

# THE LANCET

## Respiratory Medicine

### Supplementary appendix

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

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## SUPPLEMENT

The effectiveness of COVID-19 vaccines to prevent long COVID symptoms: staggered cohort analyses of data from Spain, Estonia, and the UK.

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**Figure S1: Details of the country-specific vaccination rollout and study-specific enrolment periods and definition of priority groups for vaccination.**

	United Kingdom (CPRD AURUM and CPRD GOLD)			SPAIN (SIDIAP)			ESTONIA (CORIVA)					
	Priority group*	Inclusion criteria for cohort	Enrolment windows	Priority group*	Inclusion criteria for cohort	Enrolment windows	Priority group*	Inclusion criteria for cohort	Enrolment windows			
	1) Residents in a care home for older adults and staff working in care homes for older adults	excluded as probably vaccinated before 04/01/2021	04/01/2021-27/01/2021	1) Residents and workers of nursing homes	excluded as probably vaccinated before 20/02/2021	Healthcare workers in hospitals, emergency rooms and family medicine centers	People in their 80s, then 70-80-year-olds with chronic diseases	Age ≥ 70	28/01/2021-20/04/2021			
Cohort 1	2) All those 80 years of age and over and frontline health and social care workers			2) First line healthcare workers								
	3) All those 75 years of age and over			3) Second line healthcare workers								
Cohort 2	4) All those 70 years of age and over and clinically extremely vulnerable individuals (not including pregnant women and those under 16 years of age)	Age ≥ 65 and clinically extremely vulnerable, at risk people	28/01/2021-28/02/2021	4) Severely disabled people								
	5) All those 65 years of age and over			5A) > 80 years	Age ≥ 80	20/02/2021-22/03/2021						
	6) Adults aged 16 to 65 years in an at-risk group			5B) 70-79 years								
				5C) 66-69 years								
				6) Essential workers**								
Cohort 3	7) All those 60 years of age and over	Age ≥ 50	01/03/2021-13/04/2021	7) People >16 years with high risk factors*	Age ≥ 40	24/03/2021-04/05/2021	All people 65+ and people in the risk group < 65 years old	Age ≥ 65 and ≥ 18 with high risk	21/04/2021-01/05/2021			
	8) All those 55 years of age and over			9) 50-59 years								
	9) All those 50 years of age and over			10) 40-49 years								
Cohort 4	10) Rest of the population ≥18	Age ≥ 18	14/04/2021-31/07/2021	11) 30-39 years	Age ≥ 18	17/06/2021-01/08/2021	Age group 30-39 starting vaccination	Age ≥ 19	13/06/2021-01/08/2021			
				12) 16-29 years								

\*Priority groups are country-specific and originally defined for the planning of the respective national vaccination rollout strategy by the respective governmental agency

\*\*Essential workers, frontline healthcare workers, social care workers could not be identified from the data. Therefore, people were included based on their age and records of conditions relevant for “high risk” and “at risk” categories for prioritisation.

**Table S1: Details of the country-specific vaccination rollout Country-specific lists of conditions characterising people as “clinically extremely vulnerable/high risk” or “at risk” for severe COVID-19.**

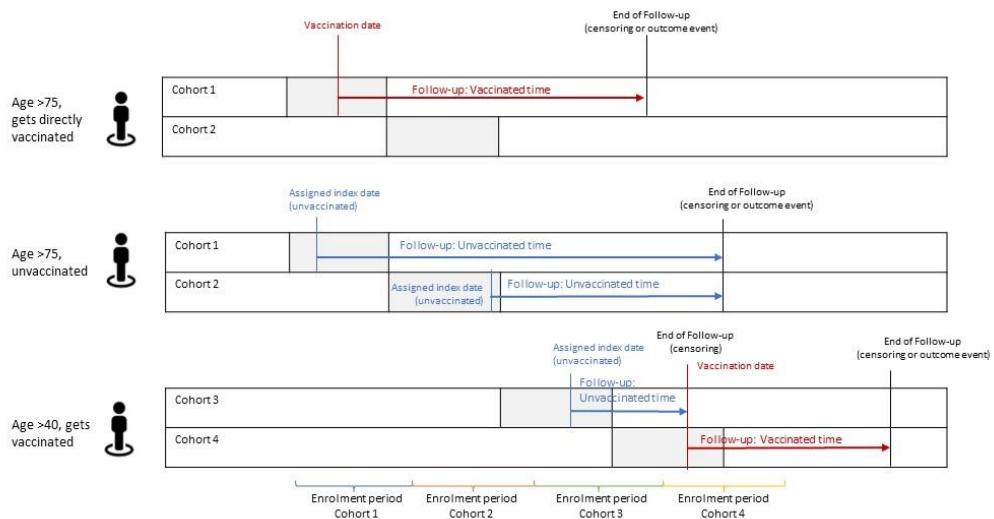
Categories	UK [1]	Spain [2]	Estonia [3]
<b>Conditions for “high risk”/ “clinically extremely vulnerable”</b>			
<i>Solid organ transplant</i>	Solid organ transplant recipients who remain on long term immune suppression therapy	Solid organ transplant recipient (or in waiting list for transplant): lung, renal, pancreatic, cardiac, hepatic, or intestinal	organ transplantation (performed up to 2 years ago)
<i>Bone marrow/stem cell transplant</i>	People who have had bone marrow or stem cell transplants in the last 6 months, or still taking immunosuppression drugs	Hematopoietic stem cell transplant recipient in the last 2 years OR >50 years of age AND/OR <80% Karnofsky index	bone marrow transplantation (performed up to 2 years ago)
<i>Immunodeficiencies</i>		Primary immunodeficiencies, excluding IgA deficiency and antibody formation defect	primary immunodeficiency
		HIV infection with <200c/ml in the last 6 months	
<i>Immunosuppressive therapy</i>	People on immunosuppression therapies sufficient to significantly increase risk of infection		people who have received immunosuppressive therapy in the last 5 years with hematological, rheumatological, gastroenterological, neurological diseases
<i>Blood cancer</i>	People with cancers of the blood or bone marrow such as leukaemia, lymphoma, or myeloma at any stage of treatment	Blood cancer in the last 5 years OR uncontrolled cancer AND/OR ECOG 3-4 AND/OR severe neutropenia (<500 neutrophiles/mm3) regardless of years since diagnosis	malignant tumors of lymphoid and hematopoietic tissue (diagnosed up to 5 years ago)
<i>Other active cancer</i>	Cancer undergoing active chemo/radiotherapy or radical radiotherapy for lung cancer	Solid organ cancer in treatment with chemotherapy or metastatic, OR receiving radiotherapy for tumours in the thorax with risks of pneumonitis (oesophageal tumour, radiotherapy on lung metastases, etc.)	other tumors (diagnosed up to 1 year ago)
<i>Neurological/muscular disease</i>			demyelinating diseases of the central nervous system
			amyotrophic lateral sclerosis; a stroke within the last year and residual symptoms of a stroke;
			dementia; Parkinson's disease
<i>Down Syndrome</i>		Individuals with Down syndrome aged >40 years	
<i>Kidney failure + Dialysis</i>		Haemodialysis or peritoneal dialysis	Kidney failure
<i>Severe respiratory disease</i>	Cystic Fibrosis, idiopathic pulmonary fibrosis, etc.	Cystic fibrosis –added on 22 June 2021, so can be omitted the purpose of the study	cystic fibrosis
	People with severe respiratory conditions including severe asthma and severe COPD		
<i>Rare diseases</i>	People with rare diseases and inborn errors of metabolism that significantly increase the risk of infections (such as SCID, homozygous sickle cell)		

Pregnancy + Heart disease	People who are pregnant with significant congenital heart disease		
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Categories	Conditions for "at risk"/ "underlying conditions"		
Severe Chronic Kidney disease	unresolved CKD stage 3-5 diagnosis		
Severe Chronic Liver disease	chronic liver disease diagnosis		
Immunosuppression	immunosuppressive drug treatment within the 12 month period leading up to and including the reporting period end date-		
	expiring immunosuppression diagnosis within the 12 months leading up to and including the reporting period end date which is not resolved		
	unresolved 'persisting' immunosuppression diagnosis		
Diabetes	unresolved diabetes diagnosis		diabetes
Chronic and severe respiratory disease	chronic respiratory disease diagnosis		chronic bronchitis, emphysema, COPD; severe asthma (oral corticosteroid therapy in the last 5 years, biological therapy), bronchiectasis disease
	Asthma treatment within the 12 month period leading up to the reporting period end date OR Emergency hospital admission due to asthma-		
Obesity	explicit high BMI/ BMI $\geq 40$		obesity (BMI $\geq 40$ )
Neurological disease	chronic neurological disease diagnosis		
Severe cardiovascular disease	chronic heart disease diagnosis		cardiological diseases
cerebrovascular disease	TIA diagnosis		
Pregnancy	pregnant in the last 9 months		
Other	'requires influenza virus vaccination'		
	learning disability diagnosis		

Sources for overview table: [1] NHS Digital. COVID-19 – high risk shielded patient list identification methodology- Rule logic. Update from 8 December 2021 — General Practice Specification and Extraction Service (GPSES), NHS Digital: “Business Rules for Patient-level Data Extracts 2019/20 COVID19 At-risk patients”, Version: 1.1, Version Date: 17/03/2020 [2] [https://beteve.cat/societat/vacunacio-grups-risc-malties-greus-simultaniament-franja-70-79-any/](https://beteve.cat/societat/vacunacio-grups-risc-malalties-greus-simultaniament-franja-70-79-any/) [3] [https://vaktsineeri.ee/wp-content/uploads/2021/06/covid-19\\_vaktsineerimise\\_plaan\\_19.01\\_0.pdf](https://vaktsineeri.ee/wp-content/uploads/2021/06/covid-19_vaktsineerimise_plaan_19.01_0.pdf)

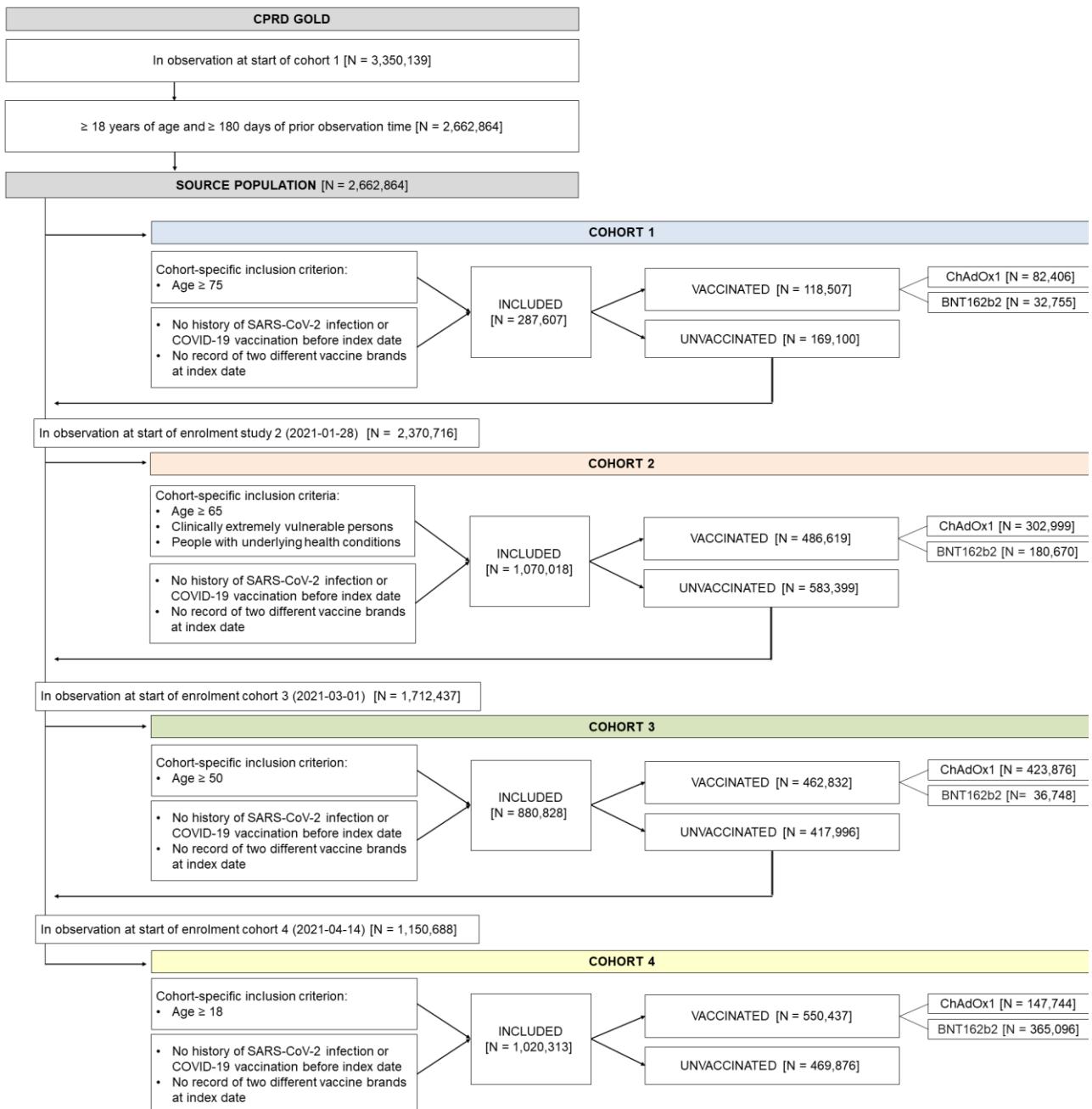
**Figure S2: Illustration of follow-up for staggered cohort study.**



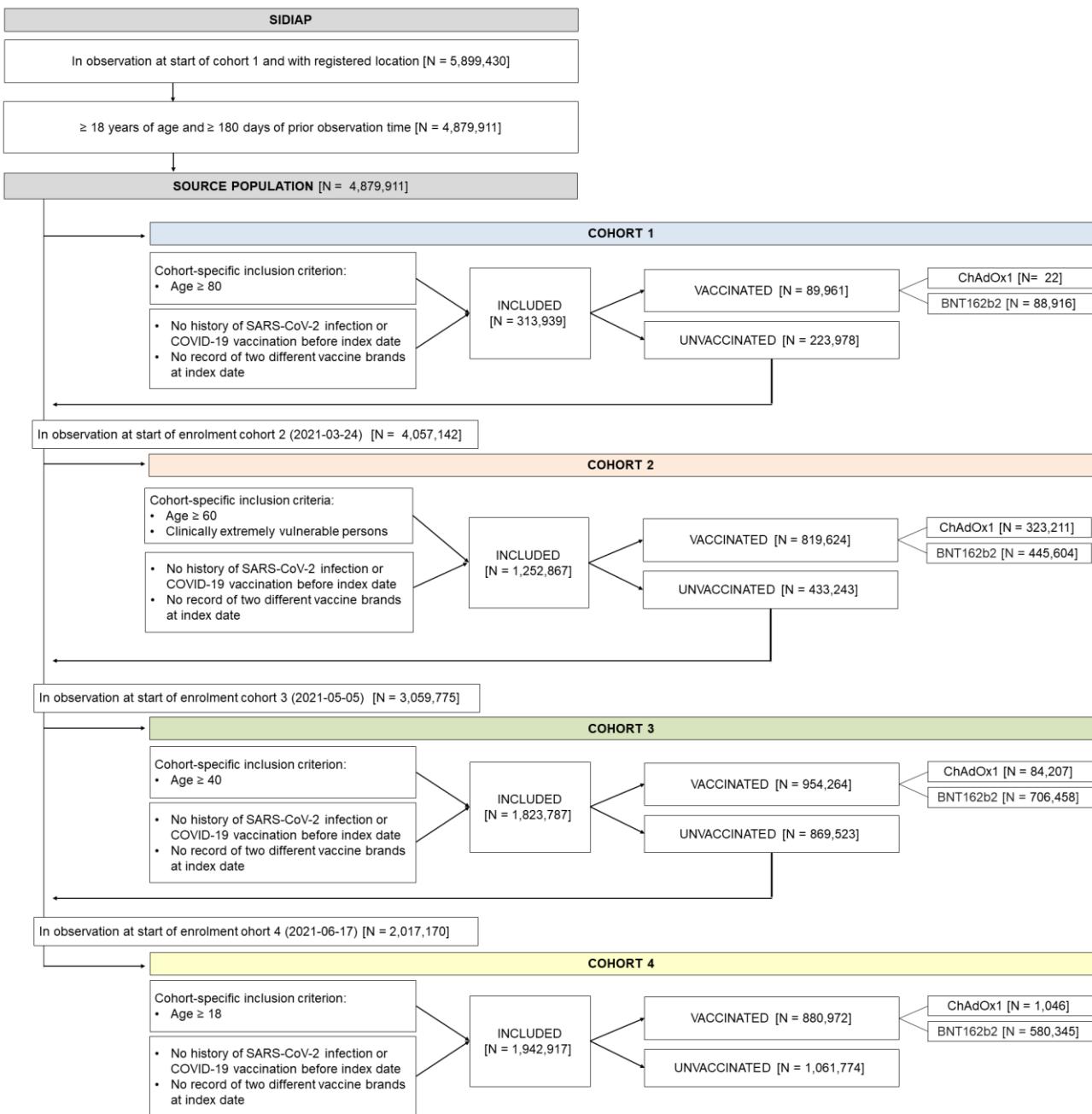
**Figure S3: Study Design using UK vaccination rollout (CPRD AURUM and GOLD) as illustrative example.**

	Study period				
	Enrolment periods				Follow-up
	04/01–27/01	28/01– 28/02	01/03-13/04	14/04–31/07	
<b>STUDY COHORT</b> Age $\geq 75$ (risk groups 2+3)	Vaccinated				→
	Unvaccinated				→
<b>STUDY COHORT</b> Age $\geq 65$ , clinically extremely vulnerable/ at-risk patients (risk groups 4-6) + Eligible unvaccinated adults in risk groups 2+3	Vaccinated				→
	Unvaccinated				→
<b>STUDY COHORT</b> Age $\geq 50$ (risk groups 7-9) + Eligible unvaccinated adults in risk groups 2-6	Vaccinated				→
	Unvaccinated				→
<b>STUDY COHORT</b> Age $\geq 18$ (risk group 10) + Eligible unvaccinated adults in risk groups 2-10	Vaccinated				→
	Unvaccinated				→

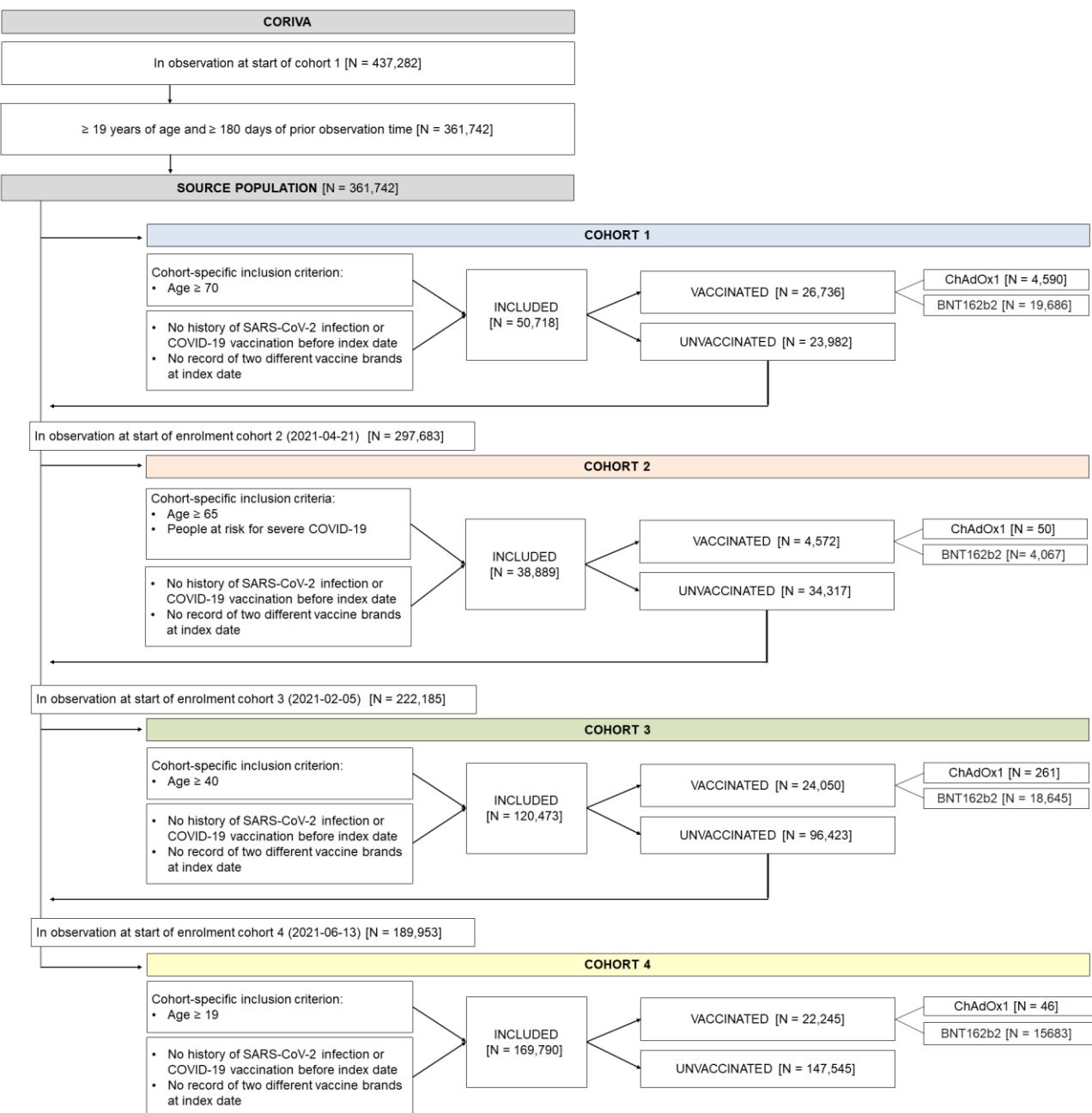
**Figure S4: Study Inclusion Flowchart CPRD GOLD.**



**Figure S5: Study Inclusion Flowchart SIDIAP.**



**Figure S6: Study Inclusion Flowchart CORIVA.**



**Table S2: Characteristics of unweighted populations in CPRD AURUM, stratified by staggered cohort and exposure status. Exposure is any COVID-19 vaccine.**

	Cohort 1			Cohort 2			Cohort 3			Cohort 4		
	Unvaccinated	Vaccinated	ASMD	Unvaccinated	Vaccinated	ASMD	Unvaccinated	Vaccinated	ASMD	Unvaccinated	Vaccinated	ASMD
Number individuals, N	346,674	552,602		1,975,726	1,563,569		1,510,401	1,528,031		2,027,763	2,085,598	
Age, median [Q25-Q75]	78 [76-82]	81 [78-86]	0.319	42 [32-55]	68 [60-73]	0.995	41 [31-53]	55 [51-60]	0.610	35 [27-45]	35 [27-43]	0.134
Sex: Female, N(%)	192,771 (56%)	314,141 (57%)	0.025	1,244,636 (63%)	852,976 (55%)	0.172	880,404 (58%)	771,929 (51%)	0.157	862,676 (43%)	958,124 (46%)	0.068
Prior observation years, median [Q25-Q75]	8,585 [3,639-12,858]	9,227 [4,146-13,566]	0.056	5,485 [2,515-8,997]	7,681 [3,354-11,795]	0.278	4,571 [2,111-8,086]	6,171 [2,786-9,744]	0.207	2,765 [1,339-6,001]	2,906 [1,273-6,724]	0.032
Number GP visits, median [Q25-Q75]	10 [5-17]	11 [6-19]		6 [2-11]	10 [6-17]		4 [1-10]	7 [3-12]		2 [0-5]	3 [1-7]	
Number of PCR tests, median [Q25-Q75]	0[0-0]	0[0-0]		0[0-0]	0[0-0]		0[0-0]	0[0-0]		0[0-0]	0[0-0]	
Comorbidities, N(%)												
Anxiety	51,067 (15%)	82,765 (15%)	0.007	435,770 (22%)	309,567 (20%)	0.056	289,563 (19%)	292,336 (19%)	0.001	265,627 (13%)	338,058 (16%)	0.088
Asthma	36,474 (11%)	61,899 (11%)	0.022	501,209 (25%)	275,768 (18%)	0.189	294,123 (19%)	209,708 (14%)	0.155	138,317 (7%)	173,056 (8%)	0.056
Chronic kidney disease	71,083 (21%)	137,953 (25%)	0.107	55,104 (3%)	154,263 (10%)	0.294	24,340 (2%)	30,896 (2%)	0.031	18,625 (1%)	5,796 (0%)	0.083
COPD	28,665 (8%)	47,422 (9%)	0.011	29,729 (2%)	107,297 (7%)	0.270	13,433 (1%)	15,685 (1%)	0.014	10,543 (1%)	2,535 (0%)	0.071
Dementia	16,610 (5%)	32,934 (6%)	0.052	6,692 (0%)	15,828 (1%)	0.082	3,425 (0%)	3,219 (0%)	0.003	2,691 (0%)	575 (0%)	0.037
Depressive disorder	42,145 (12%)	64,840 (12%)	0.013	367,463 (19%)	283,390 (18%)	0.012	236,584 (16%)	265,876 (17%)	0.047	210,644 (10%)	253,317 (12%)	0.056
Diabetes	63,154 (18%)	101,682 (18%)	0.005	107,425 (5%)	253,026 (16%)	0.351	60,932 (4%)	84,224 (6%)	0.069	49,154 (2%)	22,968 (1%)	0.101
GERD	18,336 (5%)	32,360 (6%)	0.025	68,070 (3%)	84,985 (5%)	0.097	39,594 (3%)	58,961 (4%)	0.070	31,119 (2%)	38,612 (2%)	0.025
Heart failure	17,882 (5%)	33,578 (6%)	0.040	12,275 (1%)	37,396 (2%)	0.146	5,641 (0%)	7,204 (0%)	0.015	4,611 (0%)	1,163 (0%)	0.046

	Cohort 1			Cohort 2			Cohort 3			Cohort 4		
	Unvaccinated	Vaccinated	ASMD	Unvaccinated	Vaccinated	ASMD	Unvaccinated	Vaccinated	ASMD	Unvaccinated	Vaccinated	ASMD
Hypertension	172,799 (50%)	301,294 (55%)	0.094	206,105 (10%)	545,782 (35%)	0.611	110,912 (7%)	240,120 (16%)	0.264	86,435 (4%)	54,357 (3%)	0.091
Hypothyroidism	31,444 (9%)	56,367 (10%)	0.038	78,934 (4%)	118,453 (8%)	0.154	43,892 (3%)	67,686 (4%)	0.081	30,993 (2%)	35,364 (2%)	0.013
Malignant neoplastic disease	68,984 (20%)	131,635 (24%)	0.095	60,318 (3%)	207,240 (13%)	0.379	29,689 (2%)	61,923 (4%)	0.122	22,701 (1%)	13,590 (1%)	0.050
Myocardial infarction	16,027 (5%)	29,525 (5%)	0.033	20,259 (1%)	56,161 (4%)	0.172	7,396 (0%)	12,703 (1%)	0.042	5,764 (0%)	1,621 (0%)	0.049
Osteoporosis	29,909 (9%)	59,521 (11%)	0.072	18,263 (1%)	64,108 (4%)	0.204	8,846 (1%)	15,089 (1%)	0.045	6,922 (0%)	2,535 (0%)	0.046
Pneumonia	16,992 (5%)	28,398 (5%)	0.011	31,746 (2%)	50,739 (3%)	0.107	17,785 (1%)	22,064 (1%)	0.023	13,305 (1%)	13,282 (1%)	0.002
Rheumatoid arthritis	6,596 (2%)	11,237 (2%)	0.009	14,811 (1%)	33,173 (2%)	0.116	5,548 (0%)	9,130 (1%)	0.033	3,710 (0%)	1,816 (0%)	0.026
Stroke	15,249 (4%)	26,478 (5%)	0.019	16,942 (1%)	39,907 (3%)	0.131	7,422 (0%)	10,828 (1%)	0.028	6,030 (0%)	2,291 (0%)	0.042
Venous thromboembolism	19,607 (6%)	35,332 (6%)	0.031	28,876 (1%)	63,048 (4%)	0.158	13,608 (1%)	26,299 (2%)	0.072	12,945 (1%)	4,787 (0%)	0.062

ASMD = Absolute standardized mean difference, COPD = Chronic obstructive pulmonary disease, GERD = Gastroesophageal reflux disease

**Table S3: Characteristics of weighted populations in CPRD AURUM, stratified by staggered cohort and exposure status. Exposure is ChAdOx1 vaccine.**

	Cohort 1			Cohort 2			Cohort 3			Cohort 4		
	Unvaccinated	Vaccinated	ASMD	Unvaccinated	Vaccinated	ASMD	Unvaccinated	Vaccinated	ASMD	Unvaccinated	Vaccinated	ASMD
<b>Number individuals, N</b>	100,517	99,985		308,608	304,995		448,766	445,397		242,955	243,847	
<b>Age, median [Q25-Q75]</b>	78 [76-84]	78 [76-84]	0.001	62 [47-69]	62 [47-69]	0.007	50 [41-57]	52 [41-57]	0.001	44 [41-48]	44 [41-48]	0.003
<b>Sex: Female, N(%)</b>	57,756 (57%)	57,174 (57%)	0.006	179,574 (58%)	176,871 (58%)	0.004	236,260 (53%)	234,320 (53%)	0.001	101,805 (42%)	100,846 (41%)	0.011
<b>Prior observation years, median [Q25-Q75]</b>	8,794 [3,773-13,117]	8,808 [3,657-13,132]	0.004	6,558 [2,890-10,625]	6,648 [2,929-10,696]	0.002	5,092 [2,366-8,644]	5,148 [2,369-8,639]	0.002	3,570 [1,790-6,393]	3,446 [1,646-6,446]	0.004
<b>Number GP visits, median [Q25-Q75]</b>	10 [5-18]	10 [6-18]		8 [3-15]	8 [5-15]		4 [1-11]	6 [2-10]		2 [0-7]	2 [1-7]	
<b>Number of PCR tests, median [Q25-Q75]</b>	0[0-0]	0[0-0]		0[0-0]	0[0-0]		0[0-0]	0[0-0]		0[0-0]	0[0-0]	
<b>Comorbidities, N(%)</b>												
Anxiety	15,457 (15%)	15,069 (15%)	0.009	67,125 (22%)	64,408 (21%)	0.015	90,806 (20%)	87,243 (20%)	0.016	37,475 (15%)	38,040 (16%)	0.005
Asthma	10,993 (11%)	10,863 (11%)	0.002	65,274 (21%)	62,424 (20%)	0.017	76,417 (17%)	75,841 (17%)	0.000	17,944 (7%)	17,468 (7%)	0.009
Chronic kidney disease	23,223 (23%)	22,872 (23%)	0.005	23,022 (7%)	24,288 (8%)	0.019	8,460 (2%)	8,356 (2%)	0.001	2,419 (1%)	2,043 (1%)	0.017
COPD	8,669 (9%)	8,770 (9%)	0.005	14,411 (5%)	15,226 (5%)	0.015	5,747 (1%)	4,794 (1%)	0.019	1,263 (1%)	1,250 (1%)	0.001
Dementia	6,529 (6%)	6,431 (6%)	0.003	3,880 (1%)	3,541 (1%)	0.009	898 (0%)	1,004 (0%)	0.006	203 (0%)	399 (0%)	0.023
Depressive disorder	12,559 (12%)	12,267 (12%)	0.007	60,745 (20%)	57,903 (19%)	0.018	80,264 (18%)	77,017 (17%)	0.016	32,304 (13%)	33,302 (14%)	0.011
Diabetes	18,750 (19%)	18,602 (19%)	0.001	39,262 (13%)	38,979 (13%)	0.002	25,334 (6%)	26,121 (6%)	0.009	6,679 (3%)	6,315 (3%)	0.010
GERD	5,590 (6%)	5,471 (5%)	0.004	14,645 (5%)	14,339 (5%)	0.002	14,758 (3%)	14,823 (3%)	0.002	5,727 (2%)	6,021 (2%)	0.007
Heart failure	6,181 (6%)	5,763 (6%)	0.016	6,098 (2%)	5,685 (2%)	0.008	2,241 (0%)	1,983 (0%)	0.008	610 (0%)	545 (0%)	0.006
Hypertension	52,737 (52%)	51,796 (52%)	0.013	78,623 (25%)	79,827 (26%)	0.016	51,054 (11%)	51,059 (11%)	0.003	15,350 (6%)	15,670 (6%)	0.004
Hypothyroidism	9,956 (10%)	9,690 (10%)	0.007	19,720 (6%)	19,562 (6%)	0.001	16,480 (4%)	16,361 (4%)	0.000	5,735 (2%)	5,984 (2%)	0.006
Malignant neoplastic disease	21,691 (22%)	21,468 (21%)	0.003	25,191 (8%)	27,892 (9%)	0.035	13,140 (3%)	12,870 (3%)	0.002	4,003 (2%)	3,621 (1%)	0.013
Myocardial infarction	5,182 (5%)	4,988 (5%)	0.008	7,777 (3%)	8,594 (3%)	0.018	3,415 (1%)	3,228 (1%)	0.004	933 (0%)	636 (0%)	0.022

