

SUPPLEMENTARY MATERIAL FOR:**Impact of lockdown on keyworkers – Findings from the COVID-19 survey in four UK national longitudinal studies**

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Supplementary Table S1. Survey questions.

Survey Derived Variable*	Survey Question
Exposure	
Key Worker	Are you a Key worker, or has your work been classified as critical to the Covid-19 response?
Covariates	
Chronic illness	Do you have any of the following? Please select all that apply: CM suffering from a long-standing illness
Shielding Letter	Have you received a letter or text message from the NHS or Chief Medical Officer saying that you have been identified as someone at risk of severe illness if you catch Coronavirus, because you have an underlying disease or health condition?
Outcomes	
COVID-19	Do you think that you have or have had Coronavirus? Have you been tested for Coronavirus? What was the result of your coronavirus test? If you had more than one test please report the findings of the latest test.
Change in financial situation	Overall, how do you feel your current financial situation compares to before the Coronavirus outbreak?
Change in trust in government	Since the Coronavirus outbreak please indicate how the following have changed. The amount of trust I have in the Government
Change in conflict	Since the Coronavirus outbreak please indicate how the following have changed. The amount of conflict I have had with people around me
Change in household composition	Have there been any changes to the people you are living with since the Coronavirus outbreak?
Change in psychological distress	<p>1958 and 1970 cohorts only</p> <p>The next questions are concerned with how you are feeling generally. Do you feel tired most of the time? The next questions are concerned with how you are feeling generally. Do you often feel miserable or depressed? The next questions are concerned with how you are feeling generally. Do you often get worried about things? The next questions are concerned with how you are feeling generally. Do you often get in a violent rage? The next questions are concerned with how you are feeling generally. Do you often suddenly become scared for no good reason? The next questions are concerned with how you are feeling generally. Are you easily upset or irritated? The next questions are concerned with how you are feeling generally. Are you constantly keyed up and jittery? The next questions are concerned with how you are feeling generally. Does every little thing get on your nerves and wear you out? The next questions are concerned with how you are feeling generally. Does your heart often race like mad?</p> <p>1989-1990 cohort only</p> <p>Have you recently been able to concentrate on what you're doing? Have you recently lost much sleep over worry? Have you recently felt that you are playing a useful part in things? Have you recently felt capable of making decisions about things?</p>

	<p>Have you recently felt constantly under strain? Have you recently felt you couldn't overcome your difficulties? Have you recently been able to enjoy your normal day to day activities? Have you recently been able to face up to your problems? Have you recently been feeling unhappy or depressed? Have you recently been losing confidence in yourself? Have you recently been thinking of yourself as a worthless person? Have you recently been feeling reasonably happy, all things considered?</p> <p>2000-2002 cohort only The next few questions are about how you have felt over the last 30 days. During the last 30 days, about how often did you feel so depressed that nothing could cheer you up? During the last 30 days, about how often did you feel hopeless? During the last 30 days, about how often did you feel restless or fidgety? During the last 30 days, about how often did you feel that everything was an effort? During the last 30 days, about how often did you feel worthless? During the last 30 days, about how often did you feel nervous?</p>
Change in alcohol consumption	<p>In the month before the Coronavirus outbreak, how many standard alcoholic drinks have you had on a typical day when you were drinking? In the month before the Coronavirus outbreak, how often did you have a drink containing alcohol? Since the start of the Coronavirus outbreak, how many standard alcoholic drinks do you have on a typical day when you were drinking? Since the start of the Coronavirus outbreak, how often have you had a drink containing alcohol?</p>
Change in cigarette smoking	<p>In the month before the Coronavirus outbreak, how many cigarettes a day did you usually smoke? Since the start of the Coronavirus outbreak, how many cigarettes a day have you typically smoked?</p>
Change in sleep duration	<p>In the month before the start of the Coronavirus outbreak, how many hours did you sleep each night on average? Since the start of the Coronavirus outbreak, how many hours have you slept each night on average?</p>

* Any other variable used was derived from the cohorts' longitudinal data as described in the methods section of the manuscript.

1958 refers to National Child Development Study (NCDS); 1970 refers to British Cohort Study (BCS70); 1989-1990 refers to Next Steps (NS); 2000-2002 refers to Millennium Cohort Study (MCS); SEP, socio-economic position; GCSE, general certificate of secondary education; N/A, not available; yrs, years.

Supplementary Table S2. Association of key worker status with outcomes.

