

# THE LANCET

## Supplementary appendix

This appendix formed part of the original submission and has been peer reviewed.  
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Supplement to: Drake TM, Riad AM, Fairfield CJ, et al. Characterisation of in-hospital complications associated with COVID-19 using the ISARIC WHO Clinical Characterisation Protocol UK: a prospective, multicentre cohort study. *Lancet* 2021; **398**: 223–37.

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65 **Supplementary tables**66 **Supplementary table 1 – Definition of in-hospital complications**

<b>Organ specific complication</b>	<b>Complication within this group</b>	<b>Definition</b>
Respiratory	Bacterial pneumonia (highly likely)	Clinically significant organism detected in sputum or deep respiratory culture
	Bacterial pneumonia (suspected)	Defined clinically in patient healthcare record
	Likely Acute Respiratory Distress Syndrome (ARDS)	Defined clinically in patient record or defined as one of the following combinations: <ul style="list-style-type: none"> <li>- receiving extracorporeal membrane oxygenation</li> <li>- being nursed in a prone position and receiving invasive mechanical ventilation</li> <li>- receiving mechanical ventilation and having a PF (<math>PaO_2/FiO_2</math>) ratio of 300 or less</li> </ul>
	Empyema	Defined clinically in patient healthcare record
	Pneumothorax	Defined clinically in patient healthcare record
	Pleural effusion	Defined clinically in patient healthcare record
Neurological	Meningitis	Defined clinically in patient healthcare record
	Encephalitis	Defined clinically in patient healthcare record
	Seizure	Defined clinically in patient healthcare record
	Stroke	Defined clinically in patient healthcare record
Cardiovascular	Thromboembolism	Defined clinically in patient healthcare record
	Heart Failure	Defined clinically in patient healthcare record
	Myocarditis	Defined clinically in patient healthcare record
	Endocarditis	Defined clinically in patient healthcare record
	Arrhythmia	Defined clinically in patient healthcare record
	Cardiomyopathy	Defined clinically in patient healthcare record
	Myocardial Ischaemia	Defined clinically in patient healthcare record
	Cardiac Arrest	Defined clinically in patient healthcare record
Renal	Acute Kidney Injury	Creatinine rise which corresponded to Kidney Disease Improving Global Outcomes (KDIGO) stage I or above (creatinine rise $\geq 1.5x$ baseline value or by $\geq 26.5 \mu\text{mol/L}$ )  Urine output not included within this definition
Gastrointestinal	Acute Liver Injury	Any of the following: <ul style="list-style-type: none"> <li>- International normalised ratio (INR) rise of 2.5 times or greater than the lowest entered value</li> <li>- INR of over 4.5 (in the absence of warfarin therapy)</li> </ul>

		<ul style="list-style-type: none"> <li>- Alanine aminotransferase (ALT) rise of greater than 10 times the lowest value</li> <li>- ALT over 150</li> <li>- Bilirubin rise of greater than 15</li> <li>- Bilirubin greater than 55 (in the absence of any pre-existing liver disease)</li> </ul>
	Pancreatitis	Defined clinically in patient healthcare record
	Gastrointestinal haemorrhage	Defined clinically in patient healthcare record
Systemic	Coagulopathy	Defined clinically in patient healthcare record
	Disseminated Intravascular Coagulation	Defined clinically in patient healthcare record
	Anaemia	Defined clinically in patient healthcare record
	Bloodstream Infection	Clinically significant sample in blood culture

68 **Supplementary table 2 – Complication rates by SARS-CoV-2 RT-PCR positivity status**

		Total	Any complication	Systemic	Renal	Gastrointestinal	Cardiovascular	Neurological	Respiratory
Total	N (%)	73197	36367 (49.7)	11895 (16.3)	17752 (24.3)	7901 (10.8)	8973 (12.3)	3115 (4.3)	13486 (18.4)
PCR	Confirmed	62894 (85.9)	32044 (50.9)	10617 (16.9)	15829 (25.2)	6916 (11.0)	7935 (12.6)	2753 (4.4)	11849 (18.8)
	Not confirmed	10303 (14.1)	4323 (42.0)	1278 (12.4)	1923 (18.7)	985 (9.6)	1038 (10.1)	362 (3.5)	1637 (15.9)

69 Percentage values are row percentages, except for totals which represent column percentages.

70 **Supplementary table 3A - Specific complications stratified by age and sex in adults**  
71 **admitted to hospital with severe COVID-19.**

		Total	Age (years)							
			19-29	30-39	40-49	50-59	60-69	70-79	80-89	90+
Female	Total N (%)	31977	882 (2.8)	1359 (4.2)	1960 (6.1)	3488 (10.9)	4231 (13.2)	6685 (20.9)	9178 (28.7)	4194 (13.1)
	Cryptogenic organizing pneumonia	42 (0.1)	0 (0.0)	2 (0.1)	2 (0.1)	4 (0.1)	8 (0.2)	6 (0.1)	10 (0.1)	10 (0.2)
	Likely ARDS	3251 (10.2)	53 (6.0)	145 (10.7)	313 (16.0)	550 (15.8)	703 (16.6)	662 (9.9)	602 (6.6)	223 (5.3)
	Pneumothorax	227 (0.7)	6 (0.7)	11 (0.8)	25 (1.3)	39 (1.1)	57 (1.3)	52 (0.8)	28 (0.3)	9 (0.2)
	Pleural effusion	1940 (6.1)	16 (1.8)	47 (3.5)	84 (4.3)	143 (4.1)	269 (6.4)	421 (6.3)	641 (7.0)	319 (7.6)
	Highly likely Bacterial Pneumonia	99 (0.3)	2 (0.2)	4 (0.3)	14 (0.7)	25 (0.7)	21 (0.5)	21 (0.3)	10 (0.1)	2 (0.0)
	Meningitis / Encephalitis	61 (0.2)	2 (0.2)	4 (0.3)	7 (0.4)	7 (0.2)	19 (0.4)	8 (0.1)	11 (0.1)	3 (0.1)
	Seizure	331 (1.0)	6 (0.7)	17 (1.3)	22 (1.1)	46 (1.3)	46 (1.1)	79 (1.2)	87 (0.9)	28 (0.7)
	Stroke / Cerebrovascular accident	483 (1.5)	2 (0.2)	5 (0.4)	14 (0.7)	32 (0.9)	67 (1.6)	106 (1.6)	175 (1.9)	82 (2.0)
	Other neurological complication	537 (1.7)	7 (0.8)	8 (0.6)	22 (1.1)	42 (1.2)	69 (1.6)	105 (1.6)	201 (2.2)	83 (2.0)
	Congestive heart failure	1133 (3.5)	0 (0.0)	5 (0.4)	16 (0.8)	34 (1.0)	93 (2.2)	243 (3.6)	486 (5.3)	256 (6.1)
	Endocarditis / Myocarditis Pericarditis	83 (0.3)	1 (0.1)	5 (0.4)	6 (0.3)	11 (0.3)	19 (0.4)	23 (0.3)	14 (0.2)	4 (0.1)
	Myocarditis / Pericarditis	70 (0.2)	3 (0.3)	4 (0.3)	5 (0.3)	13 (0.4)	16 (0.4)	13 (0.2)	10 (0.1)	6 (0.1)
	Cardiomyopathy	79 (0.2)	0 (0.0)	1 (0.1)	6 (0.3)	10 (0.3)	8 (0.2)	16 (0.2)	29 (0.3)	9 (0.2)
	Cardiac arrhythmia	1907 (6.0)	15 (1.7)	30 (2.2)	87 (4.4)	140 (4.0)	226 (5.3)	429 (6.4)	680 (7.4)	300 (7.2)
	Cardiac ischemia	381 (1.2)	0 (0.0)	3 (0.2)	6 (0.3)	29 (0.8)	42 (1.0)	90 (1.3)	138 (1.5)	73 (1.7)
	Cardiac arrest	653 (2.0)	5 (0.6)	13 (1.0)	25 (1.3)	65 (1.9)	93 (2.2)	161 (2.4)	200 (2.2)	91 (2.2)
	Bloodstream infection	404 (1.3)	6 (0.7)	22 (1.6)	34 (1.7)	48 (1.4)	71 (1.7)	76 (1.1)	105 (1.1)	42 (1.0)
	Coagulation disorder / DIC	724 (2.3)	14 (1.6)	24 (1.8)	46 (2.3)	101 (2.9)	135 (3.2)	146 (2.2)	190 (2.1)	68 (1.6)
	Anaemia	4126 (12.9)	81 (9.2)	160 (11.8)	250 (12.8)	432 (12.4)	628 (14.8)	856 (12.8)	1188 (12.9)	531 (12.7)
	Rhabdomyolysis / Myositis	99 (0.3)	3 (0.3)	1 (0.1)	1 (0.1)	9 (0.3)	11 (0.3)	15 (0.2)	36 (0.4)	23 (0.5)
	Acute Kidney Injury	6612 (20.7)	51 (5.8)	124 (9.1)	251 (12.8)	642 (18.4)	933 (22.1)	1533 (22.9)	2137 (23.3)	941 (22.4)
	Gastrointestinal haemorrhage	325 (1.0)	5 (0.6)	8 (0.6)	8 (0.4)	25 (0.7)	48 (1.1)	57 (0.9)	120 (1.3)	54 (1.3)
	Pancreatitis	108 (0.3)	5 (0.6)	9 (0.7)	9 (0.5)	17 (0.5)	24 (0.6)	16 (0.2)	22 (0.2)	6 (0.1)
	Deep Vein Thrombosis	167 (0.5)	2 (0.2)	10 (0.7)	9 (0.5)	31 (0.9)	33 (0.8)	30 (0.4)	41 (0.4)	11 (0.3)
	Pulmonary Embolism	382 (1.2)	3 (0.3)	15 (1.1)	27 (1.4)	65 (1.9)	83 (2.0)	78 (1.2)	90 (1.0)	21 (0.5)
	Liver Injury	2366 (7.4)	48 (5.4)	113 (8.3)	192 (9.8)	409 (11.7)	430 (10.2)	475 (7.1)	500 (5.4)	199 (4.7)
Male	Total N (%)	41025	612 (1.5)	1385 (3.4)	3021 (7.4)	5591 (13.6)	6882 (16.8)	9841 (24.0)	10662 (26.0)	3031 (7.4)
	Cryptogenic organizing pneumonia	50 (0.1)	0 (0.0)	2 (0.1)	4 (0.1)	9 (0.2)	12 (0.2)	10 (0.1)	12 (0.1)	1 (0.0)
	Likely ARDS	6417 (15.6)	62 (10.1)	247 (17.8)	697 (23.1)	1376 (24.6)	1540 (22.4)	1411 (14.3)	889 (8.3)	195 (6.4)
	Pneumothorax	466 (1.1)	6 (1.0)	20 (1.4)	47 (1.6)	113 (2.0)	121 (1.8)	87 (0.9)	55 (0.5)	17 (0.6)
	Pleural effusion	2583 (6.3)	23 (3.8)	53 (3.8)	145 (4.8)	322 (5.8)	452 (6.6)	631 (6.4)	723 (6.8)	234 (7.7)
	Highly likely Bacterial Pneumonia	260 (0.6)	1 (0.2)	10 (0.7)	38 (1.3)	78 (1.4)	60 (0.9)	54 (0.5)	17 (0.2)	2 (0.1)
	Meningitis / Encephalitis	95 (0.2)	5 (0.8)	5 (0.4)	14 (0.5)	20 (0.4)	23 (0.3)	12 (0.1)	16 (0.2)	0 (0.0)
	Seizure	497 (1.2)	13 (2.1)	33 (2.4)	45 (1.5)	89 (1.6)	87 (1.3)	105 (1.1)	105 (1.0)	20 (0.7)
	Stroke / Cerebrovascular accident	729 (1.8)	1 (0.2)	12 (0.9)	36 (1.2)	75 (1.3)	147 (2.1)	205 (2.1)	209 (2.0)	44 (1.5)
	Other neurological complication	696 (1.7)	7 (1.1)	18 (1.3)	31 (1.0)	90 (1.6)	98 (1.4)	175 (1.8)	211 (2.0)	66 (2.2)

	Total	Age (years)							
		19-29	30-39	40-49	50-59	60-69	70-79	80-89	90+
Congestive heart failure	1387 (3.4)	0 (0.0)	11 (0.8)	27 (0.9)	84 (1.5)	184 (2.7)	363 (3.7)	539 (5.1)	179 (5.9)
Endocarditis / Myocarditis Pericarditis	181 (0.4)	1 (0.2)	12 (0.9)	19 (0.6)	29 (0.5)	44 (0.6)	39 (0.4)	36 (0.3)	1 (0.0)
Myocarditis / Pericarditis	121 (0.3)	1 (0.2)	3 (0.2)	20 (0.7)	19 (0.3)	22 (0.3)	28 (0.3)	22 (0.2)	6 (0.2)
Cardiomyopathy	94 (0.2)	0 (0.0)	3 (0.2)	9 (0.3)	13 (0.2)	20 (0.3)	24 (0.2)	21 (0.2)	4 (0.1)
Cardiac arrhythmia	2933 (7.1)	20 (3.3)	48 (3.5)	143 (4.7)	367 (6.6)	597 (8.7)	790 (8.0)	759 (7.1)	209 (6.9)
Cardiac ischemia	615 (1.5)	0 (0.0)	11 (0.8)	19 (0.6)	56 (1.0)	106 (1.5)	175 (1.8)	186 (1.7)	62 (2.0)
Cardiac arrest	1249 (3.0)	4 (0.7)	19 (1.4)	68 (2.3)	175 (3.1)	238 (3.5)	327 (3.3)	315 (3.0)	103 (3.4)
Bloodstream infection	710 (1.7)	9 (1.5)	29 (2.1)	65 (2.2)	99 (1.8)	142 (2.1)	154 (1.6)	166 (1.6)	46 (1.5)
Coagulation disorder / DIC	1343 (3.3)	13 (2.1)	56 (4.0)	131 (4.3)	258 (4.6)	272 (4.0)	292 (3.0)	253 (2.4)	68 (2.2)
Anaemia	5762 (14.0)	39 (6.4)	143 (10.3)	327 (10.8)	791 (14.1)	1043 (15.2)	1432 (14.6)	1534 (14.4)	453 (14.9)
Rhabdomyolysis / Myositis	165 (0.4)	5 (0.8)	6 (0.4)	12 (0.4)	24 (0.4)	18 (0.3)	42 (0.4)	41 (0.4)	17 (0.6)
Acute Kidney Injury	11097 (27.0)	75 (12.3)	228 (16.5)	620 (20.5)	1434 (25.6)	2116 (30.7)	2775 (28.2)	3007 (28.2)	842 (27.8)
Gastrointestinal haemorrhage	529 (1.3)	5 (0.8)	9 (0.6)	32 (1.1)	65 (1.2)	91 (1.3)	120 (1.2)	159 (1.5)	48 (1.6)
Pancreatitis	139 (0.3)	6 (1.0)	18 (1.3)	18 (0.6)	36 (0.6)	21 (0.3)	23 (0.2)	14 (0.1)	3 (0.1)
Deep Vein Thrombosis	261 (0.6)	1 (0.2)	7 (0.5)	25 (0.8)	59 (1.1)	55 (0.8)	57 (0.6)	44 (0.4)	13 (0.4)
Pulmonary Embolism	622 (1.5)	11 (1.8)	14 (1.0)	78 (2.6)	139 (2.5)	136 (2.0)	135 (1.4)	96 (0.9)	13 (0.4)
Liver Injury	4732 (11.5)	80 (13.1)	223 (16.1)	515 (17.0)	988 (17.7)	1027 (14.9)	998 (10.1)	714 (6.7)	187 (6.2)

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Percentage values are row percentages, except for totals which represent column percentages. ARDS – Acute Respiratory Distress Syndrome, DIC – Disseminated Intravascular Coagulation.