	Cohort 1			Cohort 2			Cohort 3			Cohort 4		
	Unvaccinated	Vaccinated	ASMD	Unvaccinated	Vaccinated	ASMD	Unvaccinated	Vaccinated	ASMD	Unvaccinated	Vaccinated	ASMD
Osteoporosis	9,975 (10%)	10,018 (10%)	0.003	9,052 (3%)	9,423 (3%)	0.009	3,285 (1%)	3,499 (1%)	0.006	840 (0%)	934 (0%)	0.006
Pneumonia	5,770 (6%)	5,268 (5%)	0.021	9,096 (3%)	8,541 (3%)	0.009	6,196 (1%)	6,077 (1%)	0.001	1,923 (1%)	2,040 (1%)	0.005
Rheumatoid arthritis	2,002 (2%)	2,063 (2%)	0.005	4,856 (2%)	4,971 (2%)	0.004	2,266 (1%)	2,795 (1%)	0.016	665 (0%)	478 (0%)	0.016
Stroke	5,085 (5%)	4,791 (5%)	0.012	6,650 (2%)	6,616 (2%)	0.001	3,150 (1%)	2,942 (1%)	0.005	908 (0%)	773 (0%)	0.010
Venous thromboembolism	6,342 (6%)	6,069 (6%)	0.010	9,208 (3%)	9,850 (3%)	0.014	6,193 (1%)	7,393 (2%)	0.023	2,532 (1%)	1,239 (1%)	0.061

ASMD = Absolute standardized mean difference, COPD = Chronic obstructive pulmonary disease, GERD = Gastroesophageal reflux disease

**Table S4: Characteristics of unweighted populations in CPRD AURUM, stratified by staggered cohort and exposure status. Exposure is ChAdOx1 vaccine.**

	Cohort 1			Cohort 2			Cohort 3			Cohort 4		
	Unvaccinated	Vaccinated	ASMD	Unvaccinated	Vaccinated	ASMD	Unvaccinated	Vaccinated	ASMD	Unvaccinated	Vaccinated	ASMD
<b>Number individuals, N</b>	344,687	219,804		1,975,770	969,262		1,510,493	1,473,602		2,066,318	542,670	
<b>Age, median [Q25-Q75]</b>	78 [76-82]	80 [77-85]	0.240	42 [32-55]	69 [63-73]	1.059	41 [31-53]	55 [51-60]	0.605	34 [27-45]	45 [42-48]	0.507
<b>Sex: Female, N(%)</b>	191,649 (56%)	127,656 (58%)	0.050	1,244,532 (63%)	528,692 (55%)	0.172	880,468 (58%)	739,444 (50%)	0.163	880,225 (43%)	242,758 (45%)	0.043
<b>Prior observation years, median [Q25-Q75]</b>	8,597 [3,652-12,867]	8,791 [3,464-13,225]	0.018	5,485 [2,515-8,997]	7,794 [3,377-11,921]	0.288	4,571 [2,110-8,085]	6,148 [2,779-9,701]	0.203	2,723 [1,307-5,951]	3,718 [1,828-6,515]	0.143
<b>Number GP visits, median [Q25-Q75]</b>	10 [5-17]	12 [6-19]		6 [2-11]	10 [6-17]		4 [1-10]	7 [3-12]		2 [0-5]	3 [1-8]	
<b>Number of PCR tests, median [Q25-Q75]</b>	0[0-0]	0[0-0]		0[0-0]	0[0-0]		0[0-0]	0[0-0]		0[0-0]	0[0-0]	
<b>Comorbidities, N(%)</b>												
Anxiety	50,786 (15%)	33,355 (15%)	0.012	435,737 (22%)	187,469 (19%)	0.067	289,618 (19%)	281,846 (19%)	0.001	268,451 (13%)	86,805 (16%)	0.085
Asthma	36,259 (11%)	24,009 (11%)	0.013	501,234 (25%)	159,162 (16%)	0.221	294,156 (19%)	200,995 (14%)	0.157	140,178 (7%)	41,393 (8%)	0.033
Chronic kidney disease	70,604 (20%)	51,053 (23%)	0.066	55,103 (3%)	97,339 (10%)	0.299	24,361 (2%)	24,198 (2%)	0.002	18,798 (1%)	2,879 (1%)	0.045
COPD	28,448 (8%)	19,105 (9%)	0.016	29,730 (2%)	67,700 (7%)	0.274	13,436 (1%)	13,621 (1%)	0.004	10,647 (1%)	1,510 (0%)	0.038
Dementia	16,327 (5%)	16,795 (8%)	0.121	6,689 (0%)	12,106 (1%)	0.103	3,424 (0%)	1,896 (0%)	0.023	2,729 (0%)	447 (0%)	0.015
Depressive disorder	41,905 (12%)	27,009 (12%)	0.004	367,500 (19%)	170,626 (18%)	0.026	236,628 (16%)	256,789 (17%)	0.047	212,626 (10%)	74,210 (14%)	0.104
Diabetes	62,733 (18%)	39,751 (18%)	0.003	107,449 (5%)	154,348 (16%)	0.344	60,968 (4%)	78,394 (5%)	0.061	49,223 (2%)	9,729 (2%)	0.041
GERD	18,253 (5%)	12,156 (6%)	0.010	68,089 (3%)	52,694 (5%)	0.097	39,619 (3%)	56,444 (4%)	0.068	31,367 (2%)	13,807 (3%)	0.073
Heart failure	17,716 (5%)	13,147 (6%)	0.037	12,277 (1%)	24,276 (3%)	0.152	5,638 (0%)	5,673 (0%)	0.002	4,625 (0%)	681 (0%)	0.024
Hypertension	171,846 (50%)	114,922 (52%)	0.049	206,105 (10%)	345,014 (36%)	0.626	110,975 (7%)	224,543 (15%)	0.251	87,010 (4%)	31,330 (6%)	0.072

	Cohort 1			Cohort 2			Cohort 3			Cohort 4		
	Unvaccinated	Vaccinated	ASMD	Unvaccinated	Vaccinated	ASMD	Unvaccinated	Vaccinated	ASMD	Unvaccinated	Vaccinated	ASMD
Hypothyroidism	31,256 (9%)	21,855 (10%)	0.030	78,921 (4%)	73,992 (8%)	0.156	43,887 (3%)	64,026 (4%)	0.077	31,315 (2%)	13,920 (3%)	0.074
Malignant neoplastic disease	68,598 (20%)	49,023 (22%)	0.059	60,355 (3%)	131,135 (14%)	0.387	29,693 (2%)	55,601 (4%)	0.108	22,873 (1%)	7,505 (1%)	0.025
Myocardial infarction	15,938 (5%)	11,236 (5%)	0.023	20,262 (1%)	33,142 (3%)	0.163	7,401 (0%)	11,237 (1%)	0.035	5,781 (0%)	861 (0%)	0.026
Osteoporosis	29,704 (9%)	22,986 (10%)	0.063	18,255 (1%)	42,319 (4%)	0.216	8,856 (1%)	12,455 (1%)	0.031	6,980 (0%)	1,380 (0%)	0.015
Pneumonia	16,837 (5%)	12,101 (6%)	0.028	31,706 (2%)	33,170 (3%)	0.116	17,787 (1%)	20,399 (1%)	0.018	13,425 (1%)	4,297 (1%)	0.017
Rheumatoid arthritis	6,549 (2%)	4,544 (2%)	0.012	14,813 (1%)	20,294 (2%)	0.114	5,536 (0%)	8,463 (1%)	0.030	3,723 (0%)	821 (0%)	0.007
Stroke	15,118 (4%)	10,876 (5%)	0.027	16,944 (1%)	24,851 (3%)	0.132	7,424 (0%)	9,547 (1%)	0.021	6,059 (0%)	1,153 (0%)	0.016
Venous thromboembolism	19,455 (6%)	13,782 (6%)	0.026	28,887 (1%)	39,415 (4%)	0.159	13,609 (1%)	24,312 (2%)	0.067	13,021 (1%)	1,936 (0%)	0.039

ASMD = Absolute standardized mean difference, COPD = Chronic obstructive pulmonary disease, GERD = Gastroesophageal reflux disease

**Table S5: Characteristics of weighted populations in CPRD AURUM, stratified by staggered cohort and exposure status. Exposure is BNT162b2 vaccine.**

	Cohort 1			Cohort 2			Cohort 3			Cohort 4		
	Unvaccinated	Vaccinated	ASMD	Unvaccinated	Vaccinated	ASMD	Unvaccinated	Vaccinated	ASMD	Unvaccinated	Vaccinated	ASMD
<b>Number individuals, N</b>	105,853	106,684		255,400	253,164		37,236	37,227		630,449	633,628	
<b>Age, median [Q25-Q75]</b>	80 [77-85]	80 [77-85]	0.003	58 [46-67]	58 [46-68]	0.006	54 [45-64]	54 [45-64]	0.016	32 [25-37]	32 [25-37]	0.001
<b>Sex: Female, N(%)</b>	60,612 (57%)	60,891 (57%)	0.004	147,020 (58%)	146,572 (58%)	0.007	22,049 (59%)	22,144 (59%)	0.005	278,649 (44%)	282,744 (45%)	0.009
<b>Prior observation years, median [Q25-Q75]</b>	8,870 [3,918-13,035]	8,902 [3,877-12,944]	0.005	6,530 [2,947-10,507]	6,600 [2,961-10,608]	0.007	5,958 [2,702-9,858]	6,034 [2,693-9,831]	0.007	2,678 [1,314-6,010]	2,500 [1,080-6,476]	0.006
<b>Number GP visits, median [Q25-Q75]</b>	10 [5-18]	10 [6-17]		8 [3-15]	10 [5-15]		6 [2-15]	8 [4-14]		2 [0-6]	2 [0-6]	
<b>Number of PCR tests, median [Q25-Q75]</b>	0[0-0]	0[0-0]		0[0-0]	0[0-0]		0[0-0]	0[0-0]		0[0-0]	0[0-0]	
<b>Comorbidities, N(%)</b>												
Anxiety	15,706 (15%)	15,578 (15%)	0.007	57,951 (23%)	55,594 (22%)	0.018	7,672 (21%)	7,363 (20%)	0.021	96,918 (15%)	96,528 (15%)	0.004
Asthma	11,563 (11%)	11,733 (11%)	0.002	60,265 (24%)	58,010 (23%)	0.016	6,397 (17%)	6,215 (17%)	0.013	50,849 (8%)	48,590 (8%)	0.015
Chronic kidney disease	25,741 (24%)	26,243 (25%)	0.007	17,219 (7%)	18,864 (7%)	0.028	2,790 (7%)	2,621 (7%)	0.017	2,035 (0%)	1,846 (0%)	0.006
COPD	9,240 (9%)	8,999 (8%)	0.011	11,625 (5%)	12,410 (5%)	0.017	1,224 (3%)	886 (2%)	0.055	859 (0%)	807 (0%)	0.002
Dementia	6,683 (6%)	5,727 (5%)	0.040	2,225 (1%)	1,309 (1%)	0.043	618 (2%)	529 (1%)	0.019	112 (0%)	107 (0%)	0.001
Depressive disorder	12,529 (12%)	12,450 (12%)	0.005	52,883 (21%)	50,765 (20%)	0.016	6,588 (18%)	6,431 (17%)	0.011	71,832 (11%)	71,139 (11%)	0.005
Diabetes	20,227 (19%)	20,182 (19%)	0.005	32,557 (13%)	32,989 (13%)	0.008	3,153 (8%)	3,212 (9%)	0.006	8,183 (1%)	7,675 (1%)	0.008
GERD	6,148 (6%)	5,937 (6%)	0.011	12,436 (5%)	12,160 (5%)	0.003	1,552 (4%)	1,509 (4%)	0.006	9,586 (2%)	10,173 (2%)	0.007
Heart failure	6,643 (6%)	6,329 (6%)	0.014	4,618 (2%)	3,987 (2%)	0.018	767 (2%)	552 (1%)	0.044	474 (0%)	344 (0%)	0.008
Hypertension	56,732 (54%)	57,023 (53%)	0.003	62,628 (25%)	63,500 (25%)	0.013	7,802 (21%)	7,697 (21%)	0.007	11,603 (2%)	12,098 (2%)	0.005
Hypothyroidism	10,528 (10%)	10,633 (10%)	0.001	16,084 (6%)	16,368 (6%)	0.007	2,046 (5%)	2,032 (5%)	0.002	8,722 (1%)	8,355 (1%)	0.006
Malignant neoplastic disease	23,367 (22%)	23,618 (22%)	0.002	19,432 (8%)	22,945 (9%)	0.053	2,799 (8%)	2,742 (7%)	0.006	3,432 (1%)	2,913 (0%)	0.012
Myocardial infarction	5,451 (5%)	5,473 (5%)	0.001	6,811 (3%)	7,856 (3%)	0.026	704 (2%)	637 (2%)	0.013	607 (0%)	569 (0%)	0.002

	Cohort 1			Cohort 2			Cohort 3			Cohort 4		
	Unvaccinated	Vaccinated	ASMD	Unvaccinated	Vaccinated	ASMD	Unvaccinated	Vaccinated	ASMD	Unvaccinated	Vaccinated	ASMD
Osteoporosis	10,923 (10%)	10,997 (10%)	0.000	6,664 (3%)	6,208 (2%)	0.010	1,166 (3%)	1,014 (3%)	0.024	653 (0%)	702 (0%)	0.002
Pneumonia	5,814 (5%)	5,303 (5%)	0.023	7,059 (3%)	6,337 (3%)	0.016	991 (3%)	831 (2%)	0.028	3,698 (1%)	3,579 (1%)	0.003
Rheumatoid arthritis	2,115 (2%)	2,076 (2%)	0.004	4,061 (2%)	4,486 (2%)	0.014	330 (1%)	382 (1%)	0.014	723 (0%)	523 (0%)	0.010
Stroke	5,304 (5%)	4,911 (5%)	0.019	5,139 (2%)	5,592 (2%)	0.014	657 (2%)	560 (2%)	0.021	828 (0%)	669 (0%)	0.007
Venous thromboembolism	6,564 (6%)	6,603 (6%)	0.000	7,760 (3%)	7,984 (3%)	0.007	980 (3%)	965 (3%)	0.003	2,860 (0%)	1,602 (0%)	0.034

ASMD = Absolute standardized mean difference, COPD = Chronic obstructive pulmonary disease, GERD = Gastroesophageal reflux disease

**Table S6: Characteristics of unweighted populations in CPRD AURUM, stratified by staggered cohort and exposure status. Exposure is BNT162b2 vaccine.**

	Cohort 1			Cohort 2			Cohort 3			Cohort 4		
	Unvaccinated	Vaccinated	ASMD	Unvaccinated	Vaccinated	ASMD	Unvaccinated	Vaccinated	ASMD	Unvaccinated	Vaccinated	ASMD
<b>Number individuals, N</b>	348,052	332,790		1,976,163	594,262		1,510,323	54,102		2,014,161	1,335,671	
<b>Age, median [Q25-Q75]</b>	78 [76-82]	82 [79-86]	0.375	42 [32-55]	67 [56-73]	0.899	41 [31-53]	58 [50-82]	0.777	35 [27-45]	31 [25-37]	0.377
<b>Sex: Female, N(%)</b>	193,520 (56%)	186,481 (56%)	0.009	1,244,798 (63%)	324,259 (55%)	0.172	880,418 (58%)	32,310 (60%)	0.029	856,596 (43%)	625,195 (47%)	0.086
<b>Prior observation years, median [Q25-Q75]</b>	8,577 [3,627-12,851]	9,482 [4,653-13,824]	0.081	5,486 [2,515-8,998]	7,496 [3,312-11,558]	0.261	4,571 [2,110-8,085]	6,924 [3,046-10,846]	0.308	2,782 [1,350-6,019]	2,572 [1,115-6,792]	0.012
<b>Number GP visits, median [Q25-Q75]</b>	10 [5-17]	11 [6-18]		6 [2-11]	11 [6-17]		4 [1-10]	10 [5-17]		2 [0-5]	3 [1-7]	
<b>Number of PCR tests, median [Q25-Q75]</b>	0[0-0]	0[0-0]		0[0-0]	0[0-0]		0[0-0]	0[0-0]		0[0-0]	0[0-0]	
<b>Comorbidities, N(%)</b>												
Anxiety	51,245 (15%)	49,410 (15%)	0.003	435,705 (22%)	122,087 (21%)	0.037	289,623 (19%)	10,441 (19%)	0.003	264,577 (13%)	218,144 (16%)	0.090
Asthma	36,625 (11%)	37,889 (11%)	0.028	501,289 (25%)	116,596 (20%)	0.138	294,101 (19%)	8,668 (16%)	0.090	137,548 (7%)	114,378 (9%)	0.065
Chronic kidney disease	71,413 (21%)	86,899 (26%)	0.133	55,136 (3%)	56,923 (10%)	0.285	24,372 (2%)	6,692 (12%)	0.431	18,579 (1%)	2,664 (0%)	0.097
COPD	28,829 (8%)	28,317 (9%)	0.008	29,793 (2%)	39,595 (7%)	0.263	13,430 (1%)	2,063 (4%)	0.194	10,501 (1%)	942 (0%)	0.083
Dementia	16,828 (5%)	16,138 (5%)	0.001	6,731 (0%)	3,720 (1%)	0.041	3,424 (0%)	1,323 (2%)	0.194	2,673 (0%)	119 (0%)	0.047
Depressive disorder	42,297 (12%)	37,831 (11%)	0.024	367,534 (19%)	112,753 (19%)	0.010	236,577 (16%)	9,046 (17%)	0.029	209,905 (10%)	155,037 (12%)	0.038
Diabetes	63,483 (18%)	61,929 (19%)	0.010	107,471 (5%)	98,676 (17%)	0.362	60,945 (4%)	5,817 (11%)	0.259	49,143 (2%)	12,040 (1%)	0.120
GERD	18,404 (5%)	20,204 (6%)	0.034	68,110 (3%)	32,288 (5%)	0.097	39,607 (3%)	2,506 (5%)	0.108	31,062 (2%)	21,599 (2%)	0.006
Heart failure	17,980 (5%)	20,430 (6%)	0.042	12,311 (1%)	13,120 (2%)	0.134	5,627 (0%)	1,529 (3%)	0.197	4,614 (0%)	448 (0%)	0.054
Hypertension	173,422 (50%)	186,367 (56%)	0.124	206,136 (10%)	200,762 (34%)	0.586	110,969 (7%)	15,536 (29%)	0.579	86,231 (4%)	19,649 (1%)	0.169
Hypothyroidism	31,595 (9%)	34,512 (10%)	0.044	78,935 (4%)	44,456 (7%)	0.150	43,876 (3%)	3,642 (7%)	0.179	30,913 (2%)	18,516 (1%)	0.012

	Cohort 1			Cohort 2			Cohort 3			Cohort 4		
	Unvaccinated	Vaccinated	ASMD	Unvaccinated	Vaccinated	ASMD	Unvaccinated	Vaccinated	ASMD	Unvaccinated	Vaccinated	ASMD
Malignant neoplastic disease	69,247 (20%)	82,610 (25%)	0.118	60,370 (3%)	76,103 (13%)	0.367	29,693 (2%)	6,311 (12%)	0.392	22,630 (1%)	5,104 (0%)	0.086
Myocardial infarction	16,111 (5%)	18,289 (5%)	0.040	20,304 (1%)	23,019 (4%)	0.185	7,409 (0%)	1,464 (3%)	0.177	5,738 (0%)	715 (0%)	0.056
Osteoporosis	30,053 (9%)	36,535 (11%)	0.079	18,282 (1%)	21,789 (4%)	0.184	8,852 (1%)	2,632 (5%)	0.265	6,904 (0%)	1,028 (0%)	0.058
Pneumonia	17,134 (5%)	16,297 (5%)	0.001	31,724 (2%)	17,567 (3%)	0.091	17,791 (1%)	1,658 (3%)	0.131	13,263 (1%)	7,793 (1%)	0.010
Rheumatoid arthritis	6,613 (2%)	6,693 (2%)	0.008	14,823 (1%)	12,878 (2%)	0.118	5,533 (0%)	667 (1%)	0.097	3,692 (0%)	891 (0%)	0.033
Stroke	15,325 (4%)	15,601 (5%)	0.014	16,962 (1%)	15,056 (3%)	0.130	7,431 (0%)	1,281 (2%)	0.158	6,019 (0%)	1,022 (0%)	0.051
Venous thromboembolism	19,679 (6%)	21,549 (6%)	0.034	28,882 (1%)	23,632 (4%)	0.155	13,639 (1%)	1,980 (4%)	0.185	12,941 (1%)	2,541 (0%)	0.070

ASMD = Absolute standardized mean difference, COPD = Chronic obstructive pulmonary disease, GERD = Gastroesophageal reflux disease

**Table S7: Characteristics of weighted populations in CPRD GOLD, stratified by staggered cohort and exposure status. Exposure is any COVID-19 vaccine.**

	Cohort 1			Cohort 2			Cohort 3			Cohort 4		
	Unvaccinated	Vaccinated	ASMD									
<b>Number individuals, N</b>	40,084	40,014		111,674	111,393		124,883	124,955		196,235	195,302	
<b>Age, median [Q25-Q75]</b>	82 [78-86]	82 [78-86]	0.004	62 [50-69]	62 [50-69]	0.005	50 [41-58]	52 [41-58]	0.000	34 [26-42]	34 [26-43]	0.004
<b>Sex: Female, N(%)</b>	23,206 (58%)	23,175 (58%)	0.000	63,290 (57%)	63,079 (57%)	0.001	63,572 (51%)	63,955 (51%)	0.006	84,762 (43%)	85,083 (44%)	0.007
<b>Prior observation years, median [Q25-Q75]</b>	6,370 [4,781-7,264]	6,390 [4,846-7,299]	0.001	6,298 [4,106-7,083]	6,318 [3,974-7,093]	0.005	6,058 [3,280-6,959]	6,178 [3,103-6,990]	0.000	4,854 [2,137-6,608]	5,104 [1,889-6,692]	0.006
<b>Number GP visits, median [Q25-Q75]</b>	12 [7-20]	12 [8-20]		8 [3-15]	10 [5-15]		4 [0-10]	4 [1-10]		0 [0-5]	2 [0-5]	
<b>Number of PCR tests, median [Q25-Q75]</b>	0[0-0]	0[0-0]		0[0-0]	0[0-0]		0[0-0]	0[0-0]		0[0-0]	0[0-0]	
<b>Comorbidities, N(%)</b>												
Anxiety	4,933 (12%)	4,920 (12%)	0.000	22,884 (20%)	22,299 (20%)	0.012	24,993 (20%)	24,695 (20%)	0.006	31,360 (16%)	30,689 (16%)	0.007
Asthma	3,911 (10%)	3,931 (10%)	0.002	18,514 (17%)	18,209 (16%)	0.006	17,431 (14%)	17,388 (14%)	0.001	14,817 (8%)	14,596 (7%)	0.003
Chronic kidney disease	8,998 (22%)	8,953 (22%)	0.002	6,848 (6%)	7,431 (7%)	0.022	2,120 (2%)	2,287 (2%)	0.010	922 (0%)	807 (0%)	0.009
COPD	3,439 (9%)	3,341 (8%)	0.008	5,972 (5%)	6,496 (6%)	0.021	2,089 (2%)	1,938 (2%)	0.010	734 (0%)	688 (0%)	0.004
Dementia	2,634 (7%)	2,332 (6%)	0.031	1,383 (1%)	865 (1%)	0.046	283 (0%)	313 (0%)	0.005	78 (0%)	134 (0%)	0.013
Depressive disorder	3,783 (9%)	3,705 (9%)	0.006	20,874 (19%)	20,246 (18%)	0.013	22,015 (18%)	21,682 (17%)	0.007	23,010 (12%)	22,630 (12%)	0.004
Diabetes	5,928 (15%)	5,802 (14%)	0.008	11,000 (10%)	11,657 (10%)	0.020	5,345 (4%)	5,651 (5%)	0.012	2,586 (1%)	2,366 (1%)	0.009
GERD	1,930 (5%)	1,970 (5%)	0.005	4,521 (4%)	4,479 (4%)	0.001	3,343 (3%)	3,346 (3%)	0.000	2,657 (1%)	2,614 (1%)	0.001
Heart failure	2,417 (6%)	2,205 (6%)	0.022	2,002 (2%)	2,029 (2%)	0.002	639 (1%)	614 (0%)	0.003	250 (0%)	207 (0%)	0.006
Hypertension	14,288 (36%)	14,282 (36%)	0.001	22,488 (20%)	22,695 (20%)	0.006	11,108 (9%)	11,313 (9%)	0.006	4,318 (2%)	4,619 (2%)	0.011
Hypothyroidism	3,151 (8%)	3,155 (8%)	0.001	6,321 (6%)	6,361 (6%)	0.002	4,134 (3%)	4,055 (3%)	0.004	2,475 (1%)	2,621 (1%)	0.007
Malignant neoplastic disease	8,302 (21%)	8,283 (21%)	0.000	8,661 (8%)	10,177 (9%)	0.050	3,813 (3%)	3,777 (3%)	0.002	1,614 (1%)	1,676 (1%)	0.004
Myocardial infarction	2,119 (5%)	1,984 (5%)	0.015	3,308 (3%)	3,740 (3%)	0.023	1,193 (1%)	1,267 (1%)	0.006	430 (0%)	343 (0%)	0.010

	Cohort 1			Cohort 2			Cohort 3			Cohort 4		
	Unvaccinated	Vaccinated	ASMD									
Osteoporosis	3,702 (9%)	3,670 (9%)	0.002	3,154 (3%)	3,179 (3%)	0.002	1,038 (1%)	1,030 (1%)	0.001	363 (0%)	375 (0%)	0.002
Pneumonia	1,654 (4%)	1,452 (4%)	0.026	2,424 (2%)	2,211 (2%)	0.013	1,401 (1%)	1,314 (1%)	0.007	1,035 (1%)	1,055 (1%)	0.002
Rheumatoid arthritis	637 (2%)	624 (2%)	0.002	1,618 (1%)	1,818 (2%)	0.015	551 (0%)	760 (1%)	0.023	280 (0%)	157 (0%)	0.019
Stroke	2,103 (5%)	1,866 (5%)	0.027	2,468 (2%)	2,512 (2%)	0.003	916 (1%)	981 (1%)	0.006	385 (0%)	356 (0%)	0.003
Venous thromboembolism	1,732 (4%)	1,648 (4%)	0.010	2,639 (2%)	2,596 (2%)	0.002	1,466 (1%)	1,638 (1%)	0.012	959 (0%)	518 (0%)	0.036

ASMD = Absolute standardized mean difference, COPD = Chronic obstructive pulmonary disease, GERD = Gastroesophageal reflux disease

**Table S8: Characteristics of unweighted populations in CPRD GOLD, stratified by staggered cohort and exposure status. Exposure is any COVID-19 vaccine.**

	Cohort 1			Cohort 2			Cohort 3			Cohort 4		
	Unvaccinated	Vaccinated	ASMD									
<b>Number individuals, N</b>	169,100	118,507		583,399	486,619		417,996	462,832		469,876	550,437	
<b>Age, median [Q25-Q75]</b>	78 [76-82]	84 [81-87]	0.550	45 [33-58]	71 [66-75]	1.117	42 [31-55]	56 [52-61]	0.546	37 [28-49]	35 [27-43]	0.250
<b>Sex: Female, N(%)</b>	93,719 (55%)	68,258 (58%)	0.044	344,747 (59%)	262,113 (54%)	0.106	230,567 (55%)	230,957 (50%)	0.105	208,184 (44%)	249,603 (45%)	0.021
<b>Prior observation years, median [Q25-Q75]</b>	6,384 [4,890-7,256]	6,391 [5,038-7,330]	0.023	6,238 [3,777-7,056]	6,385 [4,634-7,126]	0.085	6,073 [3,241-7,000]	6,276 [3,654-7,012]	0.055	4,849 [2,107-6,655]	5,236 [2,101-6,695]	0.020
<b>Number GP visits, median [Q25-Q75]</b>	11 [6-18]	14 [9-21]		5 [1-11]	11 [6-17]		3 [0-8]	6 [2-12]		0 [0-4]	2 [0-6]	
<b>Number of PCR tests, median [Q25-Q75]</b>	0[0-0]	0[0-0]		0[0-0]	0[0-0]		0[0-0]	0[0-0]		0[0-0]	0[0-0]	
<b>Comorbidities, N(%)</b>												
Anxiety	20,097 (12%)	14,878 (13%)	0.020	132,282 (23%)	78,442 (16%)	0.166	83,022 (20%)	83,629 (18%)	0.046	65,306 (14%)	88,512 (16%)	0.061
Asthma	15,573 (9%)	12,090 (10%)	0.034	119,520 (20%)	61,821 (13%)	0.210	68,746 (16%)	52,312 (11%)	0.149	30,811 (7%)	46,774 (8%)	0.074
Chronic kidney disease	29,343 (17%)	29,934 (25%)	0.194	15,484 (3%)	49,550 (10%)	0.311	6,676 (2%)	8,145 (2%)	0.013	4,746 (1%)	1,376 (0%)	0.096
COPD	14,248 (8%)	9,602 (8%)	0.012	12,247 (2%)	39,371 (8%)	0.275	5,114 (1%)	6,699 (1%)	0.020	3,716 (1%)	953 (0%)	0.089
Dementia	6,678 (4%)	6,860 (6%)	0.086	1,986 (0%)	6,557 (1%)	0.110	1,188 (0%)	636 (0%)	0.032	774 (0%)	159 (0%)	0.044
Depressive disorder	16,339 (10%)	10,720 (9%)	0.021	111,568 (19%)	72,063 (15%)	0.115	66,705 (16%)	77,560 (17%)	0.022	50,341 (11%)	64,215 (12%)	0.030
Diabetes	23,579 (14%)	17,895 (15%)	0.033	29,125 (5%)	66,688 (14%)	0.303	12,407 (3%)	25,465 (6%)	0.126	9,225 (2%)	5,012 (1%)	0.089
GERD	7,610 (5%)	6,174 (5%)	0.033	18,053 (3%)	22,884 (5%)	0.083	8,864 (2%)	15,586 (3%)	0.076	5,920 (1%)	8,482 (2%)	0.024
Heart failure	7,475 (4%)	7,118 (6%)	0.071	4,013 (1%)	12,939 (3%)	0.154	1,732 (0%)	2,410 (1%)	0.016	1,274 (0%)	293 (0%)	0.054
Hypertension	56,298 (33%)	44,709 (38%)	0.093	58,662 (10%)	139,644 (29%)	0.485	24,457 (6%)	64,451 (14%)	0.273	16,440 (3%)	11,991 (2%)	0.080
Hypothyroidism	12,126 (7%)	9,825 (8%)	0.042	22,026 (4%)	31,923 (7%)	0.126	10,616 (3%)	19,001 (4%)	0.087	6,676 (1%)	7,790 (1%)	0.000
Malignant neoplastic disease	30,687 (18%)	26,725 (23%)	0.110	19,781 (3%)	65,779 (14%)	0.370	8,870 (2%)	19,474 (4%)	0.119	5,916 (1%)	4,164 (1%)	0.050

