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Supplementary appendix

This appendix formed part of the original submission and has been peer reviewed. We post it as supplied by the authors.

Supplement to: Lee L Y W, Cazier J-B, Starkey T, et al. COVID-19 prevalence and mortality in patients with cancer and the effect of primary tumour subtype and patient demographics: a prospective cohort study. *Lancet Oncol* 2020; published online Aug 24. http://dx.doi.org/10.1016/S1470-2045(20)30442-3.

SUPPLEMENTARY METHODS

Data Collection and analysis

Prospective data collection was performed by the pan-UK cancer centre emergency response network. Case reporting was led by a COVID-19 Emergency Response Reporting Individual (ERRI), supported by a Local Emergency Response Reporting Group (LERRG) at each centre. The UKCCMP encouraged all local reporting sites to enter data in a real time basis, as soon as a positive SARS-CoV-2 test had been identified. The data fields were then re-updated as soon as treatment and outcomes had been identified. The ERRI was a trained/training oncologist who did data review, annotation and entry. In a small number of centres, data entry was performed by data managers but with direct oversight by the ERRI. This secure EDC platform is hosted by the Institute of Translational Medicine at the University of Birmingham.

Statistical analysis & Data visualisation

Analyses were performed in R version 3.6.3 utilising the glm() (family = binomial(link = "logit")) and fisher.test() functions, respectively. Data processing and visualisation utilised R (version 3.6.3) packages including broom, dplyr, forestplot, ggplot2, ggsci, pheatmap, RColorBrewer, robustbase and viridis. Data subsetting was performed using the subset() function of 'robustbase' and data reshaping for visualisation involved the use of the tidy() function of 'broom', and group_by() and melt() functions of 'dplyr'. Functions from the ggplot2 R package were used to generate multiple plots including barplots (geom_bar) and lineplots (geom_line). The pheatmap() and forestplot() functions of the 'pheatmap' and 'forestplot' R packages was also used to generate the heatmap and forest plots, respectively.