76 **Supplementary table 3B – Comparison between suspected and highly likely bacterial**  
 77 **pneumonia by age and sex in adults admitted to hospital with severe COVID-19.**

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		Age group (years)								
		Total N	19-29	30-39	40-49	50-59	60-69	70-79	80-89	90+
Female	Total N (%)	31977	882 (2.8)	1359 (4.2)	1960 (6.1)	3488 (10.9)	4231 (13.2)	6685 (20.9)	9178 (28.7)	4194 (13.1)
	Suspected Bacterial Pneumonia	3533 (100)	43 (1.2)	101 (2.9)	188 (5.3)	403 (11.4)	539 (15.3)	771 (21.8)	1028 (29.1)	460 (13.0)
	Highly likely Bacterial Pneumonia	99 (100)	2 (2.0)	4 (4.0)	14 (14.1)	25 (25.3)	21 (21.2)	21 (21.2)	10 (10.1)	2 (2.0)
Male	Total N (%)	41025	612 (1.5)	1385 (3.4)	3021 (7.4)	5591 (13.6)	6882 (16.8)	9841 (24.0)	10662 (26.0)	3031 (7.4)
	Suspected Bacterial Pneumonia	5321 (100)	52 (1.0)	148 (2.8)	407 (7.6)	765 (14.4)	927 (17.4)	1281 (24.1)	1353 (25.4)	388 (7.3)
	Highly likely Bacterial Pneumonia	260 (100)	1 (0.4)	10 (3.8)	38 (14.6)	78 (30.0)	60 (23.1)	54 (20.8)	17 (6.5)	2 (0.8)

79

80 Percentage values are row percentages

81 **Supplementary table 3C- Comparison between suspected and highly likely bacterial**  
 82 **pneumonia by number of existing comorbidities in adults admitted to hospital with**  
 83 **severe COVID-19.**

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Number of existing comorbidities on admission		Total N	Age group (years)							
			19-29	30-39	40-49	50-59	60-69	70-79	80-89	90+
0	Total N (%)	13908	862 (6.2)	1430 (10.3)	2140 (15.4)	2907 (20.9)	2341 (16.8)	1925 (13.8)	1700 (12.2)	603 (4.3)
	Suspected Bacterial Pneumonia	1478	44 (3.0)	112 (7.6)	239 (16.2)	356 (24.1)	312 (21.1)	211 (14.3)	154 (10.4)	50 (3.4)
	Highly likely Bacterial Pneumonia	111	1 (0.9)	6 (5.4)	23 (20.7)	39 (35.1)	21 (18.9)	19 (17.1)	2 (1.8)	0 (0.0)
1	Total N (%)	17635	434 (2.5)	780 (4.4)	1550 (8.8)	2850 (16.2)	3031 (17.2)	3786 (21.5)	3768 (21.4)	1436 (8.1)
	Suspected Bacterial Pneumonia	2105	33 (1.6)	76 (3.6)	199 (9.5)	369 (17.5)	390 (18.5)	458 (21.8)	425 (20.2)	155 (7.4)
	Highly likely Bacterial Pneumonia	107	1 (0.9)	5 (4.7)	14 (13.1)	40 (37.4)	23 (21.5)	19 (17.8)	4 (3.7)	1 (0.9)
2+	Total N (%)	41654	204 (0.5)	543 (1.3)	1306 (3.1)	3344 (8.0)	5767 (13.8)	10852 (26.1)	14432 (34.6)	5206 (12.5)
	Suspected Bacterial Pneumonia	5288	18 (0.3)	62 (1.2)	160 (3.0)	445 (8.4)	766 (14.5)	1389 (26.3)	1805 (34.1)	643 (12.2)
	Highly likely Bacterial Pneumonia	141	1 (0.7)	3 (2.1)	15 (10.6)	24 (17.0)	37 (26.2)	37 (26.2)	21 (14.9)	3 (2.1)

85

86 Percentage values are row percentages

87 **Supplementary table 4 - Organ specific complications stratified by age and presence of**  
88 **comorbidity in adults admitted to hospital with severe COVID-19 in adults admitted to**  
89 **hospital with severe COVID-19.**

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Number of existing comorbidities on admission		Total	Age group (years)							
			19-29	30-39	40-49	50-59	60-69	70-79	80-89	90+
0	Total N (%)	13908	862 (6.2)	1430 (10.3)	2140 (15.4)	2907 (20.9)	2341 (16.8)	1925 (13.8)	1700 (12.2)	603 (4.3)
	Systemic	1614 (11.6)	61 (7.1)	153 (10.7)	245 (11.4)	368 (12.7)	334 (14.3)	233 (12.1)	159 (9.4)	61 (10.1)
	Renal	2170 (15.6)	45 (5.2)	122 (8.5)	273 (12.8)	497 (17.1)	497 (21.2)	365 (19.0)	281 (16.5)	90 (14.9)
	Gastrointestinal	1657 (11.9)	64 (7.4)	162 (11.3)	299 (14.0)	459 (15.8)	320 (13.7)	210 (10.9)	111 (6.5)	32 (5.3)
	Cardiovascular	1046 (7.5)	21 (2.4)	46 (3.2)	134 (6.3)	212 (7.3)	219 (9.4)	199 (10.3)	162 (9.5)	53 (8.8)
	Neurological	409 (2.9)	12 (1.4)	35 (2.4)	52 (2.4)	75 (2.6)	78 (3.3)	65 (3.4)	79 (4.6)	13 (2.2)
	Respiratory	2562 (18.4)	61 (7.1)	185 (12.9)	462 (21.6)	676 (23.3)	596 (25.5)	372 (19.3)	164 (9.6)	46 (7.6)
	Any complication	5328 (38.3)	184 (21.3)	427 (29.9)	816 (38.1)	1184 (40.7)	1059 (45.2)	811 (42.1)	650 (38.2)	197 (32.7)
	1	Total N (%)	17635	434 (2.5)	780 (4.4)	1550 (8.8)	2850 (16.2)	3031 (17.2)	3786 (21.5)	3768 (21.4)
Systemic		2495 (14.1)	49 (11.3)	113 (14.5)	218 (14.1)	439 (15.4)	516 (17.0)	508 (13.4)	468 (12.4)	184 (12.8)
Renal		3747 (21.2)	42 (9.7)	105 (13.5)	261 (16.8)	603 (21.2)	796 (26.3)	867 (22.9)	795 (21.1)	278 (19.4)
Gastrointestinal		2021 (11.5)	50 (11.5)	112 (14.4)	235 (15.2)	450 (15.8)	454 (15.0)	380 (10.0)	244 (6.5)	96 (6.7)
Cardiovascular		1801 (10.2)	14 (3.2)	52 (6.7)	103 (6.6)	255 (8.9)	353 (11.6)	427 (11.3)	417 (11.1)	180 (12.5)
Neurological		693 (3.9)	17 (3.9)	27 (3.5)	52 (3.4)	105 (3.7)	141 (4.7)	145 (3.8)	155 (4.1)	51 (3.6)
Respiratory		3416 (19.4)	55 (12.7)	155 (19.9)	331 (21.4)	716 (25.1)	797 (26.3)	707 (18.7)	488 (13.0)	167 (11.6)
Any complication		8198 (46.5)	142 (32.7)	316 (40.5)	653 (42.1)	1334 (46.8)	1555 (51.3)	1814 (47.9)	1730 (45.9)	654 (45.5)
2+		Total N (%)	41654	204 (0.5)	543 (1.3)	1306 (3.1)	3344 (8.0)	5767 (13.8)	10852 (26.1)	14432 (34.6)
	Systemic	7786 (18.7)	37 (18.1)	110 (20.3)	268 (20.5)	697 (20.8)	1158 (20.1)	1986 (18.3)	2614 (18.1)	916 (17.6)
	Renal	11835 (28.4)	39 (19.1)	126 (23.2)	340 (26.0)	978 (29.2)	1762 (30.6)	3086 (28.4)	4085 (28.3)	1419 (27.3)
	Gastrointestinal	4223 (10.1)	25 (12.3)	91 (16.8)	206 (15.8)	559 (16.7)	804 (13.9)	1054 (9.7)	1123 (7.8)	361 (6.9)
	Cardiovascular	6126 (14.7)	12 (5.9)	36 (6.6)	133 (10.2)	380 (11.4)	817 (14.2)	1594 (14.7)	2309 (16.0)	845 (16.2)
	Neurological	2013 (4.8)	9 (4.4)	29 (5.3)	58 (4.4)	172 (5.1)	281 (4.9)	515 (4.7)	707 (4.9)	242 (4.6)
	Respiratory	7508 (18.0)	29 (14.2)	117 (21.5)	376 (28.8)	871 (26.0)	1374 (23.8)	1899 (17.5)	2109 (14.6)	733 (14.1)
	Any complication	22841 (54.8)	85 (41.7)	272 (50.1)	701 (53.7)	1900 (56.8)	3340 (57.9)	5924 (54.6)	7827 (54.2)	2792 (53.6)

91 Percentage values are row percentages, except for totals which represent column percentages

92

93 **Supplementary table 5 - Specific complications stratified by age and presence of**  
94 **comorbidity in adults admitted to hospital with severe COVID-19.**

Number of existing comorbidities on admission		Total	Age group (years)							
			19-29	30-39	40-49	50-59	60-69	70-79	80-89	90+
0	Total N (%)	13908	862 (6.2)	1430 (10.3)	2140 (15.4)	2907 (20.9)	2341 (16.8)	1925 (13.8)	1700 (12.2)	603 (4.3)
	Empyema	12 (0.1)	0 (0.0)	1 (0.1)	2 (0.1)	2 (0.1)	4 (0.2)	2 (0.1)	1 (0.1)	0 (0.0)
	Likely ARDS	2167 (15.6)	44 (5.1)	156 (10.9)	405 (18.9)	593 (20.4)	525 (22.4)	310 (16.1)	113 (6.6)	21 (3.5)
	Pneumothorax	173 (1.2)	9 (1.0)	14 (1.0)	30 (1.4)	51 (1.8)	44 (1.9)	21 (1.1)	2 (0.1)	2 (0.3)
	Pleural effusion	566 (4.1)	21 (2.4)	41 (2.9)	89 (4.2)	122 (4.2)	120 (5.1)	93 (4.8)	56 (3.3)	24 (4.0)
	Highly likely Bacterial Pneumonia	111 (0.8)	1 (0.1)	6 (0.4)	23 (1.1)	39 (1.3)	21 (0.9)	19 (1.0)	2 (0.1)	0 (0.0)
	Meningitis / Encephalitis	41 (0.3)	5 (0.6)	6 (0.4)	6 (0.3)	6 (0.2)	9 (0.4)	4 (0.2)	4 (0.2)	1 (0.2)
	Seizure	106 (0.8)	6 (0.7)	18 (1.3)	18 (0.8)	24 (0.8)	14 (0.6)	12 (0.6)	13 (0.8)	1 (0.2)
	Stroke / Cerebrovascular accident	189 (1.4)	0 (0.0)	7 (0.5)	18 (0.8)	28 (1.0)	42 (1.8)	43 (2.2)	45 (2.6)	6 (1.0)
	Other neurological complication	117 (0.8)	2 (0.2)	7 (0.5)	17 (0.8)	25 (0.9)	26 (1.1)	13 (0.7)	21 (1.2)	6 (1.0)
	Congestive heart failure	111 (0.8)	0 (0.0)	5 (0.3)	7 (0.3)	16 (0.6)	16 (0.7)	23 (1.2)	27 (1.6)	17 (2.8)
	Endocarditis / Myocarditis	52 (0.4)	0 (0.0)	7 (0.5)	10 (0.5)	8 (0.3)	17 (0.7)	6 (0.3)	3 (0.2)	1 (0.2)
	Pericarditis	41 (0.3)	2 (0.2)	3 (0.2)	11 (0.5)	13 (0.4)	7 (0.3)	2 (0.1)	3 (0.2)	0 (0.0)
	Myocarditis / Pericarditis	16 (0.1)	0 (0.0)	2 (0.1)	3 (0.1)	3 (0.1)	5 (0.2)	1 (0.1)	2 (0.1)	0 (0.0)
	Cardiomyopathy	672 (4.8)	15 (1.7)	28 (2.0)	90 (4.2)	138 (4.7)	157 (6.7)	130 (6.8)	86 (5.1)	28 (4.6)
	Cardiac arrhythmia	84 (0.6)	0 (0.0)	8 (0.6)	7 (0.3)	13 (0.4)	14 (0.6)	16 (0.8)	21 (1.2)	5 (0.8)
	Cardiac ischaemia	269 (1.9)	7 (0.8)	6 (0.4)	35 (1.6)	54 (1.9)	50 (2.1)	63 (3.3)	44 (2.6)	10 (1.7)
	Cardiac arrest	193 (1.4)	3 (0.3)	20 (1.4)	36 (1.7)	38 (1.3)	43 (1.8)	26 (1.4)	20 (1.2)	7 (1.2)
	Bloodstream Infection	383 (2.8)	10 (1.2)	40 (2.8)	71 (3.3)	92 (3.2)	79 (3.4)	55 (2.9)	27 (1.6)	9 (1.5)
	Coagulation disorder / DIC	1253 (9.0)	53 (6.1)	114 (8.0)	180 (8.4)	288 (9.9)	262 (11.2)	191 (9.9)	116 (6.8)	49 (8.1)
	Anaemia	45 (0.3)	2 (0.2)	3 (0.2)	8 (0.4)	9 (0.3)	4 (0.2)	8 (0.4)	6 (0.4)	5 (0.8)
	Rhabdomyolysis / Myositis	2170 (15.6)	45 (5.2)	122 (8.5)	273 (12.8)	497 (17.1)	497 (21.2)	365 (19.0)	281 (16.5)	90 (14.9)
	Acute Kidney Injury	87 (0.6)	6 (0.7)	5 (0.3)	7 (0.3)	21 (0.7)	21 (0.9)	8 (0.4)	14 (0.8)	5 (0.8)
	Gastrointestinal haemorrhage	43 (0.3)	5 (0.6)	10 (0.7)	4 (0.2)	11 (0.4)	5 (0.2)	5 (0.3)	1 (0.1)	2 (0.3)
	Pancreatitis	99 (0.7)	2 (0.2)	8 (0.6)	15 (0.7)	31 (1.1)	25 (1.1)	10 (0.5)	6 (0.4)	2 (0.3)
	Deep Vein Thrombosis	257 (1.8)	5 (0.6)	19 (1.3)	48 (2.2)	78 (2.7)	54 (2.3)	32 (1.7)	19 (1.1)	2 (0.3)
	Pulmonary Embolism	1566 (11.3)	58 (6.7)	150 (10.5)	293 (13.7)	440 (15.1)	302 (12.9)	201 (10.4)	97 (5.7)	25 (4.1)
	Liver Injury									
1	Total N (%)	17635	434 (2.5)	780 (4.4)	1550 (8.8)	2850 (16.2)	3031 (17.2)	3786 (21.5)	3768 (21.4)	1436 (8.1)
	Empyema	23 (0.1)	0 (0.0)	3 (0.4)	2 (0.1)	3 (0.1)	6 (0.2)	3 (0.1)	3 (0.1)	3 (0.2)
	Likely ARDS	2653 (15.0)	49 (11.3)	132 (16.9)	293 (18.9)	627 (22.0)	677 (22.3)	526 (13.9)	275 (7.3)	74 (5.2)

Number of existing comorbidities on admission	Total	Age group (years)							
		19-29	30-39	40-49	50-59	60-69	70-79	80-89	90+
Pneumothorax	208 (1.2)	2 (0.5)	8 (1.0)	22 (1.4)	55 (1.9)	59 (1.9)	41 (1.1)	16 (0.4)	5 (0.3)
Pleural effusion	959 (5.4)	10 (2.3)	34 (4.4)	56 (3.6)	129 (4.5)	187 (6.2)	217 (5.7)	226 (6.0)	100 (7.0)
Highly likely Bacterial Pneumonia	107 (0.6)	1 (0.2)	5 (0.6)	14 (0.9)	40 (1.4)	23 (0.8)	19 (0.5)	4 (0.1)	1 (0.1)
Meningitis / Encephalitis	33 (0.2)	1 (0.2)	3 (0.4)	3 (0.2)	6 (0.2)	10 (0.3)	7 (0.2)	3 (0.1)	0 (0.0)
Seizure	178 (1.0)	7 (1.6)	16 (2.1)	26 (1.7)	34 (1.2)	36 (1.2)	20 (0.5)	29 (0.8)	10 (0.7)
Stroke / Cerebrovascular accident	293 (1.7)	2 (0.5)	3 (0.4)	16 (1.0)	33 (1.2)	55 (1.8)	81 (2.1)	76 (2.0)	27 (1.9)
Other neurological complication	262 (1.5)	9 (2.1)	11 (1.4)	17 (1.1)	44 (1.5)	51 (1.7)	53 (1.4)	61 (1.6)	16 (1.1)
Congestive heart failure	316 (1.8)	0 (0.0)	5 (0.6)	9 (0.6)	24 (0.8)	47 (1.6)	78 (2.1)	90 (2.4)	63 (4.4)
Endocarditis / Myocarditis	70 (0.4)	0 (0.0)	8 (1.0)	6 (0.4)	14 (0.5)	19 (0.6)	13 (0.3)	8 (0.2)	2 (0.1)
Pericarditis	53 (0.3)	1 (0.2)	2 (0.3)	8 (0.5)	8 (0.3)	12 (0.4)	13 (0.3)	7 (0.2)	2 (0.1)
Myocarditis / Pericarditis	34 (0.2)	0 (0.0)	1 (0.1)	5 (0.3)	8 (0.3)	5 (0.2)	8 (0.2)	6 (0.2)	1 (0.1)
Cardiomyopathy	1082 (6.1)	12 (2.8)	28 (3.6)	66 (4.3)	159 (5.6)	229 (7.6)	268 (7.1)	231 (6.1)	89 (6.2)
Cardiac arrhythmia	176 (1.0)	0 (0.0)	5 (0.6)	7 (0.5)	23 (0.8)	37 (1.2)	45 (1.2)	43 (1.1)	16 (1.1)
Cardiac ischaemia	461 (2.6)	1 (0.2)	16 (2.1)	27 (1.7)	87 (3.1)	96 (3.2)	98 (2.6)	95 (2.5)	41 (2.9)
Cardiac arrest	296 (1.7)	9 (2.1)	19 (2.4)	34 (2.2)	58 (2.0)	61 (2.0)	53 (1.4)	48 (1.3)	14 (1.0)
Bloodstream Infection	489 (2.8)	12 (2.8)	22 (2.8)	51 (3.3)	106 (3.7)	126 (4.2)	96 (2.5)	56 (1.5)	20 (1.4)
Coagulation disorder / DIC	2012 (11.4)	34 (7.8)	92 (11.8)	173 (11.2)	351 (12.3)	419 (13.8)	407 (10.8)	380 (10.1)	156 (10.9)
Anaemia	54 (0.3)	4 (0.9)	1 (0.1)	4 (0.3)	9 (0.3)	7 (0.2)	14 (0.4)	13 (0.3)	2 (0.1)
Rhabdomyolysis / Myositis	3747 (21.2)	42 (9.7)	105 (13.5)	261 (16.8)	603 (21.2)	796 (26.3)	867 (22.9)	795 (21.1)	278 (19.4)
Acute Kidney Injury	187 (1.1)	2 (0.5)	4 (0.5)	21 (1.4)	29 (1.0)	38 (1.3)	29 (0.8)	41 (1.1)	23 (1.6)
Gastrointestinal haemorrhage	67 (0.4)	3 (0.7)	7 (0.9)	10 (0.6)	17 (0.6)	14 (0.5)	8 (0.2)	7 (0.2)	1 (0.1)
Pancreatitis	102 (0.6)	0 (0.0)	2 (0.3)	14 (0.9)	19 (0.7)	26 (0.9)	26 (0.7)	13 (0.3)	2 (0.1)
Deep Vein Thrombosis	261 (1.5)	6 (1.4)	6 (0.8)	31 (2.0)	50 (1.8)	64 (2.1)	51 (1.3)	47 (1.2)	6 (0.4)
Pulmonary Embolism	1859 (10.5)	48 (11.1)	105 (13.5)	220 (14.2)	430 (15.1)	425 (14.0)	351 (9.3)	205 (5.4)	75 (5.2)
Liver Injury	2+	204 (0.5)	543 (1.3)	1306 (3.1)	3344 (8.0)	5767 (13.8)	10852 (26.1)	14432 (34.6)	5206 (12.5)
Total N (%)	41654								
Empyema	57 (0.1)	0 (0.0)	0 (0.0)	2 (0.2)	8 (0.2)	10 (0.2)	11 (0.1)	18 (0.1)	8 (0.2)
Likely ARDS	4871 (11.7)	23 (11.3)	106 (19.5)	314 (24.0)	709 (21.2)	1043 (18.1)	1243 (11.5)	1108 (7.7)	325 (6.2)
Pneumothorax	313 (0.8)	1 (0.5)	9 (1.7)	21 (1.6)	46 (1.4)	75 (1.3)	77 (0.7)	65 (0.5)	19 (0.4)
Pleural effusion	3006 (7.2)	8 (3.9)	25 (4.6)	85 (6.5)	214 (6.4)	416 (7.2)	743 (6.8)	1085 (7.5)	430 (8.3)
Highly likely Bacterial Pneumonia	141 (0.3)	1 (0.5)	3 (0.6)	15 (1.1)	24 (0.7)	37 (0.6)	37 (0.3)	21 (0.1)	3 (0.1)
Meningitis / Encephalitis	82 (0.2)	1 (0.5)	0 (0.0)	12 (0.9)	15 (0.4)	23 (0.4)	9 (0.1)	20 (0.1)	2 (0.0)
Seizure	545 (1.3)	6 (2.9)	16 (2.9)	24 (1.8)	77 (2.3)	83 (1.4)	152 (1.4)	150 (1.0)	37 (0.7)