	Cohort 1			Cohort 2			Cohort 3			Cohort 4		
	Unvaccinated	Vaccinated	ASMD	Unvaccinated	Vaccinated	ASMD	Unvaccinated	Vaccinated	ASMD	Unvaccinated	Vaccinated	ASMD
Myocardial infarction	7,707 (5%)	6,298 (5%)	0.035	8,409 (1%)	20,200 (4%)	0.165	2,665 (1%)	5,556 (1%)	0.059	2,003 (0%)	501 (0%)	0.066
Osteoporosis	12,736 (8%)	11,677 (10%)	0.082	5,836 (1%)	23,843 (5%)	0.232	2,580 (1%)	4,797 (1%)	0.046	1,855 (0%)	637 (0%)	0.055
Pneumonia	5,401 (3%)	4,381 (4%)	0.028	7,250 (1%)	12,120 (2%)	0.092	3,822 (1%)	4,889 (1%)	0.014	2,522 (1%)	2,797 (1%)	0.004
Rheumatoid arthritis	2,565 (2%)	1,833 (2%)	0.002	4,013 (1%)	9,000 (2%)	0.104	1,294 (0%)	2,566 (1%)	0.037	877 (0%)	316 (0%)	0.037
Stroke	7,214 (4%)	5,843 (5%)	0.032	5,886 (1%)	14,921 (3%)	0.146	2,170 (1%)	3,998 (1%)	0.042	1,591 (0%)	620 (0%)	0.048
Venous thromboembolism	6,188 (4%)	5,096 (4%)	0.033	7,342 (1%)	14,077 (3%)	0.115	3,067 (1%)	6,732 (1%)	0.069	2,611 (1%)	1,018 (0%)	0.061

ASMD = Absolute standardized mean difference, COPD = Chronic obstructive pulmonary disease, GERD = Gastroesophageal reflux disease

**Table S9: Characteristics of weighted populations in CPRD GOLD, stratified by staggered cohort and exposure status. Exposure is ChAdOx1 vaccine.**

	Cohort 1			Cohort 2			Cohort 3			Cohort 4		
	Unvaccinated	Vaccinated	ASMD									
<b>Number individuals, N</b>	29,163	29,082		82,091	82,226		116,090	115,912		70,312	70,823	
<b>Age, median [Q25-Q75]</b>	82 [79-87]	82 [80-87]	0.002	64 [53-71]	64 [53-70]	0.001	52 [42-58]	52 [42-58]	0.003	42 [39-48]	42 [38-48]	0.000
<b>Sex: Female, N(%)</b>	17,126 (59%)	17,076 (59%)	0.000	45,269 (55%)	45,487 (55%)	0.003	58,599 (50%)	58,799 (51%)	0.005	29,480 (42%)	29,458 (42%)	0.007
<b>Prior observation years, median [Q25-Q75]</b>	6,368 [4,838-7,192]	6,384 [4,978-7,263]	0.001	6,286 [4,052-7,067]	6,318 [3,931-7,096]	0.002	6,050 [3,235-6,934]	6,154 [3,053-6,985]	0.001	4,964 [2,468-6,629]	5,116 [2,196-6,678]	0.001
<b>Number GP visits, median [Q25-Q75]</b>	12 [7-21]	12 [8-20]		8 [3-16]	10 [5-16]		4 [0-10]	4 [1-10]		0 [0-6]	2 [0-6]	
<b>Number of PCR tests, median [Q25-Q75]</b>	0[0-0]	0[0-0]		0[0-0]	0[0-0]		0[0-0]	0[0-0]		0[0-0]	0[0-0]	
<b>Comorbidities, N(%)</b>												
Anxiety	3,481 (12%)	3,496 (12%)	0.003	16,202 (20%)	15,970 (19%)	0.008	23,083 (20%)	22,695 (20%)	0.008	12,154 (17%)	11,947 (17%)	0.011
Asthma	2,863 (10%)	2,870 (10%)	0.002	13,358 (16%)	13,192 (16%)	0.006	16,057 (14%)	16,029 (14%)	0.000	4,767 (7%)	4,744 (7%)	0.003
Chronic kidney disease	6,959 (24%)	6,928 (24%)	0.001	5,850 (7%)	6,384 (8%)	0.024	2,031 (2%)	2,104 (2%)	0.005	616 (1%)	517 (1%)	0.016
COPD	2,556 (9%)	2,485 (9%)	0.008	5,069 (6%)	5,523 (7%)	0.022	1,969 (2%)	1,874 (2%)	0.006	539 (1%)	478 (1%)	0.011
Dementia	2,042 (7%)	1,794 (6%)	0.034	1,319 (2%)	826 (1%)	0.053	263 (0%)	265 (0%)	0.000	59 (0%)	111 (0%)	0.021
Depressive disorder	2,641 (9%)	2,608 (9%)	0.003	14,875 (18%)	14,558 (18%)	0.011	20,497 (18%)	20,298 (18%)	0.004	10,492 (15%)	10,218 (14%)	0.014
Diabetes	4,346 (15%)	4,273 (15%)	0.006	8,933 (11%)	9,524 (12%)	0.022	5,139 (4%)	5,350 (5%)	0.009	1,459 (2%)	1,421 (2%)	0.005
GERD	1,366 (5%)	1,380 (5%)	0.003	3,514 (4%)	3,414 (4%)	0.006	3,153 (3%)	3,136 (3%)	0.001	1,258 (2%)	1,297 (2%)	0.003
Heart failure	1,844 (6%)	1,699 (6%)	0.020	1,793 (2%)	1,720 (2%)	0.006	613 (1%)	601 (1%)	0.001	177 (0%)	151 (0%)	0.008
Hypertension	10,466 (36%)	10,581 (36%)	0.010	17,843 (22%)	18,115 (22%)	0.007	10,489 (9%)	10,714 (9%)	0.007	3,119 (4%)	3,233 (5%)	0.006
Hypothyroidism	2,338 (8%)	2,360 (8%)	0.004	4,857 (6%)	4,837 (6%)	0.001	3,897 (3%)	3,742 (3%)	0.007	1,432 (2%)	1,412 (2%)	0.003
Malignant neoplastic disease	6,210 (21%)	6,164 (21%)	0.002	7,090 (9%)	8,270 (10%)	0.049	3,588 (3%)	3,590 (3%)	0.000	1,059 (2%)	1,117 (2%)	0.006
Myocardial infarction	1,569 (5%)	1,500 (5%)	0.010	2,720 (3%)	3,083 (4%)	0.024	1,155 (1%)	1,202 (1%)	0.004	319 (0%)	242 (0%)	0.018

	Cohort 1			Cohort 2			Cohort 3			Cohort 4		
	Unvaccinated	Vaccinated	ASMD	Unvaccinated	Vaccinated	ASMD	Unvaccinated	Vaccinated	ASMD	Unvaccinated	Vaccinated	ASMD
Osteoporosis	2,838 (10%)	2,846 (10%)	0.002	2,715 (3%)	2,668 (3%)	0.004	944 (1%)	986 (1%)	0.004	252 (0%)	281 (0%)	0.006
Pneumonia	1,287 (4%)	1,147 (4%)	0.024	1,997 (2%)	1,883 (2%)	0.009	1,307 (1%)	1,245 (1%)	0.005	487 (1%)	473 (1%)	0.003
Rheumatoid arthritis	464 (2%)	445 (2%)	0.005	1,280 (2%)	1,491 (2%)	0.020	514 (0%)	743 (1%)	0.027	184 (0%)	120 (0%)	0.020
Stroke	1,600 (5%)	1,421 (5%)	0.027	2,073 (3%)	2,122 (3%)	0.003	873 (1%)	963 (1%)	0.009	263 (0%)	257 (0%)	0.002
Venous thromboembolism	1,339 (5%)	1,191 (4%)	0.024	2,112 (3%)	2,219 (3%)	0.008	1,407 (1%)	1,572 (1%)	0.013	590 (1%)	297 (0%)	0.053

ASMD = Absolute standardized mean difference, COPD = Chronic obstructive pulmonary disease, GERD = Gastroesophageal reflux disease

**Table S10: Characteristics of unweighted populations in CPRD GOLD, stratified by staggered cohort and exposure status. Exposure is ChAdOx1 vaccine.**

	Cohort 1			Cohort 2			Cohort 3			Cohort 4		
	Unvaccinated	Vaccinated	ASMD									
<b>Number individuals, N</b>	168,972	82,406		582,791	302,999		418,184	423,876		485,154	147,744	
<b>Age, median [Q25-Q75]</b>	78 [76-82]	84 [82-88]	0.657	45 [33-58]	71 [66-76]	1.153	42 [31-55]	56 [52-61]	0.560	37 [28-49]	44 [41-48]	0.262
<b>Sex: Female, N(%)</b>	93,648 (55%)	47,915 (58%)	0.055	344,408 (59%)	162,753 (54%)	0.109	230,680 (55%)	210,283 (50%)	0.111	215,080 (44%)	64,999 (44%)	0.007
<b>Prior observation years, median [Q25-Q75]</b>	6,384 [4,889-7,256]	6,372 [5,153-7,257]	0.016	6,239 [3,779-7,056]	6,384 [4,669-7,114]	0.090	6,072 [3,241-7,000]	6,268 [3,572-7,002]	0.047	4,762 [2,039-6,628]	5,146 [2,398-6,663]	0.054
<b>Number GP visits, median [Q25-Q75]</b>	11 [6-18]	14 [9-21]		5 [1-11]	11 [7-18]		3 [0-8]	6 [2-12]		0 [0-4]	3 [0-7]	
<b>Number of PCR tests, median [Q25-Q75]</b>	0[0-0]	0[0-0]		0[0-0]	0[0-0]		0[0-0]	0[0-0]		0[0-0]	0[0-0]	
<b>Comorbidities, N(%)</b>												
Anxiety	20,087 (12%)	9,923 (12%)	0.005	132,145 (23%)	49,010 (16%)	0.165	83,054 (20%)	75,258 (18%)	0.054	66,918 (14%)	24,601 (17%)	0.080
Asthma	15,567 (9%)	8,491 (10%)	0.037	119,442 (20%)	39,988 (13%)	0.196	68,792 (16%)	48,034 (11%)	0.148	31,538 (7%)	10,517 (7%)	0.025
Chronic kidney disease	29,280 (17%)	21,564 (26%)	0.216	15,435 (3%)	34,168 (11%)	0.344	6,675 (2%)	7,553 (2%)	0.014	4,947 (1%)	739 (1%)	0.060
COPD	14,234 (8%)	6,837 (8%)	0.005	12,242 (2%)	27,472 (9%)	0.307	5,122 (1%)	6,334 (1%)	0.023	3,834 (1%)	640 (0%)	0.046
Dementia	6,664 (4%)	4,773 (6%)	0.086	1,998 (0%)	5,124 (2%)	0.135	1,201 (0%)	548 (0%)	0.035	831 (0%)	126 (0%)	0.024
Depressive disorder	16,333 (10%)	6,998 (8%)	0.041	111,526 (19%)	45,154 (15%)	0.113	66,763 (16%)	70,703 (17%)	0.019	51,687 (11%)	21,711 (15%)	0.122
Diabetes	23,547 (14%)	12,387 (15%)	0.031	29,089 (5%)	43,647 (14%)	0.322	12,392 (3%)	24,219 (6%)	0.135	9,455 (2%)	2,254 (2%)	0.032
GERD	7,613 (5%)	4,054 (5%)	0.020	18,044 (3%)	14,294 (5%)	0.084	8,869 (2%)	14,447 (3%)	0.079	6,051 (1%)	2,883 (2%)	0.056
Heart failure	7,468 (4%)	5,058 (6%)	0.077	4,016 (1%)	9,180 (3%)	0.174	1,738 (0%)	2,308 (1%)	0.019	1,316 (0%)	191 (0%)	0.032
Hypertension	56,262 (33%)	31,217 (38%)	0.096	58,578 (10%)	88,833 (29%)	0.499	24,450 (6%)	59,554 (14%)	0.277	16,971 (3%)	6,761 (5%)	0.055
Hypothyroidism	12,132 (7%)	7,042 (9%)	0.051	21,999 (4%)	20,521 (7%)	0.134	10,622 (3%)	17,382 (4%)	0.087	6,848 (1%)	3,245 (2%)	0.059
Malignant neoplastic disease	30,670 (18%)	18,950 (23%)	0.120	19,707 (3%)	42,687 (14%)	0.386	8,893 (2%)	17,903 (4%)	0.120	6,143 (1%)	2,192 (1%)	0.019
Myocardial infarction	7,704 (5%)	4,500 (5%)	0.041	8,413 (1%)	13,456 (4%)	0.178	2,660 (1%)	5,280 (1%)	0.063	2,057 (0%)	330 (0%)	0.035

	Cohort 1			Cohort 2			Cohort 3			Cohort 4		
	Unvaccinated	Vaccinated	ASMD	Unvaccinated	Vaccinated	ASMD	Unvaccinated	Vaccinated	ASMD	Unvaccinated	Vaccinated	ASMD
Osteoporosis	12,732 (8%)	8,564 (10%)	0.100	5,847 (1%)	16,117 (5%)	0.249	2,576 (1%)	4,330 (1%)	0.045	1,923 (0%)	408 (0%)	0.021
Pneumonia	5,401 (3%)	3,231 (4%)	0.039	7,241 (1%)	8,604 (3%)	0.113	3,814 (1%)	4,527 (1%)	0.016	2,615 (1%)	921 (1%)	0.011
Rheumatoid arthritis	2,559 (2%)	1,257 (2%)	0.001	4,017 (1%)	5,999 (2%)	0.113	1,286 (0%)	2,405 (1%)	0.039	918 (0%)	191 (0%)	0.015
Stroke	7,200 (4%)	4,193 (5%)	0.039	5,885 (1%)	10,213 (3%)	0.162	2,167 (1%)	3,789 (1%)	0.045	1,625 (0%)	369 (0%)	0.016
Venous thromboembolism	6,185 (4%)	3,550 (4%)	0.033	7,335 (1%)	9,466 (3%)	0.128	3,072 (1%)	6,339 (1%)	0.073	2,712 (1%)	460 (0%)	0.038

ASMD = Absolute standardized mean difference, COPD = Chronic obstructive pulmonary disease, GERD = Gastroesophageal reflux disease

**Table S11: Characteristics of weighted populations in CPRD GOLD, stratified by staggered cohort and exposure status. Exposure is BNT162b2 vaccine.**

	Cohort 1			Cohort 2			Cohort 3			Cohort 4		
	Unvaccinated	Vaccinated	ASMD									
<b>Number individuals, N</b>	15,295	15,304		60,813	61,113		24,008	24,157		151,713	152,100	
<b>Age, median [Q25-Q75]</b>	80 [77-85]	80 [77-85]	0.000	64 [53-70]	66 [52-70]	0.008	52 [44-58]	52 [44-58]	0.004	32 [24-38]	32 [24-38]	0.003
<b>Sex: Female, N(%)</b>	8,644 (57%)	8,657 (57%)	0.001	34,612 (57%)	34,776 (57%)	0.000	12,846 (54%)	12,993 (54%)	0.006	66,947 (44%)	67,555 (44%)	0.006
<b>Prior observation years, median [Q25-Q75]</b>	6,362 [4,297-7,433]	6,412 [4,291-7,617]	0.001	6,310 [4,208-7,084]	6,350 [4,185-7,112]	0.003	6,298 [3,967-7,101]	6,328 [3,999-7,105]	0.004	4,870 [2,099-6,618]	5,104 [1,850-6,696]	0.001
<b>Number GP visits, median [Q25-Q75]</b>	12 [7-20]	12 [8-20]		8 [3-15]	8 [4-15]		4 [0-10]	4 [1-10]		0 [0-5]	2 [0-5]	
<b>Number of PCR tests, median [Q25-Q75]</b>	0[0-0]	0[0-0]		0[0-0]	0[0-0]		0[0-0]	0[0-0]		0[0-0]	0[0-0]	
<b>Comorbidities, N(%)</b>												
Anxiety	1,969 (13%)	1,940 (13%)	0.006	11,790 (19%)	11,914 (19%)	0.003	5,342 (22%)	5,235 (22%)	0.014	24,455 (16%)	23,928 (16%)	0.011
Asthma	1,498 (10%)	1,488 (10%)	0.002	9,126 (15%)	9,093 (15%)	0.004	2,926 (12%)	2,985 (12%)	0.005	12,195 (8%)	11,929 (8%)	0.007
Chronic kidney disease	3,112 (20%)	3,057 (20%)	0.009	3,563 (6%)	3,764 (6%)	0.013	398 (2%)	407 (2%)	0.002	468 (0%)	346 (0%)	0.016
COPD	1,190 (8%)	1,151 (8%)	0.010	3,222 (5%)	3,237 (5%)	0.000	293 (1%)	274 (1%)	0.008	315 (0%)	250 (0%)	0.010
Dementia	1,087 (7%)	864 (6%)	0.060	646 (1%)	355 (1%)	0.053	55 (0%)	80 (0%)	0.019	21 (0%)	28 (0%)	0.004
Depressive disorder	1,527 (10%)	1,496 (10%)	0.007	10,709 (18%)	10,912 (18%)	0.006	4,382 (18%)	4,343 (18%)	0.007	17,112 (11%)	16,594 (11%)	0.012
Diabetes	2,193 (14%)	2,173 (14%)	0.004	6,057 (10%)	6,199 (10%)	0.006	883 (4%)	858 (4%)	0.007	1,609 (1%)	1,271 (1%)	0.023
GERD	880 (6%)	872 (6%)	0.003	2,440 (4%)	2,505 (4%)	0.004	659 (3%)	706 (3%)	0.011	1,935 (1%)	1,961 (1%)	0.001
Heart failure	857 (6%)	748 (5%)	0.032	1,097 (2%)	933 (2%)	0.022	119 (0%)	77 (0%)	0.027	107 (0%)	77 (0%)	0.008
Hypertension	5,338 (35%)	5,312 (35%)	0.004	12,828 (21%)	12,901 (21%)	0.000	2,597 (11%)	2,645 (11%)	0.004	2,260 (1%)	2,369 (2%)	0.006
Hypothyroidism	1,129 (7%)	1,067 (7%)	0.016	3,476 (6%)	3,416 (6%)	0.005	935 (4%)	954 (4%)	0.003	1,772 (1%)	1,653 (1%)	0.008
Malignant neoplastic disease	3,126 (20%)	3,097 (20%)	0.005	5,084 (8%)	5,529 (9%)	0.024	864 (4%)	922 (4%)	0.011	877 (1%)	902 (1%)	0.002
Myocardial infarction	764 (5%)	681 (4%)	0.026	1,797 (3%)	1,853 (3%)	0.005	230 (1%)	186 (1%)	0.020	189 (0%)	128 (0%)	0.013

	Cohort 1			Cohort 2			Cohort 3			Cohort 4		
	Unvaccinated	Vaccinated	ASMD									
Osteoporosis	1,312 (9%)	1,225 (8%)	0.021	1,775 (3%)	1,805 (3%)	0.002	251 (1%)	282 (1%)	0.012	154 (0%)	135 (0%)	0.004
Pneumonia	573 (4%)	475 (3%)	0.035	1,232 (2%)	1,107 (2%)	0.016	256 (1%)	244 (1%)	0.005	744 (0%)	698 (0%)	0.005
Rheumatoid arthritis	248 (2%)	234 (2%)	0.008	854 (1%)	945 (2%)	0.012	113 (0%)	102 (0%)	0.007	165 (0%)	62 (0%)	0.025
Stroke	739 (5%)	650 (4%)	0.028	1,291 (2%)	1,297 (2%)	0.000	172 (1%)	129 (1%)	0.023	204 (0%)	138 (0%)	0.013
Venous thromboembolism	640 (4%)	622 (4%)	0.006	1,355 (2%)	1,347 (2%)	0.002	273 (1%)	256 (1%)	0.008	604 (0%)	288 (0%)	0.039

ASMD = Absolute standardized mean difference, COPD = Chronic obstructive pulmonary disease, GERD = Gastroesophageal reflux disease

**Table S12: Characteristics of unweighted populations in CPRD GOLD, stratified by staggered cohort and exposure status. Exposure is BNT162b2 vaccine.**

	Cohort 1			Cohort 2			Cohort 3			Cohort 4		
	Unvaccinated	Vaccinated	ASMD									
<b>Number individuals, N</b>	169,459	32,755		584,309	180,670		416,549	36,748		465,326	365,096	
<b>Age, median [Q25-Q75]</b>	78 [76-82]	81 [79-86]	0.306	45 [33-58]	70 [66-74]	1.059	42 [31-55]	54 [50-60]	0.407	37 [28-49]	31 [24-37]	0.445
<b>Sex: Female, N(%)</b>	93,939 (55%)	18,415 (56%)	0.016	345,249 (59%)	97,747 (54%)	0.101	229,807 (55%)	19,649 (53%)	0.034	206,080 (44%)	167,510 (46%)	0.032
<b>Prior observation years, median [Q25-Q75]</b>	6,383 [4,888-7,257]	6,471 [4,653-7,782]	0.017	6,236 [3,775-7,055]	6,385 [4,543-7,116]	0.076	6,077 [3,249-7,002]	6,390 [4,490-7,312]	0.153	4,882 [2,130-6,663]	5,346 [2,052-6,725]	0.018
<b>Number GP visits, median [Q25-Q75]</b>	11 [6-18]	14 [9-21]		5 [1-11]	10 [6-16]		3 [0-8]	6 [2-11]		0 [0-4]	2 [0-6]	
<b>Number of PCR tests, median [Q25-Q75]</b>	0[0-0]	0[0-0]		0[0-0]	0[0-0]		0[0-0]	0[0-0]		0[0-0]	0[0-0]	
<b>Comorbidities, N(%)</b>												
Anxiety	20,145 (12%)	4,336 (13%)	0.041	132,397 (23%)	28,697 (16%)	0.172	82,752 (20%)	8,004 (22%)	0.047	64,849 (14%)	59,094 (16%)	0.063
Asthma	15,611 (9%)	3,250 (10%)	0.024	119,679 (20%)	21,396 (12%)	0.236	68,556 (16%)	4,053 (11%)	0.158	30,579 (7%)	33,240 (9%)	0.094
Chronic kidney disease	29,378 (17%)	7,430 (23%)	0.134	15,504 (3%)	15,033 (8%)	0.251	6,636 (2%)	566 (2%)	0.004	4,692 (1%)	578 (0%)	0.112
COPD	14,265 (8%)	2,417 (7%)	0.039	12,276 (2%)	11,545 (6%)	0.214	5,085 (1%)	348 (1%)	0.026	3,657 (1%)	285 (0%)	0.108
Dementia	6,705 (4%)	1,895 (6%)	0.085	2,008 (0%)	1,375 (1%)	0.056	1,168 (0%)	87 (0%)	0.009	746 (0%)	29 (0%)	0.053
Depressive disorder	16,385 (10%)	3,310 (10%)	0.015	111,708 (19%)	26,294 (15%)	0.122	66,510 (16%)	6,569 (18%)	0.051	49,969 (11%)	39,181 (11%)	0.000
Diabetes	23,614 (14%)	4,882 (15%)	0.028	29,200 (5%)	22,552 (12%)	0.267	12,338 (3%)	1,191 (3%)	0.016	9,143 (2%)	2,507 (1%)	0.112
GERD	7,655 (5%)	2,012 (6%)	0.072	18,069 (3%)	8,525 (5%)	0.084	8,839 (2%)	1,093 (3%)	0.054	5,864 (1%)	5,213 (1%)	0.015
Heart failure	7,502 (4%)	1,782 (5%)	0.047	4,026 (1%)	3,669 (2%)	0.116	1,715 (0%)	100 (0%)	0.024	1,236 (0%)	98 (0%)	0.063
Hypertension	56,411 (33%)	11,995 (37%)	0.070	58,749 (10%)	49,763 (28%)	0.459	24,301 (6%)	4,679 (13%)	0.239	16,363 (4%)	4,776 (1%)	0.144
Hypothyroidism	12,163 (7%)	2,373 (7%)	0.003	22,061 (4%)	11,106 (6%)	0.109	10,565 (3%)	1,553 (4%)	0.094	6,617 (1%)	4,180 (1%)	0.025
Malignant neoplastic disease	30,728 (18%)	6,972 (21%)	0.079	19,832 (3%)	22,617 (13%)	0.342	8,827 (2%)	1,522 (4%)	0.116	5,804 (1%)	1,796 (0%)	0.081
Myocardial infarction	7,716 (5%)	1,603 (5%)	0.016	8,437 (1%)	6,621 (4%)	0.141	2,644 (1%)	271 (1%)	0.012	1,985 (0%)	154 (0%)	0.080

	Cohort 1			Cohort 2			Cohort 3			Cohort 4		
	Unvaccinated	Vaccinated	ASMD									
Osteoporosis	12,776 (8%)	2,770 (8%)	0.034	5,867 (1%)	7,531 (4%)	0.200	2,558 (1%)	458 (1%)	0.066	1,841 (0%)	205 (0%)	0.072
Pneumonia	5,415 (3%)	1,032 (3%)	0.003	7,266 (1%)	3,418 (2%)	0.052	3,790 (1%)	345 (1%)	0.003	2,512 (1%)	1,696 (0%)	0.011
Rheumatoid arthritis	2,566 (2%)	512 (2%)	0.004	4,018 (1%)	2,929 (2%)	0.087	1,276 (0%)	154 (0%)	0.019	881 (0%)	111 (0%)	0.048
Stroke	7,203 (4%)	1,490 (5%)	0.015	5,907 (1%)	4,632 (3%)	0.117	2,152 (1%)	199 (1%)	0.003	1,578 (0%)	225 (0%)	0.062
Venous thromboembolism	6,198 (4%)	1,389 (4%)	0.030	7,333 (1%)	4,490 (2%)	0.091	3,056 (1%)	370 (1%)	0.029	2,585 (1%)	496 (0%)	0.072

ASMD = Absolute standardized mean difference, COPD = Chronic obstructive pulmonary disease, GERD = Gastroesophageal reflux disease

**Table S13: Characteristics of weighted populations in SIDIAP, stratified by staggered cohort and exposure status. Exposure is any COVID-19 vaccine.**

	Cohort 1			Cohort 2			Cohort 3			Cohort 4		
	Unvaccinated	Vaccinated	ASMD									
<b>Number individuals, N</b>	58,342	58,535		235,543	235,780		344,520	342,678		413,428	412,893	
<b>Age, median [Q25-Q75]</b>	86 [83-89]	86 [82-89]	0.002	68 [63-73]	68 [63-74]	0.003	52 [46-58]	52 [46-59]	0.000	36 [28-44]	36 [28-44]	0.002
<b>Sex: Female, N(%)</b>	36,115 (62%)	36,214 (62%)	0.001	128,806 (55%)	129,053 (55%)	0.001	164,316 (48%)	163,188 (48%)	0.001	188,426 (46%)	188,471 (46%)	0.001
<b>Prior observation years, median [Q25-Q75]</b>	5,538 [5,533-5,541]	5,538 [5,533-5,541]	0.001	5,576 [5,567-5,589]	5,578 [5,568-5,589]	0.000	5,618 [5,605-5,637]	5,618 [5,606-5,638]	0.003	5,652 [4,777-5,666]	5,654 [4,901-5,667]	0.004
<b>Number GP visits, median [Q25-Q75]</b>	8 [3-15]	8 [4-15]		4 [0-9]	4 [1-9]		0 [0-6]	2 [0-6]		0 [0-4]	0 [0-5]	
<b>Number of PCR tests, median [Q25-Q75]</b>	0[0-0]	0[0-0]		0[0-0]	0[0-0]		0[0-0]	0[0-0]		0[0-0]	0[0-0]	
<b>Comorbidities, N(%)</b>												
Anxiety	11,384 (20%)	11,467 (20%)	0.002	52,314 (22%)	52,262 (22%)	0.001	81,514 (24%)	80,775 (24%)	0.002	84,856 (21%)	83,145 (20%)	0.010
Asthma	3,708 (6%)	3,627 (6%)	0.007	10,973 (5%)	10,703 (5%)	0.006	14,915 (4%)	14,492 (4%)	0.005	19,969 (5%)	19,628 (5%)	0.004
Chronic kidney disease	18,755 (32%)	18,803 (32%)	0.001	21,147 (9%)	21,249 (9%)	0.001	7,411 (2%)	7,335 (2%)	0.001	3,293 (1%)	2,846 (1%)	0.012
COPD	7,008 (12%)	6,983 (12%)	0.002	17,160 (7%)	16,784 (7%)	0.006	8,852 (3%)	8,622 (3%)	0.003	3,210 (1%)	3,215 (1%)	0.000
Dementia	5,686 (10%)	5,812 (10%)	0.006	4,628 (2%)	4,425 (2%)	0.006	1,247 (0%)	1,229 (0%)	0.001	673 (0%)	689 (0%)	0.001
Depressive disorder	10,960 (19%)	11,020 (19%)	0.001	34,232 (15%)	34,571 (15%)	0.004	34,243 (10%)	32,427 (9%)	0.016	23,679 (6%)	23,024 (6%)	0.007
Diabetes	14,529 (25%)	14,269 (24%)	0.012	39,335 (17%)	39,133 (17%)	0.003	25,964 (8%)	26,135 (8%)	0.003	14,136 (3%)	14,091 (3%)	0.000
GERD	6,898 (12%)	6,871 (12%)	0.003	21,088 (9%)	21,212 (9%)	0.002	16,959 (5%)	17,024 (5%)	0.002	10,569 (3%)	10,903 (3%)	0.005
Heart failure	9,320 (16%)	9,141 (16%)	0.010	10,251 (4%)	10,196 (4%)	0.001	4,001 (1%)	3,743 (1%)	0.007	1,606 (0%)	1,565 (0%)	0.002
Hypertension	38,140 (65%)	37,917 (65%)	0.013	96,384 (41%)	96,118 (41%)	0.003	58,596 (17%)	57,241 (17%)	0.008	22,160 (5%)	22,739 (6%)	0.006
Hypothyroidism	7,350 (13%)	7,236 (12%)	0.007	24,054 (10%)	24,260 (10%)	0.003	21,956 (6%)	21,573 (6%)	0.003	17,452 (4%)	17,758 (4%)	0.004
Malignant neoplastic disease	15,402 (26%)	15,230 (26%)	0.009	37,052 (16%)	38,490 (16%)	0.016	19,765 (6%)	19,599 (6%)	0.001	9,413 (2%)	8,865 (2%)	0.009
Myocardial infarction	2,258 (4%)	2,235 (4%)	0.003	5,972 (3%)	5,812 (2%)	0.005	3,615 (1%)	3,448 (1%)	0.004	1,362 (0%)	1,364 (0%)	0.000

