.164)
<i>N</i>	11,166	11,166	11,166	11,166	11,166	11,166	11,166

Notes Personality and cognitive skills variables are standardized. All models control for individual fixed effects, job status, household income, any long term condition, month of the interview, age, region, marital status, household size and presence of children. Clustered standard errors at the individual level are in parentheses. ***, **, and * denote statistical significance at 0.01, 0.05, and 0.1 levels respectively.

Table S23. Heterogeneity by age group

	Dep. var. = GHQ12 (0 to 12)						
	(1) 2019 and Apr 2020	(2) 2019 and May 2020	(3) 2019 and Jun 2020	(4) 2019 and Jul 2020	(5) 2019 and Sep 2020	(6) 2019 and Nov 2020	(7) 2019 and Jan 2021
During COVID-19 period	1.439*** (0.441)	1.251*** (0.437)	0.734* (0.435)	0.182 (0.440)	-0.179 (0.405)	0.818* (0.482)	0.980** (0.477)
Female × during	0.787*** (0.137)	0.493*** (0.152)	0.371*** (0.135)	0.121 (0.152)	0.490*** (0.152)	0.437*** (0.160)	0.580*** (0.155)
Age over 65 × during	0.256 (0.201)	0.232 (0.220)	0.195 (0.196)	0.044 (0.211)	0.102 (0.208)	0.558** (0.238)	0.525** (0.227)
Agreeableness × during	-0.065 (0.097)	-0.211** (0.089)	-0.097 (0.091)	-0.032 (0.099)	-0.185** (0.092)	-0.095 (0.091)	-0.170* (0.095)
Conscientious × during	0.040 (0.102)	0.067 (0.091)	0.023 (0.097)	-0.072 (0.102)	0.007 (0.092)	-0.023 (0.093)	0.062 (0.091)
Extraversion × during	0.124 (0.094)	0.117 (0.093)	0.043 (0.090)	0.021 (0.091)	0.103 (0.087)	-0.041 (0.098)	-0.057 (0.095)
Neuroticism × during	-0.033 (0.085)	-0.038 (0.084)	0.031 (0.083)	-0.070 (0.085)	-0.053 (0.086)	-0.067 (0.089)	-0.025 (0.090)
Openness × during	0.085 (0.091)	0.205** (0.098)	0.229** (0.093)	0.118 (0.100)	0.229** (0.099)	0.295*** (0.098)	0.333*** (0.100)
Cognitive Skills × during	0.031 (0.077)	-0.026 (0.118)	0.022 (0.099)	0.006 (0.111)	-0.065 (0.095)	0.041 (0.106)	0.035 (0.110)
Age over 65 × Agreeableness × during	-0.046 (0.149)	0.126 (0.124)	0.017 (0.128)	-0.076 (0.143)	0.069 (0.136)	-0.075 (0.143)	0.131 (0.130)
Age over 65 × Conscientious × during	-0.491*** (0.166)	-0.467*** (0.161)	-0.354** (0.147)	-0.204 (0.145)	-0.307** (0.134)	-0.219 (0.140)	-0.227 (0.141)
Age over 65 × Extraversion × during	-0.043 (0.148)	0.037 (0.134)	0.123 (0.130)	-0.001 (0.126)	0.006 (0.121)	0.069 (0.140)	0.027 (0.126)
Age over 65 × Neuroticism × during	-0.036 (0.121)	-0.003 (0.121)	0.090 (0.119)	0.083 (0.110)	-0.003 (0.113)	0.043 (0.121)	0.078 (0.122)
Age over 65 × Openness × during	-0.109 (0.126)	-0.207* (0.126)	-0.241* (0.124)	-0.095 (0.123)	-0.225* (0.124)	-0.309** (0.131)	-0.379*** (0.131)
Age over 65 × Cognitive Skills × during	0.146 (0.128)	0.234 (0.143)	0.202 (0.126)	0.150 (0.142)	0.261** (0.127)	0.193 (0.141)	0.010 (0.138)
<i>N</i>	11,166	11,166	11,166	11,166	11,166	11,166	11,166

Notes Personality and cognitive skills variables are standardized. All models control for individual fixed effects, job status, household income, any long term condition, month of the interview, age, region, marital status, household size and presence of children. Clustered standard errors at the individual level are in parentheses. ***, **, and * denote statistical significance at 0.01, 0.05, and 0.1 levels respectively.

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