Number of existing comorbidities on admission	Total	Age group (years)							
		19-29	30-39	40-49	50-59	60-69	70-79	80-89	90+
Stroke / Cerebrovascular accident	731 (1.8)	1 (0.5)	7 (1.3)	16 (1.2)	46 (1.4)	117 (2.0)	187 (1.7)	264 (1.8)	93 (1.8)
Other neurological complication	856 (2.1)	4 (2.0)	8 (1.5)	19 (1.5)	63 (1.9)	90 (1.6)	214 (2.0)	331 (2.3)	127 (2.4)
Congestive heart failure	2101 (5.0)	0 (0.0)	6 (1.1)	27 (2.1)	78 (2.3)	214 (3.7)	506 (4.7)	914 (6.3)	356 (6.8)
Endocarditis / Myocarditis	142 (0.3)	2 (1.0)	2 (0.4)	9 (0.7)	18 (0.5)	27 (0.5)	43 (0.4)	39 (0.3)	2 (0.0)
Pericarditis	97 (0.2)	1 (0.5)	2 (0.4)	6 (0.5)	11 (0.3)	19 (0.3)	26 (0.2)	22 (0.2)	10 (0.2)
Myocarditis / Pericarditis	124 (0.3)	0 (0.0)	2 (0.4)	7 (0.5)	12 (0.4)	18 (0.3)	31 (0.3)	42 (0.3)	12 (0.2)
Cardiomyopathy	3098 (7.4)	8 (3.9)	22 (4.1)	74 (5.7)	210 (6.3)	438 (7.6)	824 (7.6)	1129 (7.8)	393 (7.5)
Cardiac arrhythmia	738 (1.8)	0 (0.0)	1 (0.2)	11 (0.8)	49 (1.5)	97 (1.7)	204 (1.9)	261 (1.8)	115 (2.2)
Cardiac ischaemia	1173 (2.8)	1 (0.5)	10 (1.8)	31 (2.4)	99 (3.0)	185 (3.2)	327 (3.0)	377 (2.6)	143 (2.7)
Cardiac arrest	626 (1.5)	3 (1.5)	12 (2.2)	30 (2.3)	51 (1.5)	109 (1.9)	151 (1.4)	203 (1.4)	67 (1.3)
Bloodstream Infection	1199 (2.9)	5 (2.5)	19 (3.5)	55 (4.2)	161 (4.8)	202 (3.5)	288 (2.7)	362 (2.5)	107 (2.1)
Coagulation disorder / DIC	6641 (15.9)	33 (16.2)	97 (17.9)	226 (17.3)	586 (17.5)	991 (17.2)	1693 (15.6)	2232 (15.5)	783 (15.0)
Anaemia	167 (0.4)	2 (1.0)	3 (0.6)	2 (0.2)	15 (0.4)	18 (0.3)	35 (0.3)	59 (0.4)	33 (0.6)
Rhabdomyolysis / Myositis	11835 (28.4)	39 (19.1)	126 (23.2)	340 (26.0)	978 (29.2)	1762 (30.6)	3086 (28.4)	4085 (28.3)	1419 (27.3)
Acute Kidney Injury	581 (1.4)	2 (1.0)	8 (1.5)	12 (0.9)	40 (1.2)	80 (1.4)	141 (1.3)	224 (1.6)	74 (1.4)
Gastrointestinal haemorrhage	138 (0.3)	3 (1.5)	10 (1.8)	13 (1.0)	25 (0.7)	26 (0.5)	26 (0.2)	29 (0.2)	6 (0.1)
Pancreatitis	228 (0.5)	1 (0.5)	7 (1.3)	5 (0.4)	40 (1.2)	37 (0.6)	52 (0.5)	66 (0.5)	20 (0.4)
Deep Vein Thrombosis	486 (1.2)	3 (1.5)	4 (0.7)	26 (2.0)	76 (2.3)	101 (1.8)	130 (1.2)	120 (0.8)	26 (0.5)
Pulmonary Embolism	3683 (8.8)	22 (10.8)	81 (14.9)	194 (14.9)	530 (15.8)	733 (12.7)	922 (8.5)	915 (6.3)	286 (5.5)
Liver Injury									

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Percentage values are row percentages, except for totals which represent column percentages. ARDS – Acute Respiratory Distress Syndrome, DIC – Disseminated Intravascular Coagulation.

100 **Supplementary table 6 - Outcomes by organ specific complications in adults admitted to**  
 101 **hospital with severe COVID-19 who survived.**

102

		Total number of patients experiencing complications		Organ-specific level complications <sup>§</sup>					
		Total patients	Any complication	Systemic	Renal	Gastrointestinal	Cardiovascular	Neurological	Respiratory
Total N (%)		50105	21784 (43.5)	7423 (14.8)	10059 (20.1)	4837 (9.7)	4035 (8.1)	1880 (3.8)	7028 (14.0)
Critical Care Admission	No	43153 (86.1)	16853 (77.4)	5557 (74.9)	7467 (74.2)	3233 (66.8)	3020 (74.8)	1461 (77.7)	3616 (51.5)
	Yes	6242 (12.5)	4926 (22.6)	1866 (25.1)	2589 (25.7)	1602 (33.1)	1015 (25.2)	419 (22.3)	3410 (48.5)
	(Missing)	710 (1.4)	5 (0.0)	0 (0.0)	3 (0.0)	2 (0.0)	0 (0.0)	0 (0.0)	2 (0.0)
Any invasive ventilation	No	45825 (91.5)	18630 (85.5)	6067 (81.7)	8271 (82.2)	3728 (77.1)	3275 (81.2)	1533 (81.5)	4498 (64.0)
	Yes	3472 (6.9)	3130 (14.4)	1352 (18.2)	1773 (17.6)	1104 (22.8)	758 (18.8)	347 (18.5)	2529 (36.0)
	(Missing)	808 (1.6)	24 (0.1)	4 (0.1)	15 (0.1)	5 (0.1)	2 (0.0)	0 (0.0)	1 (0.0)
Any non-invasive ventilation	No	42350 (87.2)	17255 (80.1)	5917 (80.3)	7738 (77.8)	3568 (74.6)	3184 (79.6)	1566 (84.3)	4232 (60.6)
	Yes	6206 (12.8)	4296 (19.9)	1454 (19.7)	2207 (22.2)	1218 (25.4)	817 (20.4)	291 (15.7)	2748 (39.4)
Any oxygen	No	15507 (31.8)	4892 (22.6)	1748 (23.7)	1942 (19.4)	940 (19.5)	888 (22.2)	580 (31.1)	627 (8.9)
	Yes	33310 (68.2)	16760 (77.4)	5642 (76.3)	8061 (80.6)	3873 (80.5)	3120 (77.8)	1285 (68.9)	6379 (91.1)

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Percentage values are row percentages, except for totals which represent column percentages. § = Denominator is number of non-missing observations for each organ system.

107 **Supplementary table 7 - Outcomes by organ specific complications in adults admitted to**  
 108 **hospital with severe COVID-19 who died.**

		Total number of patients experiencing complications		Organ-specific level complications <sup>§</sup>					
		Total	Any complication	Systemic	Renal	Gastrointestinal	Cardiovascular	Neurological	Respiratory
Total N (%)		23092	14583 (63.2)	4472 (19.4)	7693 (33.3)	3064 (13.3)	4938 (21.4)	1235 (5.3)	6458 (28.0)
Critical Care Admission	No	18972 (82.2)	11239 (77.1)	3247 (72.6)	5525 (71.8)	1906 (62.2)	3620 (73.3)	985 (79.8)	3856 (59.7)
	Yes	3792 (16.4)	3341 (22.9)	1224 (27.4)	2166 (28.2)	1158 (37.8)	1318 (26.7)	249 (20.2)	2602 (40.3)
	(Missing)	328 (1.4)	3 (0.0)	1 (0.0)	2 (0.0)	0 (0.0)	0 (0.0)	1 (0.1)	0 (0.0)
Any invasive ventilation	No	20063 (86.9)	12080 (82.8)	3489 (78.0)	5991 (77.9)	2087 (68.1)	3911 (79.2)	1040 (84.2)	4311 (66.8)
	Yes	2650 (11.5)	2489 (17.1)	978 (21.9)	1698 (22.1)	973 (31.8)	1026 (20.8)	195 (15.8)	2141 (33.2)
	(Missing)	379 (1.6)	14 (0.1)	5 (0.1)	4 (0.1)	4 (0.1)	1 (0.0)	0 (0.0)	6 (0.1)
Any non-invasive ventilation	No	17685 (79.3)	10947 (76.1)	3311 (74.8)	5623 (73.9)	2117 (70.0)	3678 (75.1)	1000 (81.8)	4100 (64.2)
	Yes	4621 (20.7)	3445 (23.9)	1113 (25.2)	1987 (26.1)	906 (30.0)	1217 (24.9)	222 (18.2)	2290 (35.8)
Any oxygen	No	2145 (9.5)	1079 (7.4)	331 (7.4)	528 (6.9)	213 (7.0)	302 (6.1)	157 (12.8)	211 (3.3)
	Yes	20385 (90.5)	13421 (92.6)	4120 (92.6)	7128 (93.1)	2832 (93.0)	4624 (93.9)	1073 (87.2)	6219 (96.7)

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 110 Percentage values are row percentages, except for totals which represent column percentages. § = Denominator is number of non-missing  
 111 observations for each organ system.  
 112



113 **Supplementary table 8 - Effect of complications on survival (adjusted Cox proportional**  
 114 **hazards models) for figure 2C**

115 *Supplementary table 8A - Any complication*

Dependent: Survival (mortality)			HR (univariable)	HR (multivariable)
Any complication	No	37839 (100.0)	-	-
	Yes	36662 (100.0)	1.91 (1.86-1.97, p<0.001)	1.74 (1.64-1.84, p<0.001)
Age on admission	19-29	1477 (100.0)	-	-
	30-39	2707 (100.0)	1.82 (1.25-2.64, p=0.002)	1.68 (1.22-2.31, p=0.002)
	40-49	4930 (100.0)	3.22 (2.29-4.53, p<0.001)	2.78 (1.97-3.94, p<0.001)
	50-59	9003 (100.0)	6.24 (4.48-8.68, p<0.001)	5.26 (3.79-7.29, p<0.001)
	60-69	11035 (100.0)	11.72 (8.43-16.27, p<0.001)	9.68 (6.99-13.40, p<0.001)
	70-79	16445 (100.0)	18.38 (13.25-25.51, p<0.001)	15.44 (11.07-21.54, p<0.001)
	80-89	19771 (100.0)	23.49 (16.93-32.59, p<0.001)	20.15 (14.56-27.89, p<0.001)
	90+	7204 (100.0)	27.63 (19.89-38.36, p<0.001)	24.73 (17.77-34.40, p<0.001)
	Sex at Birth	Female	31733 (100.0)	-
	Male	40648 (100.0)	1.23 (1.20-1.27, p<0.001)	1.30 (1.26-1.33, p<0.001)
Deprivation	1 (least deprived)	10347 (100.0)	-	-
	2	12775 (100.0)	1.00 (0.96-1.05, p=0.965)	1.03 (0.97-1.08, p=0.348)
	3	15712 (100.0)	0.99 (0.95-1.04, p=0.743)	1.06 (0.99-1.12, p=0.074)
	4	15880 (100.0)	0.95 (0.91-1.00, p=0.039)	1.07 (1.01-1.13, p=0.033)
	5 (most deprived)	17845 (100.0)	0.93 (0.89-0.97, p=0.001)	1.09 (1.03-1.15, p=0.002)

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Dependent: Survival (mortality)			HR (univariable)	HR (multivariable)
Systemic Complication	No	62531 (100.0)	-	-
	Yes	11970 (100.0)	1.27 (1.23-1.31, p<0.001)	1.20 (1.15-1.26, p<0.001)
Age on admission	19-29	1477 (100.0)	-	-
	30-39	2707 (100.0)	1.82 (1.25-2.64, p=0.002)	1.75 (1.27-2.42, p=0.001)
	40-49	4930 (100.0)	3.22 (2.29-4.53, p<0.001)	3.00 (2.12-4.26, p<0.001)
	50-59	9003 (100.0)	6.24 (4.48-8.68, p<0.001)	5.79 (4.17-8.04, p<0.001)
	60-69	11035 (100.0)	11.72 (8.43-16.27, p<0.001)	10.87 (7.84-15.07, p<0.001)
	70-79	16445 (100.0)	18.38 (13.25-25.51, p<0.001)	17.25 (12.36-24.09, p<0.001)
	80-89	19771 (100.0)	23.49 (16.93-32.59, p<0.001)	22.50 (16.24-31.18, p<0.001)
	90+	7204 (100.0)	27.63 (19.89-38.36, p<0.001)	27.61 (19.83-38.43, p<0.001)
	Sex at Birth	Female	31733 (100.0)	-
	Male	40648 (100.0)	1.23 (1.20-1.27, p<0.001)	1.34 (1.30-1.38, p<0.001)
Deprivation	1 (least deprived)	10347 (100.0)	-	-
	2	12775 (100.0)	1.00 (0.96-1.05, p=0.965)	1.03 (0.98-1.08, p=0.281)
	3	15712 (100.0)	0.99 (0.95-1.04, p=0.743)	1.06 (1.00-1.12, p=0.059)
	4	15880 (100.0)	0.95 (0.91-1.00, p=0.039)	1.07 (1.02-1.13, p=0.012)
	5 (most deprived)	17845 (100.0)	0.93 (0.89-0.97, p=0.001)	1.09 (1.04-1.15, p=0.001)

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Dependent: Survival (mortality)			HR (univariable)	HR (multivariable)
Renal complication	No	56691 (100.0)	-	-
	Yes	17810 (100.0)	1.68 (1.64-1.73, p<0.001)	1.49 (1.42-1.55, p<0.001)
Age on admission	19-29	1477 (100.0)	-	-
	30-39	2707 (100.0)	1.82 (1.25-2.64, p=0.002)	1.74 (1.26-2.39, p=0.001)
	40-49	4930 (100.0)	3.22 (2.29-4.53, p<0.001)	2.92 (2.06-4.14, p<0.001)
	50-59	9003 (100.0)	6.24 (4.48-8.68, p<0.001)	5.53 (3.99-7.68, p<0.001)
	60-69	11035 (100.0)	11.72 (8.43-16.27, p<0.001)	10.22 (7.37-14.17, p<0.001)
	70-79	16445 (100.0)	18.38 (13.25-25.51, p<0.001)	16.24 (11.63-22.67, p<0.001)
	80-89	19771 (100.0)	23.49 (16.93-32.59, p<0.001)	21.16 (15.27-29.32, p<0.001)
	90+	7204 (100.0)	27.63 (19.89-38.36, p<0.001)	26.05 (18.70-36.27, p<0.001)
	Sex at Birth	Female	31733 (100.0)	-
Male		40648 (100.0)	1.23 (1.20-1.27, p<0.001)	1.31 (1.27-1.35, p<0.001)
Deprivation	1 (least deprived)	10347 (100.0)	-	-
	2	12775 (100.0)	1.00 (0.96-1.05, p=0.965)	1.03 (0.98-1.08, p=0.317)
	3	15712 (100.0)	0.99 (0.95-1.04, p=0.743)	1.05 (0.99-1.11, p=0.089)
	4	15880 (100.0)	0.95 (0.91-1.00, p=0.039)	1.06 (1.00-1.12, p=0.046)
	5 (most deprived)	17845 (100.0)	0.93 (0.89-0.97, p=0.001)	1.08 (1.02-1.13, p=0.006)

Dependent: Survival (mortality)			HR (univariable)	HR (multivariable)
Gastrointestinal or liver complication	No	66464 (100.0)	-	-
	Yes	8037 (100.0)	1.28 (1.23-1.33, p<0.001)	1.50 (1.44-1.57, p<0.001)
Age on admission	19-29	1477 (100.0)	-	-
	30-39	2707 (100.0)	1.82 (1.25-2.64, p=0.002)	1.74 (1.26-2.39, p=0.001)
	40-49	4930 (100.0)	3.22 (2.29-4.53, p<0.001)	2.97 (2.10-4.20, p<0.001)
	50-59	9003 (100.0)	6.24 (4.48-8.68, p<0.001)	5.71 (4.12-7.92, p<0.001)
	60-69	11035 (100.0)	11.72 (8.43-16.27, p<0.001)	10.85 (7.84-15.02, p<0.001)
	70-79	16445 (100.0)	18.38 (13.25-25.51, p<0.001)	17.54 (12.58-24.45, p<0.001)
	80-89	19771 (100.0)	23.49 (16.93-32.59, p<0.001)	23.15 (16.73-32.03, p<0.001)
	90+	7204 (100.0)	27.63 (19.89-38.36, p<0.001)	28.46 (20.46-39.59, p<0.001)
Sex at Birth	Female	31733 (100.0)	-	-
	Male	40648 (100.0)	1.23 (1.20-1.27, p<0.001)	1.33 (1.29-1.37, p<0.001)
Deprivation	1 (least deprived)	10347 (100.0)	-	-
	2	12775 (100.0)	1.00 (0.96-1.05, p=0.965)	1.03 (0.98-1.08, p=0.292)
	3	15712 (100.0)	0.99 (0.95-1.04, p=0.743)	1.06 (1.00-1.12, p=0.052)
	4	15880 (100.0)	0.95 (0.91-1.00, p=0.039)	1.08 (1.02-1.14, p=0.011)
	5 (most deprived)	17845 (100.0)	0.93 (0.89-0.97, p=0.001)	1.09 (1.04-1.15, p=0.001)