	Cohort 1			Cohort 2			Cohort 3			Cohort 4		
	Unvaccinated	Vaccinated	ASMD									
Osteoporosis	9,270 (16%)	9,151 (16%)	0.007	18,870 (8%)	19,036 (8%)	0.002	7,126 (2%)	7,039 (2%)	0.001	2,254 (1%)	2,040 (0%)	0.007
Pneumonia	6,643 (11%)	6,563 (11%)	0.005	15,630 (7%)	15,557 (7%)	0.002	14,821 (4%)	14,580 (4%)	0.002	14,171 (3%)	14,083 (3%)	0.001
Rheumatoid arthritis	765 (1%)	727 (1%)	0.006	2,274 (1%)	2,286 (1%)	0.000	1,544 (0%)	1,592 (0%)	0.002	754 (0%)	646 (0%)	0.006
Stroke	5,119 (9%)	5,043 (9%)	0.006	8,750 (4%)	7,706 (3%)	0.024	4,343 (1%)	4,147 (1%)	0.005	1,828 (0%)	1,840 (0%)	0.001
Venous thromboembolism	2,469 (4%)	2,418 (4%)	0.005	4,745 (2%)	4,419 (2%)	0.010	3,365 (1%)	2,982 (1%)	0.011	1,931 (0%)	1,777 (0%)	0.005

ASMD = Absolute standardized mean difference, COPD = Chronic obstructive pulmonary disease, GERD = Gastroesophageal reflux disease

**Table S14: Characteristics of unweighted populations in SIDIAPI, stratified by staggered cohort and exposure status. Exposure is any COVID-19 vaccine.**

	Cohort 1			Cohort 2			Cohort 3			Cohort 4		
	Unvaccinated	Vaccinated	ASMD									
<b>Number individuals, N</b>	223,962	89,941		433,151	819,590		869,497	954,232		1,061,634	880,950	
<b>Age, median [Q25-Q75]</b>	85 [82-88]	87 [83-90]	0.253	67 [62-72]	72 [65-78]	0.391	48 [43-57]	54 [49-58]	0.192	38 [28-51]	37 [29-43]	0.246
<b>Sex: Female, N(%)</b>	136,888 (61%)	56,235 (63%)	0.029	237,494 (55%)	443,019 (54%)	0.016	409,207 (47%)	462,599 (48%)	0.028	488,499 (46%)	408,555 (46%)	0.007
<b>Prior observation years, median [Q25-Q75]</b>	5,539 [5,533-5,541]	5,539 [5,534-5,541]	0.051	5,576 [5,567-5,588]	5,577 [5,569-5,589]	0.185	5,616 [5,467-5,635]	5,618 [5,609-5,637]	0.246	5,651 [3,787-5,665]	5,656 [5,646-5,668]	0.195
<b>Number GP visits, median [Q25-Q75]</b>	7 [2-13]	10 [5-18]		3 [0-8]	6 [2-11]		1 [0-5]	2 [0-7]		0 [0-4]	2 [0-6]	
<b>Number of PCR tests, median [Q25-Q75]</b>	0[0-0]	0[0-1]		0[0-0]	0[0-1]		0[0-0]	0[0-1]		0[0-0]	0[0-1]	
<b>Comorbidities, N(%)</b>												
Anxiety	41,908 (19%)	18,117 (20%)	0.036	97,857 (23%)	181,286 (22%)	0.011	197,922 (23%)	233,123 (24%)	0.039	203,019 (19%)	186,562 (21%)	0.051
Asthma	13,371 (6%)	5,841 (6%)	0.022	19,809 (5%)	41,966 (5%)	0.025	36,811 (4%)	42,221 (4%)	0.009	45,374 (4%)	46,776 (5%)	0.049
Chronic kidney disease	63,041 (28%)	31,132 (35%)	0.140	32,450 (7%)	101,792 (12%)	0.165	22,454 (3%)	20,303 (2%)	0.030	20,368 (2%)	5,314 (1%)	0.118
COPD	24,459 (11%)	11,292 (13%)	0.051	28,780 (7%)	67,795 (8%)	0.062	19,020 (2%)	27,451 (3%)	0.044	15,415 (1%)	5,836 (1%)	0.077
Dementia	16,743 (7%)	10,455 (12%)	0.142	7,404 (2%)	19,153 (2%)	0.045	6,009 (1%)	2,787 (0%)	0.057	5,866 (1%)	1,310 (0%)	0.068
Depressive disorder	38,148 (17%)	18,040 (20%)	0.078	61,308 (14%)	124,929 (15%)	0.031	77,039 (9%)	98,723 (10%)	0.050	66,864 (6%)	49,608 (6%)	0.028
Diabetes	51,964 (23%)	22,968 (26%)	0.054	65,572 (15%)	155,362 (19%)	0.102	60,254 (7%)	78,356 (8%)	0.048	49,331 (5%)	29,768 (3%)	0.065
GERD	25,376 (11%)	10,728 (12%)	0.019	34,715 (8%)	87,626 (11%)	0.092	37,828 (4%)	53,565 (6%)	0.058	31,600 (3%)	23,657 (3%)	0.018
Heart failure	28,538 (13%)	16,202 (18%)	0.147	16,697 (4%)	42,924 (5%)	0.066	11,909 (1%)	10,469 (1%)	0.025	10,738 (1%)	2,776 (0%)	0.086
Hypertension	138,631 (62%)	60,128 (67%)	0.104	157,290 (36%)	390,610 (48%)	0.231	125,239 (14%)	188,390 (20%)	0.142	97,835 (9%)	43,351 (5%)	0.168
Hypothyroidism	26,875 (12%)	11,473 (13%)	0.023	42,245 (10%)	89,496 (11%)	0.038	50,396 (6%)	64,873 (7%)	0.041	49,279 (5%)	38,477 (4%)	0.013

	Cohort 1			Cohort 2			Cohort 3			Cohort 4		
	Unvaccinated	Vaccinated	ASMD	Unvaccinated	Vaccinated	ASMD	Unvaccinated	Vaccinated	ASMD	Unvaccinated	Vaccinated	ASMD
Malignant neoplastic disease	54,714 (24%)	24,173 (27%)	0.056	81,394 (19%)	151,745 (19%)	0.007	48,971 (6%)	59,566 (6%)	0.026	37,755 (4%)	18,021 (2%)	0.092
Myocardial infarction	7,886 (4%)	3,642 (4%)	0.028	9,894 (2%)	22,773 (3%)	0.031	7,570 (1%)	11,483 (1%)	0.033	6,171 (1%)	2,459 (0%)	0.046
Osteoporosis	32,239 (14%)	14,846 (17%)	0.058	29,512 (7%)	81,707 (10%)	0.114	16,393 (2%)	21,679 (2%)	0.027	14,373 (1%)	3,343 (0%)	0.105
Pneumonia	22,254 (10%)	10,959 (12%)	0.072	27,837 (6%)	61,325 (7%)	0.042	34,513 (4%)	44,236 (5%)	0.033	36,413 (3%)	32,657 (4%)	0.015
Rheumatoid arthritis	2,666 (1%)	1,204 (1%)	0.013	3,771 (1%)	8,890 (1%)	0.022	3,239 (0%)	4,770 (0%)	0.019	2,706 (0%)	1,281 (0%)	0.024
Stroke	16,690 (7%)	8,542 (9%)	0.073	14,256 (3%)	32,612 (4%)	0.037	10,877 (1%)	12,068 (1%)	0.001	9,400 (1%)	3,384 (0%)	0.063
Venous thromboembolism	8,014 (4%)	4,126 (5%)	0.051	8,172 (2%)	17,846 (2%)	0.021	7,747 (1%)	8,920 (1%)	0.005	6,632 (1%)	3,768 (0%)	0.027

ASMD = Absolute standardized mean difference, COPD = Chronic obstructive pulmonary disease, GERD = Gastroesophageal reflux disease

**Table S15: Characteristics of weighted populations in SIDIAP, stratified by staggered cohort and exposure status. Exposure is BNT162b2 vaccine.**

	Cohort 1			Cohort 2			Cohort 3			Cohort 4		
	Unvaccinated	Vaccinated	ASMD									
<b>Number individuals, N</b>	57,981	57,843		99,838	99,488		276,241	273,593		312,492	313,346	
<b>Age, median [Q25-Q75]</b>	86 [83-89]	86 [82-89]	0.000	74 [71-81]	74 [72-81]	0.006	50 [45-56]	50 [45-56]	0.003	36 [29-43]	36 [29-43]	0.004
<b>Sex: Female, N(%)</b>	35,828 (62%)	35,895 (62%)	0.005	58,343 (58%)	57,844 (58%)	0.006	130,375 (47%)	129,701 (47%)	0.004	145,270 (46%)	144,384 (46%)	0.008
<b>Prior observation years, median [Q25-Q75]</b>	5,538 [5,533-5,541]	5,538 [5,533-5,541]	0.002	5,580 [5,569-5,589]	5,580 [5,569-5,590]	0.005	5,624 [5,608-5,639]	5,624 [5,609-5,639]	0.001	5,652 [4,891-5,662]	5,652 [5,161-5,664]	0.004
<b>Number GP visits, median [Q25-Q75]</b>	8 [3-15]	8 [4-15]		4 [0-10]	6 [2-10]		0 [0-5]	2 [0-6]		0 [0-4]	0 [0-5]	
<b>Number of PCR tests, median [Q25-Q75]</b>	0[0-0]	0[0-0]		0[0-0]	0[0-0]		0[0-0]	0[0-0]		0[0-0]	0[0-0]	
<b>Comorbidities, N(%)</b>												
Anxiety	11,327 (20%)	11,359 (20%)	0.003	20,281 (20%)	20,181 (20%)	0.001	67,000 (24%)	63,263 (23%)	0.027	65,060 (21%)	64,616 (21%)	0.005
Asthma	3,734 (6%)	3,583 (6%)	0.010	5,213 (5%)	5,179 (5%)	0.001	12,220 (4%)	11,760 (4%)	0.006	15,491 (5%)	15,211 (5%)	0.005
Chronic kidney disease	18,610 (32%)	18,576 (32%)	0.000	15,548 (16%)	15,607 (16%)	0.003	5,583 (2%)	5,399 (2%)	0.003	1,999 (1%)	2,008 (1%)	0.000
COPD	6,980 (12%)	6,907 (12%)	0.003	9,163 (9%)	9,045 (9%)	0.003	6,020 (2%)	6,047 (2%)	0.002	1,998 (1%)	2,000 (1%)	0.000
Dementia	5,678 (10%)	5,771 (10%)	0.006	4,152 (4%)	3,716 (4%)	0.022	1,037 (0%)	980 (0%)	0.003	502 (0%)	506 (0%)	0.000
Depressive disorder	10,920 (19%)	10,923 (19%)	0.001	15,653 (16%)	15,532 (16%)	0.002	26,419 (10%)	24,357 (9%)	0.023	17,262 (6%)	17,507 (6%)	0.003
Diabetes	14,416 (25%)	14,096 (24%)	0.011	20,461 (20%)	20,645 (21%)	0.006	19,302 (7%)	18,543 (7%)	0.008	10,119 (3%)	10,440 (3%)	0.005
GERD	6,784 (12%)	6,826 (12%)	0.003	10,187 (10%)	10,088 (10%)	0.002	12,811 (5%)	12,805 (5%)	0.002	7,750 (2%)	8,224 (3%)	0.009
Heart failure	9,390 (16%)	8,983 (16%)	0.018	7,563 (8%)	7,296 (7%)	0.009	3,044 (1%)	2,699 (1%)	0.011	1,069 (0%)	1,049 (0%)	0.001
Hypertension	37,879 (65%)	37,465 (65%)	0.012	51,262 (51%)	50,608 (51%)	0.010	42,266 (15%)	41,291 (15%)	0.006	15,063 (5%)	15,323 (5%)	0.003
Hypothyroidism	7,310 (13%)	7,166 (12%)	0.007	11,611 (12%)	11,249 (11%)	0.010	16,597 (6%)	16,509 (6%)	0.001	13,155 (4%)	13,617 (4%)	0.007
Malignant neoplastic disease	15,302 (26%)	14,971 (26%)	0.012	19,393 (19%)	18,719 (19%)	0.015	14,311 (5%)	13,981 (5%)	0.003	6,555 (2%)	6,398 (2%)	0.004
Myocardial infarction	2,286 (4%)	2,182 (4%)	0.009	3,130 (3%)	2,924 (3%)	0.011	2,569 (1%)	2,451 (1%)	0.004	875 (0%)	880 (0%)	0.000

	Cohort 1			Cohort 2			Cohort 3			Cohort 4		
	Unvaccinated	Vaccinated	ASMD	Unvaccinated	Vaccinated	ASMD	Unvaccinated	Vaccinated	ASMD	Unvaccinated	Vaccinated	ASMD
Osteoporosis	9,170 (16%)	9,085 (16%)	0.003	11,182 (11%)	11,201 (11%)	0.002	4,764 (2%)	4,639 (2%)	0.002	1,344 (0%)	1,306 (0%)	0.002
Pneumonia	6,588 (11%)	6,476 (11%)	0.005	7,945 (8%)	7,918 (8%)	0.000	11,759 (4%)	11,273 (4%)	0.007	10,730 (3%)	10,798 (3%)	0.001
Rheumatoid arthritis	755 (1%)	718 (1%)	0.006	1,064 (1%)	1,111 (1%)	0.005	1,113 (0%)	1,026 (0%)	0.004	536 (0%)	461 (0%)	0.006
Stroke	5,070 (9%)	5,006 (9%)	0.003	5,363 (5%)	5,086 (5%)	0.012	3,121 (1%)	3,043 (1%)	0.002	1,199 (0%)	1,253 (0%)	0.003
Venous thromboembolism	2,452 (4%)	2,378 (4%)	0.006	2,660 (3%)	2,526 (3%)	0.008	2,527 (1%)	2,211 (1%)	0.012	1,394 (0%)	1,327 (0%)	0.003

ASMD = Absolute standardized mean difference, COPD = Chronic obstructive pulmonary disease, GERD = Gastroesophageal reflux disease

**Table S16: Characteristics of unweighted populations in SIDIAP, stratified by staggered cohort and exposure status. Exposure is BNT162b2 vaccine.**

	Cohort 1			Cohort 2			Cohort 3			Cohort 4		
	Unvaccinated	Vaccinated	ASMD									
<b>Number individuals, N</b>	223,960	88,896		433,111	445,581		869,109	706,435		1,068,043	580,329	
<b>Age, median [Q25-Q75]</b>	85 [82-88]	87 [84-90]	0.258	67 [62-72]	78 [74-83]	0.943	48 [43-57]	53 [48-57]	0.127	38 [28-51]	38 [31-43]	0.231
<b>Sex: Female, N(%)</b>	136,891 (61%)	55,704 (63%)	0.032	237,440 (55%)	254,378 (57%)	0.046	409,076 (47%)	341,289 (48%)	0.025	491,528 (46%)	274,150 (47%)	0.024
<b>Prior observation years, median [Q25-Q75]</b>	5,539 [5,533-5,541]	5,539 [5,533-5,541]	0.051	5,576 [5,568-5,584]	5,577 [5,569-5,588]	0.206	5,616 [5,469-5,637]	5,620 [5,610-5,638]	0.244	5,650 [3,789-5,660]	5,653 [5,646-5,664]	0.211
<b>Number GP visits, median [Q25-Q75]</b>	7 [2-13]	10 [5-18]		3 [0-8]	7 [3-12]		1 [0-5]	2 [0-7]		0 [0-4]	2 [0-6]	
<b>Number of PCR tests, median [Q25-Q75]</b>	0[0-0]	0[0-1]		0[0-0]	0[0-1]		0[0-0]	0[0-1]		0[0-0]	0[0-1]	
<b>Comorbidities, N(%)</b>												
Anxiety	41,914 (19%)	17,962 (20%)	0.038	97,901 (23%)	91,620 (21%)	0.050	197,933 (23%)	172,434 (24%)	0.039	204,108 (19%)	125,466 (22%)	0.062
Asthma	13,370 (6%)	5,796 (7%)	0.023	19,824 (5%)	25,291 (6%)	0.050	36,788 (4%)	31,586 (4%)	0.012	45,747 (4%)	30,865 (5%)	0.048
Chronic kidney disease	63,046 (28%)	30,745 (35%)	0.139	32,447 (7%)	83,968 (19%)	0.341	22,494 (3%)	13,920 (2%)	0.041	20,416 (2%)	3,171 (1%)	0.124
COPD	24,471 (11%)	11,169 (13%)	0.051	28,773 (7%)	44,207 (10%)	0.119	19,028 (2%)	17,815 (3%)	0.022	15,424 (1%)	3,218 (1%)	0.090
Dementia	16,748 (7%)	10,393 (12%)	0.143	7,389 (2%)	17,606 (4%)	0.136	6,003 (1%)	2,033 (0%)	0.058	5,878 (1%)	856 (0%)	0.068
Depressive disorder	38,161 (17%)	17,894 (20%)	0.079	61,309 (14%)	72,447 (16%)	0.059	77,050 (9%)	69,517 (10%)	0.033	67,070 (6%)	32,476 (6%)	0.029
Diabetes	51,948 (23%)	22,682 (26%)	0.054	65,583 (15%)	99,692 (22%)	0.186	60,242 (7%)	53,330 (8%)	0.024	49,433 (5%)	19,502 (3%)	0.065
GERD	25,370 (11%)	10,611 (12%)	0.019	34,704 (8%)	53,110 (12%)	0.131	37,842 (4%)	37,707 (5%)	0.046	31,662 (3%)	15,544 (3%)	0.017
Heart failure	28,525 (13%)	16,041 (18%)	0.147	16,686 (4%)	34,932 (8%)	0.171	11,920 (1%)	7,057 (1%)	0.034	10,734 (1%)	1,642 (0%)	0.090
Hypertension	138,655 (62%)	59,414 (67%)	0.103	157,291 (36%)	252,365 (57%)	0.416	125,235 (14%)	128,859 (18%)	0.104	97,944 (9%)	26,383 (5%)	0.184
Hypothyroidism	26,868 (12%)	11,363 (13%)	0.024	42,216 (10%)	53,488 (12%)	0.073	50,384 (6%)	46,214 (7%)	0.031	49,424 (5%)	25,961 (4%)	0.007
Malignant neoplastic disease	54,729 (24%)	23,784 (27%)	0.053	81,399 (19%)	96,204 (22%)	0.070	48,967 (6%)	40,510 (6%)	0.004	37,874 (4%)	11,535 (2%)	0.095

	Cohort 1			Cohort 2			Cohort 3			Cohort 4		
	Unvaccinated	Vaccinated	ASMD	Unvaccinated	Vaccinated	ASMD	Unvaccinated	Vaccinated	ASMD	Unvaccinated	Vaccinated	ASMD
Myocardial infarction	7,890 (4%)	3,590 (4%)	0.027	9,892 (2%)	14,140 (3%)	0.055	7,573 (1%)	7,753 (1%)	0.023	6,182 (1%)	1,405 (0%)	0.053
Osteoporosis	32,250 (14%)	14,701 (17%)	0.059	29,528 (7%)	56,885 (13%)	0.201	16,385 (2%)	14,126 (2%)	0.008	14,380 (1%)	1,876 (0%)	0.113
Pneumonia	22,249 (10%)	10,811 (12%)	0.071	27,831 (6%)	38,127 (9%)	0.081	34,511 (4%)	31,972 (5%)	0.028	36,645 (3%)	21,355 (4%)	0.013
Rheumatoid arthritis	2,666 (1%)	1,189 (1%)	0.013	3,769 (1%)	5,143 (1%)	0.028	3,242 (0%)	2,843 (0%)	0.005	2,700 (0%)	812 (0%)	0.026
Stroke	16,693 (7%)	8,475 (10%)	0.075	14,244 (3%)	24,307 (5%)	0.106	10,868 (1%)	8,114 (1%)	0.009	9,394 (1%)	2,033 (0%)	0.068
Venous thromboembolism	8,023 (4%)	4,072 (5%)	0.050	8,162 (2%)	12,564 (3%)	0.062	7,738 (1%)	6,066 (1%)	0.003	6,658 (1%)	2,434 (0%)	0.028

ASMD = Absolute standardized mean difference, COPD = Chronic obstructive pulmonary disease, GERD = Gastroesophageal reflux disease

**Table S17: Characteristics of weighted populations in SIDIAP, stratified by staggered cohort and exposure status. Exposure is ChAdOx1 vaccine.**

	Cohort 2			Cohort 3		
	Unvaccinated	Vaccinated	ASMD	Unvaccinated	Vaccinated	ASMD
<b>Number individuals, N</b>	120,307	120,802		44,033	43,901	
<b>Age, median [Q25-Q75]</b>	64 [61-66]	64 [61-66]	0.000	64 [61-66]	64 [61-67]	0.002
<b>Sex: Female, N(%)</b>	62,434 (52%)	62,425 (52%)	0.004	23,009 (52%)	22,980 (52%)	0.002
<b>Prior observation years, median [Q25-Q75]</b>	5,574 [5,566-5,587]	5,576 [5,566-5,588]	0.003	5,606 [5,603-5,614]	5,608 [5,603-5,614]	0.005
<b>Number GP visits, median [Q25-Q75]</b>	2 [0-7]	4 [1-8]		2 [0-7]	2 [0-7]	
<b>Number of PCR tests, median [Q25-Q75]</b>	0[0-0]	0[0-0]		0[0-0]	0[0-0]	
<b>Comorbidities, N(%)</b>						
Anxiety	28,213 (23%)	27,989 (23%)	0.007	10,333 (23%)	9,717 (22%)	0.032
Asthma	4,909 (4%)	4,785 (4%)	0.006	1,664 (4%)	1,639 (4%)	0.002
Chronic kidney disease	4,390 (4%)	4,526 (4%)	0.005	1,556 (4%)	1,597 (4%)	0.006
COPD	6,702 (6%)	6,846 (6%)	0.004	2,405 (5%)	2,350 (5%)	0.005
Dementia	470 (0%)	397 (0%)	0.010	170 (0%)	171 (0%)	0.000
Depressive disorder	16,483 (14%)	16,258 (13%)	0.007	5,940 (13%)	5,813 (13%)	0.007
Diabetes	16,127 (13%)	16,418 (14%)	0.005	5,698 (13%)	5,705 (13%)	0.002
GERD	9,580 (8%)	9,569 (8%)	0.002	3,206 (7%)	3,216 (7%)	0.002
Heart failure	2,268 (2%)	2,236 (2%)	0.003	844 (2%)	847 (2%)	0.001
Hypertension	39,422 (33%)	39,551 (33%)	0.001	13,589 (31%)	13,737 (31%)	0.009
Hypothyroidism	10,965 (9%)	11,173 (9%)	0.005	4,002 (9%)	3,830 (9%)	0.013
Malignant neoplastic disease	12,621 (10%)	12,418 (10%)	0.007	4,304 (10%)	3,910 (9%)	0.030
Myocardial infarction	2,553 (2%)	2,500 (2%)	0.004	888 (2%)	868 (2%)	0.003
Osteoporosis	6,687 (6%)	6,679 (6%)	0.001	2,155 (5%)	2,200 (5%)	0.005
Pneumonia	6,452 (5%)	6,392 (5%)	0.003	2,243 (5%)	2,167 (5%)	0.007
Rheumatoid arthritis	1,009 (1%)	931 (1%)	0.008	337 (1%)	259 (1%)	0.021
Stroke	2,693 (2%)	2,582 (2%)	0.007	965 (2%)	1,000 (2%)	0.006
Venous thromboembolism	1,686 (1%)	1,469 (1%)	0.016	659 (1%)	541 (1%)	0.023

ASMD = Absolute standardized mean difference, COPD = Chronic obstructive pulmonary disease, GERD = Gastroesophageal reflux disease

**Table S18: Characteristics of unweighted populations in SIDIAP, stratified by staggered cohort and exposure status. Exposure is ChAdOx1 vaccine.**

	Cohort 2			Cohort 3		
	Unvaccinated	Vaccinated	ASMD	Unvaccinated	Vaccinated	ASMD
<b>Number individuals, N</b>	433,636	323,204		873,400	84,204	
<b>Age, median [Q25-Q75]</b>	67 [62-72]	64 [62-67]	0.241	48 [43-57]	64 [61-67]	0.986
<b>Sex: Female, N(%)</b>	237,722 (55%)	162,269 (50%)	0.093	411,107 (47%)	44,374 (53%)	0.113
<b>Prior observation years, median [Q25-Q75]</b>	5,574 [5,565-5,587]	5,576 [5,567-5,588]	0.158	5,605 [5,452-5,611]	5,608 [5,604-5,615]	0.281
<b>Number GP visits, median [Q25-Q75]</b>	3 [0-8]	4 [1-9]		1 [0-5]	4 [1-8]	
<b>Number of PCR tests, median [Q25-Q75]</b>	0[0-0]	0[0-1]		0[0-0]	0[0-0]	
<b>Comorbidities, N(%)</b>						
Anxiety	97,950 (23%)	77,793 (24%)	0.035	198,282 (23%)	19,626 (23%)	0.014
Asthma	19,861 (5%)	13,894 (4%)	0.014	36,915 (4%)	3,283 (4%)	0.017
Chronic kidney disease	32,497 (7%)	12,206 (4%)	0.162	22,570 (3%)	3,199 (4%)	0.069
COPD	28,826 (7%)	18,658 (6%)	0.036	19,103 (2%)	4,996 (6%)	0.191
Dementia	7,407 (2%)	1,009 (0%)	0.140	6,041 (1%)	345 (0%)	0.038
Depressive disorder	61,377 (14%)	44,463 (14%)	0.011	77,249 (9%)	11,874 (14%)	0.166
Diabetes	65,666 (15%)	45,453 (14%)	0.031	60,383 (7%)	12,142 (14%)	0.245
GERD	34,755 (8%)	28,610 (9%)	0.030	37,840 (4%)	6,754 (8%)	0.154
Heart failure	16,741 (4%)	5,636 (2%)	0.129	11,981 (1%)	1,703 (2%)	0.050
Hypertension	157,484 (36%)	114,179 (35%)	0.021	125,527 (14%)	28,314 (34%)	0.463
Hypothyroidism	42,257 (10%)	30,350 (9%)	0.012	50,476 (6%)	7,763 (9%)	0.131
Malignant neoplastic disease	81,510 (19%)	36,352 (11%)	0.212	49,066 (6%)	7,842 (9%)	0.141
Myocardial infarction	9,910 (2%)	7,242 (2%)	0.003	7,561 (1%)	1,784 (2%)	0.103
Osteoporosis	29,546 (7%)	19,864 (6%)	0.027	16,434 (2%)	4,382 (5%)	0.180
Pneumonia	27,865 (6%)	18,329 (6%)	0.032	34,617 (4%)	4,445 (5%)	0.063
Rheumatoid arthritis	3,762 (1%)	2,557 (1%)	0.008	3,246 (0%)	535 (1%)	0.037
Stroke	14,284 (3%)	6,369 (2%)	0.083	10,884 (1%)	1,915 (2%)	0.078
Venous thromboembolism	8,163 (2%)	3,613 (1%)	0.063	7,746 (1%)	1,110 (1%)	0.041

ASMD = Absolute standardized mean difference, COPD = Chronic obstructive pulmonary disease, GERD = Gastroesophageal reflux disease

**Table S19: Characteristics of weighted populations in CORIVA, stratified by staggered cohort and exposure status. Exposure is any COVID-19 vaccine.**

	Cohort 1			Cohort 2			Cohort 3			Cohort 4		
	Unvaccinated	Vaccinated	ASMD									
<b>Number individuals, N</b>	10,630	10,630		3,863	3,863		17,929	17,929		18,740	18,740	
<b>Age, median [Q25-Q75]</b>	78 [72-83]	78 [72-83]	0.000	70 [65-75]	70 [65-75]	0.000	52 [45-59]	50 [45-59]	0.000	40 [30-51]	40 [30-51]	0.000
<b>Sex: Female, N(%)</b>	7,165 (67%)	7,165 (67%)	0.000	2,439 (63%)	2,439 (63%)	0.000	9,054 (50%)	9,054 (50%)	0.000	8,493 (45%)	8,493 (45%)	0.000
<b>Prior observation years, median [Q25-Q75]</b>	1,540 [1,524-1,555]	1,542 [1,524-1,556]	0.000	1,574 [1,572-1,578]	1,574 [1,572-1,578]	0.000	1,594 [1,587-1,605]	1,594 [1,587-1,605]	0.000	1,650 [1,636-1,662]	1,650 [1,635-1,662]	0.000
<b>Number GP visits, median [Q25-Q75]</b>	14 [4-24]	14 [6-23]		12 [3-23]	12 [5-22]		2 [0-11]	4 [1-10]		2 [0-8]	2 [0-8]	
<b>Number of PCR tests, median [Q25-Q75]</b>	0[0-0]	0[0-0]		0[0-0]	0[0-0]		0[0-0]	0[0-0]		0[0-0]	0[0-0]	
<b>Comorbidities, N(%)</b>												
Anxiety	1,060 (10%)	1,076 (10%)	0.005	405 (10%)	415 (11%)	0.008	1,545 (9%)	1,500 (8%)	0.009	1,552 (8%)	1,495 (8%)	0.011
Asthma	996 (9%)	917 (9%)	0.026	372 (10%)	365 (9%)	0.006	936 (5%)	894 (5%)	0.011	845 (5%)	782 (4%)	0.016
Chronic kidney disease	1,015 (10%)	999 (9%)	0.005	336 (9%)	309 (8%)	0.025	347 (2%)	339 (2%)	0.003	212 (1%)	194 (1%)	0.009
COPD	757 (7%)	723 (7%)	0.012	264 (7%)	258 (7%)	0.006	442 (2%)	417 (2%)	0.009	318 (2%)	249 (1%)	0.030
Dementia	438 (4%)	412 (4%)	0.013	106 (3%)	90 (2%)	0.027	120 (1%)	131 (1%)	0.008	71 (0%)	70 (0%)	0.001
Depressive disorder	1,076 (10%)	1,083 (10%)	0.002	462 (12%)	433 (11%)	0.023	1,787 (10%)	1,764 (10%)	0.004	1,679 (9%)	1,739 (9%)	0.011
Diabetes	1,861 (18%)	1,833 (17%)	0.007	640 (17%)	588 (15%)	0.037	1,012 (6%)	963 (5%)	0.012	814 (4%)	764 (4%)	0.014
GERD	1,416 (13%)	1,458 (14%)	0.011	523 (14%)	531 (14%)	0.006	1,562 (9%)	1,600 (9%)	0.007	1,166 (6%)	1,172 (6%)	0.001
Heart failure	3,898 (37%)	3,839 (36%)	0.011	1,003 (26%)	970 (25%)	0.020	1,348 (8%)	1,324 (7%)	0.005	781 (4%)	737 (4%)	0.012
Hypertension	8,016 (75%)	8,221 (77%)	0.045	2,569 (67%)	2,641 (68%)	0.040	5,521 (31%)	5,643 (31%)	0.015	3,359 (18%)	3,538 (19%)	0.025
Hypothyroidism	1,218 (11%)	1,160 (11%)	0.017	419 (11%)	428 (11%)	0.007	981 (5%)	948 (5%)	0.008	654 (3%)	675 (4%)	0.006
Malignant neoplastic disease	1,655 (16%)	1,732 (16%)	0.020	640 (17%)	659 (17%)	0.013	771 (4%)	782 (4%)	0.003	455 (2%)	453 (2%)	0.001
Myocardial infarction	269 (3%)	264 (2%)	0.003	86 (2%)	71 (2%)	0.026	127 (1%)	116 (1%)	0.008	81 (0%)	75 (0%)	0.005

