## Supplementary appendix

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

Supplementary Figure 1. Multistate model

All study participants start in the "General population" state, from which they can transition to other states in the model over time. To model the impact of VTE/ ATE, their occurrence was treated as a time dependent exposure.
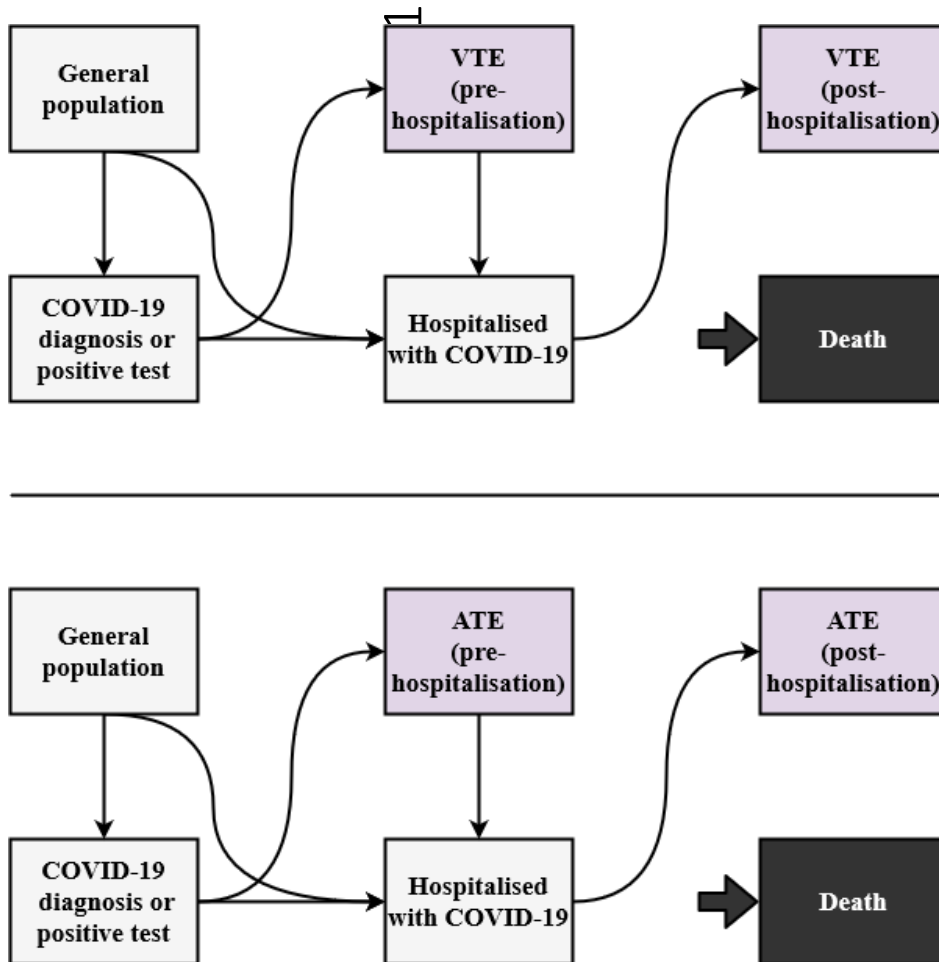
Supplementary Table 1. Cumulative incidence of study outcomes by age and sex strata

Database	Outcome	Time	Strata	Number at risk	Events	Cumulative incidence
IQVIA DA Germany	ATE	0	Age: <=44; Sex: Male	6,123	<5	
IQVIA DA Germany	ATE	30	Age: <=44; Sex: Male	3,797	<5	
IQVIA DA Germany	ATE	60	Age: <=44; Sex: Male	2,910	<5	
IQVIA DA Germany	ATE	90	Age: <=44; Sex: Male	2,123	<5	
IQVIA DA Germany	ATE	0	Age: <=44; Sex: Female	6,966	<5	
IQVIA DA Germany	ATE	30	Age: <=44; Sex: Female	4,859	<5	
IQVIA DA Germany	ATE	60	Age: <=44; Sex: Female	3,933	<5	
IQVIA DA Germany	ATE	90	Age: <=44; Sex: Female	2,994	<5	
IQVIA DA Germany	ATE	0	Age: 45-64; Sex: Male	5,147	<5	
IQVIA DA Germany	ATE	30	Age: 45-64; Sex: Male	4,117	<5	
IQVIA DA Germany	ATE	60	Age: 45-64; Sex: Male	3,499	6	0.14% (0.03% to 0.26%)
IQVIA DA Germany	ATE	90	Age: 45-64; Sex: Male	2,974	9	0.23% (0.08% to 0.39%)
IQVIA DA Germany	ATE	0	Age: 45-64; Sex: Female	6,463	<5	
IQVIA DA Germany	ATE	30	Age: 45-64; Sex: Female	5,327	<5	
IQVIA DA Germany	ATE	60	Age: 45-64; Sex: Female	4,593	<5	
IQVIA DA Germany	ATE	90	Age: 45-64; Sex: Female	3,856	<5	
IQVIA DA Germany	ATE	0	Age: >=65; Sex: Male	2,647	<5	
IQVIA DA Germany	ATE	30	Age: >=65; Sex: Male	2,456	<5	
IQVIA DA Germany	ATE	60	Age: >=65; Sex: Male	2,261	9	0.37% (0.13% to 0.61%)
IQVIA DA Germany	ATE	90	Age: >=65; Sex: Male	1,952	12	0.51% (0.22% to 0.79%)
IQVIA DA Germany	ATE	0	Age: >=65; Sex: Female	4,054	<5	
IQVIA DA Germany	ATE	30	Age: >=65; Sex: Female	3,800	8	0.20% (0.06% to 0.34%)
IQVIA DA Germany	ATE	60	Age: >=65; Sex: Female	3,521	13	0.33% (0.15% to 0.52%)
IQVIA DA Germany	ATE	90	Age: >=65; Sex: Female	3,122	16	0.42% (0.22% to 0.63%)
IQVIA DA Germany	VTE	0	Age: <=44; Sex: Male	6,122	<5	
IQVIA DA Germany	VTE	30	Age: <=44; Sex: Male	3,793	5	0.11% (0.01% to 0.20%)
IQVIA DA Germany	VTE	60	Age: <=44; Sex: Male	2,907	9	0.22% (0.08% to 0.37%)

IQVIA DA Germany	VTE	90	Age: <=44; Sex: Male	2,118	9	0.22% (0.08% to 0.37%)
IQVIA DA Germany	VTE	0	Age: <=44; Sex: Female	6,953	<5	
IQVIA DA Germany	VTE	30	Age: <=44; Sex: Female	4,841	8	0.14% (0.04% to 0.24%)
IQVIA DA Germany	VTE	60	Age: <=44; Sex: Female	3,915	9	0.17% (0.06% to 0.28%)
IQVIA DA Germany	VTE	90	Age: <=44; Sex: Female	2,979	11	0.22% (0.09% to 0.36%)
IQVIA DA Germany	VTE	0	Age: 45-64; Sex: Male	5,171	<5	
IQVIA DA Germany	VTE	30	Age: 45-64; Sex: Male	4,137	10	0.21% (0.08% to 0.35%)
IQVIA DA Germany	VTE	60	Age: 45-64; Sex: Male	3,514	16	0.37% (0.19% to 0.55%)
IQVIA DA Germany	VTE	90	Age: 45-64; Sex: Male	2,985	17	0.40% (0.21% to 0.59%)
IQVIA DA Germany	VTE	0	Age: 45-64; Sex: Female	6,448	<5	
IQVIA DA Germany	VTE	30	Age: 45-64; Sex: Female	5,297	21	0.35% (0.20% to 0.50%)
IQVIA DA Germany	VTE	60	Age: 45-64; Sex: Female	4,565	29	0.51% (0.33% to 0.70%)
IQVIA DA Germany	VTE	90	Age: 45-64; Sex: Female	3,825	34	0.63% (0.42% to 0.85%)
IQVIA DA Germany	VTE	0	Age: >=65; Sex: Male	2,703	<5	
IQVIA DA Germany	VTE	30	Age: >=65; Sex: Male	2,509	6	0.23% (0.05% to 0.41%)
IQVIA DA Germany	VTE	60	Age: >=65; Sex: Male	2,315	10	0.40% (0.15% to 0.64%)
IQVIA DA Germany	VTE	90	Age: >=65; Sex: Male	1,995	11	0.44% (0.18% to 0.70%)
IQVIA DA Germany	VTE	0	Age: >=65; Sex: Female	4,088	<5	
IQVIA DA Germany	VTE	30	Age: >=65; Sex: Female	3,827	16	0.41% (0.21% to 0.60%)
IQVIA DA Germany	VTE	60	Age: >=65; Sex: Female	3,545	24	0.62% (0.37% to 0.87%)
IQVIA DA Germany	VTE	90	Age: >=65; Sex: Female	3,150	28	0.74% (0.47% to 1.01%)
CPRD AURUM	ATE	0	Age: <=44; Sex: Male	97,118	<5	
CPRD AURUM	ATE	30	Age: <=44; Sex: Male	73,541	<5	
CPRD AURUM	ATE	60	Age: <=44; Sex: Male	37,800	<5	
CPRD AURUM	ATE	90	Age: <=44; Sex: Male	25,172	<5	
CPRD AURUM	ATE	0	Age: <=44; Sex: Female	124,759	<5	
CPRD AURUM	ATE	30	Age: <=44; Sex: Female	94,507	5	0.00% (0.01% to 0.00%)
CPRD AURUM	ATE	60	Age: <=44; Sex: Female	48,563	5	0.00% (0.01% to 0.00%)
CPRD AURUM	ATE	90	Age: <=44; Sex: Female	30,720	5	0.00% (0.01% to 0.00%)
CPRD AURUM	ATE	0	Age: 45-64; Sex: Male	67,844	<5	