Outcome	Cohort study birth year	Model 1 ^		Model 2 *		Model 3 †	
		OR (95% CI)	p-value	OR (95% CI)	p-value	OR (95% CI)	p-value
COVID-19 infection ^a	1958	1.87 (1.43, 2.43)	<0.0001	1.94 (1.45, 2.59)	<0.0001	1.95 (1.45, 2.61)	<0.0001
	1970	1.20 (0.96, 1.50)	0.100	1.21 (0.95, 1.55)	0.118	1.18 (0.92, 1.51)	0.184
	1989-1990	1.44 (1.06, 1.96)	0.020	1.42 (1.02, 1.96)	0.039	1.36 (0.98, 1.90)	0.067
	2000-2002	1.89 (1.12, 3.03)	0.012	1.57 (0.84, 2.74)	0.132	1.47 (0.75, 2.65)	0.234
Change in financial situation ^b	1958	0.37 (0.31, 0.44)	<0.0001	0.35 (0.28, 0.43)	<0.0001	0.34 (0.27, 0.42)	<0.0001
	1970	0.31 (0.26, 0.36)	<0.0001	0.31 (0.26, 0.37)	<0.0001	0.31 (0.26, 0.36)	<0.0001
	1989-1990	0.31 (0.24, 0.40)	<0.0001	0.29 (0.22, 0.38)	<0.0001	0.29 (0.22, 0.38)	<0.0001
	2000-2002	0.41 (0.26, 0.61)	<0.0001	0.40 (0.24, 0.63)	0.0002	0.39 (0.23, 0.62)	0.0002
Change in trust in government ^c	1958	0.90 (0.75, 1.07)	0.238	0.94 (0.77, 1.15)	0.565	0.94 (0.76, 1.14)	0.516
	1970	1.05 (0.90, 1.23)	0.559	1.09 (0.92, 1.30)	0.304	1.12 (0.94, 1.34)	0.191
	1989-1990	0.99 (0.79, 1.23)	0.922	0.95 (0.75, 1.21)	0.687	0.95 (0.75, 1.21)	0.695
	2000-2002	0.85 (0.60, 1.19)	0.348	0.75 (0.50, 1.11)	0.160	0.75 (0.49, 1.11)	0.158
Change in conflict ^d	1958	1.09 (0.88, 1.37)	0.432	1.13 (0.89, 1.46)	0.336	1.16 (0.91, 1.51)	0.244
	1970	1.43 (1.18, 1.75)	0.0003	1.35 (1.09, 1.67)	0.006	1.38 (1.11, 1.72)	0.004
	1989-1990	1.08 (0.77, 1.50)	0.648	1.00 (0.69, 1.40)	0.900	1.00 (0.69, 1.43)	0.994
	2000-2002	0.76 (0.50, 1.11)	0.165	0.85 (0.54, 1.30)	0.464	0.89 (0.56, 1.37)	0.613
Change in household composition ^e	1958	0.91 (0.73, 1.14)	0.439	0.93 (0.72, 1.19)	0.589	0.92 (0.71, 1.18)	0.522
	1970	1.20 (0.99, 1.45)	0.058	1.20 (0.97, 1.48)	0.094	1.17 (0.94, 1.44)	0.160
	1989-1990	0.83 (0.62, 1.11)	0.221	0.87 (0.63, 1.19)	0.378	0.87 (0.63, 1.19)	0.388
	2000-2002	0.62 (0.42, 0.89)	0.012	0.74 (0.49, 1.10)	0.145	0.72 (0.46, 1.07)	0.118

Change in psychological distress ^f	1958	1.02 (0.86, 1.21)	0.801	1.00 (0.83, 1.21)	0.991	1.00 (0.82, 1.21)	0.990
	1970	1.03 (0.88, 1.20)	0.725	1.06 (0.89, 1.25)	0.529	1.04 (0.87, 1.24)	0.669
	1989-1990	0.73 (0.59, 0.92)	0.006	0.76 (0.60, 0.97)	0.025	0.77 (0.61, 0.98)	0.034
	2000-2002	0.88 (0.64, 1.19)	0.410	0.85 (0.60, 1.20)	0.356	0.84 (0.59, 1.20)	0.340
Change in alcohol consumption ^g	1958	0.90 (0.75, 1.09)	0.284	0.91 (0.74, 1.12)	0.379	0.91 (0.73, 1.11)	0.344
	1970	0.81 (0.70, 0.94)	0.005	0.76 (0.65, 0.89)	0.0008	0.77 (0.66, 0.90)	0.001
	1989-1990	1.01 (0.82, 1.25)	0.909	1.00 (0.80, 1.26)	0.981	1.01 (0.80, 1.27)	0.941
	2000-2002	1.55 (1.07, 1.46)	0.172	1.43 (0.94, 2.14)	0.086	1.35 (0.87, 2.04)	0.172
Change in smoking ^h	1958	0.77 (0.42, 1.29)	0.348	0.77 (0.39, 1.37)	0.399	0.78 (0.40, 1.40)	0.428
	1970	0.42 (0.28, 0.62)	<0.0001	0.42 (0.26, 0.64)	0.0001	0.43 (0.27, 0.66)	0.002
	1989-1990	0.63 (0.37, 1.04)	0.079	0.71 (0.40, 1.22)	0.235	0.70 (0.39, 1.21)	0.244
	2000-2002	1.02 (0.45, 2.02)	0.961	1.13 (0.43, 2.49)	0.776	0.93 (0.32, 2.17)	0.871
Change in sleep duration ⁱ	1958	1.15 (0.94, 1.40)	0.174	1.18 (0.94, 1.46)	0.145	1.16 (0.93, 1.45)	0.184
	1970	0.97 (0.82, 1.14)	0.675	0.94 (0.78, 1.13)	0.498	0.95 (0.79, 1.14)	0.577
	1989-1990	1.00 (0.78, 1.27)	0.983	0.95 (0.73, 1.23)	0.707	0.94 (0.72, 1.22)	0.651
	2000-2002	1.76 (1.26, 2.43)	0.0008	1.54 (1.05, 2.23)	0.025	1.64 (1.11, 2.38)	0.011