	Cohort 1			Cohort 2			Cohort 3			Cohort 4		
	Unvaccinated	Vaccinated	ASMD									
Osteoporosis	675 (6%)	685 (6%)	0.004	187 (5%)	176 (5%)	0.013	233 (1%)	230 (1%)	0.001	131 (1%)	146 (1%)	0.009
Pneumonia	771 (7%)	768 (7%)	0.001	249 (6%)	244 (6%)	0.005	657 (4%)	670 (4%)	0.004	567 (3%)	562 (3%)	0.002
Rheumatoid arthritis	268 (3%)	273 (3%)	0.003	139 (4%)	122 (3%)	0.024	209 (1%)	187 (1%)	0.012	130 (1%)	116 (1%)	0.009
Stroke	460 (4%)	461 (4%)	0.001	147 (4%)	144 (4%)	0.004	179 (1%)	189 (1%)	0.006	112 (1%)	116 (1%)	0.003
Venous thromboembolism	469 (4%)	472 (4%)	0.001	171 (4%)	123 (3%)	0.064	306 (2%)	301 (2%)	0.002	219 (1%)	201 (1%)	0.009

ASMD = Absolute standardized mean difference, COPD = Chronic obstructive pulmonary disease, GERD = Gastroesophageal reflux disease

**Table S20: Characteristics of unweighted populations in CORIVA, stratified by staggered cohort and exposure status. Exposure is any COVID-19 vaccine.**

	Cohort 1			Cohort 2			Cohort 3			Cohort 4		
	Unvaccinated	Vaccinated	ASMD									
<b>Number individuals, N</b>	23,982	26,736		34,317	4,572		96,423	24,050		147,545	22,245	
<b>Age, median [Q25-Q75]</b>	79 [73-85]	77 [73-82]	0.127	72 [67-81]	70 [66-75]	0.177	54 [46-66]	51 [45-59]	0.227	42 [32-58]	40 [30-51]	0.186
<b>Sex: Female, N(%)</b>	16,532 (69%)	17,342 (65%)	0.087	21,862 (64%)	2,891 (63%)	0.010	48,984 (51%)	12,233 (51%)	0.001	72,057 (49%)	10,026 (45%)	0.076
<b>Prior observation years, median [Q25-Q75]</b>	1,540 [1,524-1,556]	1,542 [1,525-1,557]	0.019	1,575 [1,572-1,578]	1,575 [1,572-1,578]	0.002	1,595 [1,587-1,605]	1,595 [1,587-1,605]	0.002	1,650 [1,636-1,663]	1,650 [1,636-1,663]	0.003
<b>Number GP visits, median [Q25-Q75]</b>	11 [1-22]	16 [8-26]		9 [1-20]	13 [6-23]		2 [0-10]	5 [1-11]		1 [0-6]	3 [1-8]	
<b>Number of PCR tests, median [Q25-Q75]</b>	0[0-0]	0[0-0]		0[0-0]	0[0-0]		0[0-0]	0[0-0]		0[0-0]	0[0-0]	
<b>Comorbidities, N(%)</b>												
Anxiety	1,966 (8%)	3,238 (12%)	0.130	2,817 (8%)	513 (11%)	0.102	6,406 (7%)	2,162 (9%)	0.087	9,287 (6%)	1,847 (8%)	0.077
Asthma	1,986 (8%)	2,668 (10%)	0.059	2,653 (8%)	447 (10%)	0.072	4,385 (5%)	1,250 (5%)	0.030	5,405 (4%)	968 (4%)	0.035
Chronic kidney disease	2,270 (9%)	2,507 (9%)	0.003	2,939 (9%)	367 (8%)	0.019	2,523 (3%)	415 (2%)	0.061	2,335 (2%)	221 (1%)	0.052
COPD	1,569 (7%)	1,976 (7%)	0.033	2,015 (6%)	312 (7%)	0.039	2,743 (3%)	529 (2%)	0.041	2,558 (2%)	294 (1%)	0.034
Dementia	1,152 (5%)	819 (3%)	0.090	1,297 (4%)	100 (2%)	0.094	1,147 (1%)	151 (1%)	0.059	1,067 (1%)	76 (0%)	0.052
Depressive disorder	2,066 (9%)	3,233 (12%)	0.114	3,189 (9%)	535 (12%)	0.079	7,286 (8%)	2,561 (11%)	0.108	10,034 (7%)	2,152 (10%)	0.105
Diabetes	3,971 (17%)	4,734 (18%)	0.030	4,818 (14%)	712 (16%)	0.043	6,065 (6%)	1,228 (5%)	0.051	6,594 (4%)	901 (4%)	0.021
GERD	2,533 (11%)	4,585 (17%)	0.192	3,364 (10%)	667 (15%)	0.147	6,287 (7%)	2,322 (10%)	0.115	7,455 (5%)	1,427 (6%)	0.059
Heart failure	8,724 (36%)	9,642 (36%)	0.007	9,570 (28%)	1,139 (25%)	0.068	9,982 (10%)	1,607 (7%)	0.132	9,182 (6%)	828 (4%)	0.115
Hypertension	16,651 (69%)	21,677 (81%)	0.272	20,654 (60%)	3,167 (69%)	0.191	29,974 (31%)	7,555 (31%)	0.007	27,992 (19%)	4,172 (19%)	0.006
Hypothyroidism	2,496 (10%)	3,094 (12%)	0.037	3,198 (9%)	515 (11%)	0.064	4,725 (5%)	1,309 (5%)	0.025	5,180 (4%)	799 (4%)	0.004
Malignant neoplastic disease	3,194 (13%)	5,044 (19%)	0.151	5,061 (15%)	782 (17%)	0.064	4,587 (5%)	1,011 (4%)	0.027	4,134 (3%)	523 (2%)	0.028
Myocardial infarction	548 (2%)	743 (3%)	0.031	696 (2%)	86 (2%)	0.011	840 (1%)	146 (1%)	0.031	777 (1%)	87 (0%)	0.020

	Cohort 1			Cohort 2			Cohort 3			Cohort 4		
	Unvaccinated	Vaccinated	ASMD									
Osteoporosis	1,273 (5%)	2,015 (8%)	0.091	1,446 (4%)	212 (5%)	0.021	1,545 (2%)	289 (1%)	0.034	1,408 (1%)	164 (1%)	0.024
Pneumonia	1,611 (7%)	2,046 (8%)	0.036	2,081 (6%)	291 (6%)	0.012	3,342 (3%)	898 (4%)	0.014	3,919 (3%)	683 (3%)	0.025
Rheumatoid arthritis	493 (2%)	817 (3%)	0.063	891 (3%)	153 (3%)	0.044	1,022 (1%)	250 (1%)	0.002	987 (1%)	137 (1%)	0.007
Stroke	1,137 (5%)	1,011 (4%)	0.048	1,450 (4%)	169 (4%)	0.027	1,359 (1%)	232 (1%)	0.041	1,256 (1%)	133 (1%)	0.030
Venous thromboembolism	1,058 (4%)	1,207 (5%)	0.005	1,349 (4%)	149 (3%)	0.036	1,808 (2%)	387 (2%)	0.020	1,788 (1%)	235 (1%)	0.015

ASMD = Absolute standardized mean difference, COPD = Chronic obstructive pulmonary disease, GERD = Gastroesophageal reflux disease

**Table S21: Characteristics of weighted populations in CORIVA, stratified by staggered cohort and exposure status. Exposure is BNT162b2 vaccine.**

	Cohort 1			Cohort 2			Cohort 3			Cohort 4		
	Unvaccinated	Vaccinated	ASMD									
<b>Number individuals, N</b>	9,118	9,118		3,465	3,465		14,414	14,414		13,759	13,759	
<b>Age, median [Q25-Q75]</b>	78 [73-83]	78 [73-83]	0.000	70 [65-75]	70 [65-75]	0.000	50 [45-59]	50 [45-59]	0.000	38 [30-50]	38 [30-50]	0.000
<b>Sex: Female, N(%)</b>	6,206 (68%)	6,206 (68%)	0.000	2,197 (63%)	2,197 (63%)	0.000	7,324 (51%)	7,324 (51%)	0.000	6,552 (48%)	6,552 (48%)	0.000
<b>Prior observation years, median [Q25-Q75]</b>	1,542 [1,516-1,557]	1,542 [1,516-1,557]	0.000	1,574 [1,572-1,578]	1,574 [1,572-1,578]	0.000	1,594 [1,586-1,603]	1,594 [1,586-1,603]	0.000	1,650 [1,632-1,662]	1,650 [1,632-1,662]	0.000
<b>Number GP visits, median [Q25-Q75]</b>	14 [4-25]	14 [7-24]		12 [3-23]	12 [5-22]		2 [0-10]	4 [1-10]		2 [0-8]	2 [0-8]	
<b>Number of PCR tests, median [Q25-Q75]</b>	0[0-0]	0[0-0]		0[0-0]	0[0-0]		0[0-0]	0[0-0]		0[0-0]	0[0-0]	
<b>Comorbidities, N(%)</b>												
Anxiety	935 (10%)	956 (10%)	0.007	367 (11%)	373 (11%)	0.006	1,284 (9%)	1,278 (9%)	0.001	1,206 (9%)	1,170 (9%)	0.009
Asthma	891 (10%)	822 (9%)	0.026	340 (10%)	333 (10%)	0.007	747 (5%)	718 (5%)	0.009	644 (5%)	615 (4%)	0.010
Chronic kidney disease	939 (10%)	905 (10%)	0.012	302 (9%)	278 (8%)	0.025	225 (2%)	220 (2%)	0.003	144 (1%)	132 (1%)	0.008
COPD	666 (7%)	639 (7%)	0.011	238 (7%)	227 (7%)	0.013	333 (2%)	316 (2%)	0.008	223 (2%)	171 (1%)	0.032
Dementia	403 (4%)	377 (4%)	0.014	91 (3%)	81 (2%)	0.018	75 (1%)	72 (0%)	0.002	46 (0%)	38 (0%)	0.012
Depressive disorder	960 (11%)	966 (11%)	0.002	420 (12%)	411 (12%)	0.008	1,472 (10%)	1,485 (10%)	0.003	1,311 (10%)	1,367 (10%)	0.014
Diabetes	1,647 (18%)	1,624 (18%)	0.007	576 (17%)	531 (15%)	0.036	747 (5%)	731 (5%)	0.005	596 (4%)	565 (4%)	0.011
GERD	1,240 (14%)	1,268 (14%)	0.009	476 (14%)	473 (14%)	0.003	1,283 (9%)	1,322 (9%)	0.009	892 (6%)	900 (7%)	0.002
Heart failure	3,527 (39%)	3,470 (38%)	0.013	911 (26%)	877 (25%)	0.022	920 (6%)	899 (6%)	0.006	519 (4%)	484 (4%)	0.014
Hypertension	7,040 (77%)	7,234 (79%)	0.051	2,327 (67%)	2,384 (69%)	0.036	4,296 (30%)	4,340 (30%)	0.007	2,391 (17%)	2,479 (18%)	0.017
Hypothyroidism	1,080 (12%)	1,035 (11%)	0.015	376 (11%)	388 (11%)	0.011	770 (5%)	743 (5%)	0.009	500 (4%)	503 (4%)	0.001
Malignant neoplastic disease	1,485 (16%)	1,565 (17%)	0.023	579 (17%)	594 (17%)	0.012	582 (4%)	606 (4%)	0.008	324 (2%)	317 (2%)	0.003
Myocardial infarction	248 (3%)	234 (3%)	0.010	78 (2%)	68 (2%)	0.020	97 (1%)	88 (1%)	0.008	52 (0%)	52 (0%)	0.000

	Cohort 1			Cohort 2			Cohort 3			Cohort 4		
	Unvaccinated	Vaccinated	ASMD									
Osteoporosis	615 (7%)	632 (7%)	0.007	170 (5%)	167 (5%)	0.003	167 (1%)	161 (1%)	0.004	97 (1%)	107 (1%)	0.008
Pneumonia	698 (8%)	696 (8%)	0.001	222 (6%)	222 (6%)	0.001	543 (4%)	505 (4%)	0.014	418 (3%)	429 (3%)	0.005
Rheumatoid arthritis	240 (3%)	239 (3%)	0.001	128 (4%)	110 (3%)	0.028	167 (1%)	148 (1%)	0.013	97 (1%)	88 (1%)	0.008
Stroke	419 (5%)	417 (5%)	0.001	134 (4%)	131 (4%)	0.004	121 (1%)	130 (1%)	0.007	74 (1%)	82 (1%)	0.008
Venous thromboembolism	438 (5%)	416 (5%)	0.011	153 (4%)	117 (3%)	0.053	220 (2%)	214 (1%)	0.003	159 (1%)	138 (1%)	0.015

ASMD = Absolute standardized mean difference, COPD = Chronic obstructive pulmonary disease, GERD = Gastroesophageal reflux disease

**Table S22: Characteristics of unweighted populations in CORIVA, stratified by staggered cohort and exposure status. Exposure is BNT162b2 vaccine.**

	Cohort 1			Cohort 2			Cohort 3			Cohort 4		
	Unvaccinated	Vaccinated	ASMD									
<b>Number individuals, N</b>	24,073	19,686		34,320	4,067		96,471	18,645		147,553	15,683	
<b>Age, median [Q25-Q75]</b>	79 [73-85]	79 [74-83]	0.040	72 [67-81]	70 [66-75]	0.174	54 [46-66]	51 [45-59]	0.257	42 [32-58]	38 [30-50]	0.216
<b>Sex: Female, N(%)</b>	16,582 (69%)	13,022 (66%)	0.058	21,867 (64%)	2,582 (63%)	0.005	49,023 (51%)	9,570 (51%)	0.010	72,056 (49%)	7,500 (48%)	0.020
<b>Prior observation years, median [Q25-Q75]</b>	1,541 [1,516-1,558]	1,543 [1,517-1,558]	0.026	1,575 [1,572-1,578]	1,575 [1,572-1,578]	0.000	1,594 [1,587-1,603]	1,594 [1,587-1,603]	0.000	1,649 [1,633-1,663]	1,650 [1,633-1,663]	0.003
<b>Number GP visits, median [Q25-Q75]</b>	11 [1-22]	17 [9-27]		9 [1-20]	13 [6-23]		2 [0-10]	5 [1-11]		1 [0-6]	4 [1-9]	
<b>Number of PCR tests, median [Q25-Q75]</b>	0[0-0]	0[0-0]		0[0-0]	0[0-0]		0[0-0]	0[0-0]		0[0-0]	0[0-0]	
<b>Comorbidities, N(%)</b>												
Anxiety	1,966 (8%)	2,429 (12%)	0.138	2,816 (8%)	458 (11%)	0.103	6,416 (7%)	1,780 (10%)	0.106	9,291 (6%)	1,384 (9%)	0.096
Asthma	2,004 (8%)	2,029 (10%)	0.068	2,653 (8%)	404 (10%)	0.078	4,393 (5%)	969 (5%)	0.030	5,403 (4%)	730 (5%)	0.050
Chronic kidney disease	2,284 (9%)	2,041 (10%)	0.029	2,943 (9%)	326 (8%)	0.020	2,537 (3%)	263 (1%)	0.087	2,339 (2%)	146 (1%)	0.059
COPD	1,587 (7%)	1,501 (8%)	0.040	2,013 (6%)	274 (7%)	0.036	2,746 (3%)	388 (2%)	0.049	2,560 (2%)	193 (1%)	0.042
Dementia	1,162 (5%)	688 (3%)	0.067	1,301 (4%)	90 (2%)	0.093	1,136 (1%)	81 (0%)	0.083	1,062 (1%)	40 (0%)	0.067
Depressive disorder	2,070 (9%)	2,449 (12%)	0.125	3,188 (9%)	502 (12%)	0.098	7,303 (8%)	2,075 (11%)	0.122	10,051 (7%)	1,623 (10%)	0.127
Diabetes	3,964 (16%)	3,599 (18%)	0.048	4,814 (14%)	638 (16%)	0.047	6,071 (6%)	900 (5%)	0.064	6,594 (4%)	644 (4%)	0.018
GERD	2,532 (11%)	3,307 (17%)	0.184	3,364 (10%)	587 (14%)	0.142	6,296 (7%)	1,858 (10%)	0.125	7,446 (5%)	1,050 (7%)	0.070
Heart failure	8,750 (36%)	7,743 (39%)	0.062	9,570 (28%)	1,026 (25%)	0.060	10,000 (10%)	1,057 (6%)	0.174	9,185 (6%)	525 (3%)	0.135
Hypertension	16,718 (69%)	16,325 (83%)	0.321	20,659 (60%)	2,838 (70%)	0.202	29,995 (31%)	5,624 (30%)	0.020	27,979 (19%)	2,798 (18%)	0.029
Hypothyroidism	2,526 (10%)	2,352 (12%)	0.046	3,197 (9%)	464 (11%)	0.069	4,732 (5%)	988 (5%)	0.018	5,173 (4%)	576 (4%)	0.009
Malignant neoplastic disease	3,216 (13%)	3,873 (20%)	0.171	5,060 (15%)	700 (17%)	0.067	4,587 (5%)	764 (4%)	0.032	4,139 (3%)	352 (2%)	0.036
Myocardial infarction	539 (2%)	591 (3%)	0.048	696 (2%)	82 (2%)	0.001	850 (1%)	108 (1%)	0.035	779 (1%)	58 (0%)	0.024

	Cohort 1			Cohort 2			Cohort 3			Cohort 4		
	Unvaccinated	Vaccinated	ASMD									
Osteoporosis	1,283 (5%)	1,628 (8%)	0.117	1,447 (4%)	200 (5%)	0.034	1,550 (2%)	197 (1%)	0.048	1,403 (1%)	117 (1%)	0.022
Pneumonia	1,621 (7%)	1,624 (8%)	0.058	2,080 (6%)	264 (6%)	0.018	3,353 (3%)	672 (4%)	0.007	3,920 (3%)	499 (3%)	0.031
Rheumatoid arthritis	491 (2%)	603 (3%)	0.065	892 (3%)	137 (3%)	0.045	1,025 (1%)	190 (1%)	0.004	990 (1%)	99 (1%)	0.005
Stroke	1,129 (5%)	834 (4%)	0.022	1,447 (4%)	152 (4%)	0.025	1,370 (1%)	155 (1%)	0.056	1,254 (1%)	90 (1%)	0.033
Venous thromboembolism	1,067 (4%)	972 (5%)	0.024	1,353 (4%)	140 (3%)	0.027	1,808 (2%)	266 (1%)	0.035	1,785 (1%)	156 (1%)	0.021

ASMD = Absolute standardized mean difference, COPD = Chronic obstructive pulmonary disease, GERD = Gastroesophageal reflux disease

**Table S23: Characteristics of weighted populations in CPRD AURUM, stratified by staggered cohort and vaccine brand.**

	Cohort 1			Cohort 2			Cohort 3			Cohort 4		
	ChAdOx1	BNT162b2	ASMD	ChAdOx1	BNT162b2	ASMD	ChAdOx1	BNT162b2	ASMD	ChAdOx1	BNT162b2	ASMD
<b>Number individuals, N</b>	48,138	48,432		306,114	307,972		35,517	35,840		117,220	116,722	
<b>Age, median [Q25-Q75]</b>	80 [77-85]	80 [77-85]	0.003	66 [57-72]	66 [57-72]	0.003	54 [46-60]	54 [46-60]	0.000	42 [39-46]	42 [39-46]	0.004
<b>Sex: Female, N(%)</b>	27,920 (58%)	27,962 (58%)	0.005	167,623 (55%)	168,473 (55%)	0.001	21,299 (60%)	21,484 (60%)	0.000	54,350 (46%)	54,304 (47%)	0.003
<b>Prior observation years, median [Q25-Q75]</b>	8,880 [3,393-13,205]	9,028 [3,865-13,120]	0.011	7,548 [3,319-11,671]	7,538 [3,306-11,645]	0.000	6,142 [2,752-9,842]	6,058 [2,730-9,738]	0.007	3,266 [1,569-6,222]	3,210 [1,545-6,211]	0.001
<b>Number GP visits, median [Q25-Q75]</b>	12 [6-19]	12 [6-19]		10 [5-16]	10 [6-16]		8 [4-14]	8 [4-14]		4 [1-8]	4 [1-8]	
<b>Number of PCR tests, median [Q25-Q75]</b>	0[0-0]	0[0-0]		0[0-0]	0[0-0]		0[0-0]	0[0-0]		0[0-0]	0[0-0]	
<b>Comorbidities, N(%)</b>												
Anxiety	7,101 (15%)	7,442 (15%)	0.017	62,230 (20%)	61,892 (20%)	0.006	7,419 (21%)	7,362 (21%)	0.009	19,086 (16%)	19,543 (17%)	0.012
Asthma	5,241 (11%)	5,396 (11%)	0.008	57,043 (19%)	56,551 (18%)	0.007	6,365 (18%)	6,097 (17%)	0.024	9,186 (8%)	9,059 (8%)	0.003
Chronic kidney disease	11,403 (24%)	11,809 (24%)	0.016	28,219 (9%)	29,790 (10%)	0.016	1,565 (4%)	1,700 (5%)	0.016	793 (1%)	897 (1%)	0.011
COPD	4,080 (8%)	4,014 (8%)	0.007	20,765 (7%)	20,456 (7%)	0.006	661 (2%)	669 (2%)	0.000	424 (0%)	471 (0%)	0.007
Dementia	3,667 (8%)	3,510 (7%)	0.014	2,733 (1%)	2,137 (1%)	0.022	419 (1%)	288 (1%)	0.038	109 (0%)	60 (0%)	0.016
Depressive disorder	5,666 (12%)	5,885 (12%)	0.012	56,642 (19%)	57,377 (19%)	0.003	6,508 (18%)	6,556 (18%)	0.001	16,027 (14%)	16,191 (14%)	0.006
Diabetes	8,849 (18%)	9,020 (19%)	0.006	50,019 (16%)	50,218 (16%)	0.001	2,560 (7%)	2,850 (8%)	0.028	3,231 (3%)	3,106 (3%)	0.006
GERD	2,637 (5%)	2,694 (6%)	0.004	16,666 (5%)	16,658 (5%)	0.002	1,479 (4%)	1,443 (4%)	0.007	3,087 (3%)	3,046 (3%)	0.001
Heart failure	2,843 (6%)	2,904 (6%)	0.004	6,822 (2%)	6,936 (2%)	0.002	443 (1%)	361 (1%)	0.023	204 (0%)	202 (0%)	0.000
Hypertension	25,422 (53%)	26,106 (54%)	0.022	103,545 (34%)	105,521 (34%)	0.009	6,295 (18%)	6,514 (18%)	0.012	6,692 (6%)	6,522 (6%)	0.005
Hypothyroidism	4,806 (10%)	4,978 (10%)	0.010	22,667 (7%)	23,290 (8%)	0.006	1,845 (5%)	1,886 (5%)	0.003	2,985 (3%)	3,025 (3%)	0.003
Malignant neoplastic disease	10,958 (23%)	11,284 (23%)	0.013	38,507 (13%)	40,499 (13%)	0.017	2,019 (6%)	2,152 (6%)	0.014	1,504 (1%)	1,576 (1%)	0.006
Myocardial infarction	2,481 (5%)	2,516 (5%)	0.002	11,083 (4%)	11,197 (4%)	0.001	425 (1%)	521 (1%)	0.022	256 (0%)	349 (0%)	0.016
Osteoporosis	5,117 (11%)	5,335 (11%)	0.012	11,759 (4%)	11,858 (4%)	0.000	719 (2%)	667 (2%)	0.012	344 (0%)	372 (0%)	0.004
Pneumonia	2,576 (5%)	2,527 (5%)	0.006	9,543 (3%)	9,423 (3%)	0.003	808 (2%)	692 (2%)	0.024	979 (1%)	904 (1%)	0.007
Rheumatoid arthritis	935 (2%)	1,005 (2%)	0.010	6,476 (2%)	6,640 (2%)	0.003	284 (1%)	344 (1%)	0.017	216 (0%)	258 (0%)	0.008

	Cohort 1			Cohort 2			Cohort 3			Cohort 4		
	ChAdOx1	BNT162b2	ASMD	ChAdOx1	BNT162b2	ASMD	ChAdOx1	BNT162b2	ASMD	ChAdOx1	BNT162b2	ASMD
Stroke	2,314 (5%)	2,418 (5%)	0.009	7,284 (2%)	7,949 (3%)	0.013	446 (1%)	414 (1%)	0.009	294 (0%)	336 (0%)	0.007
Venous thromboembolism	3,001 (6%)	3,101 (6%)	0.007	11,833 (4%)	12,315 (4%)	0.007	812 (2%)	853 (2%)	0.006	601 (1%)	765 (1%)	0.019

ASMD = Absolute standardized mean difference, COPD = Chronic obstructive pulmonary disease, GERD = Gastroesophageal reflux disease

**Table S24: Characteristics of unweighted populations in CPROD AURUM, stratified by staggered cohort and vaccine brand.**

	Cohort 1			Cohort 2			Cohort 3			Cohort 4		
	ChAdOx1	BNT162b2	ASMD	ChAdOx1	BNT162b2	ASMD	ChAdOx1	BNT162b2	ASMD	ChAdOx1	BNT162b2	ASMD
<b>Number individuals, N</b>	219,804	332,790		969,262	594,262		1,473,602	54,102		542,670	1,335,671	
<b>Age, median [Q25-Q75]</b>	80 [77-85]	82 [79-86]	0.129	69 [63-73]	67 [56-73]	0.148	55 [51-60]	58 [50-82]	0.381	45 [42-48]	31 [25-37]	1.319
<b>Sex: Female, N(%)</b>	127,656 (58%)	186,481 (56%)	0.041	528,692 (55%)	324,259 (55%)	0.000	739,444 (50%)	32,310 (60%)	0.193	242,758 (45%)	625,195 (47%)	0.042
<b>Prior observation years, median [Q25-Q75]</b>	8,791 [3,464-13,225]	9,482 [4,653-13,824]	0.059	7,794 [3,377-11,921]	7,496 [3,312-11,558]	0.028	6,148 [2,779-9,701]	6,924 [3,046-10,846]	0.116	3,718 [1,828-6,515]	2,572 [1,115-6,792]	0.146
<b>Number GP visits, median [Q25-Q75]</b>	12 [6-19]	11 [6-18]		10 [6-17]	11 [6-17]		7 [3-12]	10 [5-17]		3 [1-8]	3 [1-7]	
<b>Number of PCR tests, median [Q25-Q75]</b>	0[0-0]	0[0-0]		0[0-0]	0[0-0]		0[0-0]	0[0-0]		0[0-0]	0[0-0]	
<b>Comorbidities, N(%)</b>												
Anxiety	33,355 (15%)	49,410 (15%)	0.009	187,469 (19%)	122,087 (21%)	0.030	281,846 (19%)	10,441 (19%)	0.004	86,805 (16%)	218,144 (16%)	0.009
Asthma	24,009 (11%)	37,889 (11%)	0.015	159,162 (16%)	116,596 (20%)	0.083	200,995 (14%)	8,668 (16%)	0.067	41,393 (8%)	114,378 (9%)	0.034
Chronic kidney disease	51,053 (23%)	86,899 (26%)	0.067	97,339 (10%)	56,923 (10%)	0.016	24,198 (2%)	6,692 (12%)	0.430	2,879 (1%)	2,664 (0%)	0.055
COPD	19,105 (9%)	28,317 (9%)	0.007	67,700 (7%)	39,595 (7%)	0.013	13,621 (1%)	2,063 (4%)	0.191	1,510 (0%)	942 (0%)	0.050
Dementia	16,795 (8%)	16,138 (5%)	0.116	12,106 (1%)	3,720 (1%)	0.065	1,896 (0%)	1,323 (2%)	0.207	447 (0%)	119 (0%)	0.034
Depressive disorder	27,009 (12%)	37,831 (11%)	0.028	170,626 (18%)	112,753 (19%)	0.035	256,789 (17%)	9,046 (17%)	0.019	74,210 (14%)	155,037 (12%)	0.062
Diabetes	39,751 (18%)	61,929 (19%)	0.014	154,348 (16%)	98,676 (17%)	0.018	78,394 (5%)	5,817 (11%)	0.201	9,729 (2%)	12,040 (1%)	0.077
GERD	12,156 (6%)	20,204 (6%)	0.023	52,694 (5%)	32,288 (5%)	0.000	56,444 (4%)	2,506 (5%)	0.040	13,807 (3%)	21,599 (2%)	0.065
Heart failure	13,147 (6%)	20,430 (6%)	0.007	24,276 (3%)	13,120 (2%)	0.020	5,673 (0%)	1,529 (3%)	0.195	681 (0%)	448 (0%)	0.033
Hypertension	114,922 (52%)	186,367 (56%)	0.075	345,014 (36%)	200,762 (34%)	0.038	224,543 (15%)	15,536 (29%)	0.330	31,330 (6%)	19,649 (1%)	0.232
Hypothyroidism	21,855 (10%)	34,512 (10%)	0.014	73,992 (8%)	44,456 (7%)	0.006	64,026 (4%)	3,642 (7%)	0.104	13,920 (3%)	18,516 (1%)	0.085
Malignant neoplastic disease	49,023 (22%)	82,610 (25%)	0.059	131,135 (14%)	76,103 (13%)	0.021	55,601 (4%)	6,311 (12%)	0.299	7,505 (1%)	5,104 (0%)	0.107
Myocardial infarction	11,236 (5%)	18,289 (5%)	0.017	33,142 (3%)	23,019 (4%)	0.024	11,237 (1%)	1,464 (3%)	0.149	861 (0%)	715 (0%)	0.032

	Cohort 1			Cohort 2			Cohort 3			Cohort 4		
	ChAdOx1	BNT162b2	ASMD	ChAdOx1	BNT162b2	ASMD	ChAdOx1	BNT162b2	ASMD	ChAdOx1	BNT162b2	ASMD
Osteoporosis	22,986 (10%)	36,535 (11%)	0.017	42,319 (4%)	21,789 (4%)	0.036	12,455 (1%)	2,632 (5%)	0.243	1,380 (0%)	1,028 (0%)	0.044
Pneumonia	12,101 (6%)	16,297 (5%)	0.027	33,170 (3%)	17,567 (3%)	0.027	20,399 (1%)	1,658 (3%)	0.114	4,297 (1%)	7,793 (1%)	0.025
Rheumatoid arthritis	4,544 (2%)	6,693 (2%)	0.004	20,294 (2%)	12,878 (2%)	0.005	8,463 (1%)	667 (1%)	0.070	821 (0%)	891 (0%)	0.026
Stroke	10,876 (5%)	15,601 (5%)	0.012	24,851 (3%)	15,056 (3%)	0.002	9,547 (1%)	1,281 (2%)	0.141	1,153 (0%)	1,022 (0%)	0.036
Venous thromboembolism	13,782 (6%)	21,549 (6%)	0.008	39,415 (4%)	23,632 (4%)	0.005	24,312 (2%)	1,980 (4%)	0.125	1,936 (0%)	2,541 (0%)	0.032

ASMD = Absolute standardized mean difference, COPD = Chronic obstructive pulmonary disease, GERD = Gastroesophageal reflux disease