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Dependent: Survival (mortality)			HR (univariable)	HR (multivariable)
Cardiovascular complication	No	65498 (100.0)	-	-
	Yes	9003 (100.0)	2.32 (2.25-2.39, p<0.001)	1.98 (1.85-2.11, p<0.001)
Age on admission	19-29	1477 (100.0)	-	-
	30-39	2707 (100.0)	1.82 (1.25-2.64, p=0.002)	1.74 (1.26-2.39, p=0.001)
	40-49	4930 (100.0)	3.22 (2.29-4.53, p<0.001)	2.93 (2.07-4.15, p<0.001)
	50-59	9003 (100.0)	6.24 (4.48-8.68, p<0.001)	5.57 (4.02-7.73, p<0.001)
	60-69	11035 (100.0)	11.72 (8.43-16.27, p<0.001)	10.23 (7.38-14.17, p<0.001)
	70-79	16445 (100.0)	18.38 (13.25-25.51, p<0.001)	16.11 (11.55-22.48, p<0.001)
	80-89	19771 (100.0)	23.49 (16.93-32.59, p<0.001)	20.85 (15.05-28.88, p<0.001)
	90+	7204 (100.0)	27.63 (19.89-38.36, p<0.001)	25.50 (18.34-35.45, p<0.001)
	Sex at Birth	Female	31733 (100.0)	-
	Male	40648 (100.0)	1.23 (1.20-1.27, p<0.001)	1.32 (1.28-1.36, p<0.001)
Deprivation	1 (least deprived)	10347 (100.0)	-	-
	2	12775 (100.0)	1.00 (0.96-1.05, p=0.965)	1.03 (0.98-1.09, p=0.219)
	3	15712 (100.0)	0.99 (0.95-1.04, p=0.743)	1.06 (1.00-1.12, p=0.053)
	4	15880 (100.0)	0.95 (0.91-1.00, p=0.039)	1.07 (1.02-1.14, p=0.012)
	5 (most deprived)	17845 (100.0)	0.93 (0.89-0.97, p=0.001)	1.10 (1.05-1.16, p<0.001)

Dependent: Survival (mortality)			HR (univariable)	HR (multivariable)
Neurological complication	No	71340 (100.0)	-	-
	Yes	3161 (100.0)	1.29 (1.22-1.37, p<0.001)	1.21 (1.13-1.29, p<0.001)
Age on admission	19-29	1477 (100.0)	-	-
	30-39	2707 (100.0)	1.82 (1.25-2.64, p=0.002)	1.76 (1.28-2.43, p=0.001)
	40-49	4930 (100.0)	3.22 (2.29-4.53, p<0.001)	3.03 (2.13-4.29, p<0.001)
	50-59	9003 (100.0)	6.24 (4.48-8.68, p<0.001)	5.84 (4.21-8.11, p<0.001)
	60-69	11035 (100.0)	11.72 (8.43-16.27, p<0.001)	10.99 (7.93-15.24, p<0.001)
	70-79	16445 (100.0)	18.38 (13.25-25.51, p<0.001)	17.42 (12.48-24.31, p<0.001)
	80-89	19771 (100.0)	23.49 (16.93-32.59, p<0.001)	22.70 (16.38-31.44, p<0.001)
	90+	7204 (100.0)	27.63 (19.89-38.36, p<0.001)	27.85 (20.00-38.77, p<0.001)
	Sex at Birth			
	Female	31733 (100.0)	-	-
	Male	40648 (100.0)	1.23 (1.20-1.27, p<0.001)	1.34 (1.31-1.38, p<0.001)
Deprivation	1 (least deprived)	10347 (100.0)	-	-
	2	12775 (100.0)	1.00 (0.96-1.05, p=0.965)	1.03 (0.98-1.08, p=0.287)
	3	15712 (100.0)	0.99 (0.95-1.04, p=0.743)	1.06 (1.00-1.12, p=0.060)
	4	15880 (100.0)	0.95 (0.91-1.00, p=0.039)	1.07 (1.01-1.13, p=0.014)
	5 (most deprived)	17845 (100.0)	0.93 (0.89-0.97, p=0.001)	1.09 (1.03-1.14, p=0.001)

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Dependent: Survival (mortality)			HR (univariable)	HR (multivariable)
Respiratory complication	No	60982 (100.0)	-	-
	Yes	13519 (100.0)	1.89 (1.83-1.94, p<0.001)	2.15 (2.04-2.27, p<0.001)
Age on admission	19-29	1477 (100.0)	-	-
	30-39	2707 (100.0)	1.82 (1.25-2.64, p=0.002)	1.65 (1.20-2.27, p=0.002)
	40-49	4930 (100.0)	3.22 (2.29-4.53, p<0.001)	2.67 (1.89-3.78, p<0.001)
	50-59	9003 (100.0)	6.24 (4.48-8.68, p<0.001)	5.12 (3.70-7.10, p<0.001)
	60-69	11035 (100.0)	11.72 (8.43-16.27, p<0.001)	9.71 (7.01-13.45, p<0.001)
	70-79	16445 (100.0)	18.38 (13.25-25.51, p<0.001)	16.45 (11.80-22.92, p<0.001)
	80-89	19771 (100.0)	23.49 (16.93-32.59, p<0.001)	22.33 (16.15-30.89, p<0.001)
	90+	7204 (100.0)	27.63 (19.89-38.36, p<0.001)	27.49 (19.78-38.21, p<0.001)
	Sex at Birth	Female	31733 (100.0)	-
	Male	40648 (100.0)	1.23 (1.20-1.27, p<0.001)	1.31 (1.27-1.35, p<0.001)
Deprivation	1 (least deprived)	10347 (100.0)	-	-
	2	12775 (100.0)	1.00 (0.96-1.05, p=0.965)	1.03 (0.98-1.08, p=0.209)
	3	15712 (100.0)	0.99 (0.95-1.04, p=0.743)	1.05 (0.99-1.11, p=0.135)
	4	15880 (100.0)	0.95 (0.91-1.00, p=0.039)	1.07 (1.01-1.13, p=0.022)
	5 (most deprived)	17845 (100.0)	0.93 (0.89-0.97, p=0.001)	1.10 (1.04-1.16, p<0.001)

134 **Supplementary table 9 - Effect of complications on odds of critical care admission**  
 135 **(adjusted logistic regression models) for figure 2D**

136 *Supplementary table 9A - Any complication*

Dependent: Critical Care Admission		No	Yes	OR (univariable)	OR (multilevel)
Any complication	No	33809 (95.1)	1760 (4.9)	-	-
	Yes	27937 (77.4)	8155 (22.6)	5.61 (5.31-5.92, p<0.001)	7.25 (6.83-7.69, p<0.001)
Age on admission	19-29	1241 (85.8)	205 (14.2)	-	-
	30-39	2101 (79.1)	555 (20.9)	1.60 (1.34-1.91, p<0.001)	1.33 (1.10-1.61, p=0.004)
	40-49	3596 (74.0)	1264 (26.0)	2.13 (1.82-2.51, p<0.001)	1.57 (1.32-1.88, p<0.001)
	50-59	6389 (71.7)	2521 (28.3)	2.39 (2.05-2.80, p<0.001)	1.63 (1.38-1.94, p<0.001)
	60-69	8166 (74.9)	2740 (25.1)	2.03 (1.75-2.38, p<0.001)	1.24 (1.04-1.47, p=0.014)
	70-79	14285 (87.9)	1960 (12.1)	0.83 (0.71-0.97, p=0.019)	0.47 (0.39-0.56, p<0.001)
	80-89	18964 (97.1)	567 (2.9)	0.18 (0.15-0.21, p<0.001)	0.10 (0.08-0.12, p<0.001)
	90+	7004 (98.6)	103 (1.4)	0.09 (0.07-0.11, p<0.001)	0.05 (0.04-0.07, p<0.001)
Sex at Birth	Female	28230 (90.1)	3100 (9.9)	-	-
	Male	33348 (83.1)	6792 (16.9)	1.85 (1.77-1.94, p<0.001)	1.49 (1.42-1.57, p<0.001)
Deprivation	1 (least deprived)	8747 (86.2)	1401 (13.8)	-	-
	2	10923 (86.9)	1653 (13.1)	0.94 (0.88-1.02, p=0.146)	0.86 (0.79-0.94, p=0.001)
	3	13352 (86.3)	2115 (13.7)	0.99 (0.92-1.06, p=0.765)	0.89 (0.82-0.98, p=0.012)
	4	13360 (85.1)	2340 (14.9)	1.09 (1.02-1.17, p=0.014)	0.89 (0.82-0.97, p=0.011)
	5 (most deprived)	15352 (86.5)	2405 (13.5)	0.98 (0.91-1.05, p=0.540)	0.78 (0.72-0.85, p<0.001)

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Dependent: Critical Care Admission		No	Yes	OR (univariable)	OR (multilevel)
Systemic complication	No	53004 (88.5)	6875 (11.5)	-	-
	Yes	8742 (74.2)	3040 (25.8)	2.68 (2.55-2.81, p<0.001)	3.15 (2.97-3.33, p<0.001)
Age on admission	19-29	1241 (85.8)	205 (14.2)	-	-
	30-39	2101 (79.1)	555 (20.9)	1.60 (1.34-1.91, p<0.001)	1.45 (1.21-1.74, p<0.001)
	40-49	3596 (74.0)	1264 (26.0)	2.13 (1.82-2.51, p<0.001)	1.84 (1.56-2.18, p<0.001)
	50-59	6389 (71.7)	2521 (28.3)	2.39 (2.05-2.80, p<0.001)	2.05 (1.74-2.41, p<0.001)
	60-69	8166 (74.9)	2740 (25.1)	2.03 (1.75-2.38, p<0.001)	1.70 (1.45-2.00, p<0.001)
	70-79	14285 (87.9)	1960 (12.1)	0.83 (0.71-0.97, p=0.019)	0.69 (0.58-0.81, p<0.001)
	80-89	18964 (97.1)	567 (2.9)	0.18 (0.15-0.21, p<0.001)	0.15 (0.13-0.18, p<0.001)
	90+	7004 (98.6)	103 (1.4)	0.09 (0.07-0.11, p<0.001)	0.08 (0.06-0.10, p<0.001)
Sex at Birth	Female	28230 (90.1)	3100 (9.9)	-	-
	Male	33348 (83.1)	6792 (16.9)	1.85 (1.77-1.94, p<0.001)	1.65 (1.58-1.74, p<0.001)
Deprivation	1 (least deprived)	8747 (86.2)	1401 (13.8)	-	-
	2	10923 (86.9)	1653 (13.1)	0.94 (0.88-1.02, p=0.146)	0.88 (0.81-0.96, p=0.005)
	3	13352 (86.3)	2115 (13.7)	0.99 (0.92-1.06, p=0.765)	0.90 (0.83-0.98, p=0.020)
	4	13360 (85.1)	2340 (14.9)	1.09 (1.02-1.17, p=0.014)	0.91 (0.84-0.99, p=0.035)
	5 (most deprived)	15352 (86.5)	2405 (13.5)	0.98 (0.91-1.05, p=0.540)	0.82 (0.75-0.89, p<0.001)

Dependent: Critical Care Admission		No	Yes	OR (univariable)	OR (multilevel)
Renal complication	No	48812 (90.3)	5238 (9.7)	-	-
	Yes	12934 (73.4)	4677 (26.6)	3.37 (3.22-3.52, p<0.001)	4.36 (4.14-4.58, p<0.001)
Age on admission	19-29	1241 (85.8)	205 (14.2)	-	-
	30-39	2101 (79.1)	555 (20.9)	1.60 (1.34-1.91, p<0.001)	1.45 (1.21-1.74, p<0.001)
	40-49	3596 (74.0)	1264 (26.0)	2.13 (1.82-2.51, p<0.001)	1.74 (1.47-2.06, p<0.001)
	50-59	6389 (71.7)	2521 (28.3)	2.39 (2.05-2.80, p<0.001)	1.82 (1.54-2.14, p<0.001)
	60-69	8166 (74.9)	2740 (25.1)	2.03 (1.75-2.38, p<0.001)	1.40 (1.19-1.65, p<0.001)
	70-79	14285 (87.9)	1960 (12.1)	0.83 (0.71-0.97, p=0.019)	0.54 (0.46-0.64, p<0.001)
	80-89	18964 (97.1)	567 (2.9)	0.18 (0.15-0.21, p<0.001)	0.11 (0.10-0.14, p<0.001)
	90+	7004 (98.6)	103 (1.4)	0.09 (0.07-0.11, p<0.001)	0.06 (0.05-0.07, p<0.001)
Sex at Birth	Female	28230 (90.1)	3100 (9.9)	-	-
	Male	33348 (83.1)	6792 (16.9)	1.85 (1.77-1.94, p<0.001)	1.51 (1.44-1.59, p<0.001)
Deprivation	1 (least deprived)	8747 (86.2)	1401 (13.8)	-	-
	2	10923 (86.9)	1653 (13.1)	0.94 (0.88-1.02, p=0.146)	0.89 (0.81-0.97, p=0.009)
	3	13352 (86.3)	2115 (13.7)	0.99 (0.92-1.06, p=0.765)	0.89 (0.82-0.97, p=0.011)
	4	13360 (85.1)	2340 (14.9)	1.09 (1.02-1.17, p=0.014)	0.89 (0.81-0.97, p=0.006)
	5 (most deprived)	15352 (86.5)	2405 (13.5)	0.98 (0.91-1.05, p=0.540)	0.79 (0.73-0.86, p<0.001)

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Dependent: Critical Care Admission		No	Yes	OR (univariable)	OR (multilevel)
Gastrointestinal or liver complication	No	56625 (88.8)	7173 (11.2)	-	-
	Yes	5121 (65.1)	2742 (34.9)	4.23 (4.01-4.45, p<0.001)	3.52 (3.32-3.74, p<0.001)
Age on admission	19-29	1241 (85.8)	205 (14.2)	-	-
	30-39	2101 (79.1)	555 (20.9)	1.60 (1.34-1.91, p<0.001)	1.45 (1.21-1.75, p<0.001)
	40-49	3596 (74.0)	1264 (26.0)	2.13 (1.82-2.51, p<0.001)	1.84 (1.56-2.19, p<0.001)
	50-59	6389 (71.7)	2521 (28.3)	2.39 (2.05-2.80, p<0.001)	2.08 (1.77-2.45, p<0.001)
	60-69	8166 (74.9)	2740 (25.1)	2.03 (1.75-2.38, p<0.001)	1.82 (1.55-2.14, p<0.001)
	70-79	14285 (87.9)	1960 (12.1)	0.83 (0.71-0.97, p=0.019)	0.77 (0.65-0.90, p=0.001)
	80-89	18964 (97.1)	567 (2.9)	0.18 (0.15-0.21, p<0.001)	0.18 (0.15-0.21, p<0.001)
	90+	7004 (98.6)	103 (1.4)	0.09 (0.07-0.11, p<0.001)	0.09 (0.07-0.12, p<0.001)
Sex at Birth	Female	28230 (90.1)	3100 (9.9)	-	-
	Male	33348 (83.1)	6792 (16.9)	1.85 (1.77-1.94, p<0.001)	1.56 (1.48-1.63, p<0.001)
Deprivation	1 (least deprived)	8747 (86.2)	1401 (13.8)	-	-
	2	10923 (86.9)	1653 (13.1)	0.94 (0.88-1.02, p=0.146)	0.89 (0.82-0.97, p=0.009)
	3	13352 (86.3)	2115 (13.7)	0.99 (0.92-1.06, p=0.765)	0.93 (0.86-1.01, p=0.096)
	4	13360 (85.1)	2340 (14.9)	1.09 (1.02-1.17, p=0.014)	0.94 (0.87-1.03, p=0.170)
	5 (most deprived)	15352 (86.5)	2405 (13.5)	0.98 (0.91-1.05, p=0.540)	0.85 (0.78-0.92, p<0.001)

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Dependent: Critical Care Admission		No	Yes	OR (univariable)	OR (multilevel)
Cardiovascular complication	No	55139 (87.9)	7619 (12.1)	-	-
	Yes	6607 (74.2)	2296 (25.8)	2.51 (2.38-2.65, p<0.001)	3.64 (3.42-3.88, p<0.001)
Age on admission	19-29	1241 (85.8)	205 (14.2)	-	-
	30-39	2101 (79.1)	555 (20.9)	1.60 (1.34-1.91, p<0.001)	1.48 (1.24-1.78, p<0.001)
	40-49	3596 (74.0)	1264 (26.0)	2.13 (1.82-2.51, p<0.001)	1.83 (1.54-2.16, p<0.001)
	50-59	6389 (71.7)	2521 (28.3)	2.39 (2.05-2.80, p<0.001)	2.02 (1.72-2.37, p<0.001)
	60-69	8166 (74.9)	2740 (25.1)	2.03 (1.75-2.38, p<0.001)	1.63 (1.39-1.91, p<0.001)
	70-79	14285 (87.9)	1960 (12.1)	0.83 (0.71-0.97, p=0.019)	0.63 (0.53-0.74, p<0.001)
	80-89	18964 (97.1)	567 (2.9)	0.18 (0.15-0.21, p<0.001)	0.13 (0.11-0.16, p<0.001)
	90+	7004 (98.6)	103 (1.4)	0.09 (0.07-0.11, p<0.001)	0.07 (0.05-0.09, p<0.001)
Sex at Birth	Female	28230 (90.1)	3100 (9.9)	-	-
	Male	33348 (83.1)	6792 (16.9)	1.85 (1.77-1.94, p<0.001)	1.61 (1.53-1.69, p<0.001)
Deprivation	1 (least deprived)	8747 (86.2)	1401 (13.8)	-	-
	2	10923 (86.9)	1653 (13.1)	0.94 (0.88-1.02, p=0.146)	0.89 (0.81-0.97, p=0.006)
	3	13352 (86.3)	2115 (13.7)	0.99 (0.92-1.06, p=0.765)	0.92 (0.84-1.00, p=0.046)
	4	13360 (85.1)	2340 (14.9)	1.09 (1.02-1.17, p=0.014)	0.92 (0.85-1.00, p=0.050)
	5 (most deprived)	15352 (86.5)	2405 (13.5)	0.98 (0.91-1.05, p=0.540)	0.83 (0.76-0.90, p<0.001)