All analyses used generalized linear models with logit link. Significant *p*-values are highlighted in bold.

^a COVID-19 infection was coded as 0=No, 1=Yes.

^b Change in financial situation was coded as 0=Same or Better, 1=Worse.

^c Change in trust in government was coded as 0=Same or more, 1=Less.

^d Change in conflict during lockdown was coded as 0=Less, 1=Same or more.

^e Change in household composition during lockdown was coded as 0=No, 1=Yes.

^f Change in psychological distress during lockdown was coded as 1=an increase in the mental health score, 0=same or lower score.

^g Change in alcohol consumption was coded as 1=more drinks per week during lockdown compared to pre-lockdown or 0=same or lower.

^h Change in smoking was coded as 0=Same or less cigarettes smoked during lockdown compared to before lockdown, 1=More cigarettes.

ⁱ Change in sleep duration was coded as 0=same or more hours slept during lockdown and 1=less hours slept during lockdown.

[^] Model 1 was adjusted for combined weight, sex and ethnicity.

^{*} Model 2 was adjusted for combined weight, sex, ethnicity, highest educational attainment (adult SEP) and childhood SEP.

[†] Model 3 was adjusted for combined weight, sex, ethnicity, highest educational attainment (adult SEP) childhood SEP, presence of chronic illness and shielding letter.

OR, odds ratio; CI, confidence interval.

Supplementary Table S3. Association of key worker status with outcomes showing results for the fully adjusted model 3 only.

Cohort	Effect size	Change in financial situation	Change in psychological distress	Change in alcohol consumption	Change in smoking	Change in sleep duration
1958	OR (95% CI)	0.34 (0.27, 0.42)	0.99 (0.81, 1.20)	0.89 (0.72, 1.09)	0.78 (0.40, 1.40)	1.18 (0.94, 1.47)
	<i>p</i> -value	<0.0001	0.883	0.274	0.428	0.154
1970	OR (95% CI)	0.31 (0.26, 0.37)	1.02 (0.86, 1.22)	0.77 (0.65, 0.90)	0.39 (0.23, 0.65)	0.95 (0.79, 1.15)
	<i>p</i> -value	<0.0001	0.825	0.001	0.0004	0.608
1989-1990	OR (95% CI)	0.30 (0.22, 0.39)	0.71 (0.55, 0.95)	1.04 (0.83, 1.31)	0.62 (0.31, 1.21)	0.96 (0.73, 1.25)
	<i>p</i> -value	<0.0001	0.021	0.724	0.166	0.754
2000-2002	OR (95% CI)	0.39 (0.23, 0.62)	0.78 (0.51, 1.21)	1.30 (0.83, 1.98)	0.48 (0.15, 1.30)	1.78 (1.19, 2.61)
	<i>p</i> -value	0.0001	0.274	0.229	0.178	0.004

All analyses used generalized linear models with logit link. Adjustment was made for combined weight, sex, ethnicity, highest educational attainment (adult SEP), childhood SEP, presence of chronic illness and shielding letter. All models for the psychological distress analyses have been further adjusted for psychological distress prior lockdown. All models for the alcohol analyses have been further adjusted for the number of drinks per week before the lockdown. All models for the sleep analyses have been further adjusted for the number of hours slept before the lockdown.

Abbreviations and coding as in *Supplementary Table S2*. Significant *p*-values are highlighted in bold.

Supplementary Table S4. Sensitivity analysis results for the COVID-19 infection outcome.