**Table S25: Characteristics of weighted populations in CPRD GOLD, stratified by staggered cohort and vaccine brand.**

	Cohort 1			Cohort 2			Cohort 3			Cohort 4		
	ChAdOx1	BNT162b2	ASMD									
<b>Number individuals, N</b>	7,490	7,490		77,012	76,978		24,590	24,597		49,538	49,577	
<b>Age, median [Q25-Q75]</b>	82 [78-86]	80 [78-86]	0.000	70 [65-74]	70 [65-74]	0.004	54 [49-59]	54 [49-59]	0.009	42 [37-46]	42 [37-47]	0.003
<b>Sex: Female, N(%)</b>	4,266 (57%)	4,266 (57%)	0.000	41,394 (54%)	41,607 (54%)	0.006	13,052 (53%)	13,078 (53%)	0.002	22,308 (45%)	22,520 (45%)	0.008
<b>Prior observation years, median [Q25-Q75]</b>	6,450 [4,277-7,775]	6,444 [4,097-7,785]	0.000	6,376 [4,403-7,251]	6,376 [4,504-7,256]	0.005	6,372 [4,283-7,183]	6,368 [4,371-7,134]	0.004	4,970 [2,259-6,663]	4,944 [2,211-6,667]	0.005
<b>Number GP visits, median [Q25-Q75]</b>	14 [9-21]	14 [9-21]		10 [6-16]	10 [6-17]		6 [2-11]	6 [2-11]		2 [0-6]	2 [0-7]	
<b>Number of PCR tests, median [Q25-Q75]</b>	0[0-0]	0[0-0]		0[0-0]	0[0-0]		0[0-0]	0[0-0]		0[0-0]	0[0-0]	
<b>Comorbidities, N(%)</b>												
Anxiety	1,008 (13%)	1,015 (14%)	0.002	12,765 (17%)	12,897 (17%)	0.005	5,218 (21%)	5,293 (22%)	0.007	8,501 (17%)	8,578 (17%)	0.004
Asthma	783 (10%)	774 (10%)	0.004	9,867 (13%)	10,028 (13%)	0.006	2,993 (12%)	2,826 (11%)	0.021	3,700 (7%)	3,568 (7%)	0.010
Chronic kidney disease	1,711 (23%)	1,694 (23%)	0.005	7,209 (9%)	7,045 (9%)	0.007	530 (2%)	411 (2%)	0.035	193 (0%)	202 (0%)	0.003
COPD	568 (8%)	583 (8%)	0.008	5,739 (7%)	5,725 (7%)	0.001	321 (1%)	274 (1%)	0.017	170 (0%)	165 (0%)	0.002
Dementia	543 (7%)	495 (7%)	0.025	726 (1%)	737 (1%)	0.001	55 (0%)	74 (0%)	0.015	28 (0%)	21 (0%)	0.006
Depressive disorder	733 (10%)	729 (10%)	0.002	11,461 (15%)	11,746 (15%)	0.011	4,478 (18%)	4,427 (18%)	0.005	7,038 (14%)	7,119 (14%)	0.004
Diabetes	1,114 (15%)	1,107 (15%)	0.003	10,260 (13%)	10,130 (13%)	0.005	1,051 (4%)	963 (4%)	0.018	768 (2%)	654 (1%)	0.019
GERD	451 (6%)	447 (6%)	0.002	3,691 (5%)	3,753 (5%)	0.004	763 (3%)	770 (3%)	0.001	975 (2%)	978 (2%)	0.000
Heart failure	395 (5%)	411 (5%)	0.009	1,763 (2%)	1,819 (2%)	0.005	125 (1%)	81 (0%)	0.028	50 (0%)	54 (0%)	0.002
Hypertension	2,761 (37%)	2,754 (37%)	0.002	21,627 (28%)	21,686 (28%)	0.002	3,184 (13%)	3,261 (13%)	0.009	1,842 (4%)	1,975 (4%)	0.014
Hypothyroidism	579 (8%)	566 (8%)	0.007	4,932 (6%)	4,869 (6%)	0.003	1,064 (4%)	1,065 (4%)	0.000	979 (2%)	1,028 (2%)	0.007
Malignant neoplastic disease	1,632 (22%)	1,744 (23%)	0.036	10,682 (14%)	9,986 (13%)	0.026	1,007 (4%)	1,089 (4%)	0.017	598 (1%)	660 (1%)	0.011
Myocardial infarction	330 (4%)	325 (4%)	0.004	2,919 (4%)	2,943 (4%)	0.002	239 (1%)	217 (1%)	0.010	90 (0%)	85 (0%)	0.002
Osteoporosis	665 (9%)	638 (9%)	0.013	3,388 (4%)	3,496 (5%)	0.007	323 (1%)	314 (1%)	0.003	103 (0%)	92 (0%)	0.005
Pneumonia	286 (4%)	258 (3%)	0.020	1,807 (2%)	1,724 (2%)	0.007	263 (1%)	252 (1%)	0.005	271 (1%)	265 (1%)	0.002
Rheumatoid arthritis	111 (1%)	111 (1%)	0.001	1,437 (2%)	1,460 (2%)	0.002	123 (1%)	115 (0%)	0.005	58 (0%)	40 (0%)	0.011
Stroke	325 (4%)	321 (4%)	0.003	2,134 (3%)	2,072 (3%)	0.005	207 (1%)	148 (1%)	0.028	96 (0%)	91 (0%)	0.002

	Cohort 1				Cohort 2				Cohort 3				Cohort 4			
	ChAdOx1	BNT162b2	ASMD	ChAdOx1	BNT162b2	ASMD	ChAdOx1	BNT162b2	ASMD	ChAdOx1	BNT162b2	ASMD	ChAdOx1	BNT162b2	ASMD	
Venous thromboembolism	306 (4%)	341 (5%)	0.023	2,125 (3%)	2,153 (3%)	0.002	288 (1%)	285 (1%)	0.001	146 (0%)	198 (0%)	0.018				

ASMD = Absolute standardized mean difference, COPD = Chronic obstructive pulmonary disease, GERD = Gastroesophageal reflux disease

**Table S26: Characteristics of unweighted populations in CPRD GOLD, stratified by staggered cohort and vaccine brand.**

	Cohort 1			Cohort 2			Cohort 3			Cohort 4		
	ChAdOx1	BNT162b2	ASMD									
<b>Number individuals, N</b>	82,406	32,755		302,999	180,670		423,876	36,748		147,744	365,096	
<b>Age, median [Q25-Q75]</b>	84 [82-88]	81 [79-86]	0.351	71 [66-76]	70 [66-74]	0.132	56 [52-61]	54 [50-60]	0.171	44 [41-48]	31 [24-37]	1.090
<b>Sex: Female, N(%)</b>	47,915 (58%)	18,415 (56%)	0.039	162,753 (54%)	97,747 (54%)	0.008	210,283 (50%)	19,649 (53%)	0.077	64,999 (44%)	167,510 (46%)	0.038
<b>Prior observation years, median [Q25-Q75]</b>	6,372 [5,153-7,257]	6,471 [4,653-7,782]	0.001	6,384 [4,669-7,114]	6,385 [4,543-7,116]	0.014	6,268 [3,572-7,002]	6,390 [4,490-7,312]	0.107	5,146 [2,398-6,663]	5,346 [2,052-6,725]	0.017
<b>Number GP visits, median [Q25-Q75]</b>	14 [9-21]	14 [9-21]		11 [7-18]	10 [6-16]		6 [2-12]	6 [2-11]		3 [0-7]	2 [0-6]	
<b>Number of PCR tests, median [Q25-Q75]</b>	0[0-0]	0[0-0]		0[0-0]	0[0-0]		0[0-0]	0[0-0]		0[0-0]	0[0-0]	
<b>Comorbidities, N(%)</b>												
Anxiety	9,923 (12%)	4,336 (13%)	0.036	49,010 (16%)	28,697 (16%)	0.008	75,258 (18%)	8,004 (22%)	0.101	24,601 (17%)	59,094 (16%)	0.013
Asthma	8,491 (10%)	3,250 (10%)	0.013	39,988 (13%)	21,396 (12%)	0.041	48,034 (11%)	4,053 (11%)	0.010	10,517 (7%)	33,240 (9%)	0.073
Chronic kidney disease	21,564 (26%)	7,430 (23%)	0.081	34,168 (11%)	15,033 (8%)	0.100	7,553 (2%)	566 (2%)	0.019	739 (1%)	578 (0%)	0.060
COPD	6,837 (8%)	2,417 (7%)	0.034	27,472 (9%)	11,545 (6%)	0.100	6,334 (1%)	348 (1%)	0.050	640 (0%)	285 (0%)	0.070
Dementia	4,773 (6%)	1,895 (6%)	0.000	5,124 (2%)	1,375 (1%)	0.085	548 (0%)	87 (0%)	0.025	126 (0%)	29 (0%)	0.036
Depressive disorder	6,998 (8%)	3,310 (10%)	0.056	45,154 (15%)	26,294 (15%)	0.010	70,703 (17%)	6,569 (18%)	0.032	21,711 (15%)	39,181 (11%)	0.119
Diabetes	12,387 (15%)	4,882 (15%)	0.004	43,647 (14%)	22,552 (12%)	0.056	24,219 (6%)	1,191 (3%)	0.120	2,254 (2%)	2,507 (1%)	0.080
GERD	4,054 (5%)	2,012 (6%)	0.054	14,294 (5%)	8,525 (5%)	0.000	14,447 (3%)	1,093 (3%)	0.025	2,883 (2%)	5,213 (1%)	0.041
Heart failure	5,058 (6%)	1,782 (5%)	0.030	9,180 (3%)	3,669 (2%)	0.064	2,308 (1%)	100 (0%)	0.043	191 (0%)	98 (0%)	0.037
Hypertension	31,217 (38%)	11,995 (37%)	0.026	88,833 (29%)	49,763 (28%)	0.039	59,554 (14%)	4,679 (13%)	0.039	6,761 (5%)	4,776 (1%)	0.194
Hypothyroidism	7,042 (9%)	2,373 (7%)	0.048	20,521 (7%)	11,106 (6%)	0.025	17,382 (4%)	1,553 (4%)	0.006	3,245 (2%)	4,180 (1%)	0.082
Malignant neoplastic disease	18,950 (23%)	6,972 (21%)	0.041	42,687 (14%)	22,617 (13%)	0.046	17,903 (4%)	1,522 (4%)	0.004	2,192 (1%)	1,796 (0%)	0.100
Myocardial infarction	4,500 (5%)	1,603 (5%)	0.026	13,456 (4%)	6,621 (4%)	0.039	5,280 (1%)	271 (1%)	0.051	330 (0%)	154 (0%)	0.050
Osteoporosis	8,564 (10%)	2,770 (8%)	0.066	16,117 (5%)	7,531 (4%)	0.054	4,330 (1%)	458 (1%)	0.021	408 (0%)	205 (0%)	0.054
Pneumonia	3,231 (4%)	1,032 (3%)	0.042	8,604 (3%)	3,418 (2%)	0.062	4,527 (1%)	345 (1%)	0.013	921 (1%)	1,696 (0%)	0.022
Rheumatoid arthritis	1,257 (2%)	512 (2%)	0.003	5,999 (2%)	2,929 (2%)	0.027	2,405 (1%)	154 (0%)	0.021	191 (0%)	111 (0%)	0.035

	Cohort 1			Cohort 2			Cohort 3			Cohort 4		
	ChAdOx1	BNT162b2	ASMD	ChAdOx1	BNT162b2	ASMD	ChAdOx1	BNT162b2	ASMD	ChAdOx1	BNT162b2	ASMD
Stroke	4,193 (5%)	1,490 (5%)	0.025	10,213 (3%)	4,632 (3%)	0.048	3,789 (1%)	199 (1%)	0.042	369 (0%)	225 (0%)	0.048
Venous thromboembolism	3,550 (4%)	1,389 (4%)	0.003	9,466 (3%)	4,490 (2%)	0.039	6,339 (1%)	370 (1%)	0.044	460 (0%)	496 (0%)	0.037

ASMD = Absolute standardized mean difference, COPD = Chronic obstructive pulmonary disease, GERD = Gastroesophageal reflux disease

**Table S27: Number of records for any long COVID symptoms between 90 and 365 days after SARS-CoV-2 across cohorts and databases, stratified by exposure status. Exposure is any COVID-19 vaccine. No censoring at second vaccine dose for vaccinated group.**

Database name	Staggered cohort	Vaccinated			Unvaccinated		
		Individuals (N)	COVID-19 (N)	LongCOVID-19 (N (%))	Individuals (N)	COVID-19 (N)	LongCOVID-19 (N (%))
<b>AURUM</b>							
	Cohort1	552,602	20,651	1,630 (7.89%)	346,674	13,948	1,303 (9.34%)
	Cohort2	1,563,569	113,983	4,280 (3.75%)	1,975,726	271,107	9,687 (3.57%)
	Cohort3	1,528,031	176,582	3,955 (2.24%)	1,510,401	184,985	5,648 (3.05%)
	Cohort4	2,085,598	307,647	5,052 (1.64%)	2,027,763	171,903	4,833 (2.81%)
<b>CORIVA</b>							
	Cohort1	26,736	3,159	901 (28.52%)	23,982	4,301	1,214 (28.23%)
	Cohort2	4,572	670	195 (29.10%)	34,317	6,354	1,813 (28.53%)
	Cohort3	24,050	6,215	1,507 (24.25%)	96,423	20,751	5,361 (25.83%)
	Cohort4	22,245	6,346	1,510 (23.79%)	147,545	33,260	7,831 (23.54%)
<b>GOLD</b>							
	Cohort1	118,507	2,157	129 (5.98%)	169,100	3,232	174 (5.38%)
	Cohort2	486,619	14,930	390 (2.61%)	583,399	37,152	951 (2.56%)
	Cohort3	462,832	25,624	274 (1.07%)	417,996	23,144	503 (2.17%)
	Cohort4	550,437	33,156	375 (1.13%)	469,876	21,878	351 (1.60%)
<b>SIDIAP</b>							
	Cohort1	89,941	21,978	2,325 (10.58%)	223,962	46,448	5,014 (10.79%)
	Cohort2	819,590	175,358	15,846 (9.04%)	433,151	86,583	9,054 (10.46%)
	Cohort3	954,232	258,472	19,180 (7.42%)	869,497	217,025	19,895 (9.17%)
	Cohort4	880,950	311,277	23,505 (7.55%)	1,061,634	259,395	26,716 (10.30%)

**Table S28: Number of records for any long COVID symptoms between 28 and 365 days after SARS-CoV-2 across cohorts and databases, stratified by exposure status. Exposure is any COVID-19 vaccine.**

Database name	Staggered cohort	Vaccinated			Unvaccinated		
		Individuals (N)	COVID-19 (N)	LongCOVID-19 (N (%))	Individuals (N)	COVID-19 (N)	LongCOVID-19 (N (%))
<b>AURUM</b>							
	Cohort1	552,602	3,620	1,146 (31.66%)	346,674	4,064	987 (24.29%)
	Cohort2	1,563,569	8,803	2,102 (23.88%)	1,975,726	68,744	8,125 (11.82%)
	Cohort3	1,528,031	8,011	1,405 (17.54%)	1,510,401	72,127	6,613 (9.17%)
	Cohort4	2,085,598	79,203	6,897 (8.71%)	2,027,763	153,898	9,944 (6.46%)
<b>CORIVA</b>							
	Cohort1	26,736	345	127 (36.81%)	23,982	3,200	1,142 (35.69%)
	Cohort2	4,572	30	13 (43.33%)	34,317	4,211	1,483 (35.22%)
	Cohort3	24,050	413	116 (28.09%)	96,423	13,460	4,224 (31.38%)
	Cohort4	22,245	1,429	355 (24.84%)	147,545	23,988	6,769 (28.22%)
<b>GOLD</b>							
	Cohort1	118,507	392	102 (26.02%)	169,100	617	113 (18.31%)
	Cohort2	486,619	1,071	233 (21.76%)	583,399	10,751	1,063 (9.89%)
	Cohort3	462,832	1,414	169 (11.95%)	417,996	9,968	745 (7.47%)
	Cohort4	550,437	12,067	614 (5.09%)	469,876	20,316	1,004 (4.94%)
<b>SIDIAP</b>							
	Cohort1	89,941	416	150 (36.06%)	223,962	7,305	1,561 (21.37%)
	Cohort2	819,590	6,199	1,944 (31.36%)	433,151	30,702	5,784 (18.84%)
	Cohort3	954,232	9,609	2,136 (22.23%)	869,497	89,335	14,518 (16.25%)
	Cohort4	880,950	46,574	9,002 (19.33%)	1,061,634	182,695	30,537 (16.71%)

**Table S29: Number of records for any long COVID symptoms between 28 and 365 days after SARS-CoV-2 across cohorts and databases, stratified by exposure status. Exposure is any COVID-19 vaccine. No censoring at second vaccine dose for vaccinated group.**

Database name	Staggered cohort	Vaccinated			Unvaccinated		
		Individuals (N)	COVID-19 (N)	LongCOVID-19 (N (%))	Individuals (N)	COVID-19 (N)	LongCOVID-19 (N (%))
<b>AURUM</b>							
	Cohort1	552,602	20,651	2,860 (13.85%)	346,674	13,948	2,151 (15.42%)
	Cohort2	1,563,569	113,983	9,610 (8.43%)	1,975,726	271,107	19,172 (7.07%)
	Cohort3	1,528,031	176,582	9,469 (5.36%)	1,510,401	184,985	11,524 (6.23%)
	Cohort4	2,085,598	307,647	11,016 (3.58%)	2,027,763	171,903	10,269 (5.97%)
<b>CORIVA</b>							
	Cohort1	26,736	3,159	1,131 (35.80%)	23,982	4,301	1,503 (34.95%)
	Cohort2	4,572	670	228 (34.03%)	34,317	6,354	2,204 (34.69%)
	Cohort3	24,050	6,215	1,789 (28.79%)	96,423	20,751	6,420 (30.94%)
	Cohort4	22,245	6,346	1,762 (27.77%)	147,545	33,260	9,361 (28.14%)
<b>GOLD</b>							
	Cohort1	118,507	2,157	250 (11.59%)	169,100	3,232	320 (9.90%)
	Cohort2	486,619	14,930	1,048 (7.02%)	583,399	37,152	2,322 (6.25%)
	Cohort3	462,832	25,624	1,072 (4.18%)	417,996	23,144	1,303 (5.63%)
	Cohort4	550,437	33,156	1,145 (3.45%)	469,876	21,878	1,042 (4.76%)
<b>SIDIAP</b>							
	Cohort1	89,941	21,978	4,065 (18.50%)	223,962	46,448	8,403 (18.09%)
	Cohort2	819,590	175,358	27,053 (15.43%)	433,151	86,583	14,823 (17.12%)
	Cohort3	954,232	258,472	32,460 (12.56%)	869,497	217,025	32,043 (14.76%)
	Cohort4	880,950	311,277	39,053 (12.55%)	1,061,634	259,395	41,437 (15.97%)

**Table S30: Number of records for post-acute COVID-19 recorded between 90 and 365 days after SARS-CoV-2 across cohorts and databases, stratified by exposure status. Exposure is any COVID-19 vaccine.**

Database name	Staggered cohort	Vaccinated			Unvaccinated		
		Individuals (N)	COVID-19 (N)	LongCOVID-19 (N (%))	Individuals (N)	COVID-19 (N)	LongCOVID-19 (N (%))
<b>AURUM</b>							
	Cohort1	552,602	3,620	9 (0.25%)	346,674	4,064	16 (0.39%)
	Cohort2	1,563,569	8,803	48 (0.55%)	1,975,726	68,744	251 (0.37%)
	Cohort3	1,528,031	8,011	42 (0.52%)	1,510,401	72,127	179 (0.25%)
	Cohort4	2,085,598	79,203	110 (0.14%)	2,027,763	153,898	216 (0.14%)
<b>SIDIAP</b>							
	Cohort1	89,941	416	< 5	223,962	7,305	6 (0.08%)
	Cohort2	819,590	6,199	17 (0.27%)	433,151	30,702	55 (0.18%)
	Cohort3	954,232	9,609	19 (0.20%)	869,497	89,335	147 (0.16%)
	Cohort4	880,950	46,574	47 (0.10%)	1,061,634	182,695	202 (0.11%)

**Table S31: Number of records for post-acute COVID-19 recorded between 90 and 365 days after SARS-CoV-2 across cohorts and databases, stratified by exposure status. Exposure is any COVID-19 vaccine. No censoring at second vaccine dose for vaccinated group.**

Database name	Staggered cohort	Vaccinated			Unvaccinated		
		Individuals (N)	COVID-19 (N)	LongCOVID-19 (N (%))	Individuals (N)	COVID-19 (N)	LongCOVID-19 (N (%))
<b>AURUM</b>							
	Cohort1	552,602	20,651	17 (0.08%)	346,674	13,948	22 (0.16%)
	Cohort2	1,563,569	113,983	152 (0.13%)	1,975,726	271,107	436 (0.16%)
	Cohort3	1,528,031	176,582	193 (0.11%)	1,510,401	184,985	256 (0.14%)
	Cohort4	2,085,598	307,647	174 (0.06%)	2,027,763	171,903	219 (0.13%)
<b>SIDIAP</b>							
	Cohort1	89,941	21,978	6 (0.03%)	223,962	46,448	16 (0.03%)
	Cohort2	819,590	175,358	90 (0.05%)	433,151	86,583	91 (0.11%)
	Cohort3	954,232	258,472	123 (0.05%)	869,497	217,025	210 (0.10%)
	Cohort4	880,950	311,277	101 (0.03%)	1,061,634	259,395	220 (0.08%)

**Table S32: Number of records for post-acute COVID-19 across cohorts and databases, stratified by exposure status. Exposure is any COVID-19 vaccine.**

Database name	Staggered cohort	Vaccinated			Unvaccinated		
		Individuals (N)	COVID-19 (N)	LongCOVID-19 (N (%))	Individuals (N)	COVID-19 (N)	LongCOVID-19 (N (%))
<b>AURUM</b>							
	Cohort1	552,602	3,620	35 (0.97%)	346,674	4,064	30 (0.74%)
	Cohort2	1,563,569	8,803	373 (4.24%)	1,975,726	68,744	1,723 (2.51%)
	Cohort3	1,528,031	8,011	561 (7.00%)	1,510,401	72,127	1,655 (2.29%)
	Cohort4	2,085,598	79,203	874 (1.10%)	2,027,763	153,898	2,215 (1.44%)
<b>SIDIAP</b>							
	Cohort1	89,941	416	< 5	223,962	7,305	24 (0.33%)
	Cohort2	819,590	6,199	31 (0.50%)	433,151	30,702	190 (0.62%)
	Cohort3	954,232	9,609	49 (0.51%)	869,497	89,335	483 (0.54%)
	Cohort4	880,950	46,574	132 (0.28%)	1,061,634	182,695	675 (0.37%)

**Table S33: Number of records for post-acute COVID-19 across cohorts and databases, stratified by exposure status. Exposure is any COVID-19 vaccine. No censoring at second vaccine dose for vaccinated group.**

Database name	Staggered cohort	Vaccinated			Unvaccinated		
		Individuals (N)	COVID-19 (N)	LongCOVID-19 (N (%))	Individuals (N)	COVID-19 (N)	LongCOVID-19 (N (%))
<b>AURUM</b>							
	Cohort1	552,602	20,651	231 (1.12%)	346,674	13,948	177 (1.27%)
	Cohort2	1,563,569	113,983	1,958 (1.72%)	1,975,726	271,107	4,359 (1.61%)
	Cohort3	1,528,031	176,582	2,717 (1.54%)	1,510,401	184,985	2,752 (1.49%)
	Cohort4	2,085,598	307,647	2,180 (0.71%)	2,027,763	171,903	2,373 (1.38%)
<b>SIDIAP</b>							
	Cohort1	89,941	21,978	53 (0.24%)	223,962	46,448	143 (0.31%)
	Cohort2	819,590	175,358	562 (0.32%)	433,151	86,583	393 (0.45%)
	Cohort3	954,232	258,472	697 (0.27%)	869,497	217,025	886 (0.41%)
	Cohort4	880,950	311,277	583 (0.19%)	1,061,634	259,395	899 (0.35%)

**Table S34: Number of records for any long COVID symptoms between 90 and 365 days after SARS-CoV-2 across cohorts and databases, stratified by exposure status. Exposure is ChAdOx1 vaccine.**

Database name	Staggered cohort	Vaccinated			Unvaccinated		
		Individuals (N)	COVID-19 (N)	LongCOVID-19 (N (%))	Individuals (N)	COVID-19 (N)	LongCOVID-19 (N (%))
<b>AURUM</b>							
	Cohort1	219,804	1,670	392 (23.47%)	344,687	3,280	550 (16.77%)
	Cohort2	969,262	5,983	937 (15.66%)	1,975,770	68,733	4,978 (7.24%)
	Cohort3	1,473,602	7,095	858 (12.09%)	1,510,493	72,133	3,503 (4.86%)
	Cohort4	542,670	12,999	581 (4.47%)	2,066,318	158,000	5,215 (3.30%)
<b>GOLD</b>							
	Cohort1	82,406	240	59 (24.58%)	168,972	607	86 (14.17%)
	Cohort2	302,999	661	121 (18.31%)	582,791	10,701	566 (5.29%)
	Cohort3	423,876	1,296	95 (7.33%)	418,184	10,010	316 (3.16%)
	Cohort4	147,744	1,923	74 (3.85%)	485,154	21,122	395 (1.87%)
<b>SIDIAP</b>							
	Cohort2	323,204	3,271	800 (24.46%)	433,636	31,025	3,806 (12.27%)
	Cohort3	84,204	1,394	344 (24.68%)	873,400	91,557	9,942 (10.86%)

**Table S35: Number of records for any long COVID symptoms between 90 and 365 days after SARS-CoV-2 across cohorts and databases, stratified by exposure status. Exposure is ChAdOx1 vaccine. No censoring at second vaccine dose for vaccinated group.**

Database name	Staggered cohort	Vaccinated			Unvaccinated		
		Individuals (N)	COVID-19 (N)	LongCOVID-19 (N (%))	Individuals (N)	COVID-19 (N)	LongCOVID-19 (N (%))
<b>AURUM</b>							
	Cohort1	219,804	9,206	706 (7.67%)	344,687	13,164	1,115 (8.47%)
	Cohort2	969,262	71,983	2,843 (3.95%)	1,975,770	271,096	9,717 (3.58%)
	Cohort3	1,473,602	171,942	3,841 (2.23%)	1,510,493	184,991	5,643 (3.05%)
	Cohort4	542,670	89,055	1,210 (1.36%)	2,066,318	176,005	5,286 (3.00%)
<b>GOLD</b>							
	Cohort1	82,406	1,538	83 (5.40%)	168,972	3,222	178 (5.52%)
	Cohort2	302,999	10,070	270 (2.68%)	582,791	37,102	939 (2.53%)
	Cohort3	423,876	24,342	258 (1.06%)	418,184	23,186	505 (2.18%)
	Cohort4	147,744	10,925	109 (1.00%)	485,154	22,684	403 (1.78%)
<b>SIDIAP</b>							
	Cohort2	323,204	70,701	6,133 (8.67%)	433,636	86,906	9,129 (10.50%)
	Cohort3	84,204	16,401	1,622 (9.89%)	873,400	219,247	20,400 (9.30%)

**Table S36: Number of records for any long COVID symptoms between 28 and 365 days after SARS-CoV-2 across cohorts and databases, stratified by exposure status. Exposure is ChAdOx1 vaccine.**

Database name	Staggered cohort	Vaccinated			Unvaccinated		
		Individuals (N)	COVID-19 (N)	LongCOVID-19 (N (%))	Individuals (N)	COVID-19 (N)	LongCOVID-19 (N (%))
<b>AURUM</b>							
	Cohort1	219,804	1,670	502 (30.06%)	344,687	3,280	754 (22.99%)
	Cohort2	969,262	5,983	1,397 (23.35%)	1,975,770	68,733	8,154 (11.86%)
	Cohort3	1,473,602	7,095	1,279 (18.03%)	1,510,493	72,133	6,601 (9.15%)
	Cohort4	542,670	12,999	1,049 (8.07%)	2,066,318	158,000	10,589 (6.70%)
<b>GOLD</b>							
	Cohort1	82,406	240	73 (30.42%)	168,972	607	112 (18.45%)
	Cohort2	302,999	661	156 (23.60%)	582,791	10,701	1,046 (9.77%)
	Cohort3	423,876	1,296	160 (12.35%)	418,184	10,010	753 (7.52%)
	Cohort4	147,744	1,923	143 (7.44%)	485,154	21,122	1,084 (5.13%)
<b>SIDIAP</b>							
	Cohort2	323,204	3,271	964 (29.47%)	433,636	31,025	5,877 (18.94%)
	Cohort3	84,204	1,394	409 (29.34%)	873,400	91,557	15,113 (16.51%)

**Table S37: Number of records for any long COVID symptoms between 28 and 365 days after SARS-CoV-2 across cohorts and databases, stratified by exposure status. Exposure is ChAdOx1 vaccine. No censoring at second vaccine dose for vaccinated group.**

Database name	Staggered cohort	Vaccinated			Unvaccinated		
		Individuals (N)	COVID-19 (N)	LongCOVID-19 (N (%))	Individuals (N)	COVID-19 (N)	LongCOVID-19 (N (%))
<b>AURUM</b>							
	Cohort1	219,804	9,206	1,246 (13.53%)	344,687	13,164	1,912 (14.52%)
	Cohort2	969,262	71,983	6,377 (8.86%)	1,975,770	271,096	19,200 (7.08%)
	Cohort3	1,473,602	171,942	9,191 (5.35%)	1,510,493	184,991	11,512 (6.22%)
	Cohort4	542,670	89,055	3,088 (3.47%)	2,066,318	176,005	10,913 (6.20%)
<b>GOLD</b>							
	Cohort1	82,406	1,538	170 (11.05%)	168,972	3,222	319 (9.90%)
	Cohort2	302,999	10,070	715 (7.10%)	582,791	37,102	2,305 (6.21%)
	Cohort3	423,876	24,342	1,014 (4.17%)	418,184	23,186	1,312 (5.66%)
	Cohort4	147,744	10,925	376 (3.44%)	485,154	22,684	1,122 (4.95%)
<b>SIDIAP</b>							
	Cohort2	323,204	70,701	10,205 (14.43%)	433,636	86,906	14,921 (17.17%)
	Cohort3	84,204	16,401	2,680 (16.34%)	873,400	219,247	32,664 (14.90%)

**Table S38: Number of records for post-acute COVID-19 recorded between 90 and 365 days after SARS-CoV-2 across cohorts and databases, stratified by exposure status. Exposure is ChAdOx1 vaccine.**

Database name	Staggered cohort	Vaccinated			Unvaccinated		
		Individuals (N)	COVID-19 (N)	LongCOVID-19 (N (%))	Individuals (N)	COVID-19 (N)	LongCOVID-19 (N (%))
<b>AURUM</b>	Cohort1	219,804	1,670	< 5	344,687	3,280	10 (0.30%)
	Cohort2	969,262	5,983	28 (0.47%)	1,975,770	68,733	257 (0.37%)
	Cohort3	1,473,602	7,095	39 (0.55%)	1,510,493	72,133	182 (0.25%)
	Cohort4	542,670	12,999	29 (0.22%)	2,066,318	158,000	238 (0.15%)
<b>SIDIAP</b>	Cohort2	323,204	3,271	11 (0.34%)	433,636	31,025	57 (0.18%)
	Cohort3	84,204	1,394	< 5	873,400	91,557	156 (0.17%)

**Table S39: Number of records for post-acute COVID-19 recorded between 90 and 365 days after SARS-CoV-2 across cohorts and databases, stratified by exposure status. Exposure is ChAdOx1 vaccine. No censoring at second vaccine dose for vaccinated group.**

Database name	Staggered cohort	Vaccinated			Unvaccinated		
		Individuals (N)	COVID-19 (N)	LongCOVID-19 (N (%))	Individuals (N)	COVID-19 (N)	LongCOVID-19 (N (%))
<b>AURUM</b>							
	Cohort1	219,804	9,206	9 (0.10%)	344,687	13,164	16 (0.12%)
	Cohort2	969,262	71,983	92 (0.13%)	1,975,770	271,096	442 (0.16%)
	Cohort3	1,473,602	171,942	189 (0.11%)	1,510,493	184,991	259 (0.14%)
	Cohort4	542,670	89,055	73 (0.08%)	2,066,318	176,005	241 (0.14%)
<b>SIDIAP</b>							
	Cohort2	323,204	70,701	54 (0.08%)	433,636	86,906	95 (0.11%)
	Cohort3	84,204	16,401	14 (0.09%)	873,400	219,247	219 (0.10%)