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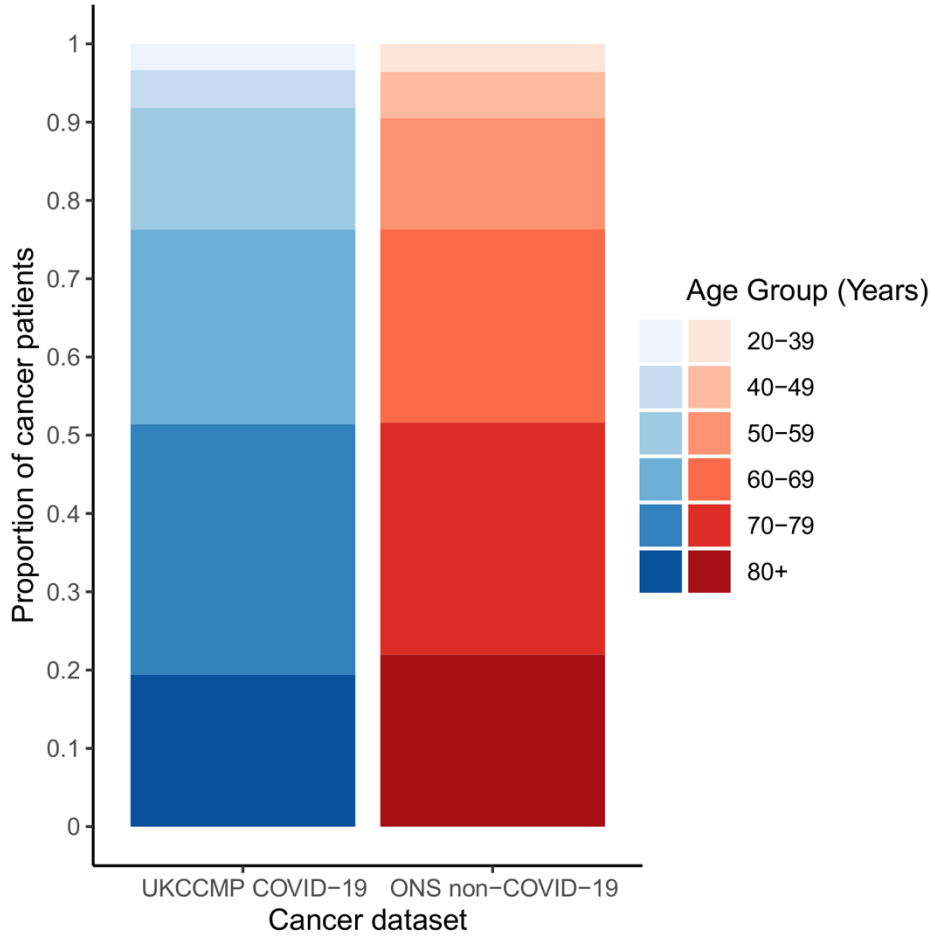
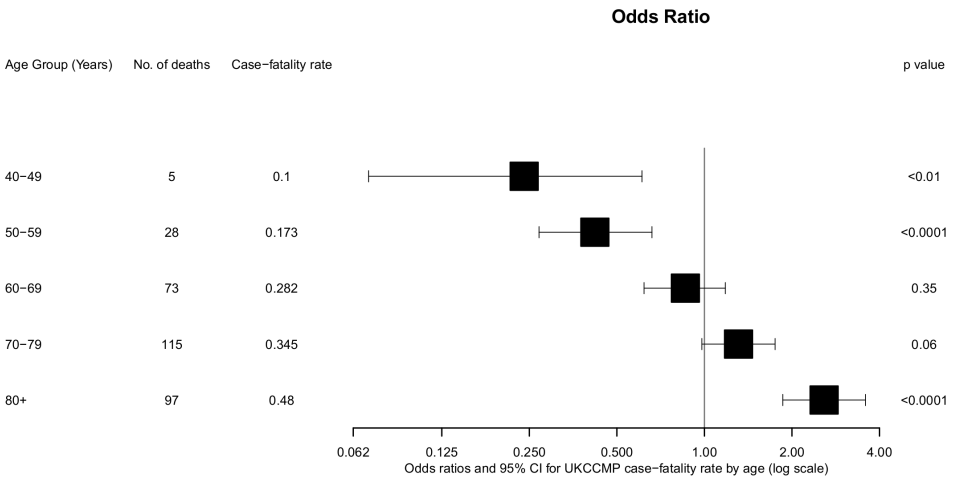
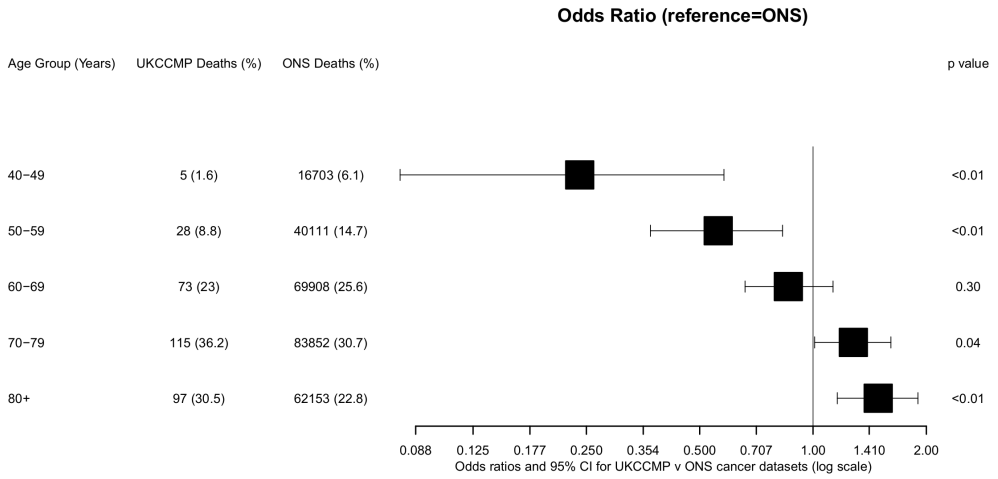