CPRD AURUM	ATE	30	Age: 45-64; Sex: Male	49,164		25	0.04% (0.06% to 0.03%)
CPRD AURUM	ATE	60	Age: 45-64; Sex: Male	24,676		40	0.08% (0.11% to 0.06%)
CPRD AURUM	ATE	90	Age: 45-64; Sex: Male	14,998		48	0.12% (0.17% to 0.09%)
CPRD AURUM	ATE	0	Age: 45-64; Sex: Female	77,183	<5		
CPRD AURUM	ATE	30	Age: 45-64; Sex: Female	56,430		18	0.02% (0.04% to 0.02%)
CPRD AURUM	ATE	60	Age: 45-64; Sex: Female	28,540		21	0.03% (0.05% to 0.02%)
CPRD AURUM	ATE	90	Age: 45-64; Sex: Female	17,099		22	0.04% (0.06% to 0.02%)
CPRD AURUM	ATE	0	Age: >=65; Sex: Male	27,279	<5		
CPRD AURUM	ATE	30	Age: >=65; Sex: Male	14,988		42	0.16% (0.22% to 0.12%)
CPRD AURUM	ATE	60	Age: >=65; Sex: Male	7,737		55	0.26% (0.34% to 0.19%)
CPRD AURUM	ATE	90	Age: >=65; Sex: Male	4,609		56	0.27% (0.36% to 0.20%)
CPRD AURUM	ATE	0	Age: >=65; Sex: Female	32,277	<5		
CPRD AURUM	ATE	30	Age: >=65; Sex: Female	17,914		17	0.06% (0.09% to 0.04%)
CPRD AURUM	ATE	60	Age: >=65; Sex: Female	8,863		30	0.15% (0.22% to 0.10%)
CPRD AURUM	ATE	90	Age: >=65; Sex: Female	5,058		31	0.16% (0.23% to 0.11%)
CPRD AURUM	VTE	0	Age: <=44; Sex: Male	97,049	<5		
CPRD AURUM	VTE	30	Age: <=44; Sex: Male	73,451		65	0.07% (0.09% to 0.06%)
CPRD AURUM	VTE	60	Age: <=44; Sex: Male	37,753		73	0.09% (0.11% to 0.07%)
CPRD AURUM	VTE	90	Age: <=44; Sex: Male	25,149		73	0.09% (0.11% to 0.07%)
CPRD AURUM	VTE	0	Age: <=44; Sex: Female	124,632	<5		
CPRD AURUM	VTE	30	Age: <=44; Sex: Female	94,366		66	0.06% (0.07% to 0.04%)
CPRD AURUM	VTE	60	Age: <=44; Sex: Female	48,498		71	0.06% (0.08% to 0.05%)
CPRD AURUM	VTE	90	Age: <=44; Sex: Female	30,676		73	0.07% (0.09% to 0.05%)
CPRD AURUM	VTE	0	Age: 45-64; Sex: Male	67,870	<5		
CPRD AURUM	VTE	30	Age: 45-64; Sex: Male	49,021		240	0.38% (0.44% to 0.34%)
CPRD AURUM	VTE	60	Age: 45-64; Sex: Male	24,618		274	0.48% (0.54% to 0.42%)
CPRD AURUM	VTE	90	Age: 45-64; Sex: Male	14,975		283	0.52% (0.59% to 0.46%)
CPRD AURUM	VTE	0	Age: 45-64; Sex: Female	77,078	<5		
CPRD AURUM	VTE	30	Age: 45-64; Sex: Female	56,284		111	0.16% (0.19% to 0.13%)
CPRD AURUM	VTE	60	Age: 45-64; Sex: Female	28,468		130	0.21% (0.25% to 0.17%)

CPRD AURUM	VTE	90	Age: 45-64; Sex: Female	17,049	133	0.22% (0.26% to 0.18%)
CPRD AURUM	VTE	0	Age: >=65; Sex: Male	27,431	<5	
CPRD AURUM	VTE	30	Age: >=65; Sex: Male	15,022	136	0.53% (0.63% to 0.45%)
CPRD AURUM	VTE	60	Age: >=65; Sex: Male	7,748	171	0.77% (0.90% to 0.66%)
CPRD AURUM	VTE	90	Age: >=65; Sex: Male	4,601	181	0.87% (1.02% to 0.75%)
CPRD AURUM	VTE	0	Age: >=65; Sex: Female	32,149	<5	
CPRD AURUM	VTE	30	Age: >=65; Sex: Female	17,765	149	0.50% (0.59% to 0.43%)
CPRD AURUM	VTE	60	Age: >=65; Sex: Female	8,758	176	0.65% (0.76% to 0.56%)
CPRD AURUM	VTE	90	Age: >=65; Sex: Female	5,003	187	0.76% (0.89% to 0.65%)
IPCI	ATE	0	Age: <=44; Sex: Male	7,988	<5	
IPCI	ATE	30	Age: <=44; Sex: Male	5,656	<5	
IPCI	ATE	60	Age: <=44; Sex: Male	3,700	<5	
IPCI	ATE	90	Age: <=44; Sex: Male	1,601	<5	
IPCI	ATE	0	Age: <=44; Sex: Female	10,437	<5	
IPCI	ATE	30	Age: <=44; Sex: Female	7,365	<5	
IPCI	ATE	60	Age: <=44; Sex: Female	4,922	<5	
IPCI	ATE	90	Age: <=44; Sex: Female	2,073	<5	
IPCI	ATE	0	Age: 45-64; Sex: Male	6,480	<5	
IPCI	ATE	30	Age: 45-64; Sex: Male	4,502	<5	
IPCI	ATE	60	Age: 45-64; Sex: Male	3,015	7	0.16% (0.34% to 0.07%)
IPCI	ATE	90	Age: 45-64; Sex: Male	1,165	7	0.16% (0.34% to 0.07%)
IPCI	ATE	0	Age: 45-64; Sex: Female	7,633	<5	
IPCI	ATE	30	Age: 45-64; Sex: Female	5,411	<5	
IPCI	ATE	60	Age: 45-64; Sex: Female	3,648	<5	
IPCI	ATE	90	Age: 45-64; Sex: Female	1,426	<5	
IPCI	ATE	0	Age: >=65; Sex: Male	3,180	<5	
IPCI	ATE	30	Age: >=65; Sex: Male	1,850	<5	
IPCI	ATE	60	Age: >=65; Sex: Male	1,195	6	0.27% (0.62% to 0.12%)
IPCI	ATE	90	Age: >=65; Sex: Male	438	7	0.35% (0.77% to 0.16%)
IPCI	ATE	0	Age: >=65; Sex: Female	3,478	<5	

IPCI	ATE	30	Age: >=65; Sex: Female	2,120		7	0.23% (0.48% to 0.11%)
IPCI	ATE	60	Age: >=65; Sex: Female	1,339		8	0.27% (0.55% to 0.14%)
IPCI	ATE	90	Age: >=65; Sex: Female	495		10	0.43% (0.85% to 0.22%)
IPCI	VTE	0	Age: <=44; Sex: Male	7,995	<5		
IPCI	VTE	30	Age: <=44; Sex: Male	5,663	<5		
IPCI	VTE	60	Age: <=44; Sex: Male	3,705	<5		
IPCI	VTE	90	Age: <=44; Sex: Male	1,600	<5		
IPCI	VTE	0	Age: <=44; Sex: Female	10,428	<5		
IPCI	VTE	30	Age: <=44; Sex: Female	7,355	<5		
IPCI	VTE	60	Age: <=44; Sex: Female	4,915		7	0.10% (0.21% to 0.05%)
IPCI	VTE	90	Age: <=44; Sex: Female	2,073		7	0.10% (0.21% to 0.05%)
IPCI	VTE	0	Age: 45-64; Sex: Male	6,543	<5		
IPCI	VTE	30	Age: 45-64; Sex: Male	4,539		17	0.30% (0.48% to 0.18%)
IPCI	VTE	60	Age: 45-64; Sex: Male	3,039		19	0.34% (0.54% to 0.22%)
IPCI	VTE	90	Age: 45-64; Sex: Male	1,176		19	0.34% (0.54% to 0.22%)
IPCI	VTE	0	Age: 45-64; Sex: Female	7,630	<5		
IPCI	VTE	30	Age: 45-64; Sex: Female	5,418	<5		
IPCI	VTE	60	Age: 45-64; Sex: Female	3,659	<5		
IPCI	VTE	90	Age: 45-64; Sex: Female	1,429		5	0.13% (0.35% to 0.05%)
IPCI	VTE	0	Age: >=65; Sex: Male	3,292	<5		
IPCI	VTE	30	Age: >=65; Sex: Male	1,908		12	0.45% (0.80% to 0.26%)
IPCI	VTE	60	Age: >=65; Sex: Male	1,228		13	0.51% (0.89% to 0.30%)
IPCI	VTE	90	Age: >=65; Sex: Male	452		14	0.59% (1.02% to 0.34%)
IPCI	VTE	0	Age: >=65; Sex: Female	3,505	<5		
IPCI	VTE	30	Age: >=65; Sex: Female	2,147		8	0.27% (0.55% to 0.14%)
IPCI	VTE	60	Age: >=65; Sex: Female	1,346		11	0.43% (0.79% to 0.23%)
IPCI	VTE	90	Age: >=65; Sex: Female	502		12	0.51% (0.94% to 0.28%)
IQVIA LPD Italy	ATE	0	Age: <=44; Sex: Male	3,497	<5		
IQVIA LPD Italy	ATE	30	Age: <=44; Sex: Male	2,545	<5		
IQVIA LPD Italy	ATE	60	Age: <=44; Sex: Male	2,216	<5		

IQVIA LPD Italy	ATE	90	Age: <=44; Sex: Male	1,912	<5		
IQVIA LPD Italy	ATE	0	Age: <=44; Sex: Female	4,398	<5		
IQVIA LPD Italy	ATE	30	Age: <=44; Sex: Female	3,557	<5		
IQVIA LPD Italy	ATE	60	Age: <=44; Sex: Female	3,202	<5		
IQVIA LPD Italy	ATE	90	Age: <=44; Sex: Female	2,843	<5		
IQVIA LPD Italy	ATE	0	Age: 45-64; Sex: Male	4,095	<5		
IQVIA LPD Italy	ATE	30	Age: 45-64; Sex: Male	3,482	<5		
IQVIA LPD Italy	ATE	60	Age: 45-64; Sex: Male	3,150	<5		
IQVIA LPD Italy	ATE	90	Age: 45-64; Sex: Male	2,866	<5		
IQVIA LPD Italy	ATE	0	Age: 45-64; Sex: Female	5,635	<5		
IQVIA LPD Italy	ATE	30	Age: 45-64; Sex: Female	5,079	<5		
IQVIA LPD Italy	ATE	60	Age: 45-64; Sex: Female	4,761	<5		
IQVIA LPD Italy	ATE	90	Age: 45-64; Sex: Female	4,403	<5		
IQVIA LPD Italy	ATE	0	Age: >=65; Sex: Male	3,176	<5		
IQVIA LPD Italy	ATE	30	Age: >=65; Sex: Male	2,535	<5		
IQVIA LPD Italy	ATE	60	Age: >=65; Sex: Male	2,328		6	0.19% (0.43% to 0.09%)
IQVIA LPD Italy	ATE	90	Age: >=65; Sex: Male	2,164		6	0.19% (0.43% to 0.09%)
IQVIA LPD Italy	ATE	0	Age: >=65; Sex: Female	3,982	<5		
IQVIA LPD Italy	ATE	30	Age: >=65; Sex: Female	3,447	<5		
IQVIA LPD Italy	ATE	60	Age: >=65; Sex: Female	3,229	<5		
IQVIA LPD Italy	ATE	90	Age: >=65; Sex: Female	3,065	<5		
IQVIA LPD Italy	VTE	0	Age: <=44; Sex: Male	3,498	<5		
IQVIA LPD Italy	VTE	30	Age: <=44; Sex: Male	2,546	<5		
IQVIA LPD Italy	VTE	60	Age: <=44; Sex: Male	2,217	<5		
IQVIA LPD Italy	VTE	90	Age: <=44; Sex: Male	1,913	<5		
IQVIA LPD Italy	VTE	0	Age: <=44; Sex: Female	4,393	<5		
IQVIA LPD Italy	VTE	30	Age: <=44; Sex: Female	3,552	<5		
IQVIA LPD Italy	VTE	60	Age: <=44; Sex: Female	3,196	<5		
IQVIA LPD Italy	VTE	90	Age: <=44; Sex: Female	2,837	<5		
IQVIA LPD Italy	VTE	0	Age: 45-64; Sex: Male	4,114	<5		