**Table S40: Number of records for post-acute COVID-19 across cohorts and databases, stratified by exposure status. Exposure is ChAdOx1 vaccine.**

Database name	Staggered cohort	Vaccinated			Unvaccinated		
		Individuals (N)	COVID-19 (N)	LongCOVID-19 (N (%))	Individuals (N)	COVID-19 (N)	LongCOVID-19 (N (%))
<b>AURUM</b>							
	Cohort1	219,804	1,670	10 (0.60%)	344,687	3,280	28 (0.85%)
	Cohort2	969,262	5,983	229 (3.83%)	1,975,770	68,733	1,720 (2.50%)
	Cohort3	1,473,602	7,095	543 (7.65%)	1,510,493	72,133	1,655 (2.29%)
	Cohort4	542,670	12,999	279 (2.15%)	2,066,318	158,000	2,325 (1.47%)
<b>SIDIAP</b>							
	Cohort2	323,204	3,271	21 (0.64%)	433,636	31,025	191 (0.62%)
	Cohort3	84,204	1,394	10 (0.72%)	873,400	91,557	507 (0.55%)

**Table S41: Number of records for post-acute COVID-19 across cohorts and databases, stratified by exposure status. Exposure is ChAdOx1 vaccine. No censoring at second vaccine dose for vaccinated group.**

Database name	Staggered cohort	Vaccinated			Unvaccinated		
		Individuals (N)	COVID-19 (N)	LongCOVID-19 (N (%))	Individuals (N)	COVID-19 (N)	LongCOVID-19 (N (%))
<b>AURUM</b>							
	Cohort1	219,804	9,206	94 (1.02%)	344,687	13,164	169 (1.28%)
	Cohort2	969,262	71,983	1,228 (1.71%)	1,975,770	271,096	4,358 (1.61%)
	Cohort3	1,473,602	171,942	2,653 (1.54%)	1,510,493	184,991	2,758 (1.49%)
	Cohort4	542,670	89,055	902 (1.01%)	2,066,318	176,005	2,487 (1.41%)
<b>SIDIAP</b>							
	Cohort2	323,204	70,701	250 (0.35%)	433,636	86,906	395 (0.45%)
	Cohort3	84,204	16,401	62 (0.38%)	873,400	219,247	920 (0.42%)

**Table S42: Number of records for any long COVID symptoms between 90 and 365 days after SARS-CoV-2 across cohorts and databases, stratified by exposure status. Exposure is BNT162b2 vaccine.**

Database name	Staggered cohort	Vaccinated			Unvaccinated		
		Individuals (N)	COVID-19 (N)	LongCOVID-19 (N (%))	Individuals (N)	COVID-19 (N)	LongCOVID-19 (N (%))
<b>AURUM</b>							
	Cohort1	332,790	1,950	512 (26.26%)	348,052	4,643	878 (18.91%)
	Cohort2	594,262	2,819	498 (17.67%)	1,976,163	68,965	5,032 (7.30%)
	Cohort3	54,102	910	65 (7.14%)	1,510,323	72,147	3,510 (4.87%)
	Cohort4	1,335,671	58,815	2,982 (5.07%)	2,014,161	152,621	4,645 (3.04%)
<b>CORIVA</b>							
	Cohort1	19,686	272	78 (28.68%)	24,073	3,274	930 (28.41%)
	Cohort2	4,067	27	11 (40.74%)	34,320	4,213	1,209 (28.70%)
	Cohort3	18,645	117	43 (36.75%)	96,471	13,494	3,522 (26.10%)
	Cohort4	15,683	280	73 (26.07%)	147,553	23,999	5,642 (23.51%)
<b>GOLD</b>							
	Cohort1	32,755	133	26 (19.55%)	169,459	663	93 (14.03%)
	Cohort2	180,670	408	57 (13.97%)	584,309	10,912	583 (5.34%)
	Cohort3	36,748	115	8 (6.96%)	416,549	9,887	307 (3.11%)
	Cohort4	365,096	8,833	192 (2.17%)	465,326	20,138	337 (1.67%)
<b>SIDIAP</b>							
	Cohort1	88,896	407	114 (28.01%)	223,960	7,308	1,012 (13.85%)
	Cohort2	445,581	1,820	531 (29.18%)	433,111	30,668	3,731 (12.17%)
	Cohort3	706,435	3,101	529 (17.06%)	869,109	89,157	9,423 (10.57%)
	Cohort4	580,329	17,629	3,032 (17.20%)	1,068,043	188,658	21,854 (11.58%)

**Table S43: Number of records for any long COVID symptoms between 90 and 365 days after SARS-CoV-2 across cohorts and databases, stratified by exposure status. Exposure is BNT162b2 vaccine. No censoring at second vaccine dose for vaccinated group.**

Database name	Staggered cohort	Vaccinated			Unvaccinated		
		Individuals (N)	COVID-19 (N)	LongCOVID-19 (N (%))	Individuals (N)	COVID-19 (N)	LongCOVID-19 (N (%))
<b>AURUM</b>							
	Cohort1	332,790	11,444	924 (8.07%)	348,052	14,527	1,451 (9.99%)
	Cohort2	594,262	41,993	1,437 (3.42%)	1,976,163	271,328	9,769 (3.60%)
	Cohort3	54,102	4,607	114 (2.47%)	1,510,323	185,004	5,648 (3.05%)
	Cohort4	1,335,671	192,780	3,459 (1.79%)	2,014,161	170,626	4,716 (2.76%)
<b>CORIVA</b>							
	Cohort1	19,686	2,421	675 (27.88%)	24,073	4,375	1,229 (28.09%)
	Cohort2	4,067	615	177 (28.78%)	34,320	6,356	1,816 (28.57%)
	Cohort3	18,645	5,016	1,260 (25.12%)	96,471	20,785	5,380 (25.88%)
	Cohort4	15,683	4,635	1,131 (24.40%)	147,553	33,271	7,830 (23.53%)
<b>GOLD</b>							
	Cohort1	32,755	561	42 (7.49%)	169,459	3,278	185 (5.64%)
	Cohort2	180,670	4,829	119 (2.46%)	584,309	37,313	958 (2.57%)
	Cohort3	36,748	1,218	15 (1.23%)	416,549	23,063	496 (2.15%)
	Cohort4	365,096	20,049	240 (1.20%)	465,326	21,700	345 (1.59%)
<b>SIDIAP</b>							
	Cohort1	88,896	21,739	2,307 (10.61%)	223,960	46,451	5,027 (10.82%)
	Cohort2	445,581	92,880	8,652 (9.32%)	433,111	86,549	9,057 (10.46%)
	Cohort3	706,435	200,466	14,351 (7.16%)	869,109	216,847	19,863 (9.16%)
	Cohort4	580,329	216,140	15,867 (7.34%)	1,068,043	265,358	27,867 (10.50%)

**Table S44: Number of records for any long COVID symptoms between 28 and 365 days after SARS-CoV-2 across cohorts and databases, stratified by exposure status. Exposure is BNT162b2 vaccine.**

Database name	Staggered cohort	Vaccinated			Unvaccinated		
		Individuals (N)	COVID-19 (N)	LongCOVID-19 (N (%))	Individuals (N)	COVID-19 (N)	LongCOVID-19 (N (%))
<b>AURUM</b>							
	Cohort1	332,790	1,950	644 (33.03%)	348,052	4,643	1,165 (25.09%)
	Cohort2	594,262	2,819	704 (24.97%)	1,976,163	68,965	8,209 (11.90%)
	Cohort3	54,102	910	125 (13.74%)	1,510,323	72,147	6,609 (9.16%)
	Cohort4	1,335,671	58,815	5,232 (8.90%)	2,014,161	152,621	9,782 (6.41%)
<b>CORIVA</b>							
	Cohort1	19,686	272	93 (34.19%)	24,073	3,274	1,160 (35.43%)
	Cohort2	4,067	27	12 (44.44%)	34,320	4,213	1,488 (35.32%)
	Cohort3	18,645	117	45 (38.46%)	96,471	13,494	4,249 (31.49%)
	Cohort4	15,683	280	87 (31.07%)	147,553	23,999	6,766 (28.19%)
<b>GOLD</b>							
	Cohort1	32,755	133	28 (21.05%)	169,459	663	119 (17.95%)
	Cohort2	180,670	408	77 (18.87%)	584,309	10,912	1,088 (9.97%)
	Cohort3	36,748	115	9 (7.83%)	416,549	9,887	736 (7.44%)
	Cohort4	365,096	8,833	412 (4.66%)	465,326	20,138	999 (4.96%)
<b>SIDIAP</b>							
	Cohort1	88,896	407	149 (36.61%)	223,960	7,308	1,572 (21.51%)
	Cohort2	445,581	1,820	654 (35.93%)	433,111	30,668	5,785 (18.86%)
	Cohort3	706,435	3,101	665 (21.44%)	869,109	89,157	14,483 (16.24%)
	Cohort4	580,329	17,629	3,758 (21.32%)	1,068,043	188,658	31,888 (16.90%)

**Table S45: Number of records for any long COVID symptoms between 28 and 365 days after SARS-CoV-2 across cohorts and databases, stratified by exposure status. Exposure is BNT162b2 vaccine. No censoring at second vaccine dose for vaccinated group.**

Database name	Staggered cohort	Vaccinated			Unvaccinated		
		Individuals (N)	COVID-19 (N)	LongCOVID-19 (N (%))	Individuals (N)	COVID-19 (N)	LongCOVID-19 (N (%))
<b>AURUM</b>							
	Cohort1	332,790	11,444	1,614 (14.10%)	348,052	14,527	2,336 (16.08%)
	Cohort2	594,262	41,993	3,232 (7.70%)	1,976,163	271,328	19,255 (7.10%)
	Cohort3	54,102	4,607	277 (6.01%)	1,510,323	185,004	11,518 (6.23%)
	Cohort4	1,335,671	192,780	7,120 (3.69%)	2,014,161	170,626	10,106 (5.92%)
<b>CORIVA</b>							
	Cohort1	19,686	2,421	860 (35.52%)	24,073	4,375	1,524 (34.83%)
	Cohort2	4,067	615	209 (33.98%)	34,320	6,356	2,209 (34.75%)
	Cohort3	18,645	5,016	1,480 (29.51%)	96,471	20,785	6,446 (31.01%)
	Cohort4	15,683	4,635	1,324 (28.57%)	147,553	33,271	9,360 (28.13%)
<b>GOLD</b>							
	Cohort1	32,755	561	74 (13.19%)	169,459	3,278	326 (9.95%)
	Cohort2	180,670	4,829	330 (6.83%)	584,309	37,313	2,347 (6.29%)
	Cohort3	36,748	1,218	55 (4.52%)	416,549	23,063	1,294 (5.61%)
	Cohort4	365,096	20,049	691 (3.45%)	465,326	21,700	1,037 (4.78%)
<b>SIDIAP</b>							
	Cohort1	88,896	21,739	4,035 (18.56%)	223,960	46,451	8,414 (18.11%)
	Cohort2	445,581	92,880	15,002 (16.15%)	433,111	86,549	14,831 (17.14%)
	Cohort3	706,435	200,466	24,302 (12.12%)	869,109	216,847	32,011 (14.76%)
	Cohort4	580,329	216,140	26,363 (12.20%)	1,068,043	265,358	42,859 (16.15%)

**Table S46: Number of records for post-acute COVID-19 recorded between 90 and 365 days after SARS-CoV-2 across cohorts and databases, stratified by exposure status. Exposure is BNT162b2 vaccine.**

Database name	Staggered cohort	Vaccinated			Unvaccinated		
		Individuals (N)	COVID-19 (N)	LongCOVID-19 (N (%))	Individuals (N)	COVID-19 (N)	LongCOVID-19 (N (%))
<b>AURUM</b>							
	Cohort1	332,790	1,950	6 (0.31%)	348,052	4,643	19 (0.41%)
	Cohort2	594,262	2,819	20 (0.71%)	1,976,163	68,965	264 (0.38%)
	Cohort3	54,102	910	< 5	1,510,323	72,147	179 (0.25%)
	Cohort4	1,335,671	58,815	70 (0.12%)	2,014,161	152,621	211 (0.14%)
<b>SIDIAP</b>							
	Cohort1	88,896	407	< 5	223,960	7,308	6 (0.08%)
	Cohort2	445,581	1,820	5 (0.27%)	433,111	30,668	56 (0.18%)
	Cohort3	706,435	3,101	5 (0.16%)	869,109	89,157	145 (0.16%)
	Cohort4	580,329	17,629	23 (0.13%)	1,068,043	188,658	216 (0.11%)

**Table S47: Number of records for post-acute COVID-19 recorded between 90 and 365 days after SARS-CoV-2 across cohorts and databases, stratified by exposure status. Exposure is BNT162b2 vaccine. No censoring at second vaccine dose for vaccinated group.**

Database name	Staggered cohort	Vaccinated			Unvaccinated		
		Individuals (N)	COVID-19 (N)	LongCOVID-19 (N (%))	Individuals (N)	COVID-19 (N)	LongCOVID-19 (N (%))
<b>AURUM</b>							
	Cohort1	332,790	11,444	8 (0.07%)	348,052	14,527	25 (0.17%)
	Cohort2	594,262	41,993	60 (0.14%)	1,976,163	271,328	449 (0.17%)
	Cohort3	54,102	4,607	< 5	1,510,323	185,004	257 (0.14%)
	Cohort4	1,335,671	192,780	89 (0.05%)	2,014,161	170,626	214 (0.13%)
<b>SIDIAP</b>							
	Cohort1	88,896	21,739	6 (0.03%)	223,960	46,451	16 (0.03%)
	Cohort2	445,581	92,880	29 (0.03%)	433,111	86,549	93 (0.11%)
	Cohort3	706,435	200,466	81 (0.04%)	869,109	216,847	208 (0.10%)
	Cohort4	580,329	216,140	66 (0.03%)	1,068,043	265,358	233 (0.09%)

**Table S48: Number of records for post-acute COVID-19 across cohorts and databases, stratified by exposure status. Exposure is BNT162b2 vaccine.**

Database name	Staggered cohort	Vaccinated			Unvaccinated		
		Individuals (N)	COVID-19 (N)	LongCOVID-19 (N (%))	Individuals (N)	COVID-19 (N)	LongCOVID-19 (N (%))
<b>AURUM</b>							
	Cohort1	332,790	1,950	25 (1.28%)	348,052	4,643	33 (0.71%)
	Cohort2	594,262	2,819	144 (5.11%)	1,976,163	68,965	1,711 (2.48%)
	Cohort3	54,102	910	18 (1.98%)	1,510,323	72,147	1,644 (2.28%)
	Cohort4	1,335,671	58,815	524 (0.89%)	2,014,161	152,621	2,169 (1.42%)
<b>SIDIAP</b>							
	Cohort1	88,896	407	< 5	223,960	7,308	25 (0.34%)
	Cohort2	445,581	1,820	< 5	433,111	30,668	189 (0.62%)
	Cohort3	706,435	3,101	15 (0.48%)	869,109	89,157	484 (0.54%)
	Cohort4	580,329	17,629	47 (0.27%)	1,068,043	188,658	693 (0.37%)

**Table S49: Number of records for post-acute COVID-19 across cohorts and databases, stratified by exposure status. Exposure is BNT162b2 vaccine. No censoring at second vaccine dose for vaccinated group.**

Database name	Staggered cohort	Vaccinated			Unvaccinated		
		Individuals (N)	COVID-19 (N)	LongCOVID-19 (N (%))	Individuals (N)	COVID-19 (N)	LongCOVID-19 (N (%))
<b>AURUM</b>							
	Cohort1	332,790	11,444	137 (1.20%)	348,052	14,527	188 (1.29%)
	Cohort2	594,262	41,993	730 (1.74%)	1,976,163	271,328	4,354 (1.60%)
	Cohort3	54,102	4,607	64 (1.39%)	1,510,323	185,004	2,744 (1.48%)
	Cohort4	1,335,671	192,780	1,129 (0.59%)	2,014,161	170,626	2,326 (1.36%)
<b>SIDIAP</b>							
	Cohort1	88,896	21,739	52 (0.24%)	223,960	46,451	144 (0.31%)
	Cohort2	445,581	92,880	259 (0.28%)	433,111	86,549	396 (0.46%)
	Cohort3	706,435	200,466	510 (0.25%)	869,109	216,847	885 (0.41%)
	Cohort4	580,329	216,140	410 (0.19%)	1,068,043	265,358	922 (0.35%)

**Table S50: Number of records for any long COVID symptoms between 90 and 365 days after SARS-CoV-2 across cohorts and databases, stratified by vaccine brand.**

Database name	Staggered cohort	BNT162b2			ChAdOx1		
		Individuals (N)	COVID-19 (N)	LongCOVID-19 (N (%))	Individuals (N)	COVID-19 (N)	LongCOVID-19 (N (%))
<b>AURUM</b>							
	Cohort Cohort 1	332,790	1,950	512 (26.26%)	219,804	1,670	392 (23.47%)
	Cohort Cohort 2	594,262	2,819	498 (17.67%)	969,262	5,983	937 (15.66%)
	Cohort Cohort 3	54,102	910	65 (7.14%)	1,473,602	7,095	858 (12.09%)
	Cohort Cohort 4	1,335,671	58,815	2,982 (5.07%)	542,670	12,999	581 (4.47%)
<b>GOLD</b>							
	Cohort Cohort 1	32,755	133	26 (19.55%)	82,406	240	59 (24.58%)
	Cohort Cohort 2	180,670	408	57 (13.97%)	302,999	661	121 (18.31%)
	Cohort Cohort 3	36,748	115	8 (6.96%)	423,876	1,296	95 (7.33%)
	Cohort Cohort 4	365,096	8,833	192 (2.17%)	147,744	1,923	74 (3.85%)

**Table S51: Number of records for any long COVID symptoms between 90 and 365 days after SARS-CoV-2 across cohorts and databases, stratified by vaccine brand. No censoring at second vaccine dose for vaccinated group.**

Database name	Staggered cohort	BNT162b2			ChAdOx1		
		Individuals (N)	COVID-19 (N)	LongCOVID-19 (N (%))	Individuals (N)	COVID-19 (N)	LongCOVID-19 (N (%))
AURUM	Cohort Cohort 1	332,790	11,445	924 (8.07%)	219,804	9,205	705 (7.66%)
	Cohort Cohort 2	594,262	41,993	1,437 (3.42%)	969,262	71,983	2,843 (3.95%)
	Cohort Cohort 3	54,102	4,607	114 (2.47%)	1,473,602	171,942	3,841 (2.23%)
	Cohort Cohort 4	1,335,671	192,780	3,459 (1.79%)	542,670	89,055	1,210 (1.36%)
GOLD	Cohort Cohort 1	32,755	561	42 (7.49%)	82,406	1,538	83 (5.40%)
	Cohort Cohort 2	180,670	4,829	119 (2.46%)	302,999	10,070	270 (2.68%)
	Cohort Cohort 3	36,748	1,218	15 (1.23%)	423,876	24,342	258 (1.06%)
	Cohort Cohort 4	365,096	20,049	240 (1.20%)	147,744	10,925	109 (1.00%)

**Table S52: Number of records for any long COVID symptoms between 28 and 365 days after SARS-CoV-2 across cohorts and databases, stratified by vaccine brand.**

Database name	Staggered cohort	BNT162b2			ChAdOx1		
		Individuals (N)	COVID-19 (N)	LongCOVID-19 (N (%))	Individuals (N)	COVID-19 (N)	LongCOVID-19 (N (%))
<b>AURUM</b>							
	Cohort Cohort 1	332,790	1,950	644 (33.03%)	219,804	1,670	502 (30.06%)
	Cohort Cohort 2	594,262	2,819	704 (24.97%)	969,262	5,983	1,397 (23.35%)
	Cohort Cohort 3	54,102	910	125 (13.74%)	1,473,602	7,095	1,279 (18.03%)
	Cohort Cohort 4	1,335,671	58,815	5,232 (8.90%)	542,670	12,999	1,049 (8.07%)
<b>GOLD</b>							
	Cohort Cohort 1	32,755	133	28 (21.05%)	82,406	240	73 (30.42%)
	Cohort Cohort 2	180,670	408	77 (18.87%)	302,999	661	156 (23.60%)
	Cohort Cohort 3	36,748	115	9 (7.83%)	423,876	1,296	160 (12.35%)
	Cohort Cohort 4	365,096	8,833	412 (4.66%)	147,744	1,923	143 (7.44%)

**Table S53: Number of records for any long COVID symptoms between 28 and 365 days after SARS-CoV-2 across cohorts and databases, stratified by vaccine brand. No censoring at second vaccine dose for vaccinated group.**

Database name	Staggered cohort	BNT162b2			ChAdOx1		
		Individuals (N)	COVID-19 (N)	LongCOVID-19 (N (%))	Individuals (N)	COVID-19 (N)	LongCOVID-19 (N (%))
<b>AURUM</b>	Cohort Cohort 1	332,790	11,445	1,614 (14.10%)	219,804	9,205	1,245 (13.53%)
	Cohort Cohort 2	594,262	41,993	3,232 (7.70%)	969,262	71,983	6,377 (8.86%)
	Cohort Cohort 3	54,102	4,607	277 (6.01%)	1,473,602	171,942	9,191 (5.35%)
	Cohort Cohort 4	1,335,671	192,780	7,120 (3.69%)	542,670	89,055	3,088 (3.47%)
<b>GOLD</b>	Cohort Cohort 1	32,755	561	74 (13.19%)	82,406	1,538	170 (11.05%)
	Cohort Cohort 2	180,670	4,829	330 (6.83%)	302,999	10,070	715 (7.10%)
	Cohort Cohort 3	36,748	1,218	55 (4.52%)	423,876	24,342	1,014 (4.17%)
	Cohort Cohort 4	365,096	20,049	691 (3.45%)	147,744	10,925	376 (3.44%)

**Table S54: Follow-up time, censoring proportion and reason for censoring** in vaccine effectiveness analysis for any long COVID symptoms between 90 and 365 days after SARS-CoV-2 across cohorts and databases, stratified by vaccine brand. Follow-up ends at first vaccine dose after index date.

Data base	Cohort	Time to event/censor		Censoring proportion			Reason for censoring	
		Vaccinated	Unvaccinated	Vaccinated	Unvaccinated	Vaccinated	Unvaccinated	Vaccinated
CPRD AURUM	1	77 [74-79]	20 [12-52]	99.9%	99.7%	2.6%	17.0%	97.2%
	2	77 [72-80]	53 [29-259]	99.9%	99.8%	2.8%	28.1%	97.1%
	3	77 [70-81]	193 [64-296]	99.9%	99.8%	3.5%	50.9%	96.4%
	4	62 [56-77]	209 [184-234]	99.8%	99.7%	8.1%	83.9%	91.8%
CPRD GOLD	1	71 [61-78]	15 [9-27]	99.9%	99.9%	3.1%	17.5%	96.9%
	2	71 [65-77]	49 [29-171]	99.9%	99.9%	4.6%	30.8%	95.4%
	3	73 [69-77]	118 [49-261]	99.9%	99.9%	5.7%	51.3%	94.3%
	4	62 [56-70]	188 [155-214]	99.9%	99.9%	8.7%	85.8%	91.3%
CORIVA	1	42 [22-42]	369 [96-677]	99.5%	95.5%	1.1%	53.2%	98.4%
	2	42 [42-42]	641 [99-647]	99.8%	94.8%	1.4%	53.9%	98.3%
	3	42 [38-42]	610 [118-628]	99.5%	94.4%	3.3%	59.1%	96.3%
	4	42 [35-141]	560 [140-579]	98.4%	94.0%	15.6%	66.9%	27.1%
SIDIAP	1	21 [21-21]	35 [28-43]	99.9%	99.5%	0.6%	17.2%	99.3%
	2	69 [21-81]	65 [30-433]	99.8%	99.1%	0.6%	36.9%	99.3%
	3	22 [21-28]	205 [38-393]	99.8%	98.8%	1.5%	49.6%	98.3%
	4	23 [21-31]	342 [83-364]	99.3%	97.8%	7.0%	59.8%	92.2%

**Table S55: Vaccine effectiveness against any long COVID symptoms between 90 and 365 days and COVID-19 across cohorts for CPRD GOLD, AURUM and CORIVA. Exposure is any COVID-19 vaccine.**

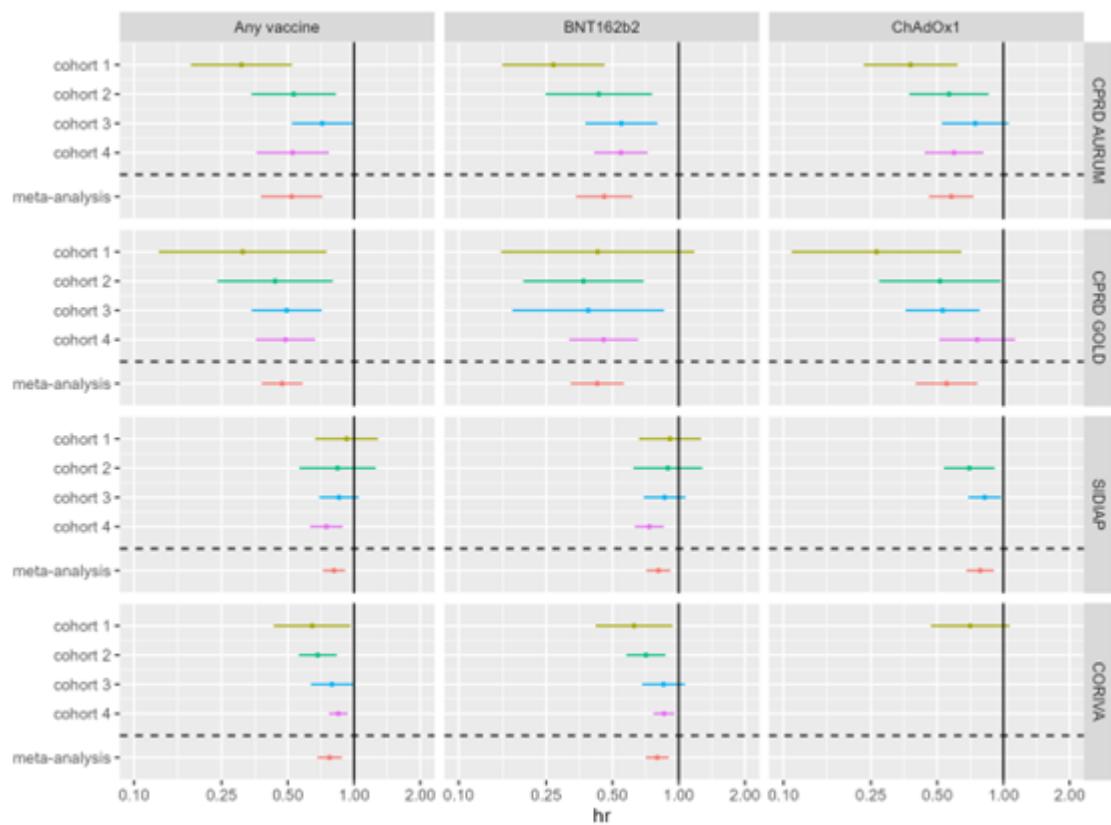
Database	Staggered cohort	Long Covid	Covid-19
CPRD AURUM	Cohort 1	0.31 [0.18-0.52]	0.44 [0.27-0.74]
	Cohort 2	0.53 [0.34-0.83]	1.01 [0.65-1.56]
	Cohort 3	0.72 [0.52-0.99]	1.27 [0.93-1.73]
	Cohort 4	0.53 [0.36-0.77]	0.99 [0.68-1.44]
CPRD GOLD	Cohort 1	0.31 [0.13-0.75]	0.41 [0.19-0.87]
	Cohort 2	0.44 [0.24-0.8]	0.85 [0.49-1.46]
	Cohort 3	0.49 [0.34-0.71]	1.09 [0.89-1.33]
	Cohort 4	0.49 [0.36-0.67]	0.71 [0.58-0.87]
CORIVA	Cohort 1	0.65 [0.43-0.97]	0.76 [0.52-1.12]
	Cohort 2	0.68 [0.56-0.83]	0.75 [0.68-0.83]
	Cohort 3	0.79 [0.64-0.99]	1.07 [0.87-1.31]
	Cohort 4	0.85 [0.77-0.93]	1.01 [0.95-1.07]

\*Data from SIDIAP not available

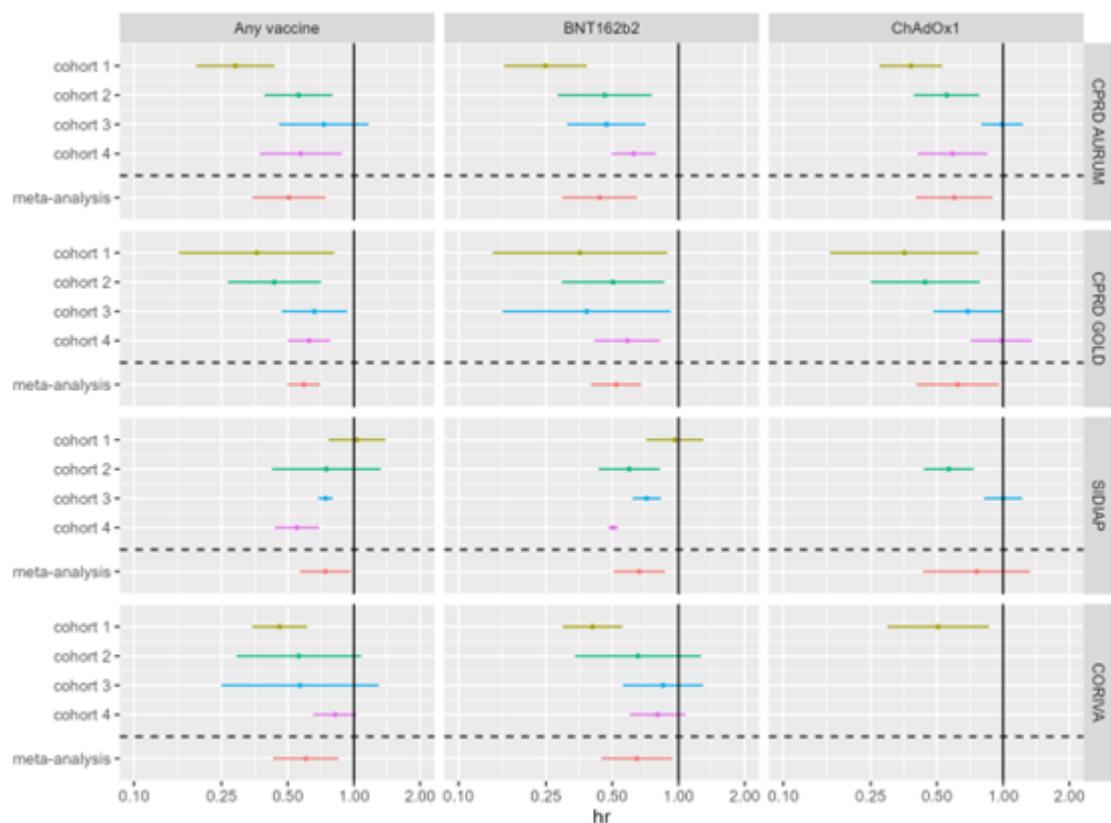
**Table S56: Fine-Gray and Cox estimates** for any COVID-19 vaccine effectiveness across databases and cohorts.