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Dependent: Critical Care Admission		No	Yes	OR (univariable)	OR (multilevel)
Neurological complication	No	59321 (86.5)	9264 (13.5)	-	-
	Yes	2425 (78.8)	651 (21.2)	1.72 (1.57-1.88, p<0.001)	1.88 (1.70-2.08, p<0.001)
Age on admission	19-29	1241 (85.8)	205 (14.2)	-	-
	30-39	2101 (79.1)	555 (20.9)	1.60 (1.34-1.91, p<0.001)	1.51 (1.26-1.81, p<0.001)
	40-49	3596 (74.0)	1264 (26.0)	2.13 (1.82-2.51, p<0.001)	1.91 (1.62-2.26, p<0.001)
	50-59	6389 (71.7)	2521 (28.3)	2.39 (2.05-2.80, p<0.001)	2.17 (1.85-2.55, p<0.001)
	60-69	8166 (74.9)	2740 (25.1)	2.03 (1.75-2.38, p<0.001)	1.85 (1.58-2.17, p<0.001)
	70-79	14285 (87.9)	1960 (12.1)	0.83 (0.71-0.97, p=0.019)	0.75 (0.64-0.88, p<0.001)
	80-89	18964 (97.1)	567 (2.9)	0.18 (0.15-0.21, p<0.001)	0.17 (0.14-0.20, p<0.001)
	90+	7004 (98.6)	103 (1.4)	0.09 (0.07-0.11, p<0.001)	0.09 (0.07-0.11, p<0.001)
Sex at Birth	Female	28230 (90.1)	3100 (9.9)	-	-
	Male	33348 (83.1)	6792 (16.9)	1.85 (1.77-1.94, p<0.001)	1.65 (1.57-1.73, p<0.001)
Deprivation	1 (least deprived)	8747 (86.2)	1401 (13.8)	-	-
	2	10923 (86.9)	1653 (13.1)	0.94 (0.88-1.02, p=0.146)	0.90 (0.82-0.97, p=0.010)
	3	13352 (86.3)	2115 (13.7)	0.99 (0.92-1.06, p=0.765)	0.92 (0.85-1.00, p=0.065)
	4	13360 (85.1)	2340 (14.9)	1.09 (1.02-1.17, p=0.014)	0.94 (0.86-1.02, p=0.114)
	5 (most deprived)	15352 (86.5)	2405 (13.5)	0.98 (0.91-1.05, p=0.540)	0.83 (0.77-0.91, p<0.001)

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Dependent: Critical Care Admission		No	Yes	OR (univariable)	OR (multilevel)
Respiratory complication	No	54321 (93.2)	3986 (6.8)	-	-
	Yes	7425 (55.6)	5929 (44.4)	10.88 (10.38-11.41, p<0.001)	12.48 (11.81-13.18, p<0.001)
Age on admission	19-29	1241 (85.8)	205 (14.2)	-	-
	30-39	2101 (79.1)	555 (20.9)	1.60 (1.34-1.91, p<0.001)	1.28 (1.05-1.56, p=0.015)
	40-49	3596 (74.0)	1264 (26.0)	2.13 (1.82-2.51, p<0.001)	1.40 (1.17-1.68, p<0.001)
	50-59	6389 (71.7)	2521 (28.3)	2.39 (2.05-2.80, p<0.001)	1.56 (1.31-1.86, p<0.001)
	60-69	8166 (74.9)	2740 (25.1)	2.03 (1.75-2.38, p<0.001)	1.27 (1.06-1.51, p=0.008)
	70-79	14285 (87.9)	1960 (12.1)	0.83 (0.71-0.97, p=0.019)	0.52 (0.44-0.62, p<0.001)
	80-89	18964 (97.1)	567 (2.9)	0.18 (0.15-0.21, p<0.001)	0.11 (0.09-0.14, p<0.001)
	90+	7004 (98.6)	103 (1.4)	0.09 (0.07-0.11, p<0.001)	0.06 (0.04-0.08, p<0.001)
Sex at Birth	Female	28230 (90.1)	3100 (9.9)	-	-
	Male	33348 (83.1)	6792 (16.9)	1.85 (1.77-1.94, p<0.001)	1.53 (1.44-1.61, p<0.001)
Deprivation	1 (least deprived)	8747 (86.2)	1401 (13.8)	-	-
	2	10923 (86.9)	1653 (13.1)	0.94 (0.88-1.02, p=0.146)	0.86 (0.79-0.95, p=0.003)
	3	13352 (86.3)	2115 (13.7)	0.99 (0.92-1.06, p=0.765)	0.90 (0.82-0.99, p=0.029)
	4	13360 (85.1)	2340 (14.9)	1.09 (1.02-1.17, p=0.014)	0.88 (0.81-0.97, p=0.009)
	5 (most deprived)	15352 (86.5)	2405 (13.5)	0.98 (0.91-1.05, p=0.540)	0.80 (0.73-0.88, p<0.001)

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156 **Supplementary table 10 - Effect of complications on odds of worse ability to self-care at**  
 157 **discharge (adjusted logistic regression models) for figure 4C**

158 *Supplementary table 10A - Any complication*

Dependent: Self-care ability		Equivalent to before illness	Worse	OR (univariable)	OR (multilevel)
Any complication	No	19692 (77.4)	5759 (22.6)	-	-
	Yes	12174 (61.7)	7550 (38.3)	2.12 (2.04-2.21, p<0.001)	2.41 (2.30-2.52, p<0.001)
Age (years)	19-29	1121 (86.7)	172 (13.3)	-	-
	30-39	1962 (83.7)	383 (16.3)	1.27 (1.05-1.55, p=0.015)	1.54 (1.24-1.92, p<0.001)
	40-49	3331 (79.9)	838 (20.1)	1.64 (1.38-1.96, p<0.001)	2.03 (1.66-2.48, p<0.001)
	50-59	5508 (78.8)	1486 (21.2)	1.76 (1.49-2.09, p<0.001)	2.22 (1.82-2.69, p<0.001)
	60-69	5451 (73.3)	1990 (26.7)	2.38 (2.02-2.82, p<0.001)	3.02 (2.49-3.66, p<0.001)
	70-79	6237 (66.5)	3139 (33.5)	3.28 (2.79-3.88, p<0.001)	4.18 (3.46-5.06, p<0.001)
	80-89	6069 (61.4)	3810 (38.6)	4.09 (3.48-4.84, p<0.001)	5.38 (4.45-6.50, p<0.001)
Sex at Birth	90+	1940 (58.5)	1377 (41.5)	4.63 (3.89-5.52, p<0.001)	6.26 (5.13-7.65, p<0.001)
	Female	14550 (70.9)	5968 (29.1)	-	-
	Male	17230 (70.2)	7308 (29.8)	1.03 (0.99-1.08, p=0.107)	1.05 (1.01-1.10, p=0.021)
Deprivation	1 (least deprived)	4468 (69.7)	1946 (30.3)	-	-
	2	5473 (70.0)	2345 (30.0)	0.98 (0.92-1.06, p=0.655)	0.97 (0.90-1.05, p=0.442)
	3	6751 (69.4)	2983 (30.6)	1.01 (0.95-1.09, p=0.680)	1.03 (0.95-1.12, p=0.438)
	4	7008 (70.2)	2982 (29.8)	0.98 (0.91-1.05, p=0.504)	1.07 (0.99-1.16, p=0.095)
	5 (most deprived)	8156 (72.8)	3052 (27.2)	0.86 (0.80-0.92, p<0.001)	1.03 (0.95-1.11, p=0.545)

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Dependent: Self-care ability		Equivalent to before illness	Worse	OR (univariable)	OR (multilevel)
Systemic complication	No	26339 (73.7)	9378 (26.3)	-	-
	Yes	3812 (56.1)	2987 (43.9)	2.20 (2.09-2.32, p<0.001)	2.39 (2.25-2.53, p<0.001)
Age (years)	19-29	1121 (86.7)	172 (13.3)	-	-
	30-39	1962 (83.7)	383 (16.3)	1.27 (1.05-1.55, p=0.015)	1.66 (1.33-2.09, p<0.001)
	40-49	3331 (79.9)	838 (20.1)	1.64 (1.38-1.96, p<0.001)	2.28 (1.85-2.82, p<0.001)
	50-59	5508 (78.8)	1486 (21.2)	1.76 (1.49-2.09, p<0.001)	2.46 (2.01-3.02, p<0.001)
	60-69	5451 (73.3)	1990 (26.7)	2.38 (2.02-2.82, p<0.001)	3.36 (2.74-4.11, p<0.001)
	70-79	6237 (66.5)	3139 (33.5)	3.28 (2.79-3.88, p<0.001)	4.66 (3.82-5.69, p<0.001)
Sex at Birth	80-89	6069 (61.4)	3810 (38.6)	4.09 (3.48-4.84, p<0.001)	6.03 (4.94-7.36, p<0.001)
	90+	1940 (58.5)	1377 (41.5)	4.63 (3.89-5.52, p<0.001)	6.99 (5.68-8.62, p<0.001)
	Female	14550 (70.9)	5968 (29.1)	-	-
	Male	17230 (70.2)	7308 (29.8)	1.03 (0.99-1.08, p=0.107)	1.10 (1.05-1.15, p<0.001)
Deprivation	1 (least deprived)	4468 (69.7)	1946 (30.3)	-	-
	2	5473 (70.0)	2345 (30.0)	0.98 (0.92-1.06, p=0.655)	0.98 (0.91-1.07, p=0.687)
	3	6751 (69.4)	2983 (30.6)	1.01 (0.95-1.09, p=0.680)	1.03 (0.95-1.12, p=0.412)
	4	7008 (70.2)	2982 (29.8)	0.98 (0.91-1.05, p=0.504)	1.09 (1.01-1.19, p=0.031)
	5 (most deprived)	8156 (72.8)	3052 (27.2)	0.86 (0.80-0.92, p<0.001)	1.03 (0.95-1.12, p=0.429)



Dependent: Self-care ability		Equivalent to before illness	Worse	OR (univariable)	OR (multilevel)
Renal complication	No	25847 (74.1)	9039 (25.9)	-	-
	Yes	5287 (58.2)	3791 (41.8)	2.05 (1.95-2.15, p<0.001)	2.12 (2.01-2.23, p<0.001)
Age (years)	19-29	1121 (86.7)	172 (13.3)	-	-
	30-39	1962 (83.7)	383 (16.3)	1.27 (1.05-1.55, p=0.015)	1.67 (1.34-2.10, p<0.001)
	40-49	3331 (79.9)	838 (20.1)	1.64 (1.38-1.96, p<0.001)	2.25 (1.83-2.77, p<0.001)
	50-59	5508 (78.8)	1486 (21.2)	1.76 (1.49-2.09, p<0.001)	2.38 (1.95-2.91, p<0.001)
	60-69	5451 (73.3)	1990 (26.7)	2.38 (2.02-2.82, p<0.001)	3.27 (2.68-3.99, p<0.001)
	70-79	6237 (66.5)	3139 (33.5)	3.28 (2.79-3.88, p<0.001)	4.45 (3.66-5.43, p<0.001)
	80-89	6069 (61.4)	3810 (38.6)	4.09 (3.48-4.84, p<0.001)	5.72 (4.70-6.97, p<0.001)
	90+	1940 (58.5)	1377 (41.5)	4.63 (3.89-5.52, p<0.001)	6.61 (5.38-8.13, p<0.001)
Sex at Birth	Female	14550 (70.9)	5968 (29.1)	-	-
	Male	17230 (70.2)	7308 (29.8)	1.03 (0.99-1.08, p=0.107)	1.06 (1.01-1.11, p=0.017)
Deprivation	1 (least deprived)	4468 (69.7)	1946 (30.3)	-	-
	2	5473 (70.0)	2345 (30.0)	0.98 (0.92-1.06, p=0.655)	0.97 (0.89-1.05, p=0.443)
	3	6751 (69.4)	2983 (30.6)	1.01 (0.95-1.09, p=0.680)	1.02 (0.94-1.11, p=0.590)
	4	7008 (70.2)	2982 (29.8)	0.98 (0.91-1.05, p=0.504)	1.06 (0.98-1.15, p=0.139)
	5 (most deprived)	8156 (72.8)	3052 (27.2)	0.86 (0.80-0.92, p<0.001)	1.01 (0.94-1.10, p=0.724)

Dependent: Self-care ability		Equivalent to before illness	Worse	OR (univariable)	OR (multilevel)
Gastrointestinal complication	No	29144 (71.4)	11650 (28.6)	-	-
	Yes	2722 (62.1)	1659 (37.9)	1.52 (1.43-1.63, p<0.001)	1.95 (1.82-2.10, p<0.001)
Age (years)	19-29	1121 (86.7)	172 (13.3)	-	-
	30-39	1962 (83.7)	383 (16.3)	1.27 (1.05-1.55, p=0.015)	1.57 (1.27-1.95, p<0.001)
	40-49	3331 (79.9)	838 (20.1)	1.64 (1.38-1.96, p<0.001)	2.14 (1.76-2.61, p<0.001)
	50-59	5508 (78.8)	1486 (21.2)	1.76 (1.49-2.09, p<0.001)	2.39 (1.97-2.89, p<0.001)
	60-69	5451 (73.3)	1990 (26.7)	2.38 (2.02-2.82, p<0.001)	3.37 (2.79-4.08, p<0.001)
	70-79	6237 (66.5)	3139 (33.5)	3.28 (2.79-3.88, p<0.001)	4.75 (3.94-5.73, p<0.001)
	80-89	6069 (61.4)	3810 (38.6)	4.09 (3.48-4.84, p<0.001)	6.14 (5.09-7.41, p<0.001)
	90+	1940 (58.5)	1377 (41.5)	4.63 (3.89-5.52, p<0.001)	7.12 (5.85-8.67, p<0.001)
Sex at Birth	Female	14550 (70.9)	5968 (29.1)	-	-
	Male	17230 (70.2)	7308 (29.8)	1.03 (0.99-1.08, p=0.107)	1.09 (1.04-1.14, p<0.001)
Deprivation	1 (least deprived)	4468 (69.7)	1946 (30.3)	-	-
	2	5473 (70.0)	2345 (30.0)	0.98 (0.92-1.06, p=0.655)	0.97 (0.90-1.05, p=0.470)
	3	6751 (69.4)	2983 (30.6)	1.01 (0.95-1.09, p=0.680)	1.05 (0.97-1.13, p=0.262)
	4	7008 (70.2)	2982 (29.8)	0.98 (0.91-1.05, p=0.504)	1.09 (1.01-1.18, p=0.023)
	5 (most deprived)	8156 (72.8)	3052 (27.2)	0.86 (0.80-0.92, p<0.001)	1.05 (0.97-1.13, p=0.272)

Dependent: Self-care ability		Equivalent to before illness	Worse	OR (univariable)	OR (multilevel)
Cardiovascular complication	No	28222 (72.7)	10600 (27.3)	-	-
	Yes	1957 (53.3)	1716 (46.7)	2.33 (2.18-2.50, p<0.001)	2.18 (2.02-2.35, p<0.001)
Age (years)	19-29	1121 (86.7)	172 (13.3)	-	-
	30-39	1962 (83.7)	383 (16.3)	1.27 (1.05-1.55, p=0.015)	1.69 (1.34-2.12, p<0.001)
	40-49	3331 (79.9)	838 (20.1)	1.64 (1.38-1.96, p<0.001)	2.26 (1.83-2.79, p<0.001)
	50-59	5508 (78.8)	1486 (21.2)	1.76 (1.49-2.09, p<0.001)	2.46 (2.00-3.01, p<0.001)
	60-69	5451 (73.3)	1990 (26.7)	2.38 (2.02-2.82, p<0.001)	3.34 (2.73-4.08, p<0.001)
	70-79	6237 (66.5)	3139 (33.5)	3.28 (2.79-3.88, p<0.001)	4.60 (3.77-5.62, p<0.001)
Sex at Birth	80-89	6069 (61.4)	3810 (38.6)	4.09 (3.48-4.84, p<0.001)	5.91 (4.84-7.21, p<0.001)
	90+	1940 (58.5)	1377 (41.5)	4.63 (3.89-5.52, p<0.001)	6.74 (5.47-8.30, p<0.001)
	Female	14550 (70.9)	5968 (29.1)	-	-
	Male	17230 (70.2)	7308 (29.8)	1.03 (0.99-1.08, p=0.107)	1.10 (1.05-1.15, p<0.001)
Deprivation	1 (least deprived)	4468 (69.7)	1946 (30.3)	-	-
	2	5473 (70.0)	2345 (30.0)	0.98 (0.92-1.06, p=0.655)	0.98 (0.90-1.06, p=0.554)
	3	6751 (69.4)	2983 (30.6)	1.01 (0.95-1.09, p=0.680)	1.03 (0.95-1.12, p=0.447)
	4	7008 (70.2)	2982 (29.8)	0.98 (0.91-1.05, p=0.504)	1.08 (1.00-1.18, p=0.051)
	5 (most deprived)	8156 (72.8)	3052 (27.2)	0.86 (0.80-0.92, p<0.001)	1.03 (0.95-1.12, p=0.507)