IQVIA LPD Italy	VTE	30	Age: 45-64; Sex: Male	3,507	<5	
IQVIA LPD Italy	VTE	60	Age: 45-64; Sex: Male	3,172	8	0.23% (0.45% to 0.11%)
IQVIA LPD Italy	VTE	90	Age: 45-64; Sex: Male	2,885	10	0.29% (0.54% to 0.16%)
IQVIA LPD Italy	VTE	0	Age: 45-64; Sex: Female	5,624	<5	
IQVIA LPD Italy	VTE	30	Age: 45-64; Sex: Female	5,069	6	0.11% (0.25% to 0.05%)
IQVIA LPD Italy	VTE	60	Age: 45-64; Sex: Female	4,747	10	0.19% (0.36% to 0.10%)
IQVIA LPD Italy	VTE	90	Age: 45-64; Sex: Female	4,389	10	0.19% (0.36% to 0.10%)
IQVIA LPD Italy	VTE	0	Age: >=65; Sex: Male	3,253	<5	
IQVIA LPD Italy	VTE	30	Age: >=65; Sex: Male	2,587	5	0.16% (0.38% to 0.07%)
IQVIA LPD Italy	VTE	60	Age: >=65; Sex: Male	2,374	10	0.32% (0.60% to 0.17%)
IQVIA LPD Italy	VTE	90	Age: >=65; Sex: Male	2,209	12	0.39% (0.69% to 0.22%)
IQVIA LPD Italy	VTE	0	Age: >=65; Sex: Female	3,956	<5	
IQVIA LPD Italy	VTE	30	Age: >=65; Sex: Female	3,424	<5	
IQVIA LPD Italy	VTE	60	Age: >=65; Sex: Female	3,206	13	0.35% (0.60% to 0.20%)
IQVIA LPD Italy	VTE	90	Age: >=65; Sex: Female	3,037	21	0.58% (0.89% to 0.38%)
SIDIAP CMBD-AH	ATE	0	Age: <=44; Sex: Male	105,868	<5	
SIDIAP CMBD-AH	ATE	30	Age: <=44; Sex: Male	102,198	30	0.03% (0.04% to 0.02%)
SIDIAP CMBD-AH	ATE	60	Age: <=44; Sex: Male	97,041	35	0.03% (0.05% to 0.02%)
SIDIAP CMBD-AH	ATE	90	Age: <=44; Sex: Male	87,264	36	0.03% (0.05% to 0.02%)
SIDIAP CMBD-AH	ATE	0	Age: <=44; Sex: Female	112,759	6	0.01% (0.01% to 0.00%)
SIDIAP CMBD-AH	ATE	30	Age: <=44; Sex: Female	109,446	27	0.02% (0.04% to 0.02%)
SIDIAP CMBD-AH	ATE	60	Age: <=44; Sex: Female	104,300	29	0.03% (0.04% to 0.02%)
SIDIAP CMBD-AH	ATE	90	Age: <=44; Sex: Female	94,497	29	0.03% (0.04% to 0.02%)
SIDIAP CMBD-AH	ATE	0	Age: 45-64; Sex: Male	57,866	81	0.14% (0.17% to 0.11%)
SIDIAP CMBD-AH	ATE	30	Age: 45-64; Sex: Male	55,344	282	0.49% (0.55% to 0.43%)
SIDIAP CMBD-AH	ATE	60	Age: 45-64; Sex: Male	51,925	318	0.55% (0.62% to 0.50%)
SIDIAP CMBD-AH	ATE	90	Age: 45-64; Sex: Male	46,584	343	0.60% (0.67% to 0.54%)
SIDIAP CMBD-AH	ATE	0	Age: 45-64; Sex: Female	58,685	30	0.05% (0.07% to 0.04%)
SIDIAP CMBD-AH	ATE	30	Age: 45-64; Sex: Female	56,871	137	0.23% (0.28% to 0.20%)
SIDIAP CMBD-AH	ATE	60	Age: 45-64; Sex: Female	54,299	148	0.25% (0.30% to 0.22%)

SIDIAP CMBD-AH	ATE	90	Age: 45-64; Sex: Female	49,332	153	0.26% (0.31% to 0.22%)
SIDIAP CMBD-AH	ATE	0	Age: >=65; Sex: Male	50,920	480	0.94% (1.03% to 0.86%)
SIDIAP CMBD-AH	ATE	30	Age: >=65; Sex: Male	32,367	1395	2.74% (2.89% to 2.60%)
SIDIAP CMBD-AH	ATE	60	Age: >=65; Sex: Male	26,378	1509	2.97% (3.12% to 2.82%)
SIDIAP CMBD-AH	ATE	90	Age: >=65; Sex: Male	22,516	1562	3.08% (3.23% to 2.93%)
SIDIAP CMBD-AH	ATE	0	Age: >=65; Sex: Female	56,349	426	0.76% (0.83% to 0.69%)
SIDIAP CMBD-AH	ATE	30	Age: >=65; Sex: Female	39,822	1132	2.01% (2.13% to 1.90%)
SIDIAP CMBD-AH	ATE	60	Age: >=65; Sex: Female	34,780	1255	2.23% (2.36% to 2.11%)
SIDIAP CMBD-AH	ATE	90	Age: >=65; Sex: Female	30,458	1353	2.42% (2.55% to 2.29%)
SIDIAP CMBD-AH	VTE	0	Age: <=44; Sex: Male	105,844	14	0.01% (0.02% to 0.01%)
SIDIAP CMBD-AH	VTE	30	Age: <=44; Sex: Male	102,154	57	0.05% (0.07% to 0.04%)
SIDIAP CMBD-AH	VTE	60	Age: <=44; Sex: Male	97,012	61	0.06% (0.07% to 0.05%)
SIDIAP CMBD-AH	VTE	90	Age: <=44; Sex: Male	87,229	64	0.06% (0.08% to 0.05%)
SIDIAP CMBD-AH	VTE	0	Age: <=44; Sex: Female	112,747	<5	
SIDIAP CMBD-AH	VTE	30	Age: <=44; Sex: Female	109,432	29	0.03% (0.04% to 0.02%)
SIDIAP CMBD-AH	VTE	60	Age: <=44; Sex: Female	104,261	57	0.05% (0.07% to 0.04%)
SIDIAP CMBD-AH	VTE	90	Age: <=44; Sex: Female	94,457	57	0.05% (0.07% to 0.04%)
SIDIAP CMBD-AH	VTE	0	Age: 45-64; Sex: Male	58,008	130	0.22% (0.27% to 0.19%)
SIDIAP CMBD-AH	VTE	30	Age: 45-64; Sex: Male	55,292	531	0.92% (1.00% to 0.84%)
SIDIAP CMBD-AH	VTE	60	Age: 45-64; Sex: Male	51,958	556	0.96% (1.05% to 0.89%)
SIDIAP CMBD-AH	VTE	90	Age: 45-64; Sex: Male	46,658	580	1.01% (1.09% to 0.93%)
SIDIAP CMBD-AH	VTE	0	Age: 45-64; Sex: Female	58,697	36	0.06% (0.09% to 0.04%)
SIDIAP CMBD-AH	VTE	30	Age: 45-64; Sex: Female	56,830	193	0.33% (0.38% to 0.29%)
SIDIAP CMBD-AH	VTE	60	Age: 45-64; Sex: Female	54,275	211	0.36% (0.41% to 0.32%)
SIDIAP CMBD-AH	VTE	90	Age: 45-64; Sex: Female	49,315	218	0.37% (0.43% to 0.33%)
SIDIAP CMBD-AH	VTE	0	Age: >=65; Sex: Male	52,158	407	0.78% (0.86% to 0.71%)
SIDIAP CMBD-AH	VTE	30	Age: >=65; Sex: Male	32,938	1439	2.76% (2.90% to 2.62%)
SIDIAP CMBD-AH	VTE	60	Age: >=65; Sex: Male	27,018	1551	2.98% (3.13% to 2.84%)
SIDIAP CMBD-AH	VTE	90	Age: >=65; Sex: Male	23,110	1595	3.07% (3.22% to 2.92%)
SIDIAP CMBD-AH	VTE	0	Age: >=65; Sex: Female	57,154	248	0.43% (0.49% to 0.38%)