Cohort	Effect size	Key worker COVID-19 infection: self-reported or positive test	Key worker COVID-19 infection: positive test only (whole sample)	Key worker COVID-19 infection: positive test only (only tested)
1958	OR (95% CI)	1.95 (1.45, 2.61)	3.87 (1.52, 9.73)	2.97 (0.65, 17.10)
	<i>p</i> -value	<0.0001	0.004	0.184
	<i>n</i>	296	19	19
1970	OR (95% CI)	1.18 (0.92, 1.51)	1.43 (0.42, 4.54)	0.39 (0.07, 1.92)
	<i>p</i> -value	0.184	0.547	0.262
	<i>n</i>	379	17	17
1989-1990	OR (95% CI)	1.36 (0.98, 1.90)	2.81 (0.73, 11.50)	0.91 (0.13, 5.63)
	<i>p</i> -value	0.067	0.129	0.923
	<i>n</i>	197	12	12
2000-2002	OR (95% CI)	1.47 (0.75, 2.65)	3.69 (0.17, 30.15)	0.54 (0.87, 1.48)
	<i>p</i> -value	0.234	0.267	0.729
	<i>n</i>	158	7	7
Pooled Results	OR (95% CI)	1.43 (1.22, 1.68)	2.74 (1.46, 5.13)	1.00 (0.38, 2.61)
	<i>p</i> -value	<0.0001	0.002	0.998
	<i>n</i>	1030	55	55

All analyses used generalized linear models with logit link. Significant *p*-values are highlighted in bold.
Abbreviations and coding as in *Supplementary Table S2*.

Supplementary Table S5. Working status breakdown for outcomes significant in the meta-analysis.

Outcome	Cohort study birth year	Key workers ¹	Other workers ²	p-value*	Volunteers ³	p-value ^o	In teaching ⁴	p-value [^]	Not working or retired ⁵	p-value [·]
COVID-19 infection	1958	85/853	58/955	0.006	13/327	0.003	7/145	0.094	133/2542	<0.0001
	1970	141/1255	101/1294	0.009	14/120	1.00	17/114	0.377	106/969	0.897
	1989-1990	76/507	61/561	0.094	4/40	0.602	9/96	0.263	47/475	0.042
	2000-2002	20/176	22/402	0.033	9/149	0.179	68/950	0.111	39/822	0.003
Change in financial situation	1958	149/788	326/657	0.006	113/224	0.003	56/93	0.094	860/1648	<0.0001
	1970	252/1144	417/956	<0.0001	72/58	<0.0001	71/57	<0.0001	519/460	<0.0001
	1989-1990	91/492	127/481	0.023	29/14	<0.0001	53/48	<0.0001	234/223	<0.0001
	2000-2002	27/169	70/326	0.276	43/64	<0.0001	241/751	0.002	277/462	<0.0001
Change in household conflict	1958	43/859	37/902	0.450	12/317	0.493	3/145	0.196	102/2325	0.549
	1970	110/1230	72/1258	0.001	14/114	0.508	11/114	1.00	71/864	0.357
	1989-1990	60/497	57/517	0.714	3/40	0.600	7/91	0.362	50/369	0.641
	2000-2002	32/152	65/299	0.989	27/78	0.124	224/717	0.072	140/541	0.395
Change in alcohol consumption	1958	172/723	206/727	<0.0001	70/251	<0.0001	35/110	<0.0001	470/1912	<0.0001
	1970	398/957	429/892	0.090	52/77	0.013	44/75	0.103	312/627	0.045
	1989-1990	195/380	199/392	0.980	17/26	0.560	33/67	0.949	136/304	0.345
	2000-2002	44/149	80/295	0.770	19/88	0.380	112/859	<0.0001	125/584	0.127
Change in smoking	1958	15/923	14/999	0.835	1/339	0.117	3/149	1.00	69/2607	0.113
	1970	30/1366	59/1336	0.003	11/123	0.0001	6/125	0.146	66/1010	<0.0001
	1989-1990	21/562	26/596	0.712	4/40	0.163	3/102	0.925	34/488	0.037
	2000-2002	8/188	21/403	0.785	9/101	0.214	19/999	0.097	43/818	0.724

For each working status category, results are reported as the counts of “1” responses and counts of “0” responses for each outcome category, separated by ‘/’. *p*-values are from Chi squared test. Significant *p*-values are highlighted in bold.

¹ Key worker status was self-assigned based on whether the participant reported that their work had been classified as critical to the COVID-19 response.

² In paid employment, but not key worker.

³ In unpaid employment/volunteering.

⁴ Not in paid or unpaid employment but receiving teaching during lockdown.

⁵ Not working or retired.

* *p*-value for the comparison between key workers and other workers.

^o *p*-value for the comparison between key workers and volunteers.

[^] *p*-value for the comparison between key workers and those in teaching.

^ˆ *p*-value for the comparison between key workers and those not working/retired.

Other abbreviations and coding as in Supplementary Table S2.