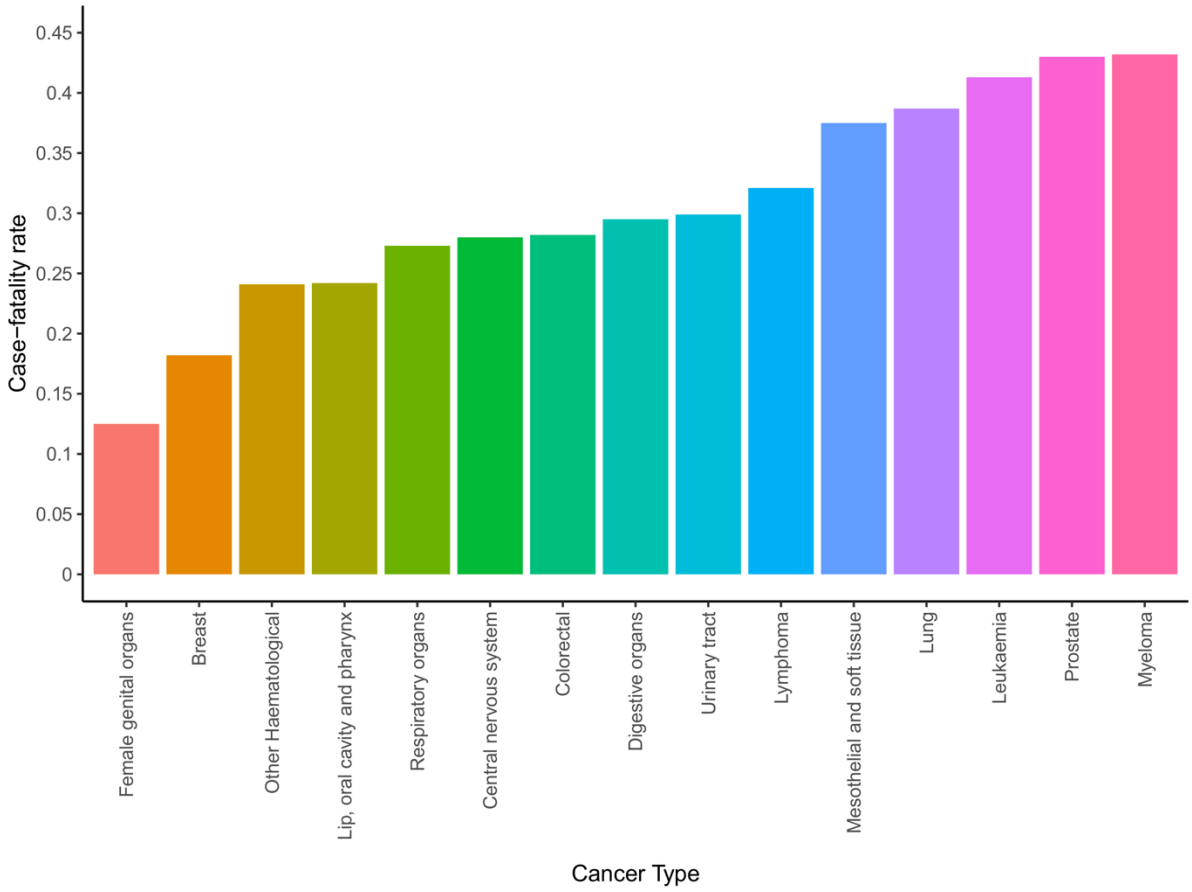
Supplementary Figure 1. Stacked bar chart showing age distribution of cancer patients in the UKCCMP who had contracted SARS-CoV-2 and ONS cancer control population.



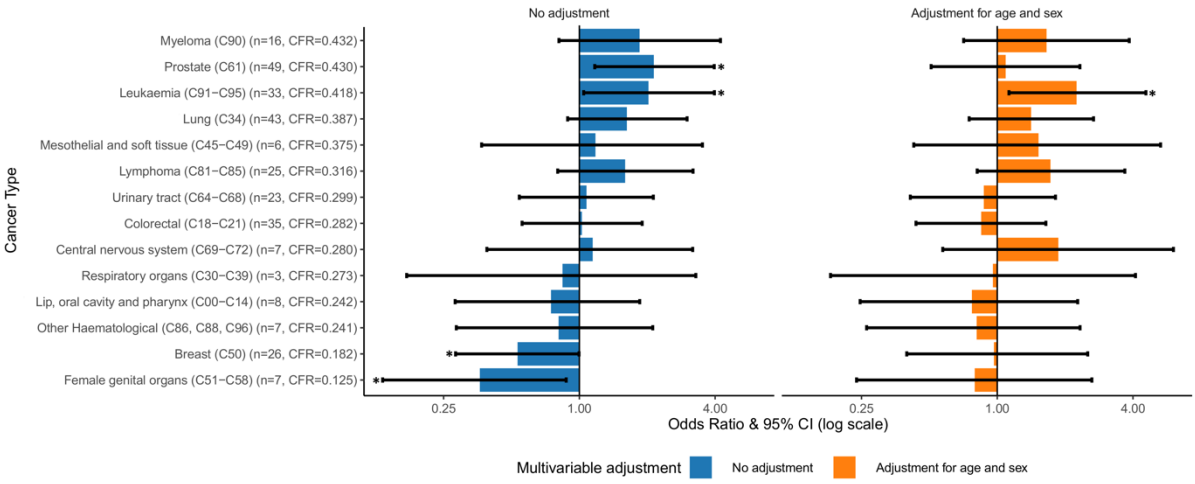
Supplementary Figure 2. Forest plot showing distribution of age groups of cancer patients who died in the UKCCMP and case fatality rates. Odds ratio are relative to the UK CCMP population.