SIDIAP CMBD-AH	VTE	30	Age: >=65; Sex: Female	40,536	810	1.42% (1.52% to 1.32%)
SIDIAP CMBD-AH	VTE	60	Age: >=65; Sex: Female	35,337	951	1.67% (1.78% to 1.57%)
SIDIAP CMBD-AH	VTE	90	Age: >=65; Sex: Female	30,956	1005	1.77% (1.88% to 1.66%)
CPRD AURUM	Death	0	Age: <=44; Sex: Male	97,060	<5	
CPRD AURUM	Death	30	Age: <=44; Sex: Male	73,558	31	0.03% (0.02% to 0.05%)
CPRD AURUM	Death	60	Age: <=44; Sex: Male	37,813	36	0.04% (0.03% to 0.06%)
CPRD AURUM	Death	90	Age: <=44; Sex: Male	25,185	39	0.05% (0.03% to 0.07%)
CPRD AURUM	Death	0	Age: <=44; Sex: Female	124,708	<5	
CPRD AURUM	Death	30	Age: <=44; Sex: Female	94,506	20	0.02% (0.01% to 0.02%)
CPRD AURUM	Death	60	Age: <=44; Sex: Female	48,567	22	0.02% (0.01% to 0.03%)
CPRD AURUM	Death	90	Age: <=44; Sex: Female	30,727	25	0.03% (0.02% to 0.04%)
CPRD AURUM	Death	0	Age: 45-64; Sex: Male	67,192	<5	
CPRD AURUM	Death	30	Age: 45-64; Sex: Male	49,279	303	0.49% (0.43% to 0.54%)
CPRD AURUM	Death	60	Age: 45-64; Sex: Male	24,792	342	0.59% (0.53% to 0.66%)
CPRD AURUM	Death	90	Age: 45-64; Sex: Male	15,082	354	0.66% (0.58% to 0.73%)
CPRD AURUM	Death	0	Age: 45-64; Sex: Female	76,755	<5	
CPRD AURUM	Death	30	Age: 45-64; Sex: Female	56,423	173	0.24% (0.20% to 0.28%)
CPRD AURUM	Death	60	Age: 45-64; Sex: Female	28,554	196	0.30% (0.25% to 0.34%)
CPRD AURUM	Death	90	Age: 45-64; Sex: Female	17,108	205	0.33% (0.28% to 0.38%)
CPRD AURUM	Death	0	Age: >=65; Sex: Male	22,417	<5	
CPRD AURUM	Death	30	Age: >=65; Sex: Male	14,706	1839	8.65% (8.26% to 9.02%)
CPRD AURUM	Death	60	Age: >=65; Sex: Male	7,767	1999	10.00% (9.57% to 10.43%)
CPRD AURUM	Death	90	Age: >=65; Sex: Male	4,674	2042	10.59% (10.12% to 11.05%)
CPRD AURUM	Death	0	Age: >=65; Sex: Female	26,934	<5	
CPRD AURUM	Death	30	Age: >=65; Sex: Female	17,434	1897	7.44% (7.12% to 7.77%)
CPRD AURUM	Death	60	Age: >=65; Sex: Female	8,770	2078	8.78% (8.40% to 9.15%)
CPRD AURUM	Death	90	Age: >=65; Sex: Female	5,040	2127	9.38% (8.97% to 9.79%)
IPCI	Death	0	Age: <=44; Sex: Male	7,995	<5	
IPCI	Death	30	Age: <=44; Sex: Male	5,665	<5	
IPCI	Death	60	Age: <=44; Sex: Male	3,706	<5	

IPCI	Death	90	Age: <=44; Sex: Male	1,601	<5	
IPCI	Death	0	Age: <=44; Sex: Female	10,446	<5	
IPCI	Death	30	Age: <=44; Sex: Female	7,373	<5	
IPCI	Death	60	Age: <=44; Sex: Female	4,928	<5	
IPCI	Death	90	Age: <=44; Sex: Female	2,075	<5	
IPCI	Death	0	Age: 45-64; Sex: Male	6,551	<5	
IPCI	Death	30	Age: 45-64; Sex: Male	4,566	8	0.13% (0.04% to 0.22%)
IPCI	Death	60	Age: 45-64; Sex: Male	3,063	11	0.21% (0.08% to 0.33%)
IPCI	Death	90	Age: 45-64; Sex: Male	1,185	13	0.29% (0.12% to 0.46%)
IPCI	Death	0	Age: 45-64; Sex: Female	7,654	<5	
IPCI	Death	30	Age: 45-64; Sex: Female	5,441	9	0.13% (0.04% to 0.21%)
IPCI	Death	60	Age: 45-64; Sex: Female	3,674	11	0.17% (0.07% to 0.27%)
IPCI	Death	90	Age: 45-64; Sex: Female	1,438	12	0.20% (0.08% to 0.31%)
IPCI	Death	0	Age: >=65; Sex: Male	2,960	<5	
IPCI	Death	30	Age: >=65; Sex: Male	1,893	169	6.56% (5.59% to 7.51%)
IPCI	Death	60	Age: >=65; Sex: Male	1,233	182	7.34% (6.29% to 8.38%)
IPCI	Death	90	Age: >=65; Sex: Male	455	184	7.50% (6.43% to 8.56%)
IPCI	Death	0	Age: >=65; Sex: Female	3,291	<5	
IPCI	Death	30	Age: >=65; Sex: Female	2,136	113	3.90% (3.19% to 4.61%)
IPCI	Death	60	Age: >=65; Sex: Female	1,358	127	4.66% (3.84% to 5.46%)
IPCI	Death	90	Age: >=65; Sex: Female	511	133	5.23% (4.30% to 6.16%)
IQVIA LPD Italy	Death	0	Age: <=44; Sex: Male	3,494	<5	
IQVIA LPD Italy	Death	30	Age: <=44; Sex: Male	2,542	<5	
IQVIA LPD Italy	Death	60	Age: <=44; Sex: Male	2,213	<5	
IQVIA LPD Italy	Death	90	Age: <=44; Sex: Male	1,913	<5	
IQVIA LPD Italy	Death	0	Age: <=44; Sex: Female	4,395	<5	
IQVIA LPD Italy	Death	30	Age: <=44; Sex: Female	3,556	<5	
IQVIA LPD Italy	Death	60	Age: <=44; Sex: Female	3,201	<5	
IQVIA LPD Italy	Death	90	Age: <=44; Sex: Female	2,842	<5	
IQVIA LPD Italy	Death	0	Age: 45-64; Sex: Male	4,074	<5	

IQVIA LPD Italy	Death	30	Age: 45-64; Sex: Male	3,508	17	0.45% (0.23% to 0.66%)
IQVIA LPD Italy	Death	60	Age: 45-64; Sex: Male	3,194	21	0.56% (0.32% to 0.80%)
IQVIA LPD Italy	Death	90	Age: 45-64; Sex: Male	2,913	23	0.63% (0.37% to 0.89%)
IQVIA LPD Italy	Death	0	Age: 45-64; Sex: Female	5,625	<5	
IQVIA LPD Italy	Death	30	Age: 45-64; Sex: Female	5,083	6	0.11% (0.02% to 0.20%)
IQVIA LPD Italy	Death	60	Age: 45-64; Sex: Female	4,765	6	0.11% (0.02% to 0.20%)
IQVIA LPD Italy	Death	90	Age: 45-64; Sex: Female	4,407	6	0.11% (0.02% to 0.20%)
IQVIA LPD Italy	Death	0	Age: >=65; Sex: Male	2,788	<5	
IQVIA LPD Italy	Death	30	Age: >=65; Sex: Male	2,510	167	6.10% (5.20% to 6.99%)
IQVIA LPD Italy	Death	60	Age: >=65; Sex: Male	2,370	193	7.09% (6.12% to 8.05%)
IQVIA LPD Italy	Death	90	Age: >=65; Sex: Male	2,221	202	7.45% (6.45% to 8.43%)
IQVIA LPD Italy	Death	0	Age: >=65; Sex: Female	3,616	<5	
IQVIA LPD Italy	Death	30	Age: >=65; Sex: Female	3,374	113	3.18% (2.60% to 3.75%)
IQVIA LPD Italy	Death	60	Age: >=65; Sex: Female	3,204	128	3.62% (3.00% to 4.23%)
IQVIA LPD Italy	Death	90	Age: >=65; Sex: Female	3,050	132	3.74% (3.11% to 4.37%)
SIDIAP CMBD-AH	Death	0	Age: <=44; Sex: Male	105,639	<5	
SIDIAP CMBD-AH	Death	30	Age: <=44; Sex: Male	102,091	14	0.01% (0.01% to 0.02%)
SIDIAP CMBD-AH	Death	60	Age: <=44; Sex: Male	96,991	22	0.02% (0.01% to 0.03%)
SIDIAP CMBD-AH	Death	90	Age: <=44; Sex: Male	87,206	23	0.02% (0.01% to 0.03%)
SIDIAP CMBD-AH	Death	0	Age: <=44; Sex: Female	112,641	<5	
SIDIAP CMBD-AH	Death	30	Age: <=44; Sex: Female	109,399	10	0.01% (0.00% to 0.01%)
SIDIAP CMBD-AH	Death	60	Age: <=44; Sex: Female	104,279	12	0.01% (0.00% to 0.02%)
SIDIAP CMBD-AH	Death	90	Age: <=44; Sex: Female	94,489	15	0.01% (0.01% to 0.02%)
SIDIAP CMBD-AH	Death	0	Age: 45-64; Sex: Male	55,286	<5	
SIDIAP CMBD-AH	Death	30	Age: 45-64; Sex: Male	53,996	184	0.34% (0.29% to 0.38%)
SIDIAP CMBD-AH	Death	60	Age: 45-64; Sex: Male	51,492	312	0.58% (0.51% to 0.64%)
SIDIAP CMBD-AH	Death	90	Age: 45-64; Sex: Male	46,490	371	0.70% (0.62% to 0.77%)
SIDIAP CMBD-AH	Death	0	Age: 45-64; Sex: Female	57,496	<5	
SIDIAP CMBD-AH	Death	30	Age: 45-64; Sex: Female	56,346	91	0.16% (0.13% to 0.19%)
SIDIAP CMBD-AH	Death	60	Age: 45-64; Sex: Female	54,052	134	0.24% (0.20% to 0.28%)

SIDIAP CMBD-AH	Death	90	Age: 45-64; Sex: Female	49,193	150	0.27% (0.22% to 0.31%)
SIDIAP CMBD-AH	Death	0	Age: >=65; Sex: Male	26,999	<5	
SIDIAP CMBD-AH	Death	30	Age: >=65; Sex: Male	24,187	2628	9.77% (9.41% to 10.12%)
SIDIAP CMBD-AH	Death	60	Age: >=65; Sex: Male	22,713	3371	12.57% (12.17% to 12.97%)
SIDIAP CMBD-AH	Death	90	Age: >=65; Sex: Male	20,472	3664	13.74% (13.33% to 14.15%)
SIDIAP CMBD-AH	Death	0	Age: >=65; Sex: Female	34,936	<5	
SIDIAP CMBD-AH	Death	30	Age: >=65; Sex: Female	32,267	2428	6.98% (6.71% to 7.24%)
SIDIAP CMBD-AH	Death	60	Age: >=65; Sex: Female	30,782	3058	8.81% (8.51% to 9.11%)
SIDIAP CMBD-AH	Death	90	Age: >=65; Sex: Female	28,185	3386	9.82% (9.50% to 10.13%)

Supplementary Table 2. Hazard ratios associated with VTE/ ATE and COVID-19 worsening*, adjusted for age and sex

Transition	Hazard ratio (95% confidence interval)
VTE multistate model	
COVID-19 to COVID-19 hospitalised	1.36 (0.95 to 1.96)
COVID-19 to death	4.42 (3.07 to 6.36)
COVID-19 hospitalised to death	1.63 (1.39 to 1.90)
ATE multistate model	
COVID-19 to COVID-19 hospitalised	1.05 (0.89 to 1.25)
COVID-19 to death	3.16 (2.65 to 3.75)
COVID-19 hospitalised to death	1.93 (1.57 to 2.37)

*Data from SIDIAP CMBD-AH: Information System for Research in Primary Care with hospital linkage.