Dependent: Self-care ability		Equivalent to before illness	Worse	OR (univariable)	OR (multilevel)
Neurological complication	No	29467 (72.4)	11216 (27.6)	-	-
	Yes	645 (37.5)	1074 (62.5)	4.37 (3.96-4.84, p<0.001)	4.35 (3.90-4.84, p<0.001)
Age (years)	19-29	1121 (86.7)	172 (13.3)	-	-
	30-39	1962 (83.7)	383 (16.3)	1.27 (1.05-1.55, p=0.015)	1.68 (1.33-2.10, p<0.001)
	40-49	3331 (79.9)	838 (20.1)	1.64 (1.38-1.96, p<0.001)	2.27 (1.84-2.81, p<0.001)
	50-59	5508 (78.8)	1486 (21.2)	1.76 (1.49-2.09, p<0.001)	2.47 (2.02-3.03, p<0.001)
	60-69	5451 (73.3)	1990 (26.7)	2.38 (2.02-2.82, p<0.001)	3.41 (2.78-4.17, p<0.001)
	70-79	6237 (66.5)	3139 (33.5)	3.28 (2.79-3.88, p<0.001)	4.73 (3.87-5.78, p<0.001)
	80-89	6069 (61.4)	3810 (38.6)	4.09 (3.48-4.84, p<0.001)	6.08 (4.98-7.43, p<0.001)
	90+	1940 (58.5)	1377 (41.5)	4.63 (3.89-5.52, p<0.001)	6.97 (5.66-8.60, p<0.001)
Sex at Birth	Female	14550 (70.9)	5968 (29.1)	-	-
	Male	17230 (70.2)	7308 (29.8)	1.03 (0.99-1.08, p=0.107)	1.10 (1.05-1.15, p<0.001)
Deprivation	1 (least deprived)	4468 (69.7)	1946 (30.3)	-	-
	2	5473 (70.0)	2345 (30.0)	0.98 (0.92-1.06, p=0.655)	0.98 (0.91-1.07, p=0.681)
	3	6751 (69.4)	2983 (30.6)	1.01 (0.95-1.09, p=0.680)	1.04 (0.96-1.13, p=0.327)
	4	7008 (70.2)	2982 (29.8)	0.98 (0.91-1.05, p=0.504)	1.11 (1.02-1.20, p=0.015)
	5 (most deprived)	8156 (72.8)	3052 (27.2)	0.86 (0.80-0.92, p<0.001)	1.03 (0.95-1.12, p=0.465)

Dependent: Self-care ability		Equivalent to before illness	Worse	OR (univariable)	OR (multilevel)
Respiratory complication	No	26878 (74.2)	9360 (25.8)	-	-
	Yes	3380 (52.4)	3069 (47.6)	2.61 (2.47-2.75, p<0.001)	3.61 (3.39-3.84, p<0.001)
Age (years)	19-29	1121 (86.7)	172 (13.3)	-	-
	30-39	1962 (83.7)	383 (16.3)	1.27 (1.05-1.55, p=0.015)	1.58 (1.25-1.99, p<0.001)
	40-49	3331 (79.9)	838 (20.1)	1.64 (1.38-1.96, p<0.001)	2.02 (1.63-2.50, p<0.001)
	50-59	5508 (78.8)	1486 (21.2)	1.76 (1.49-2.09, p<0.001)	2.22 (1.80-2.72, p<0.001)
	60-69	5451 (73.3)	1990 (26.7)	2.38 (2.02-2.82, p<0.001)	3.24 (2.64-3.98, p<0.001)
	70-79	6237 (66.5)	3139 (33.5)	3.28 (2.79-3.88, p<0.001)	4.90 (4.00-6.00, p<0.001)
Sex at Birth	80-89	6069 (61.4)	3810 (38.6)	4.09 (3.48-4.84, p<0.001)	6.63 (5.42-8.12, p<0.001)
	90+	1940 (58.5)	1377 (41.5)	4.63 (3.89-5.52, p<0.001)	7.59 (6.14-9.38, p<0.001)
	Female	14550 (70.9)	5968 (29.1)	-	-
	Male	17230 (70.2)	7308 (29.8)	1.03 (0.99-1.08, p=0.107)	1.06 (1.02-1.11, p=0.009)
Deprivation	1 (least deprived)	4468 (69.7)	1946 (30.3)	-	-
	2	5473 (70.0)	2345 (30.0)	0.98 (0.92-1.06, p=0.655)	0.98 (0.90-1.06, p=0.614)
	3	6751 (69.4)	2983 (30.6)	1.01 (0.95-1.09, p=0.680)	1.03 (0.95-1.12, p=0.419)
	4	7008 (70.2)	2982 (29.8)	0.98 (0.91-1.05, p=0.504)	1.08 (1.00-1.17, p=0.062)
	5 (most deprived)	8156 (72.8)	3052 (27.2)	0.86 (0.80-0.92, p<0.001)	1.04 (0.96-1.13, p=0.366)

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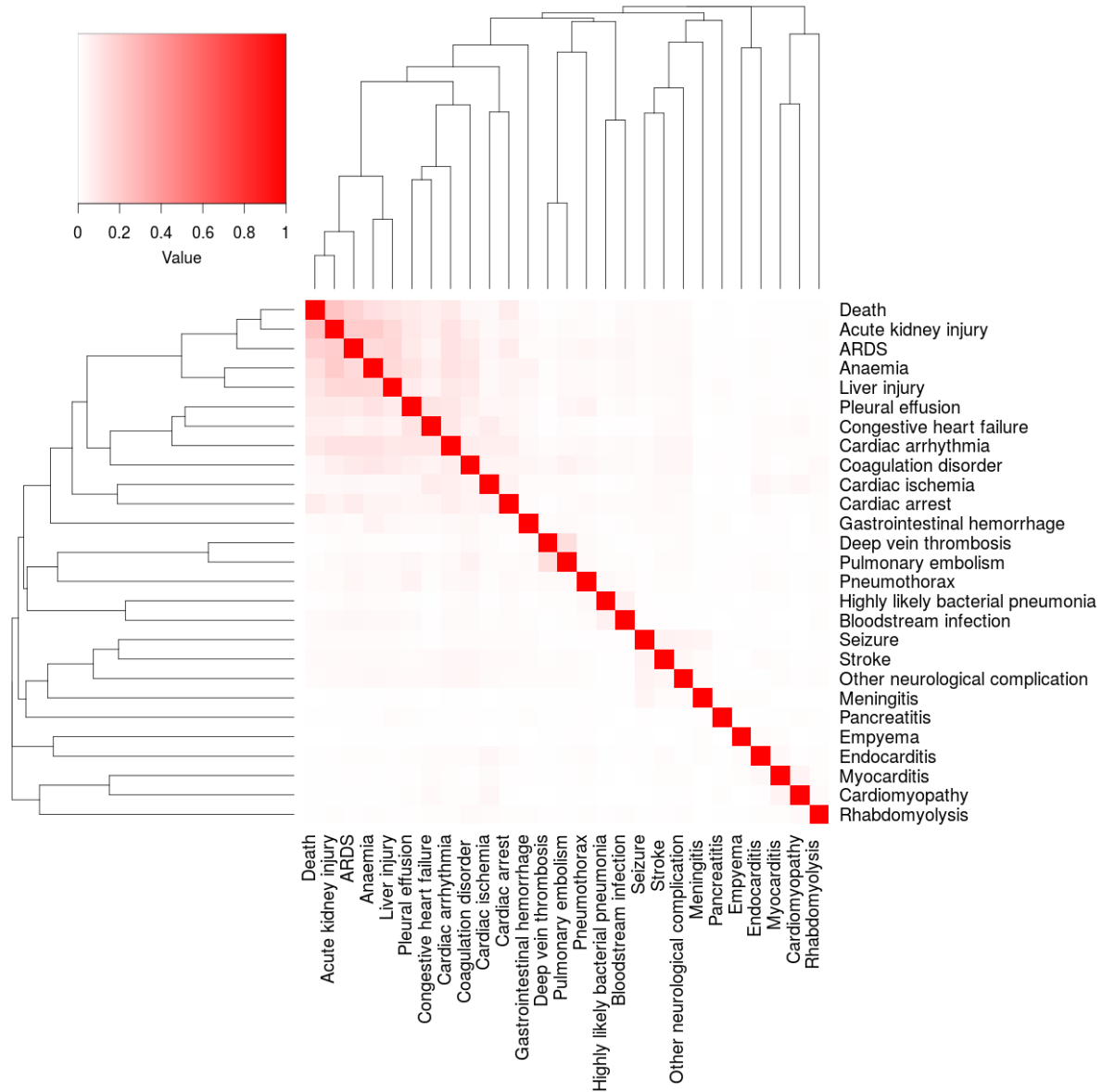
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185 **Supplementary Figures**

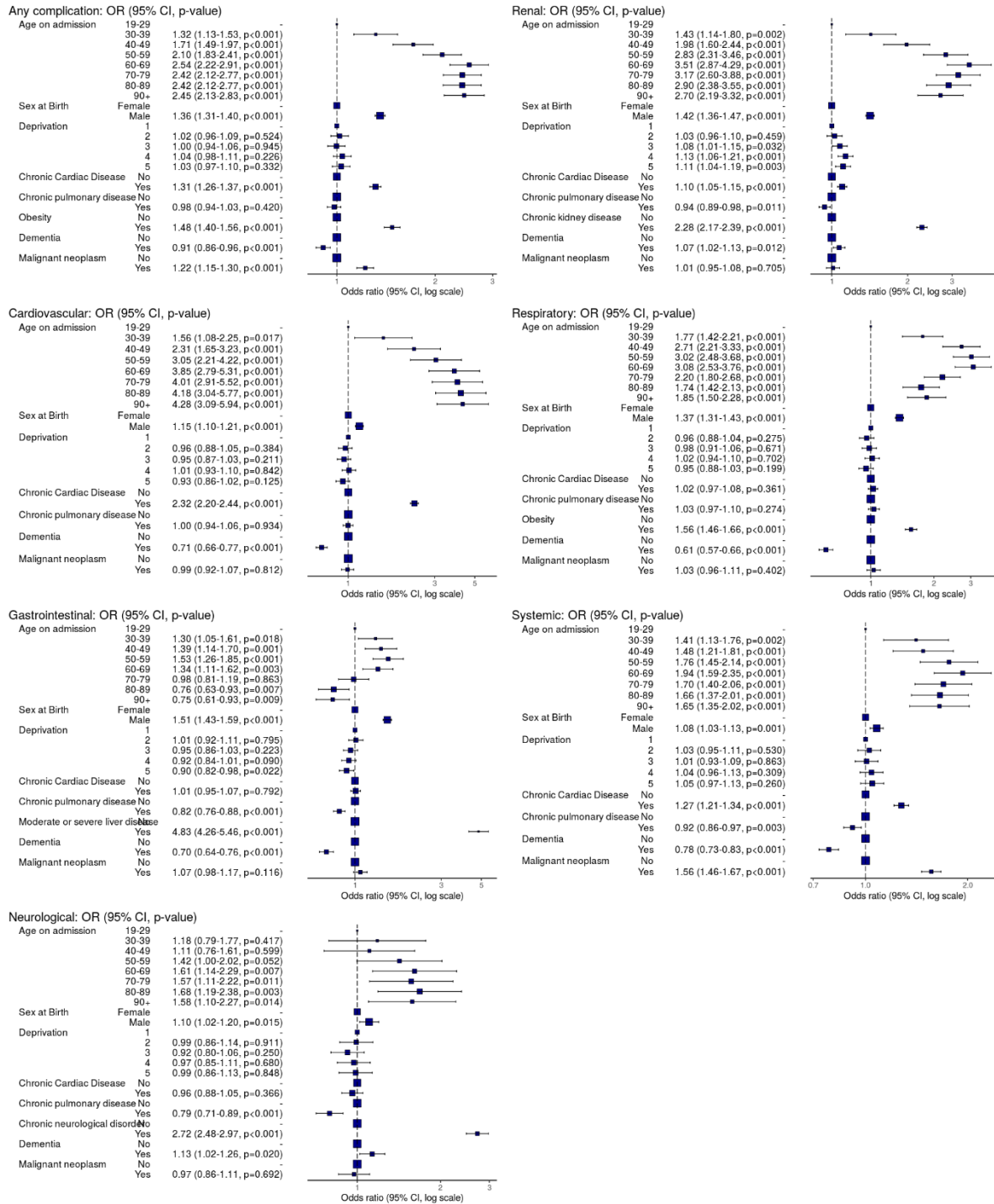
186 **Supplementary figure 1** – Heatmap of co-occurrence of complications. Measured using the  
 187 Jaccard similarity index, where 1 is perfect co-occurrence and 0 is no co-occurrence.



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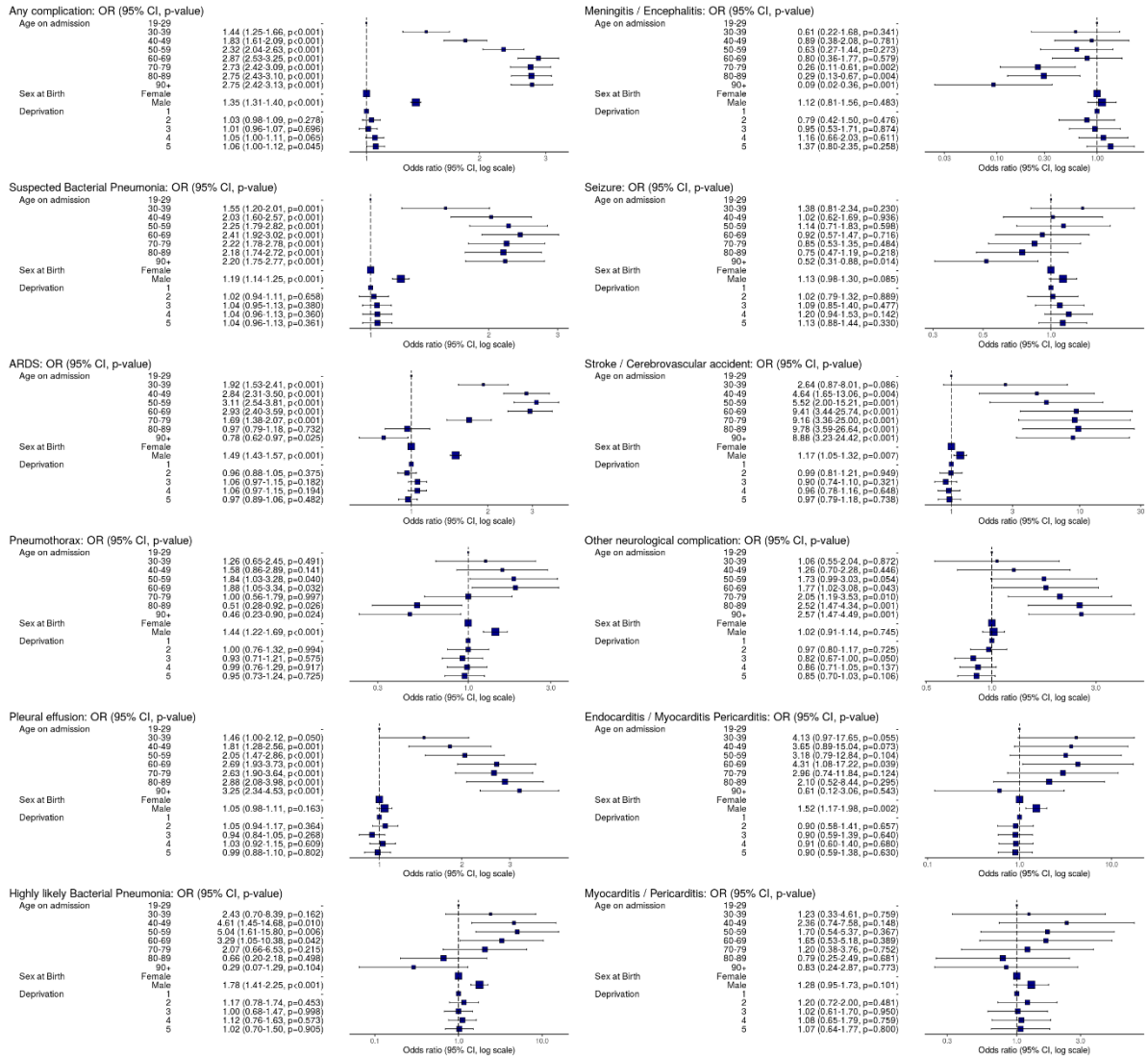
189 **Supplementary figure 2** - Adjusted effect of age and sex on organ specific complications in  
 190 adults with severe COVID-19 (also adjusted for centre as a random effect).

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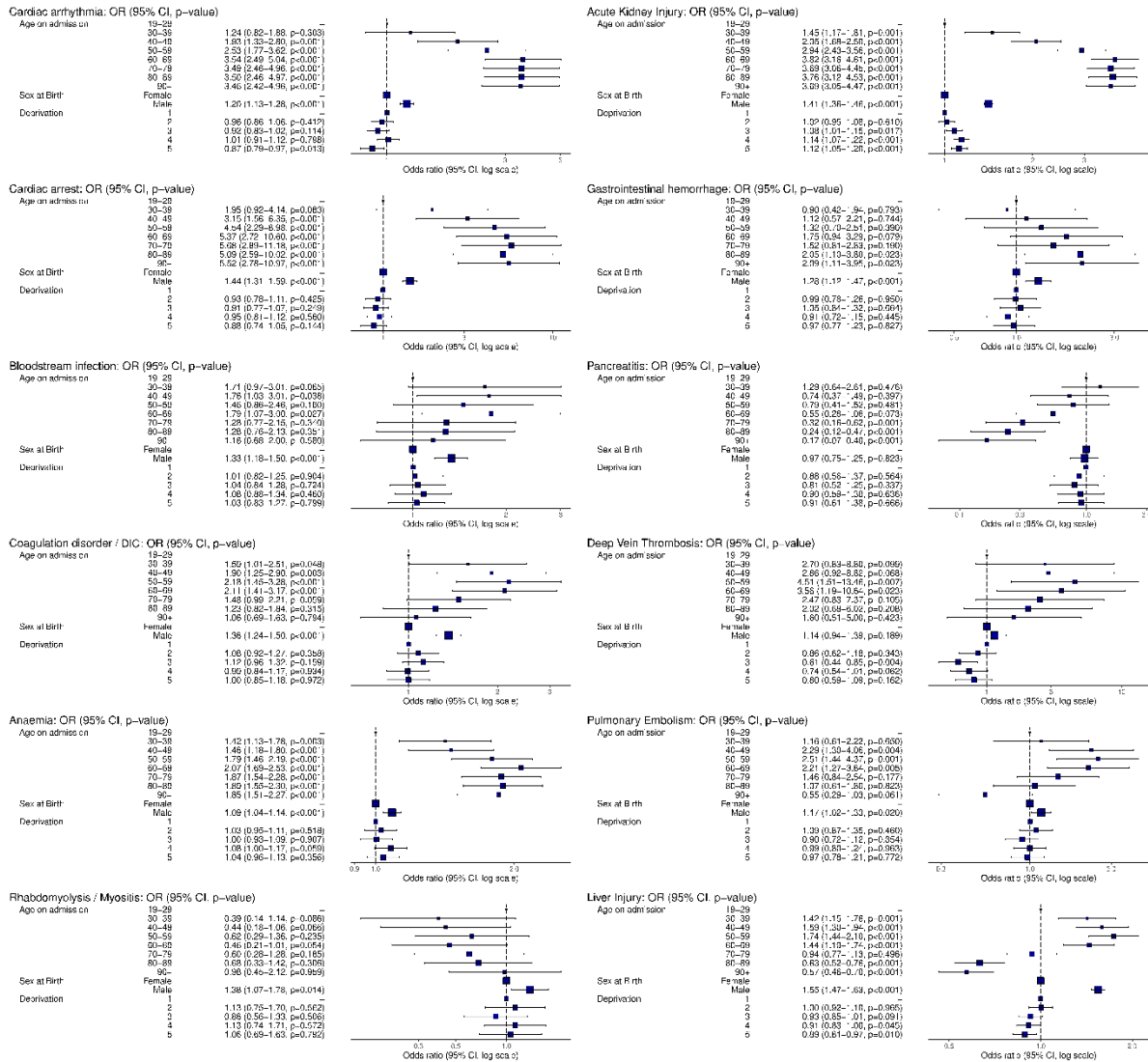
193 **Supplementary figure 3 - Effect of age, sex and deprivation on specific complications in adults**  
 194 with COVID-19 (also adjusted for centre as a random effect).