Supplementary Figure 3: Forest plot showing distribution of age groups of patients who died in the UKCCMP relative to the age distribution of the ONS cancer control population.



Supplementary Figure 4: Case fatality rate of patients following a presenting with COVID-19 in the UKCCMP cohort, assessed by tumour subtype.



Supp Figure 5. Waterfall plot showing risk of death for each tumour subtype following COVID-19 compared to other subtypes (reference), before and after age and sex correction multivariable correction. ** denotes statistical significance of p adjusted, where* * p<0.05.

	Haematological malignancies (n=227)	Non-haematological malignancies (n=817)	Univariate analysis		Multivariable adjusted analysis	
			Odds Ratio (CI)	p value	Odds Ratio (CI)	p value
Patient features						
- Male	148 (65.2%)	447 (54.7%)	1.53 (1.13-2.09)	<0.01	1.58 (1.16-2.16)	<0.01
- Female	79 (34.8%)	366 (44.8%)				
- Other	0 (0.0%)	4 (0.5%)				
- Median age/years (std)	69 (14.16)	70 (13.09)		0.03		
Co-morbidities						
- Cardiovascular disease	21 (9.3%)	124 (15.2%)	0.56 (0.34-0.91)	0.02	0.62 (0.36-1.01)	0.07
- COPD	7 (3.1%)	73 (8.9%)	0.32 (0.13-0.66)	<0.01	0.35 (0.14-0.72)	<0.01
- Diabetes	33 (14.5%)	145 (17.7%)	0.79 (0.51-1.18)	0.26	0.78 (0.50-1.17)	0.24
- Hypertension	60 (26.4%)	283 (34.6%)	0.66 (0.47-0.92)	0.02	0.68 (0.47-0.97)	0.03
- None	52 (22.9%)	153 (18.7%)	1.32 (0.91-1.90)	0.14	1.31 (0.87-1.96)	0.19
- No data	39 (17.2%)	136 (16.6%)				
Smoking status						
- Current smoker	7 (3.1%)	38 (4.7%)	0.99 (0.39-2.17)	0.98	0.77 (0.30-1.74)	0.56
- Ex-smoker	32 (14.1%)	234 (28.6%)	0.59 (0.37-0.94)	0.03	0.63 (0.38-1.03)	0.07
- Never smoker	52 (22.9%)	218 (26.7%)	1.66 (1.06-2.63)	0.03	1.67 (1.04-2.70)	0.04
- No data	136 (59.9%)	327 (40.0%)				
Patient outcome						
- Death (all cause)	82 (36.1%)	237 (29.0%)	1.61 (1.15-2.24)	<0.01	1.74 (1.21-2.48)	<0.01
- Death (COVID-19)	80 (35.2%)	215 (26.3%)	1.77 (1.27-2.48)	<0.01	1.93 (1.35-2.77)	<0.01
- Death (Cancer)	1 (0.4%)	18 (2.2%)	0.21 (0.01-1.02)	0.13	0.22 (0.01-1.06)	0.14
- Death (other)	1 (0.4%)	4 (0.5%)	0.96 (0.05-6.54)	0.97	1.12 (0.06-7.79)	0.92
- Hospitalised	5 (2.2%)	36 (4.4%)	0.52 (0.18-1.23)	0.178	0.53 (0.18-1.26)	0.19
Cancer treatment within 4 weeks						
- Chemotherapy	108 (47.6%)	241 (29.5%)	2.17 (1.60-2.93)	<0.0001	2.15 (1.57-2.95)	<0.0001
- Immunotherapy	0 (0.0%)	39 (4.8%)	0.00 (0.00-2.90E+07)	0.98	0.00 (0.00-3.17E+07)	0.981
- Radiotherapy	2 (0.9%)	84 (10.3%)	0.08 (0.01-0.25)	<0.01	0.07 (0.01-0.24)	<0.01