Supplementary Table 3. VTE multistate model transitions

	Overall	From General Population			From COVID-19 diagnosed or test positive			VTE (pre-hospitalisation)		From hospitalised with COVID-19		From VTE (post-hospitalisation)
		To COVID-19 diagnosed or test positive	To hospitalised with COVID-19	To death	To VTE (pre-hospitalisation)	To hospitalised with COVID-19	To death	To hospitalised with COVID-19	To death	To VTE (post-hospitalisation)	To death	To death
N	5,489,533	376,349	9,091	35,314	370	21,014	3,502	29	20	783	4,365	164
Age	44 [25 to 60]	40 [22 to 55]	72 [57 to 83]	84 [72 to 90]	66 [55 to 79]	64 [51 to 76]	86 [79 to 91]	69 [58 to 77]	83 [72 to 87]	68 [58 to 77]	82 [74 to 88]	75 [68 to 83]
Age: Under 20	1,068,646 (19.5%)	81,883 (21.8%)	126 (1.4%)	95 (0.3%)	0 (0.0%)	202 (1.0%)	<5	0 (0.0%)	0 (0.0%)	0 (0.0%)	<5	0 (0.0%)
Age: 20 to 29	570,979 (10.4%)	49,721 (13.2%)	249 (2.7%)	129 (0.4%)	9 (2.4%)	569 (2.7%)	<5	0 (0.0%)	0 (0.0%)	6 (0.8%)	<5	0 (0.0%)
Age: 30 to 39	723,084 (13.2%)	52,474 (13.9%)	393 (4.3%)	302 (0.9%)	16 (4.3%)	1,271 (6.0%)	13 (0.4%)	<5	0 (0.0%)	22 (2.8%)	12 (0.3%)	<5
Age: 40 to 49	951,192 (17.3%)	68,186 (18.1%)	721 (7.9%)	954 (2.7%)	43 (11.6%)	2,662 (12.7%)	32 (0.9%)	<5	0 (0.0%)	56 (7.2%)	55 (1.3%)	<5
Age: 50 to 59	788,718 (14.4%)	53,400 (14.2%)	1,105 (12.2%)	2,377 (6.7%)	62 (16.8%)	3,994 (19.0%)	93 (2.7%)	<5	<5	143 (18.3%)	151 (3.5%)	16 (9.8%)
Age: 60 to 69	606,110 (11.0%)	31,827 (8.5%)	1,485 (16.3%)	3,953 (11.2%)	76 (20.5%)	4,261 (20.3%)	232 (6.6%)	7 (24.1%)	<5	193 (24.6%)	472 (10.8%)	32 (19.5%)
Age: 70 to 79	456,117 (8.3%)	20,095 (5.3%)	2,023 (22.3%)	6,302 (17.8%)	75 (20.3%)	4,007 (19.1%)	505 (14.4%)	9 (31.0%)	<5	213 (27.2%)	1,051 (24.1%)	54 (32.9%)
Age: 80 or older	324,687 (5.9%)	18,763 (5.0%)	2,989 (32.9%)	21,202 (60.0%)	89 (24.1%)	4,048 (19.3%)	2,623 (74.9%)	5 (17.2%)	12 (60.0%)	150 (19.2%)	2,619 (60.0%)	58 (35.4%)
Sex: Male	2,715,176 (49.5%)	180,221 (47.9%)	4,987 (54.9%)	18,204 (51.5%)	177 (47.8%)	11,632 (55.4%)	1,618 (46.2%)	16 (55.2%)	10 (50.0%)	474 (60.5%)	2,456 (56.3%)	103 (62.8%)
Years of prior observation time	14.7 [12.9 to 14.7]	14.7 [13.0 to 14.7]	14.7 [14.7 to 14.7]	14.7 [14.7 to 14.7]	14.7 [14.7 to 14.7]	14.7 [14.7 to 14.7]	14.7 [14.7 to 14.7]	14.7 [14.7 to 14.7]	14.7 [14.7 to 14.7]	14.7 [14.7 to 14.7]	14.7 [14.7 to 14.7]	14.7 [14.7 to 14.7]
Comorbidities												
Autoimmune disease	83,377 (1.5%)	5,473 (1.5%)	324 (3.6%)	1,369 (3.9%)	12 (3.2%)	652 (3.1%)	160 (4.6%)	<5	0 (0.0%)	28 (3.6%)	212 (4.9%)	6 (3.7%)
Antiphospholipid syndrome	2,351 (0.0%)	145 (0.0%)	5 (0.1%)	23 (0.1%)	0 (0.0%)	14 (0.1%)	<5	0 (0.0%)	0 (0.0%)	0 (0.0%)	5 (0.1%)	0 (0.0%)
Thrombophilia	4,871 (0.1%)	332 (0.1%)	17 (0.2%)	59 (0.2%)	<5	31 (0.1%)	<5	0 (0.0%)	0 (0.0%)	0 (0.0%)	10 (0.2%)	0 (0.0%)

Asthma	293,530 (5.3%)	22,752 (6.0%)	619 (6.8%)	1,998 (5.7%)	34 (9.2%)	1,452 (6.9%)	214 (6.1%)	6 (20.7%)	0 (0.0%)	56 (7.2%)	290 (6.6%)	9 (5.5%)
Atrial fibrillation	131,106 (2.4%)	7,980 (2.1%)	1,408 (15.5%)	8,413 (23.8%)	19 (5.1%)	1,790 (8.5%)	829 (23.7%)	0 (0.0%)	<5	36 (4.6%)	1,107 (25.4%)	13 (7.9%)
Malignant neoplastic disease	334,738 (6.1%)	18,744 (5.0%)	2,029 (22.3%)	13,700 (38.8%)	64 (17.3%)	3,109 (14.8%)	1,059 (30.2%)	6 (20.7%)	10 (50.0%)	135 (17.2%)	1,460 (33.4%)	35 (21.3%)
Diabetes mellitus	405,227 (7.4%)	26,227 (7.0%)	2,739 (30.1%)	10,497 (29.7%)	65 (17.6%)	4,687 (22.3%)	1,074 (30.7%)	<5	7 (35.0%)	163 (20.8%)	1,580 (36.2%)	43 (26.2%)
Obesity	849,916 (15.5%)	62,904 (16.7%)	3,237 (35.6%)	9,073 (25.7%)	139 (37.6%)	7,167 (34.1%)	924 (26.4%)	10 (34.5%)	7 (35.0%)	258 (33.0%)	1,561 (35.8%)	56 (34.1%)
Heart disease	573,769 (10.5%)	35,051 (9.3%)	3,780 (41.6%)	19,130 (54.2%)	85 (23.0%)	6,064 (28.9%)	1,985 (56.7%)	10 (34.5%)	7 (35.0%)	224 (28.6%)	2,635 (60.4%)	59 (36.0%)
Hypertensive disorder	925,838 (16.9%)	55,515 (14.8%)	4,940 (54.3%)	21,319 (60.4%)	162 (43.8%)	8,976 (42.7%)	2,243 (64.0%)	14 (48.3%)	11 (55.0%)	349 (44.6%)	2,964 (67.9%)	91 (55.5%)
Renal impairment	239,550 (4.4%)	14,295 (3.8%)	2,512 (27.6%)	13,374 (37.9%)	56 (15.1%)	3,410 (16.2%)	1,456 (41.6%)	6 (20.7%)	5 (25.0%)	124 (15.8%)	1,959 (44.9%)	37 (22.6%)
COPD	154,015 (2.8%)	8,323 (2.2%)	1,402 (15.4%)	6,768 (19.2%)	32 (8.6%)	1,938 (9.2%)	595 (17.0%)	5 (17.2%)	<5	77 (9.8%)	956 (21.9%)	22 (13.4%)
Dementia	54,963 (1.0%)	5,828 (1.5%)	583 (6.4%)	6,837 (19.4%)	19 (5.1%)	977 (4.6%)	1,126 (32.2%)	0 (0.0%)	5 (25.0%)	32 (4.1%)	695 (15.9%)	16 (9.8%)
Smoking	1,116,778 (20.3%)	64,926 (17.3%)	1,985 (21.8%)	8,610 (24.4%)	60 (16.2%)	4,349 (20.7%)	630 (18.0%)	5 (17.2%)	<5	173 (22.1%)	1,027 (23.5%)	48 (29.3%)
Medication use (183 days prior to four days prior)												
Non-steroidal anti-inflammatory drugs	940,465 (17.1%)	74,149 (19.7%)	2,269 (25.0%)	8,308 (23.5%)	96 (25.9%)	5,160 (24.6%)	895 (25.6%)	6 (20.7%)	7 (35.0%)	192 (24.5%)	1,086 (24.9%)	37 (22.6%)
Cox2 inhibitors	22,207 (0.4%)	1,593 (0.4%)	49 (0.5%)	112 (0.3%)	<5	156 (0.7%)	19 (0.5%)	0 (0.0%)	0 (0.0%)	9 (1.1%)	22 (0.5%)	<5
Systemic corticosteroids	207,880 (3.8%)	15,410 (4.1%)	796 (8.8%)	4,302 (12.2%)	20 (5.4%)	1,445 (6.9%)	406 (11.6%)	<5	<5	51 (6.5%)	500 (11.5%)	17 (10.4%)
Antithrombotic and anticoagulant therapies	65,631 (1.2%)	4,633 (1.2%)	412 (4.5%)	2,481 (7.0%)	15 (4.1%)	613 (2.9%)	221 (6.3%)	0 (0.0%)	<5	32 (4.1%)	262 (6.0%)	9 (5.5%)
Lipid modifying agents	46,713 (0.9%)	2,879 (0.8%)	197 (2.2%)	1,119 (3.2%)	6 (1.6%)	386 (1.8%)	92 (2.6%)	<5	0 (0.0%)	11 (1.4%)	114 (2.6%)	0 (0.0%)
Antineoplastic and immunomodulating agents	45,875 (0.8%)	3,992 (1.1%)	134 (1.5%)	911 (2.6%)	<5	252 (1.2%)	78 (2.2%)	0 (0.0%)	0 (0.0%)	8 (1.0%)	68 (1.6%)	<5
Hormonal contraceptives for systemic use	44,664 (0.8%)	4,701 (1.2%)	73 (0.8%)	353 (1.0%)	<5	138 (0.7%)	23 (0.7%)	0 (0.0%)	0 (0.0%)	<5	22 (0.5%)	0 (0.0%)
Tamoxifen	1,304 (0.0%)	75 (0.0%)	<5	27 (0.1%)	<5	9 (0.0%)	<5	0 (0.0%)	0 (0.0%)	0 (0.0%)	<5	0 (0.0%)