196 **Supplementary figure 3 (continued) - Effect of age, sex and deprivation on specific**  
 197 **complications in adults with COVID-19 (also adjusted for centre as a random effect).**

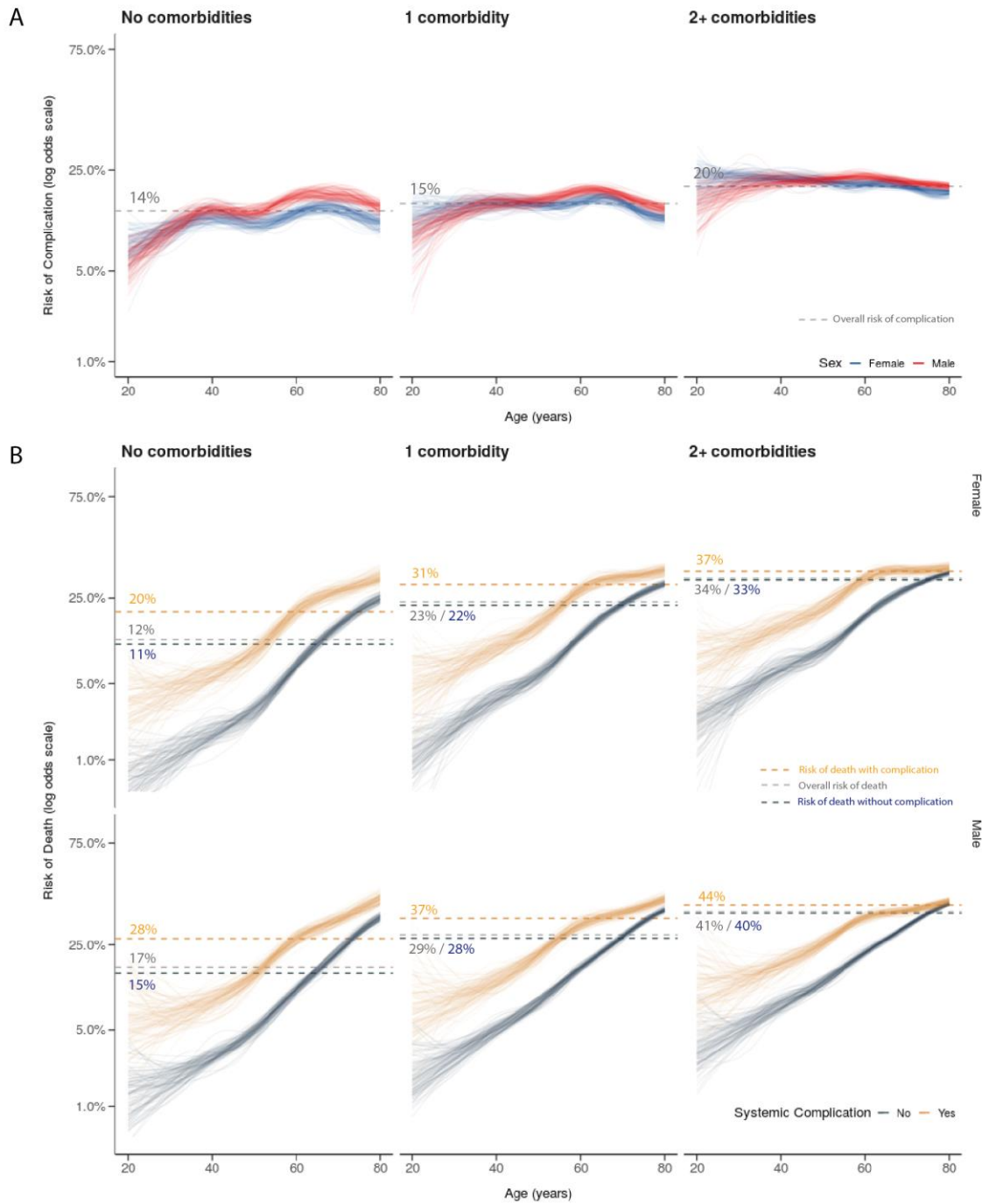
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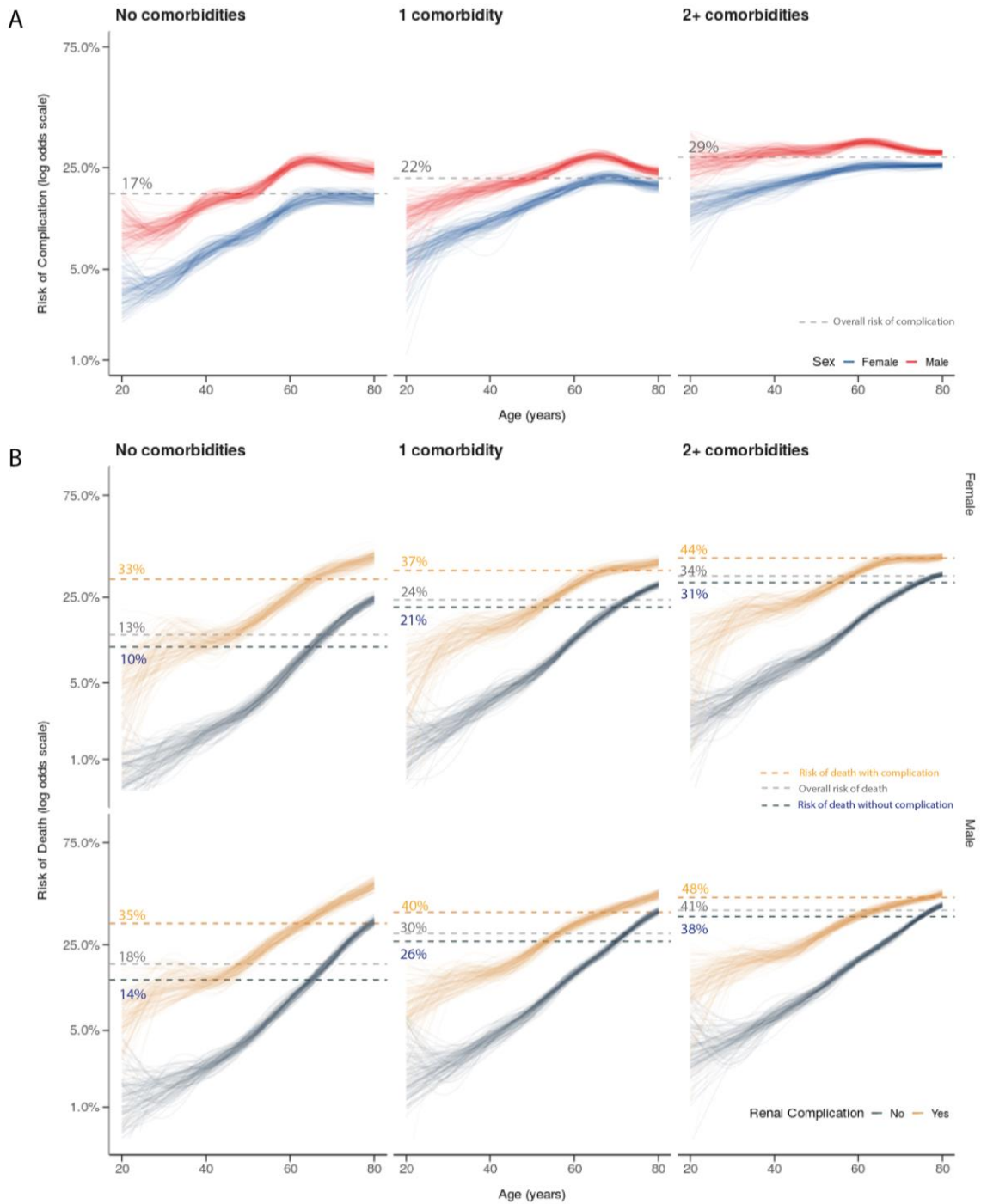
200 DIC- Disseminated intravascular coagulation.

201 **Supplementary figure 4 - Relationship between age, sex, comorbidities and adjusted**  
 202 **outcomes using generalised additive models. (A) Shows relationships for the outcome of**  
 203 **adjusted risk of systemic complications. (B) Shows relationships for the outcome of adjusted**  
 204 **mortality risk, stratified by presence of systemic complications. Each line represents one**  
 205 **bootstrap replicate (i.e. one simulated patient).**



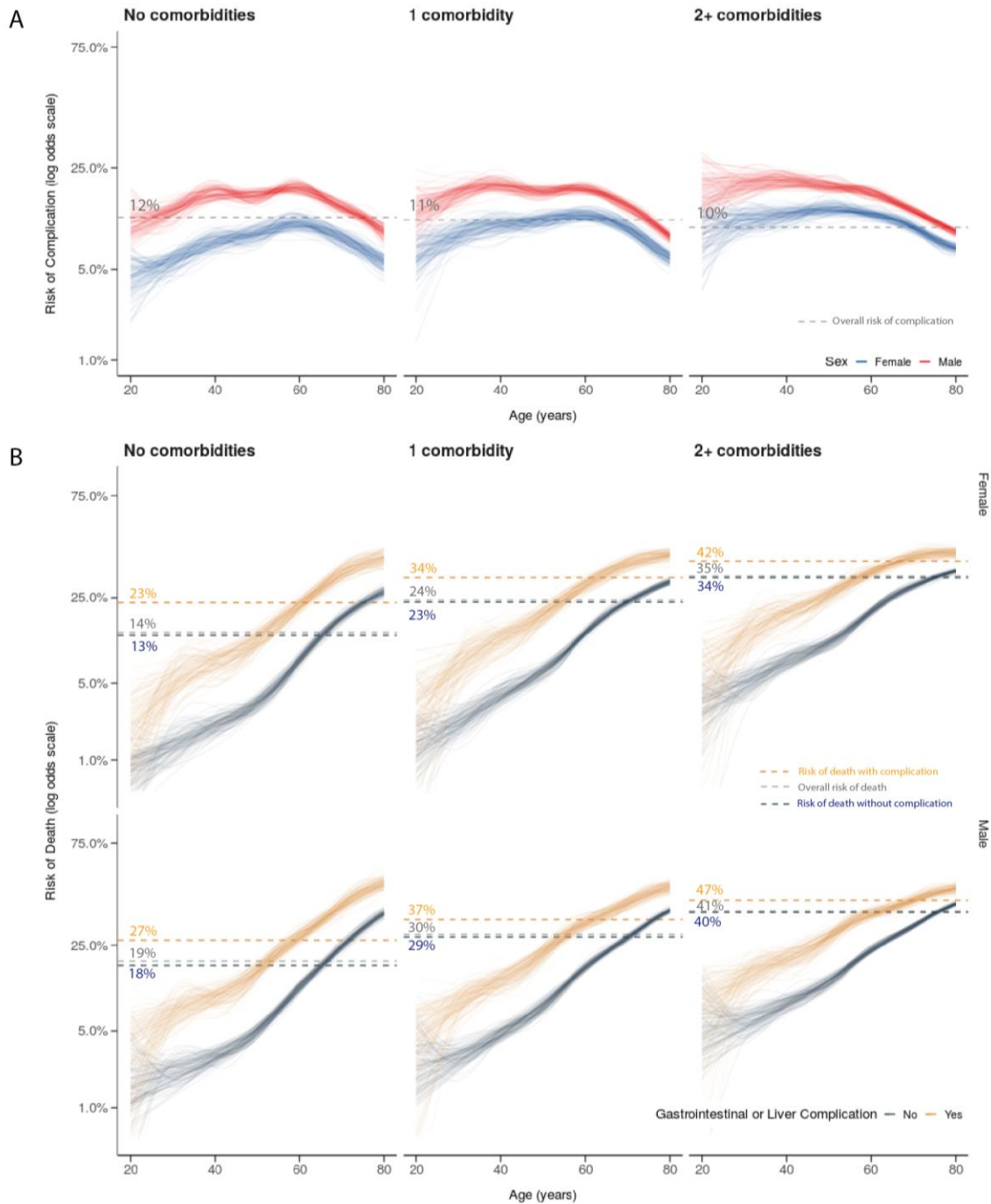
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207 **Supplementary figure 5** - Relationship between age, sex, comorbidities and adjusted  
 208 outcomes using generalised additive models. (A) Shows relationships for the outcome of  
 209 adjusted risk of renal complications. (B) Shows relationships for the outcome of adjusted  
 210 mortality risk, stratified by presence of renal complications. Each line represents one bootstrap  
 211 replicate (i.e. one simulated patient).



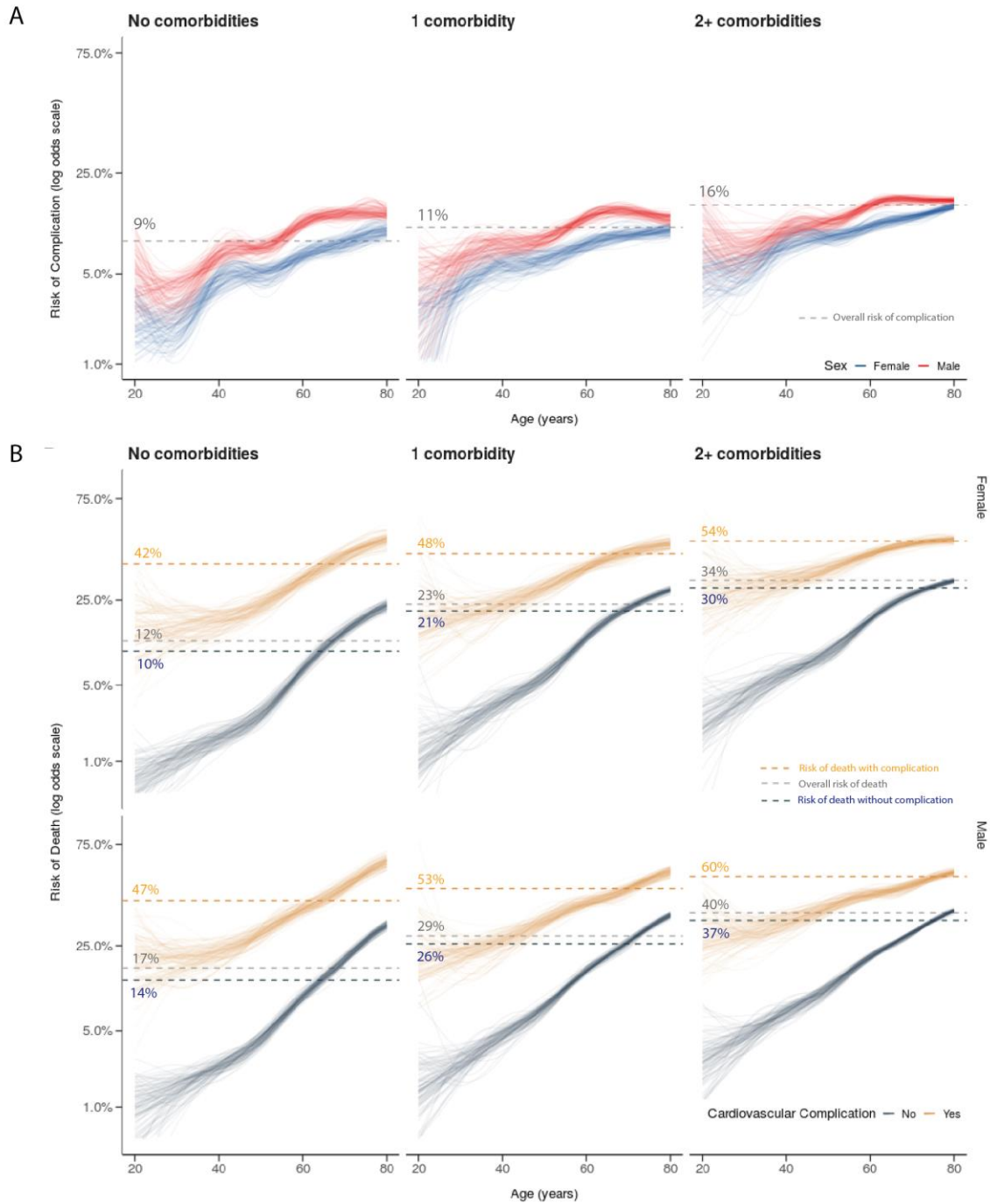
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213 **Supplementary figure 6** - Relationship between age, sex, comorbidities and adjusted  
 214 outcomes using generalised additive models. (A) Shows relationships for the outcome of  
 215 adjusted risk of gastrointestinal or liver complications. (B) Shows relationships for the outcome  
 216 of adjusted mortality risk, stratified by presence of gastrointestinal or liver complications. Each  
 217 line represents one bootstrap replicate (i.e. one simulated patient).