- Surgery	0 (0.0%)	36 (4.4%)	0.00 (0.00-8.99E+07)	0.98	0.00 (0.00-1.39E+08)	0.98
- Targeted therapy	26 (11.5%)	65 (8.0%)	1.49 (0.91-2.39)	0.10	1.45 (0.87-2.33)	0.134
COVID-19 Symptoms						
- Chills	9 (4.0%)	23 (2.8%)	1.49 (0.64-3.16)	0.32	1.45 (0.62-3.11)	0.36
- Coryzal symptoms	13 (5.7%)	47 (5.8%)	1.04 (0.53-1.90)	0.91	1.03 (0.52-1.90)	0.93
- Cough	93 (41.0%)	381 (46.6%)	0.83 (0.60-1.14)	0.26	0.82 (0.59-1.13)	0.22
- Diarrhoea	26 (11.5%)	63 (7.7%)	1.63 (0.99-2.62)	0.05	1.67 (1.01-2.70)	0.04
- Fatigue	46 (20.3%)	150 (18.4%)	1.19 (0.81-1.73)	0.36	1.22 (0.83-1.77)	0.31
- Fever	133 (58.6%)	450 (55.1%)	1.34 (0.96-1.90)	0.09	1.26 (0.89-1.79)	0.19
- Headache	15 (6.6%)	28 (3.4%)	2.09 (1.07-3.94)	0.03	2.11 (1.07-4.00)	0.03
- Myalgia	18 (7.9%)	60 (7.3%)	1.13 (0.64-1.93)	0.65	1.15 (0.64-1.97)	0.62
- Nausea and/or Vomiting	8 (3.5%)	43 (5.3%)	0.68 (0.29-1.40)	0.33	0.70 (0.30-1.45)	0.37
- Shortness of breath	84 (37.0%)	324 (39.7%)	0.95 (0.69-1.30)	0.73	0.92 (0.66-1.27)	0.61
- Sore throat	9 (4.0%)	32 (3.9%)	1.05 (0.47-2.16)	0.89	0.98 (0.43-2.04)	0.96
- Asymptomatic	5 (2.2%)	39 (4.8%)	0.47 (0.16-1.09)	0.11	0.50 (0.17-1.18)	0.15
- No data	35 (15.4%)	99 (12.1%)				
COVID-19 Severity Score						
- severe/critical	119 (52.4%)	339 (41.5%)	1.53 (1.13-2.06)	<0.01	1.57 (1.15-2.15)	<0.01
- mild	103 (45.4%)	448 (54.8%)				
- No data	5 (2.2%)	30 (3.7%)				
COVID-19 treatment						
- Antibiotics	145 (63.9%)	495 (60.6%)	1.35 (0.93-2.00)	0.12	1.35 (0.92-2.00)	0.13
- Fluids	86 (37.9%)	247 (30.2%)	1.52 (1.10-2.11)	0.01	1.54 (1.10-2.14)	0.01
- High Flow Oxygen (HFO)	29 (12.8%)	61 (7.5%)	1.89 (1.16-3.01)	<0.01	1.82 (1.11-2.94)	0.02
- ITU + Ventilation	19 (8.4%)	25 (3.1%)	3.00 (1.60-5.57)	<0.01	2.73 (1.43-5.11)	<0.01
- ITU - Ventilation	7 (3.1%)	12 (1.5%)	2.19 (0.81-5.54)	0.10	2.16 (0.78-5.54)	0.12
- Non-invasive Ventilation	19 (8.4%)	35 (4.3%)	2.11 (1.16-3.75)	0.01	2.10 (1.14-3.76)	0.01
- Oxygen	99 (43.6%)	310 (37.9%)	1.38 (1.00-1.90)	0.05	1.41 (1.01-1.96)	0.04
- None	26 (11.5%)	134 (16.4%)	0.67 (0.42-1.04)	0.08	0.65 (0.41-1.02)	0.07
- No data	40 (17.6%)	128 (15.7%)				

Supp. Table 1: Univariate and multivariate analyses of differences in patient demographics/symptoms/cancer treatments and clinical course of haematological vs. non-haematological malignancies. Univariate analysis was conducted with presence compared to absence (reference for each category) in haematological malignancies vs. non-haematological malignancies. Multivariate analyses were conducted corrected for patient age and sex.