Sex hormones and modulators of the genital system	54,885 (1.0%)	5,520 (1.5%)	99 (1.1%)	385 (1.1%)	<5	198 (0.9%)	27 (0.8%)	0 (0.0%)	0 (0.0%)	<5	28 (0.6%)	0 (0.0%)
Immunoglobulins	2,820 (0.1%)	218 (0.1%)	11 (0.1%)	0 (0.0%)	0 (0.0%)	14 (0.1%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
Summary variables												
One or more condition of interest	1,455,634 (26.5%)	98,897 (26.3%)	6,305 (69.4%)	27,943 (79.1%)	222 (60.0%)	12,363 (58.8%)	2,766 (79.0%)	15 (51.7%)	17 (85.0%)	478 (61.0%)	3,670 (84.1%)	118 (72.0%)
One or more medication of interest	1,071,907 (19.5%)	84,541 (22.5%)	2,678 (29.5%)	10,141 (28.7%)	105 (28.4%)	5,911 (28.1%)	1,082 (30.9%)	6 (20.7%)	8 (40.0%)	216 (27.6%)	1,339 (30.7%)	46 (28.0%)
One or more condition/ medication of interest	2,161,241 (39.4%)	155,399 (41.3%)	6,985 (76.8%)	29,214 (82.7%)	254 (68.6%)	14,545 (69.2%)	2,936 (83.8%)	17 (58.6%)	19 (95.0%)	550 (70.2%)	3,863 (88.5%)	125 (76.2%)

Supplementary Table 4. ATE multistate model transitions

		From General Population			From COVID-19 diagnosed or test positive			ATE (pre-hospitalisation)		From hospitalised with COVID-19		From ATE (post-hospitalisation)
	Overall	To COVID-19 diagnosed or test positive	To hospitalised with COVID-19	To death	To ATE (pre-hospitalisation)	To hospitalised with COVID-19	To death	To hospitalised with COVID-19	To death	To ATE (post-hospitalisation)	To death	To death
N	5,489,533	376,349	9,091	35,314	1,181	20,910	3,440	133	82	323	4,437	92
Age	44 [25 to 60]	40 [22 to 55]	72 [57 to 83]	84 [72 to 90]	73 [61 to 82]	64 [51 to 76]	87 [80 to 91]	75 [66 to 83]	84 [75 to 89]	75 [65 to 84]	82 [74 to 88]	79 [72 to 85]
Age: Under 20	1,068,646 (19.5%)	81,883 (21.8%)	126 (1.4%)	95 (0.3%)	5 (0.4%)	202 (1.0%)	<5	0 (0.0%)	0 (0.0%)	0 (0.0%)	<5	0 (0.0%)
Age: 20 to 29	570,979 (10.4%)	49,721 (13.2%)	249 (2.7%)	129 (0.4%)	8 (0.7%)	569 (2.7%)	<5	0 (0.0%)	0 (0.0%)	<5	<5	0 (0.0%)
Age: 30 to 39	723,084 (13.2%)	52,474 (13.9%)	393 (4.3%)	302 (0.9%)	19 (1.6%)	1,271 (6.1%)	12 (0.3%)	<5	<5	<5	13 (0.3%)	0 (0.0%)
Age: 40 to 49	951,192 (17.3%)	68,186 (18.1%)	721 (7.9%)	954 (2.7%)	79 (6.7%)	2,660 (12.7%)	31 (0.9%)	5 (3.8%)	<5	12 (3.7%)	57 (1.3%)	<5
Age: 50 to 59	788,718 (14.4%)	53,400 (14.2%)	1,105 (12.2%)	2,377 (6.7%)	141 (11.9%)	3,986 (19.1%)	96 (2.8%)	12 (9.0%)	0 (0.0%)	36 (11.1%)	160 (3.6%)	7 (7.6%)
Age: 60 to 69	606,110 (11.0%)	31,827 (8.5%)	1,485 (16.3%)	3,953 (11.2%)	246 (20.8%)	4,241 (20.3%)	224 (6.5%)	27 (20.3%)	9 (11.0%)	55 (17.0%)	492 (11.1%)	12 (13.0%)
Age: 70 to 79	456,117 (8.3%)	20,095 (5.3%)	2,023 (22.3%)	6,302 (17.8%)	313 (26.5%)	3,974 (19.0%)	492 (14.3%)	42 (31.6%)	17 (20.7%)	98 (30.3%)	1,078 (24.3%)	27 (29.3%)
Age: 80 or older	324,687 (5.9%)	18,763 (5.0%)	2,989 (32.9%)	21,202 (60.0%)	370 (31.3%)	4,007 (19.2%)	2,581 (75.0%)	46 (34.6%)	54 (65.9%)	117 (36.2%)	2,632 (59.3%)	45 (48.9%)
Sex: Male	2,715,176 (49.5%)	180,221 (47.9%)	4,987 (54.9%)	18,204 (51.5%)	610 (51.7%)	11,570 (55.3%)	1,592 (46.3%)	78 (58.6%)	36 (43.9%)	196 (60.7%)	2,502 (56.4%)	57 (62.0%)
Years of prior observation time	14.7 [12.9 to 14.7]	14.7 [13.0 to 14.7]	14.7 [14.7 to 14.7]	14.7 [14.7 to 14.7]	14.7 [14.7 to 14.7]	14.7 [14.7 to 14.7]	14.7 [14.7 to 14.7]	14.7 [14.7 to 14.7]	14.7 [14.7 to 14.7]	14.7 [14.7 to 14.7]	14.7 [14.7 to 14.7]	14.7 [14.7 to 14.7]
Comorbidities												
Autoimmune disease	83,377 (1.5%)	5,473 (1.5%)	324 (3.6%)	1,369 (3.9%)	41 (3.5%)	648 (3.1%)	157 (4.6%)	5 (3.8%)	<5	15 (4.6%)	212 (4.8%)	6 (6.5%)
Antiphospholipid syndrome	2,351 (0.0%)	145 (0.0%)	5 (0.1%)	23 (0.1%)	<5	14 (0.1%)	<5	0 (0.0%)	0 (0.0%)	0 (0.0%)	5 (0.1%)	0 (0.0%)
Thrombophilia	4,871 (0.1%)	332 (0.1%)	17 (0.2%)	59 (0.2%)	8 (0.7%)	28 (0.1%)	<5	<5	0 (0.0%)	<5	9 (0.2%)	<5

Asthma	293,530 (5.3%)	22,752 (6.0%)	619 (6.8%)	1,998 (5.7%)	65 (5.5%)	1,448 (6.9%)	212 (6.2%)	10 (7.5%)	<5	17 (5.3%)	294 (6.6%)	5 (5.4%)
Atrial fibrillation	131,106 (2.4%)	7,980 (2.1%)	1,408 (15.5%)	8,413 (23.8%)	186 (15.7%)	1,757 (8.4%)	812 (23.6%)	33 (24.8%)	21 (25.6%)	61 (18.9%)	1,097 (24.7%)	23 (25.0%)
Malignant neoplastic disease	334,738 (6.1%)	18,744 (5.0%)	2,029 (22.3%)	13,700 (38.8%)	217 (18.4%)	3,079 (14.7%)	1,046 (30.4%)	36 (27.1%)	23 (28.0%)	65 (20.1%)	1,471 (33.2%)	24 (26.1%)
Diabetes mellitus	405,227 (7.4%)	26,227 (7.0%)	2,739 (30.1%)	10,497 (29.7%)	348 (29.5%)	4,646 (22.2%)	1,052 (30.6%)	44 (33.1%)	29 (35.4%)	136 (42.1%)	1,584 (35.7%)	39 (42.4%)
Obesity	849,916 (15.5%)	62,904 (16.7%)	3,237 (35.6%)	9,073 (25.7%)	390 (33.0%)	7,124 (34.1%)	902 (26.2%)	53 (39.8%)	29 (35.4%)	109 (33.7%)	1,591 (35.9%)	26 (28.3%)
Heart disease	573,769 (10.5%)	35,051 (9.3%)	3,780 (41.6%)	19,130 (54.2%)	535 (45.3%)	5,995 (28.7%)	1,947 (56.6%)	79 (59.4%)	45 (54.9%)	169 (52.3%)	2,638 (59.5%)	56 (60.9%)
Hypertensive disorder	925,838 (16.9%)	55,515 (14.8%)	4,940 (54.3%)	21,319 (60.4%)	764 (64.7%)	8,897 (42.5%)	2,198 (63.9%)	93 (69.9%)	56 (68.3%)	204 (63.2%)	2,989 (67.4%)	66 (71.7%)
Renal impairment	239,550 (4.4%)	14,295 (3.8%)	2,512 (27.6%)	13,374 (37.9%)	272 (23.0%)	3,368 (16.1%)	1,428 (41.5%)	48 (36.1%)	33 (40.2%)	92 (28.5%)	1,959 (44.2%)	37 (40.2%)
COPD	154,015 (2.8%)	8,323 (2.2%)	1,402 (15.4%)	6,768 (19.2%)	122 (10.3%)	1,926 (9.2%)	587 (17.1%)	17 (12.8%)	12 (14.6%)	52 (16.1%)	957 (21.6%)	21 (22.8%)
Dementia	54,963 (1.0%)	5,828 (1.5%)	583 (6.4%)	6,837 (19.4%)	99 (8.4%)	969 (4.6%)	1,113 (32.4%)	8 (6.0%)	18 (22.0%)	27 (8.4%)	704 (15.9%)	7 (7.6%)
Smoking	1,116,778 (20.3%)	64,926 (17.3%)	1,985 (21.8%)	8,610 (24.4%)	299 (25.3%)	4,323 (20.7%)	615 (17.9%)	31 (23.3%)	17 (20.7%)	85 (26.3%)	1,052 (23.7%)	23 (25.0%)
Medication use (183 days prior to four days prior)												
Non-steroidal anti-inflammatory drugs	940,465 (17.1%)	74,149 (19.7%)	2,269 (25.0%)	8,308 (23.5%)	303 (25.7%)	5,130 (24.5%)	879 (25.6%)	36 (27.1%)	23 (28.0%)	76 (23.5%)	1,099 (24.8%)	24 (26.1%)
Cox2 inhibitors	22,207 (0.4%)	1,593 (0.4%)	49 (0.5%)	112 (0.3%)	18 (1.5%)	154 (0.7%)	19 (0.6%)	<5	0 (0.0%)	0 (0.0%)	23 (0.5%)	0 (0.0%)
Systemic corticosteroids	207,880 (3.8%)	15,410 (4.1%)	796 (8.8%)	4,302 (12.2%)	106 (9.0%)	1,426 (6.8%)	401 (11.7%)	20 (15.0%)	7 (8.5%)	26 (8.0%)	508 (11.4%)	9 (9.8%)
Antithrombotic and anticoagulant therapies	65,631 (1.2%)	4,633 (1.2%)	412 (4.5%)	2,481 (7.0%)	59 (5.0%)	606 (2.9%)	219 (6.4%)	7 (5.3%)	<5	13 (4.0%)	264 (5.9%)	7 (7.6%)
Lipid modifying agents	46,713 (0.9%)	2,879 (0.8%)	197 (2.2%)	1,119 (3.2%)	31 (2.6%)	384 (1.8%)	88 (2.6%)	<5	<5	7 (2.2%)	114 (2.6%)	0 (0.0%)
Antineoplastic and immunomodulating agents	45,875 (0.8%)	3,992 (1.1%)	134 (1.5%)	911 (2.6%)	18 (1.5%)	249 (1.2%)	75 (2.2%)	<5	<5	0 (0.0%)	69 (1.6%)	0 (0.0%)
Hormonal contraceptives for systemic use	44,664 (0.8%)	4,701 (1.2%)	73 (0.8%)	353 (1.0%)	<5	137 (0.7%)	22 (0.6%)	<5	<5	<5	22 (0.5%)	0 (0.0%)
Tamoxifen	1,304 (0.0%)	75 (0.0%)	<5	27 (0.1%)	0 (0.0%)	9 (0.0%)	<5	0 (0.0%)	0 (0.0%)	0 (0.0%)	<5	0 (0.0%)