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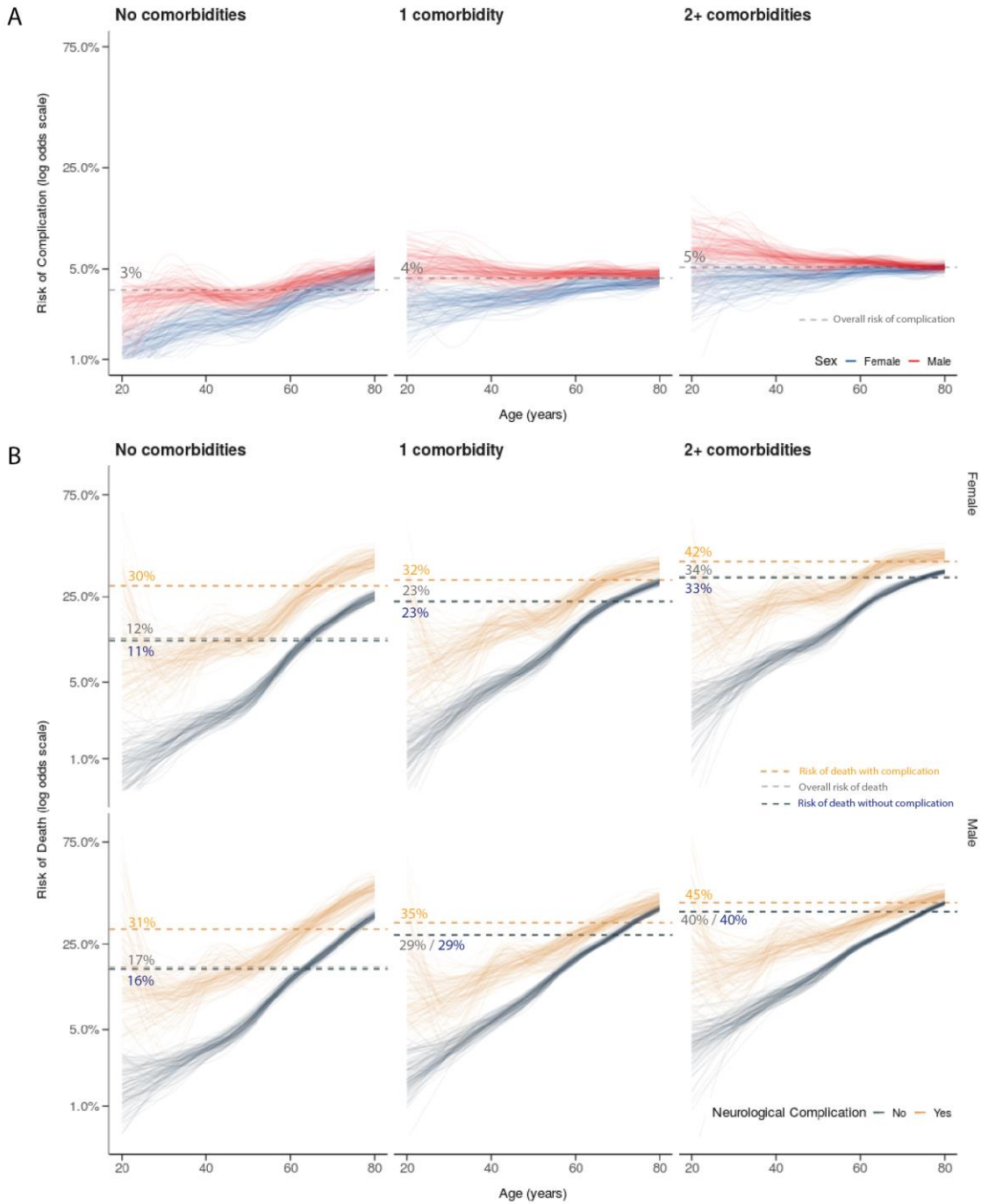
219 **Supplementary figure 7** - Relationship between age, sex, comorbidities and adjusted  
 220 outcomes using generalised additive models. (A) Shows relationships for the outcome of  
 221 adjusted risk of cardiovascular complications. (B) Shows relationships for the outcome of  
 222 adjusted mortality risk, stratified by presence of cardiovascular complications. Each line  
 223 represents one bootstrap replicate (i.e. one simulated patient).



224

225 **Supplementary figure 8** - Relationship between age, sex, comorbidities and adjusted  
 226 outcomes using generalised additive models. (A) Shows relationships for the outcome of  
 227 adjusted risk of neurological complications. (B) Shows relationships for the outcome of adjusted  
 228 mortality risk, stratified by presence of neurological complications. Each line represents one  
 229 bootstrap replicate (i.e. one simulated patient).

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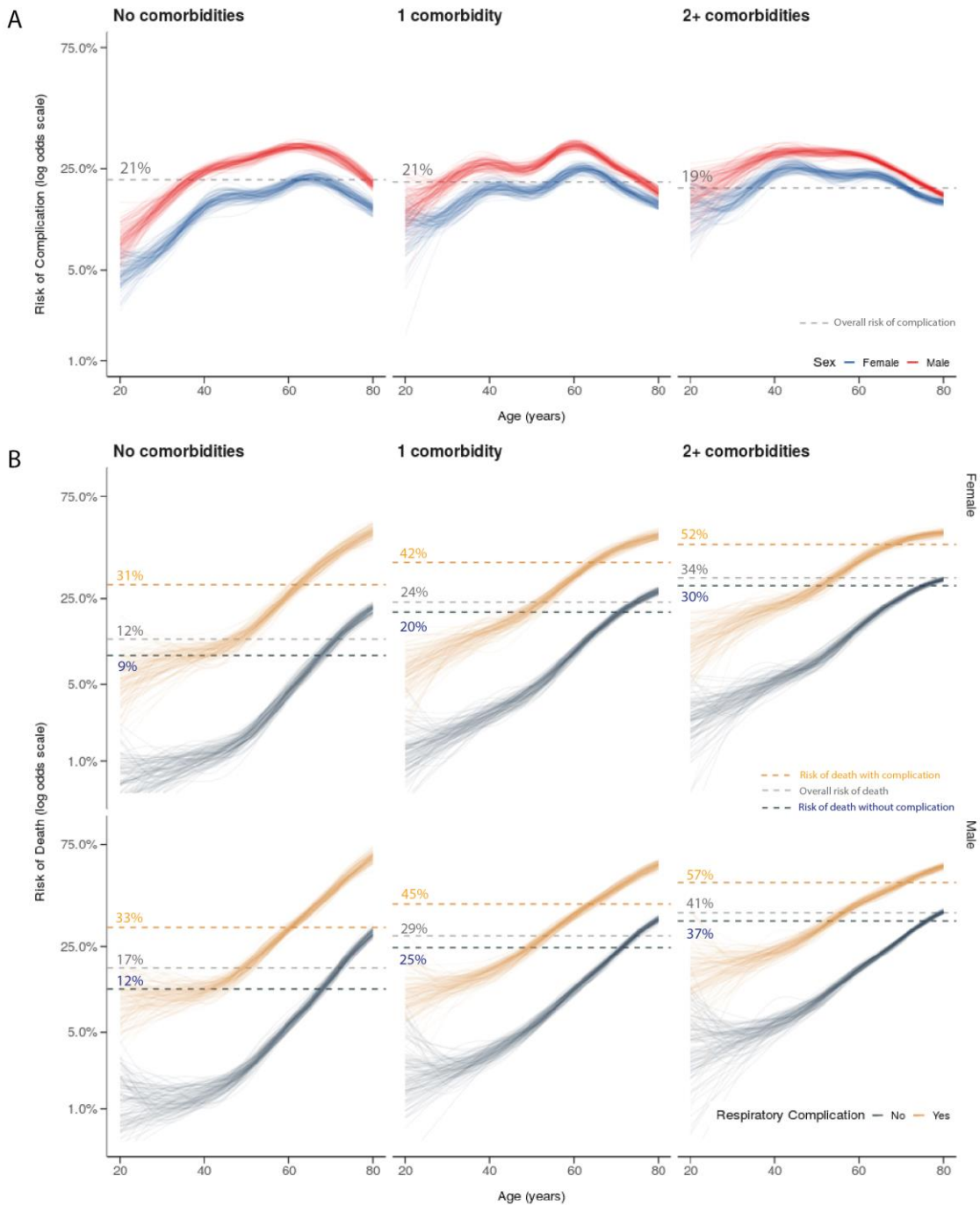


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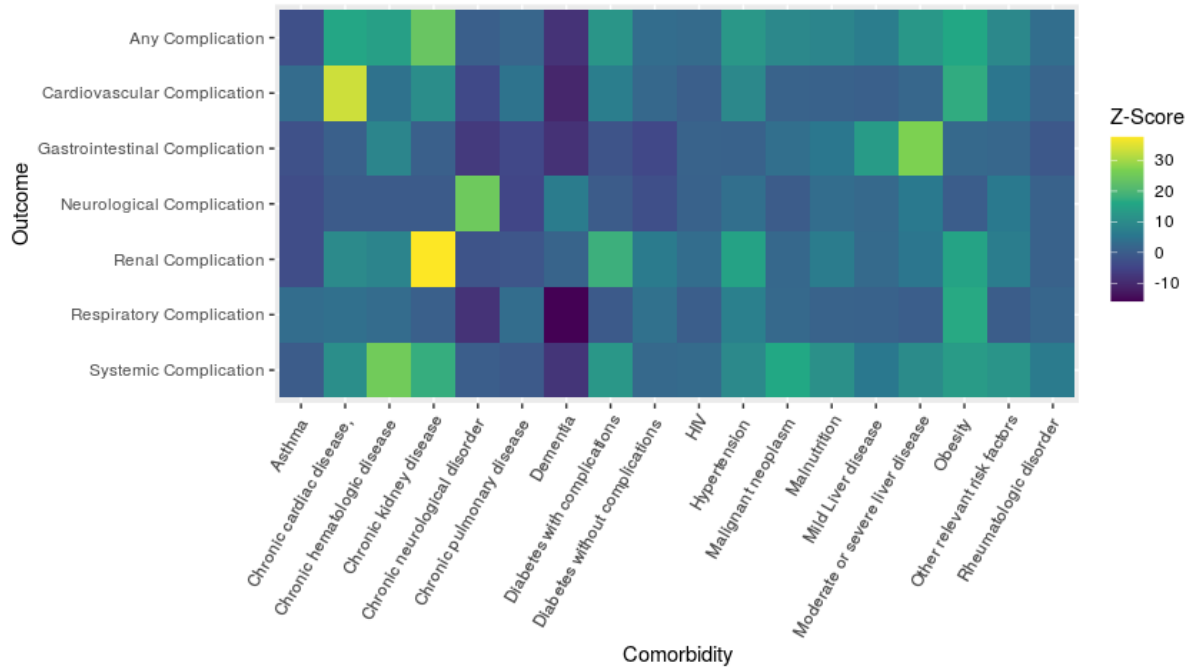
232 **Supplementary figure 9** - Relationship between age, sex, comorbidities and adjusted  
 233 outcomes using generalised additive models. (A) Shows relationships for the outcome of  
 234 adjusted risk of respiratory complications. (B) Shows relationships for the outcome of adjusted  
 235 mortality risk, stratified by presence of respiratory complications. Each line represents one  
 236 bootstrap replicate (i.e. one simulated patient).

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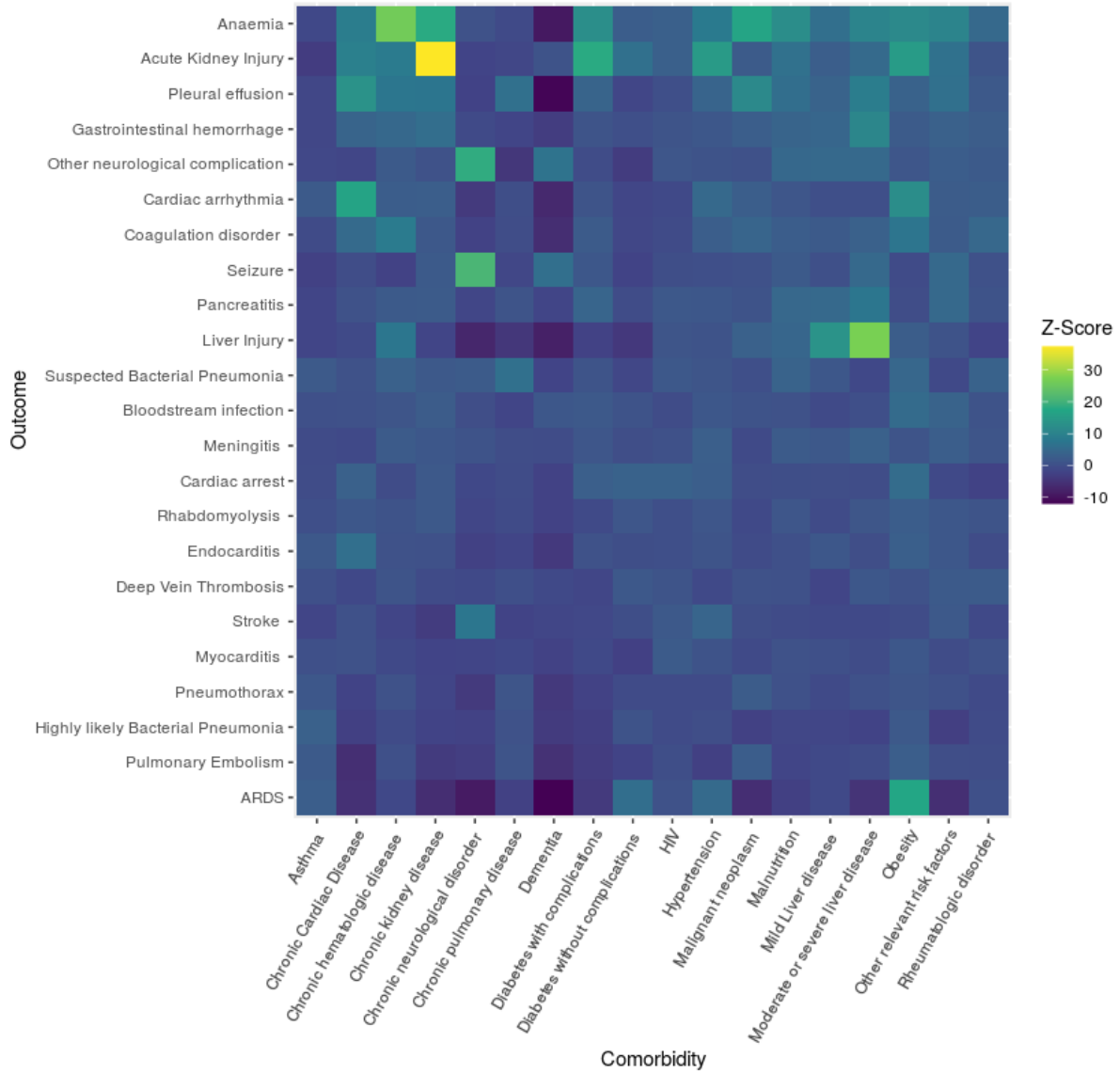
239 **Supplementary figure 11** - Associations between specific comorbidities and organ specific  
 240 complications in adults with severe COVID-19.



241  
 242 *A positive Z-score represents stronger associations between variables in positive direction, whereas negative z-score*  
 243 *represents effect in opposite direction.*



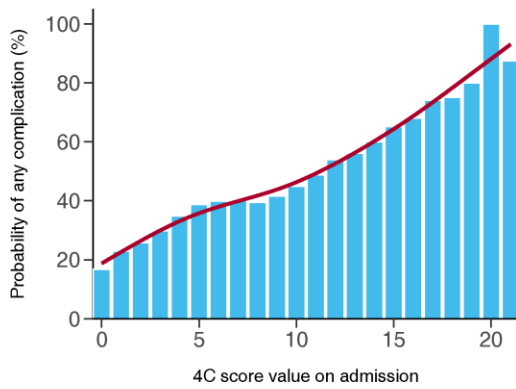
244 **Supplementary figure 12 - Effect of specific comorbidities on specific complications in adults**  
 245 **with COVID-19.**



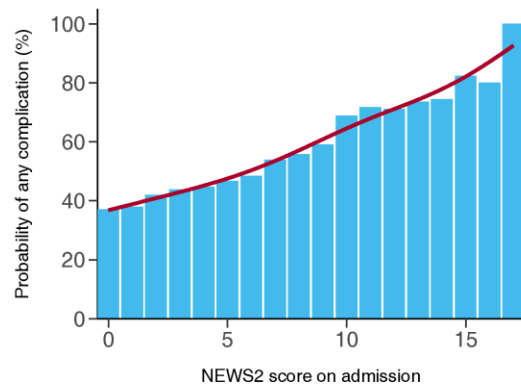
246  
 247 *A positive Z-score represents stronger associations between variables in positive direction, whereas negative z-score*  
 248 *represents effect in opposite direction.*  
 249

250 **Supplementary figure 13** – Probability of complication by admission severity score and  
 251 symptoms in those who survived. (A) ISARIC 4C mortality score against proportion of patients  
 252 experiencing any complication. (B) National Early Warning Score 2 against proportion of  
 253 patients experiencing any complication. (C) Quick Sequential Organ Failure Assessment score  
 254 against proportion of patients experiencing any complication. (D) Total number of symptoms on  
 255 admission against proportion of patients experiencing any complication. For continuous  
 256 outcomes (4C score, NEWS2 and number of symptoms), red line shows smoothed conditional  
 257 mean line using generalised additive model. Higher scores indicate critical illness.

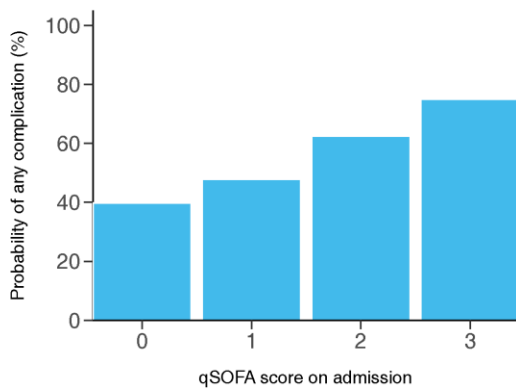
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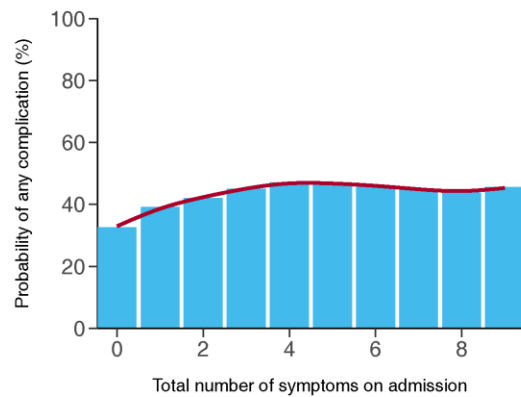
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D



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