|											
Sex hormones and modulators of the genital system	54,885 (1.0%)	5,520 (1.5%)	99 (1.1%)	385 (1.1%)	7 (0.6%)	197 (0.9%)	26 (0.8%)	<5	<5	<5	27 (0.6%)	<5
Immunoglobulins	2,820 (0.1%)	218 (0.1%)	11 (0.1%)	0 (0.0%)	0 (0.0%)	14 (0.1%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
Summary variables	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
One or more condition of interest	1,455,634 (26.5%)	98,897 (26.3%)	6,305 (69.4%)	27,943 (79.1%)	807 (68.3%)	12,270 (58.7%)	2,710 (78.8%)	108 (81.2%)	73 (89.0%)	248 (76.8%)	3,711 (83.6%)	77 (83.7%)
One or more medication of interest	1,071,907 (19.5%)	84,541 (22.5%)	2,678 (29.5%)	10,141 (28.7%)	347 (29.4%)	5,874 (28.1%)	1,062 (30.9%)	43 (32.3%)	28 (34.1%)	94 (29.1%)	1,354 (30.5%)	31 (33.7%)
One or more condition/ medication of interest	2,161,241 (39.4%)	155,399 (41.3%)	6,985 (76.8%)	29,214 (82.7%)	915 (77.5%)	14,448 (69.1%)	2,877 (83.6%)	114 (85.7%)	78 (95.1%)	268 (83.0%)	3,907 (88.1%)	81 (88.0%)

Supplementary Table 5. Patient characteristics of persons with a positive PCR test or a diagnosis of COVID-19 or hospitalised with COVID-19 before September 2020

|	COVID-19 diagnosis or PCR positive test result					Hospitalised with COVID-19
	CPRD AURUM	DA Germany	IPCI	LPD Italy	SIDIAP CMBD-AH	SIDIAP CMBD-AH
N	24,589	6,713	4,304	4,734	93,969	20,467
Earliest index date	01/03/2020	02/03/2020	01/03/2020	01/03/2020	01/03/2020	01/03/2020
Latest index date	31/08/2020	31/08/2020	31/08/2020	31/08/2020	31/08/2020	31/08/2020
Age	58 [43 to 77]	44 [28 to 59]	52 [35 to 64]	54 [43 to 68]	49 [32 to 68]	66 [51 to 79]
Age: Under 20	186 (0.8%)	784 (11.7%)	222 (5.2%)	71 (1.5%)	8,085 (8.6%)	113 (0.6%)
Age: 20 to 29	1,974 (8.0%)	1,003 (14.9%)	543 (12.6%)	374 (7.9%)	11,874 (12.6%)	692 (3.4%)
Age: 30 to 39	2,684 (10.9%)	1,026 (15.3%)	534 (12.4%)	516 (10.9%)	12,930 (13.8%)	1,277 (6.2%)
Age: 40 to 49	3,569 (14.5%)	1,056 (15.7%)	681 (15.8%)	926 (19.6%)	15,649 (16.7%)	2,368 (11.6%)
Age: 50 to 59	4,643 (18.9%)	1,269 (18.9%)	887 (20.6%)	1,062 (22.4%)	14,034 (14.9%)	3,508 (17.1%)
Age: 60 to 69	3,216 (13.1%)	741 (11.0%)	605 (14.1%)	698 (14.7%)	9,214 (9.8%)	3,604 (17.6%)
Age: 70 to 79	2,843 (11.6%)	354 (5.3%)	409 (9.5%)	545 (11.5%)	8,177 (8.7%)	4,152 (20.3%)
Age: 80 or older	5,474 (22.3%)	480 (7.2%)	423 (9.8%)	542 (11.4%)	14,006 (14.9%)	4,753 (23.2%)
Sex: Male	10,403 (42.3%)	3,057 (45.5%)	1,699 (39.5%)	1,975 (41.7%)	41,485 (44.1%)	11,009 (53.8%)
Smoker	5,403 (22.0%)	204 (3.0%)	521 (12.1%)	518 (10.9%)	17,385 (18.5%)	4,090 (20.0%)
Years of prior observation time	12.6 [4.5 to 25.0]	5.8 [3.3 to 10.9]	6.5 [4.9 to 9.1]	8.5 [6.4 to 8.8]	14.3 [14.2 to 14.5]	14.2 [14.2 to 14.3]
Comorbidities						

Autoimmune disease	783 (3.2%)	452 (6.7%)	85 (2.0%)	247 (5.2%)	2,018 (2.1%)	668 (3.3%)
Antiphospholipid syndrome	23 (0.1%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	57 (0.1%)	19 (0.1%)
Thrombophilia	36 (0.1%)	21 (0.3%)	0 (0.0%)	0 (0.0%)	133 (0.1%)	41 (0.2%)
Asthma	3,073 (12.5%)	807 (12.0%)	375 (8.7%)	449 (9.5%)	5,870 (6.2%)	1,435 (7.0%)
Atrial fibrillation	1,820 (7.4%)	150 (2.2%)	191 (4.4%)	199 (4.2%)	5,302 (5.6%)	2,161 (10.6%)
Malignant neoplastic disease	2,499 (10.2%)	465 (6.9%)	422 (9.8%)	503 (10.6%)	8,777 (9.3%)	3,686 (18.0%)
Diabetes mellitus	4,186 (17.0%)	757 (11.3%)	500 (11.6%)	442 (9.3%)	11,725 (12.5%)	4,727 (23.1%)
Obesity	1,369 (5.6%)	815 (12.1%)	171 (4.0%)	50 (1.1%)	20,385 (21.7%)	6,714 (32.8%)
Heart disease	4,595 (18.7%)	1,530 (22.8%)	557 (12.9%)	966 (20.4%)	16,773 (17.8%)	6,519 (31.9%)
Hypertensive disorder	6,846 (27.8%)	1,884 (28.1%)	827 (19.2%)	1,576 (33.3%)	24,436 (26.0%)	9,189 (44.9%)
Renal impairment	3,717 (15.1%)	315 (4.7%)	245 (5.7%)	181 (3.8%)	9,555 (10.2%)	3,922 (19.2%)
COPD	1,404 (5.7%)	689 (10.3%)	166 (3.9%)	146 (3.1%)	4,638 (4.9%)	2,129 (10.4%)
Dementia	2,121 (8.6%)	212 (3.2%)	72 (1.7%)	73 (1.5%)	6,267 (6.7%)	1,524 (7.4%)
Medication use (183 days prior to four days prior)						
Non-steroidal anti-inflammatory drugs	808 (3.3%)	1,137 (16.9%)	441 (10.2%)	1,214 (25.6%)	18,752 (20.0%)	4,453 (21.8%)
Cox2 inhibitors	19 (0.1%)	80 (1.2%)	34 (0.8%)	95 (2.0%)	598 (0.6%)	204 (1.0%)
Systemic corticosteroids	1,157 (4.7%)	171 (2.5%)	310 (7.2%)	458 (9.7%)	3,748 (4.0%)	1,361 (6.6%)
Antithrombotic and anticoagulant therapies	997 (4.1%)	321 (4.8%)	261 (6.1%)	522 (11.0%)	3,838 (4.1%)	1,617 (7.9%)
Lipid modifying agents	1,359 (5.5%)	308 (4.6%)	256 (5.9%)	464 (9.8%)	3,056 (3.3%)	1,329 (6.5%)
Antineoplastic and immunomodulating agents	232 (0.9%)	44 (0.7%)	218 (5.1%)	98 (2.1%)	1,208 (1.3%)	345 (1.7%)
Hormonal contraceptives for systemic use	361 (1.5%)	82 (1.2%)	186 (4.3%)	63 (1.3%)	1,407 (1.5%)	154 (0.8%)
Tamoxifen	9 (0.0%)	<5	<5	<5	32 (0.0%)	11 (0.1%)
Sex hormones and modulators of the genital system	655 (2.7%)	102 (1.5%)	244 (5.7%)	144 (3.0%)	1,731 (1.8%)	223 (1.1%)
Immunoglobulins	0 (0.0%)	<5	0 (0.0%)	0 (0.0%)	60 (0.1%)	23 (0.1%)
Summary variables						

|						
One or more condition of interest	9,457 (38.5%)	2,051 (30.6%)	1,189 (27.6%)	1,258 (26.6%)	36,607 (39.0%)	12,562 (61.4%)
One or more medication of interest	2,479 (10.1%)	1,346 (20.1%)	884 (20.5%)	1,450 (30.6%)	22,541 (24.0%)	5,560 (27.2%)
One or more condition/ medication of interest	10,918 (44.4%)	2,870 (42.8%)	1,761 (40.9%)	2,223 (47.0%)	49,874 (53.1%)	14,698 (71.8%)

Supplementary Figure 2. Cumulative incidence of VTE, ATE and death among people hospitalised with COVID-19, stratified by age and sex. Estimates (solid lines) with 95% confidence intervals (dashed lines).
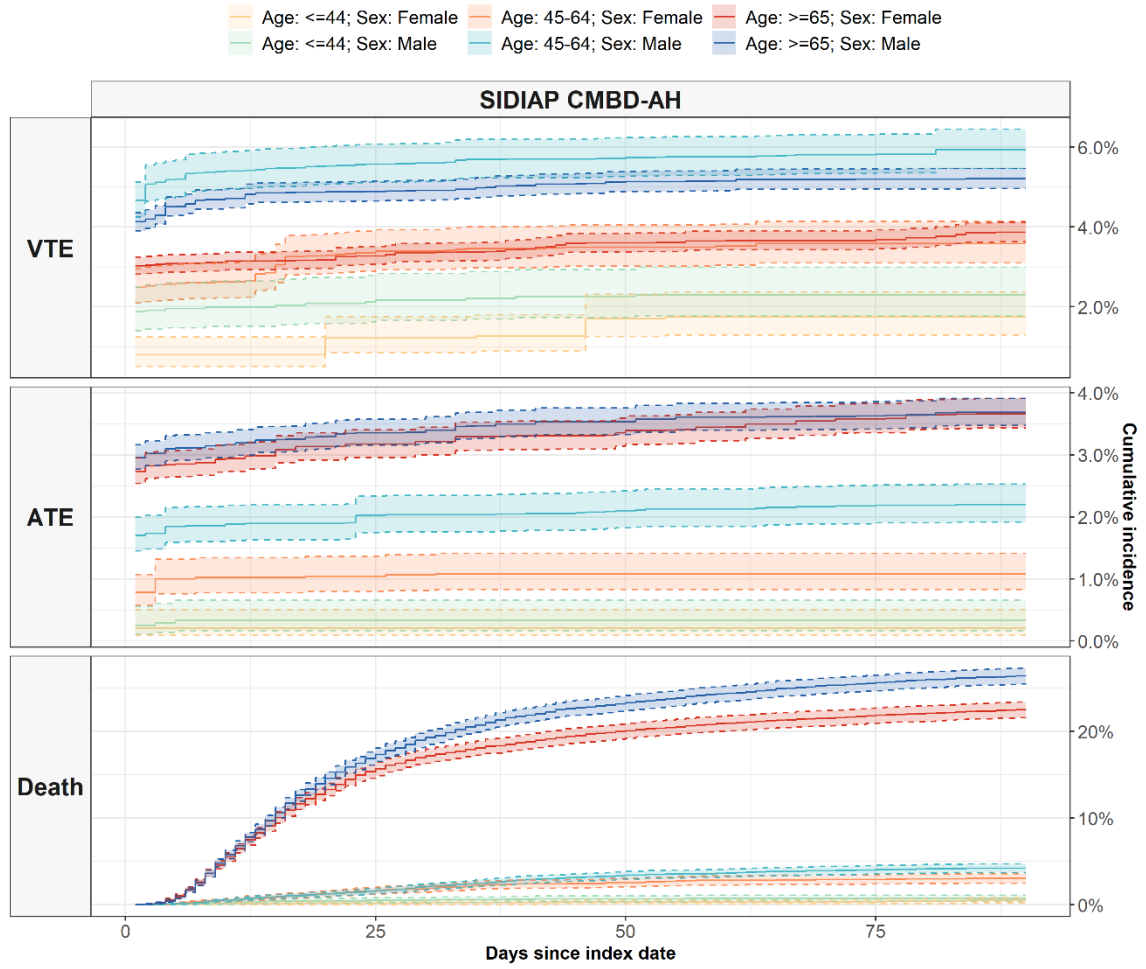
Supplementary Figure 3. Incidence of outcome events stratified by time period
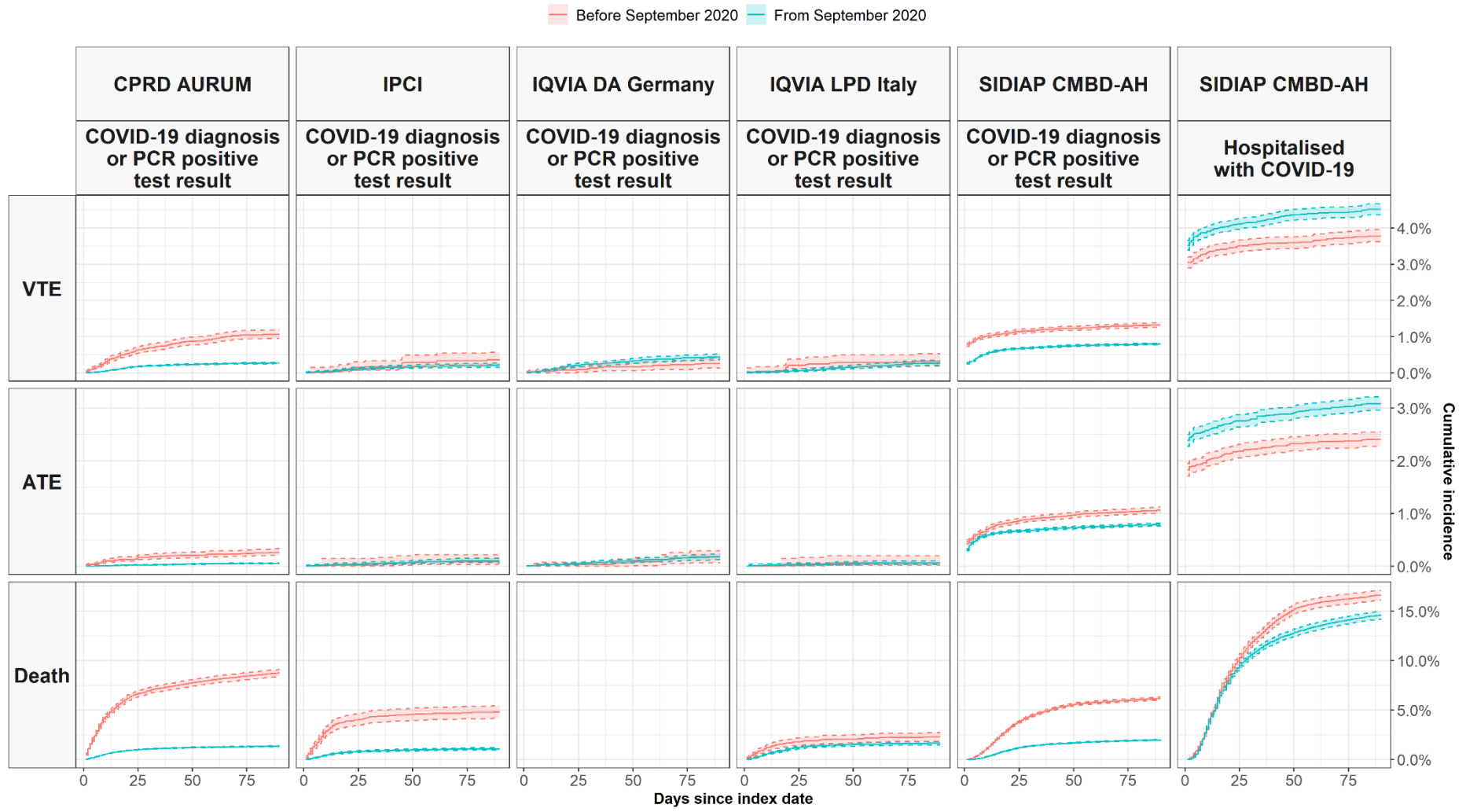
Supplementary Figure 4. Incidence of outcomes stratified by definition of COVID-19 (where the broad diagnosis definition included a wider set of diagnostic codes, such as "suspected COVID-19").
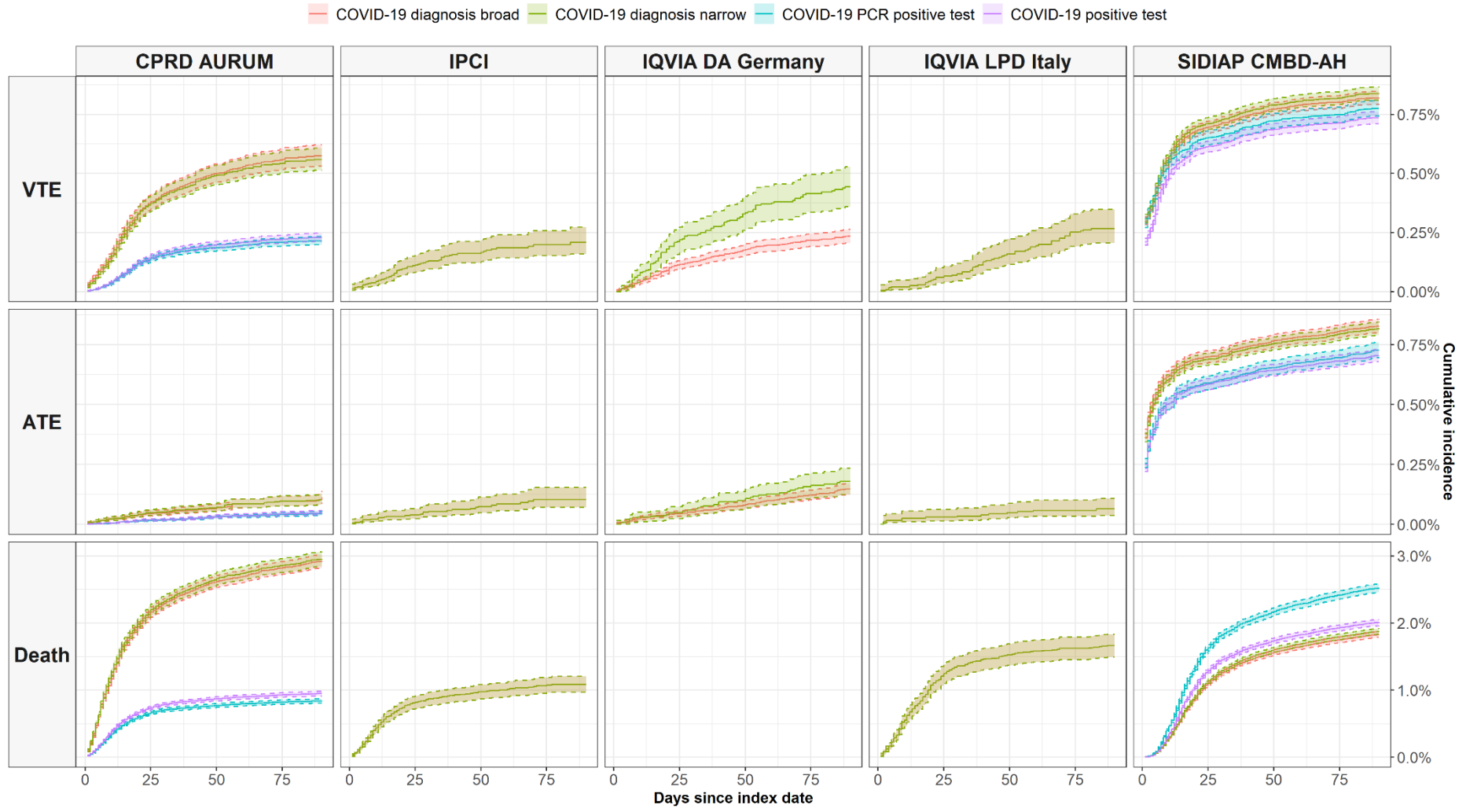
Supplementary Figure 5. Incidence of outcomes by whether year of prior history was required (NB estimates are overlapping)