Database	Cohort	Fine-Gray, sHR [95%CI]	Cox, HR [95%CI]
<b>AURUM</b>			
	Cohort 1	0.31 [0.18-0.52]	0.29 [0.17-0.5]
	Cohort 2	0.53 [0.34-0.83]	0.53 [0.34-0.82]
	Cohort 3	0.72 [0.52-0.99]	0.71 [0.52-0.98]
	Cohort 4	0.53 [0.36-0.77]	0.53 [0.36-0.77]
<b>CORIVA</b>			
	Cohort 1	0.65 [0.43-0.97]	0.62 [0.41-0.92]
	Cohort 2	0.68 [0.56-0.83]	0.67 [0.55-0.82]
	Cohort 3	0.79 [0.64-0.99]	0.79 [0.63-0.98]
	Cohort 4	0.85 [0.77-0.93]	0.85 [0.77-0.93]
<b>GOLD</b>			
	Cohort 1	0.31 [0.13-0.75]	0.3 [0.12-0.72]
	Cohort 2	0.44 [0.24-0.8]	0.43 [0.23-0.78]
	Cohort 3	0.49 [0.34-0.71]	0.49 [0.34-0.71]
	Cohort 4	0.49 [0.36-0.67]	0.49 [0.36-0.67]
<b>SIDIAP</b>			
	Cohort 1	0.93 [0.67-1.29]	0.83 [0.59-1.15]
	Cohort 2	0.84 [0.56-1.26]	0.82 [0.55-1.22]
	Cohort 3	0.85 [0.7-1.05]	0.85 [0.69-1.04]
	Cohort 4	0.75 [0.63-0.89]	0.75 [0.63-0.89]

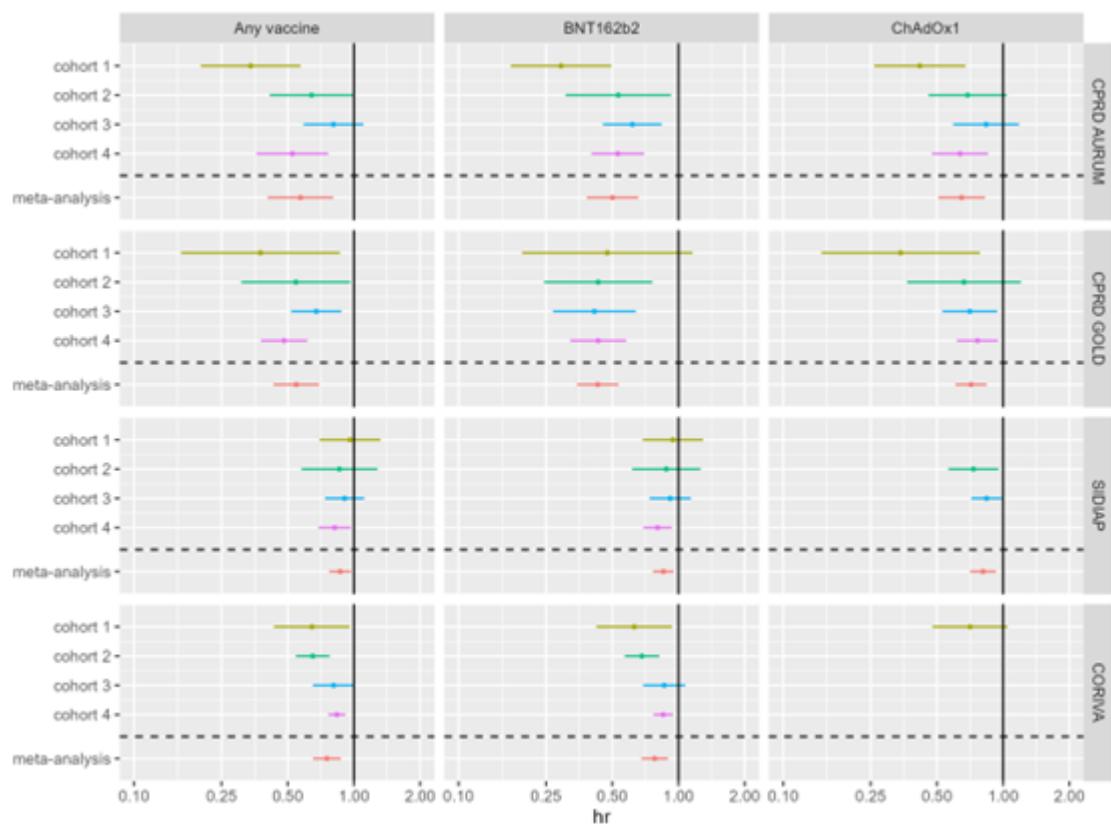
**Figure S7: Forest plots for vaccine effectiveness on preventing any long COVID symptoms between 90 and 365 days after SARS-CoV-2 across cohorts and databases. No censoring at second vaccine dose for vaccinated group.**



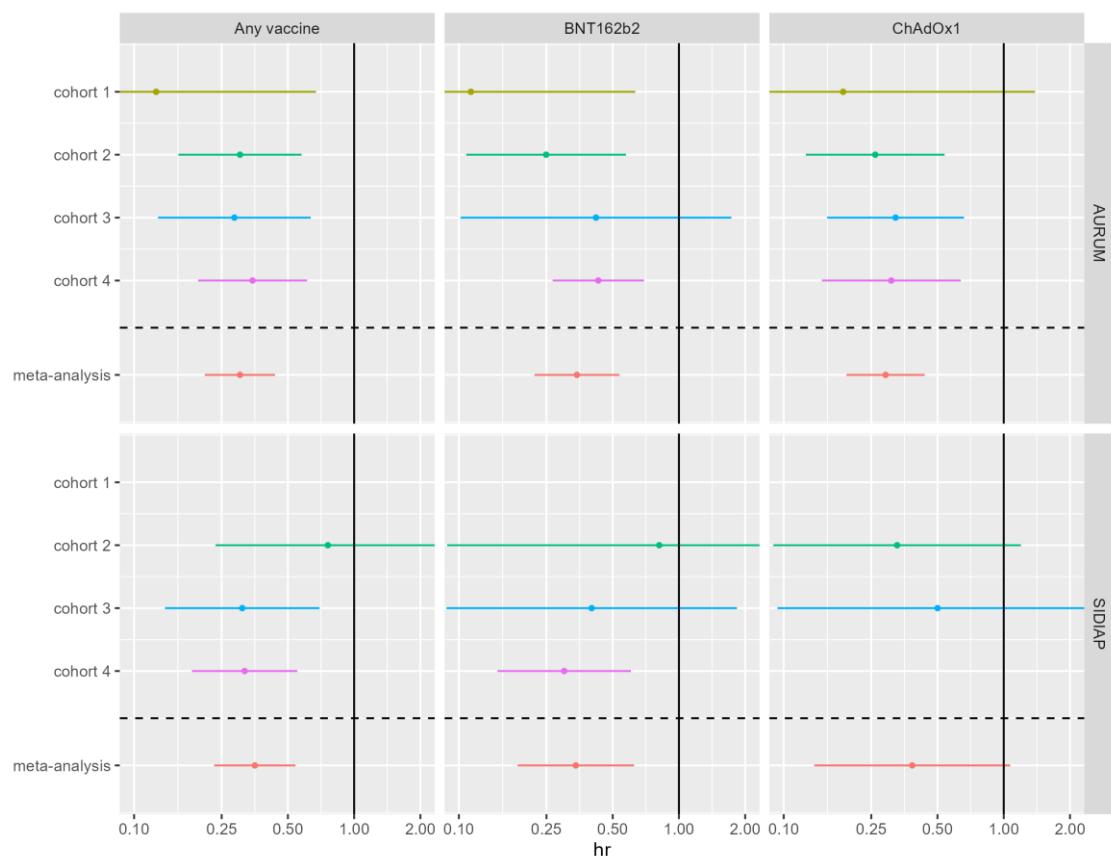
**Figure S8: Forest plots for vaccine effectiveness on preventing any long COVID symptoms between 28 and 365 days after SARS-CoV-2 across cohorts and databases.**



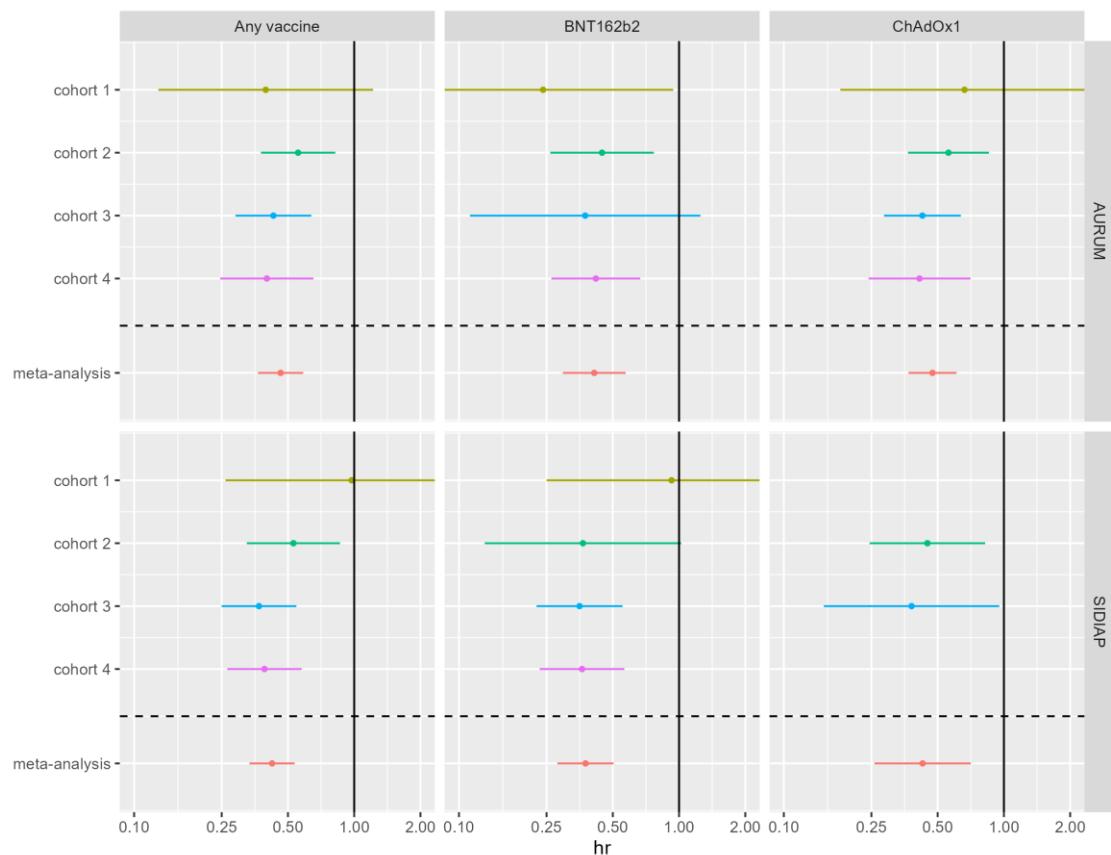
**Figure S9: Forest plots for vaccine effectiveness on preventing any long COVID symptoms between 28 and 365 days after SARS-CoV-2 across cohorts and databases. No censoring at second vaccine dose for vaccinated group.**



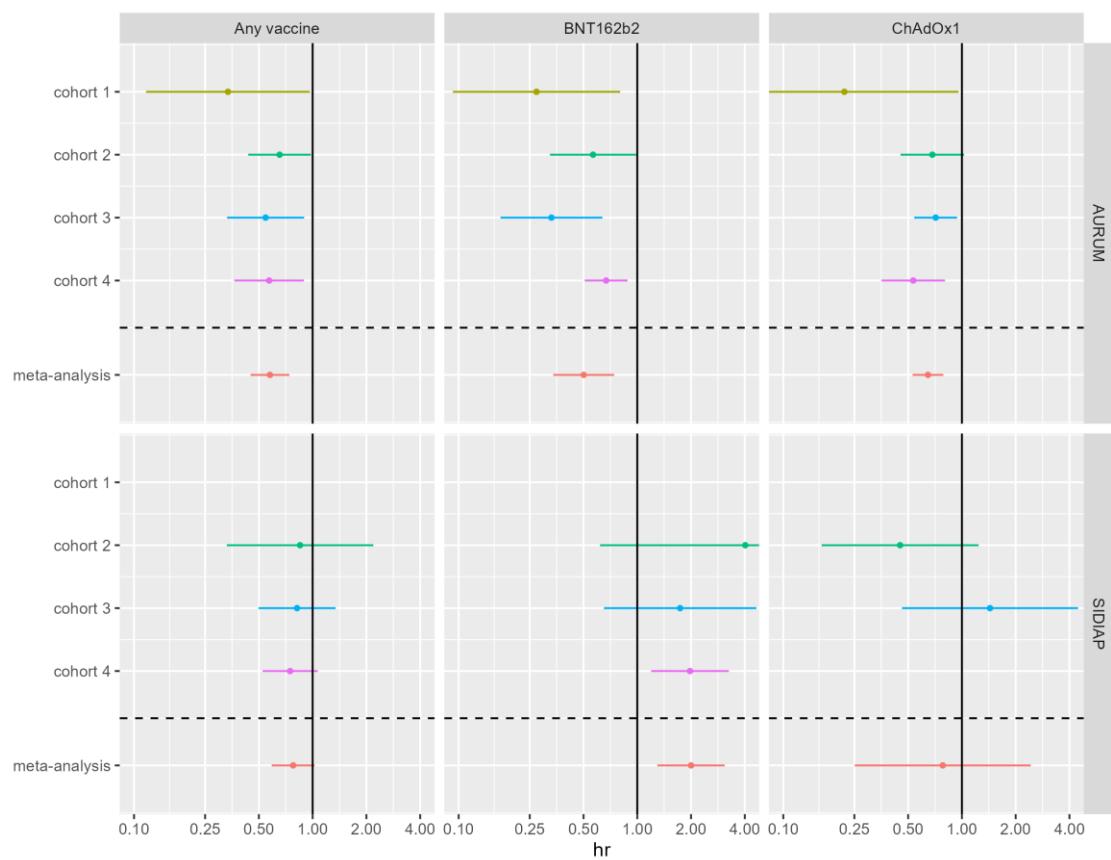
**Figure S10: Forest plots for vaccine effectiveness on preventing post-acute COVID-19 recorded between 90 and 365 days after SARS-CoV-2 across cohorts and databases.**



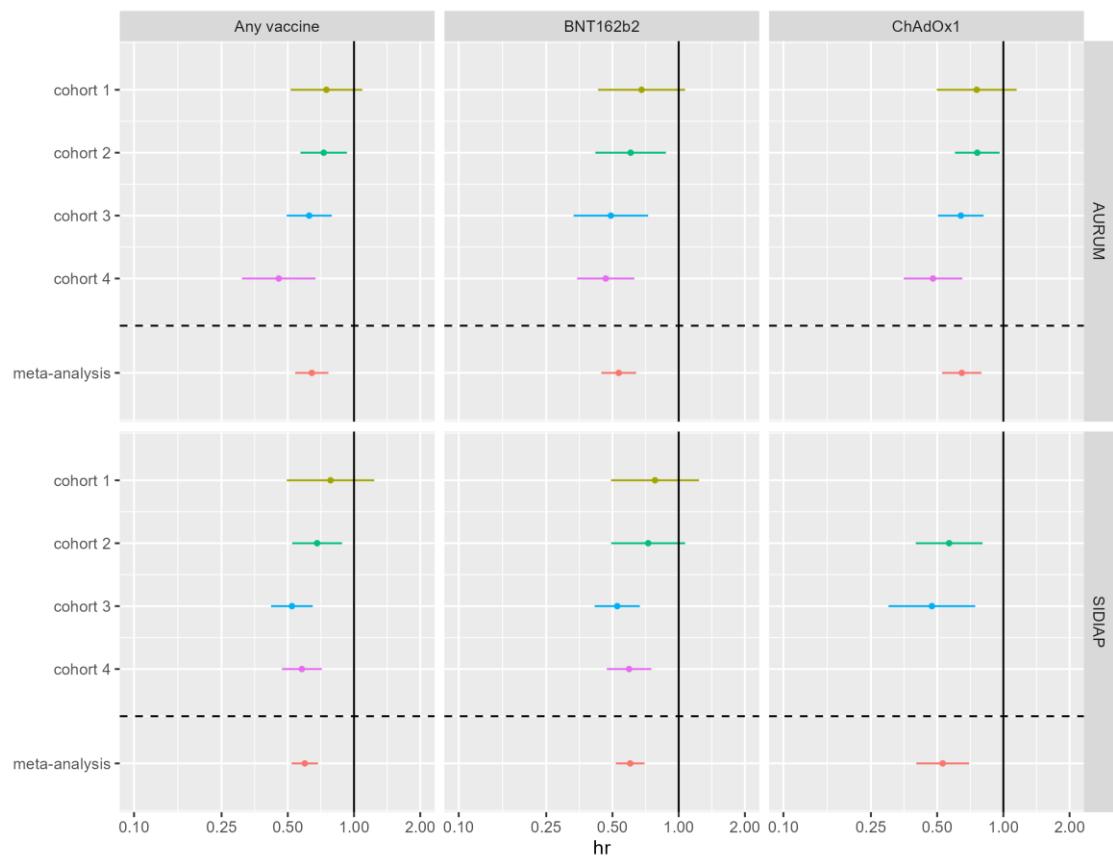
**Figure S11: Forest plots for vaccine effectiveness on preventing post-acute COVID-19 recorded between 90 and 365 days after SARS-CoV-2 across cohorts and databases. No censoring at second vaccine dose for vaccinated group.**



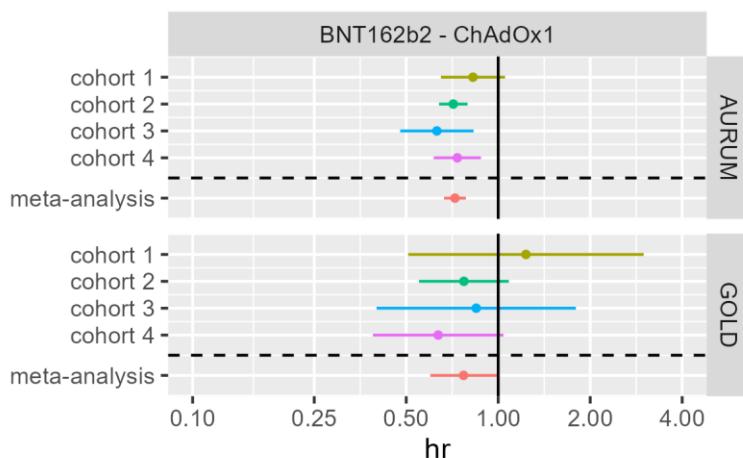
**Figure S12: Forest plots for vaccine effectiveness on preventing post-acute COVID-19 across cohorts and databases.**



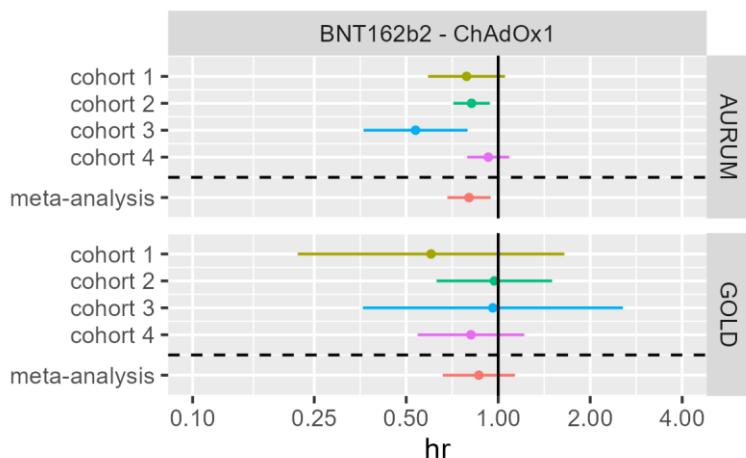
**Figure S13: Forest plots for vaccine effectiveness on preventing post-acute COVID-19 across cohorts and databases. No censoring at second vaccine dose for vaccinated group.**



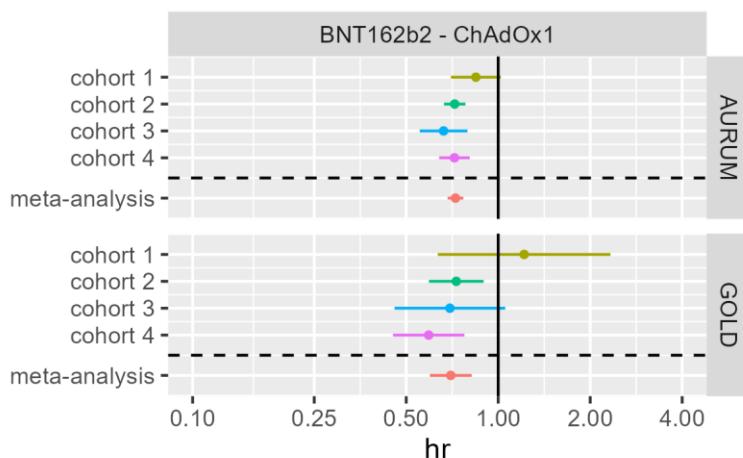
**Figure S14: Forest plots for comparative effectiveness on preventing any long COVID symptoms between 90 and 365 days after SARS-CoV-2 across cohorts and databases. No censoring at second vaccine dose for vaccinated group.**



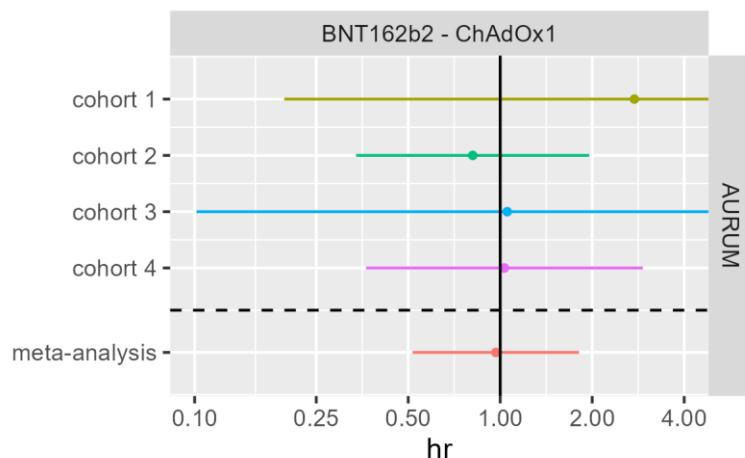
**Figure S15: Forest plots for comparative effectiveness on preventing any long COVID symptoms between 28 and 365 days after SARS-CoV-2 across cohorts and databases.**



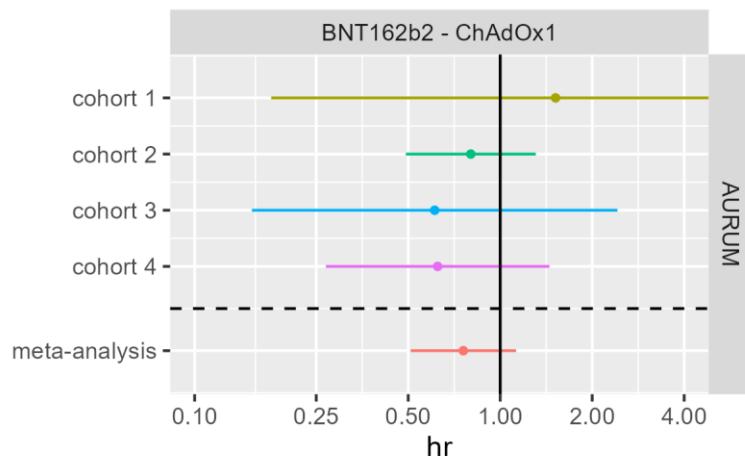
**Figure S16: Forest plots for comparative effectiveness on preventing any long COVID symptoms between 28 and 365 days after SARS-CoV-2 across cohorts and databases. No censoring at second vaccine dose for vaccinated group.**



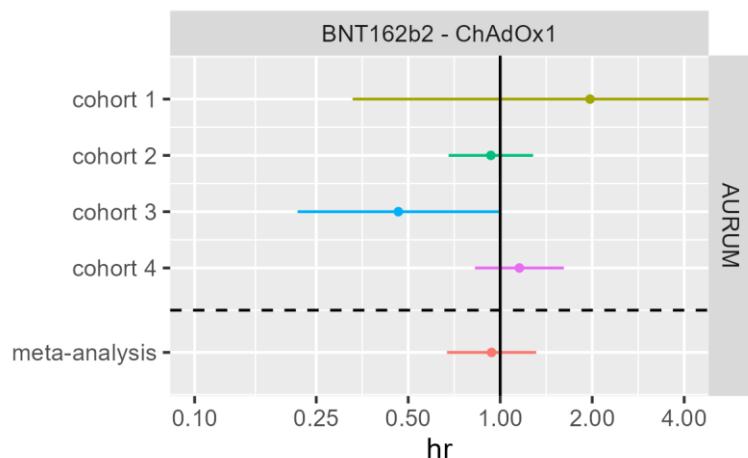
**Figure S17: Forest plots for comparative effectiveness on preventing post-acute COVID-19 recorded between 90 and 365 days after SARS-CoV-2 across cohorts and databases.**



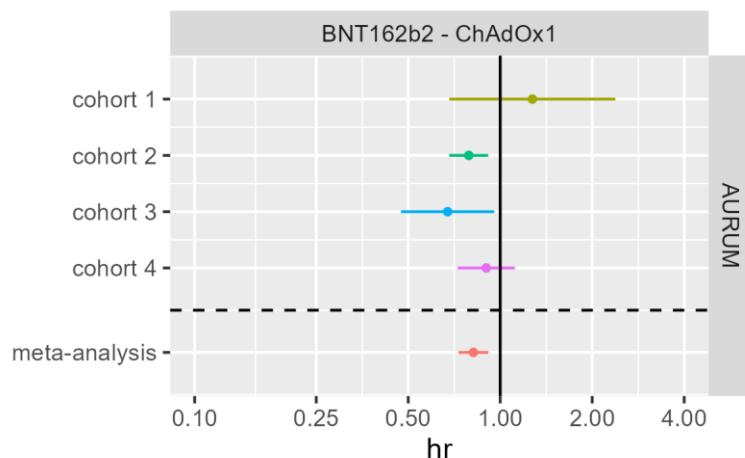
**Figure S18: Forest plots for comparative effectiveness on preventing post-acute COVID-19 recorded between 90 and 365 days after SARS-CoV-2 across cohorts and databases. No censoring at second vaccine dose for vaccinated group.**



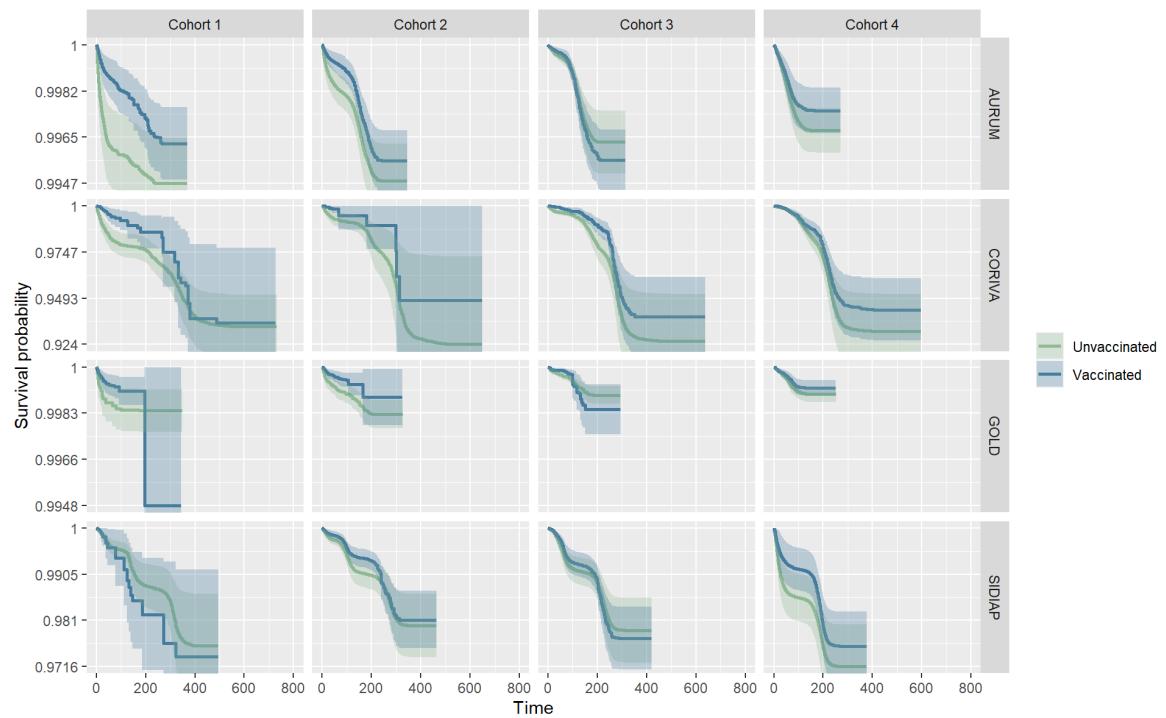
**Figure S19: Forest plots for comparative effectiveness on preventing post-acute COVID-19 across cohorts and databases.**



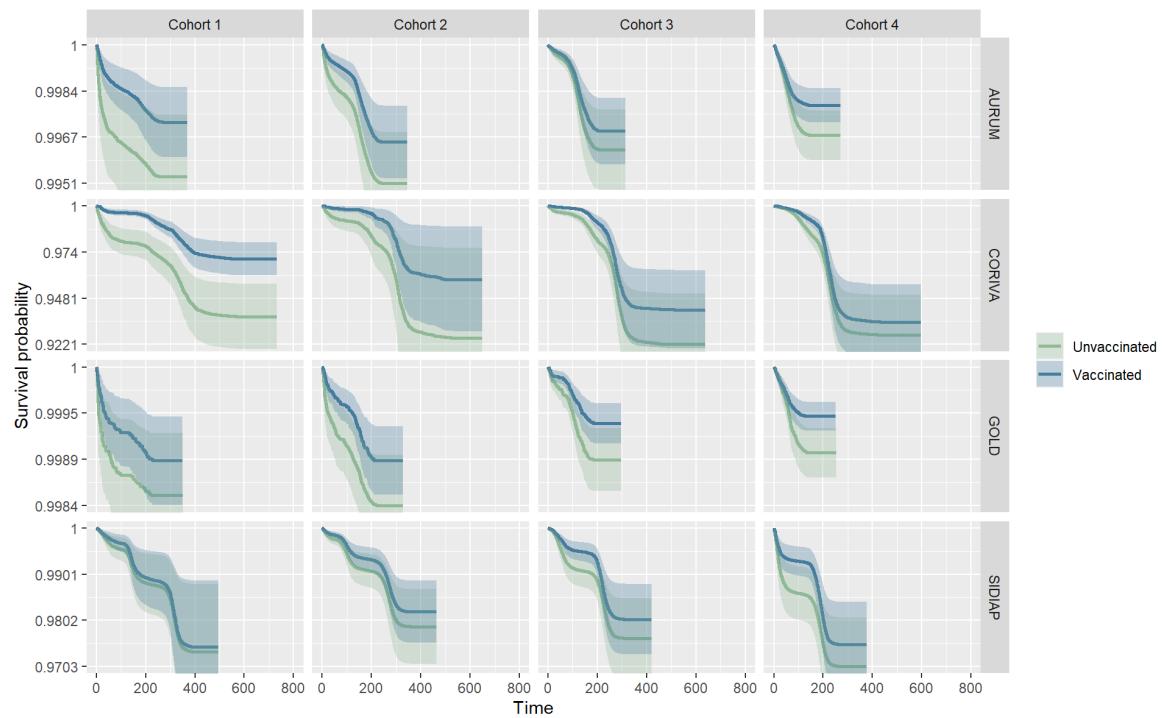
**Figure S20: Forest plots for comparative effectiveness on preventing post-acute COVID-19 across cohorts and databases. No censoring at second vaccine dose for vaccinated group.**



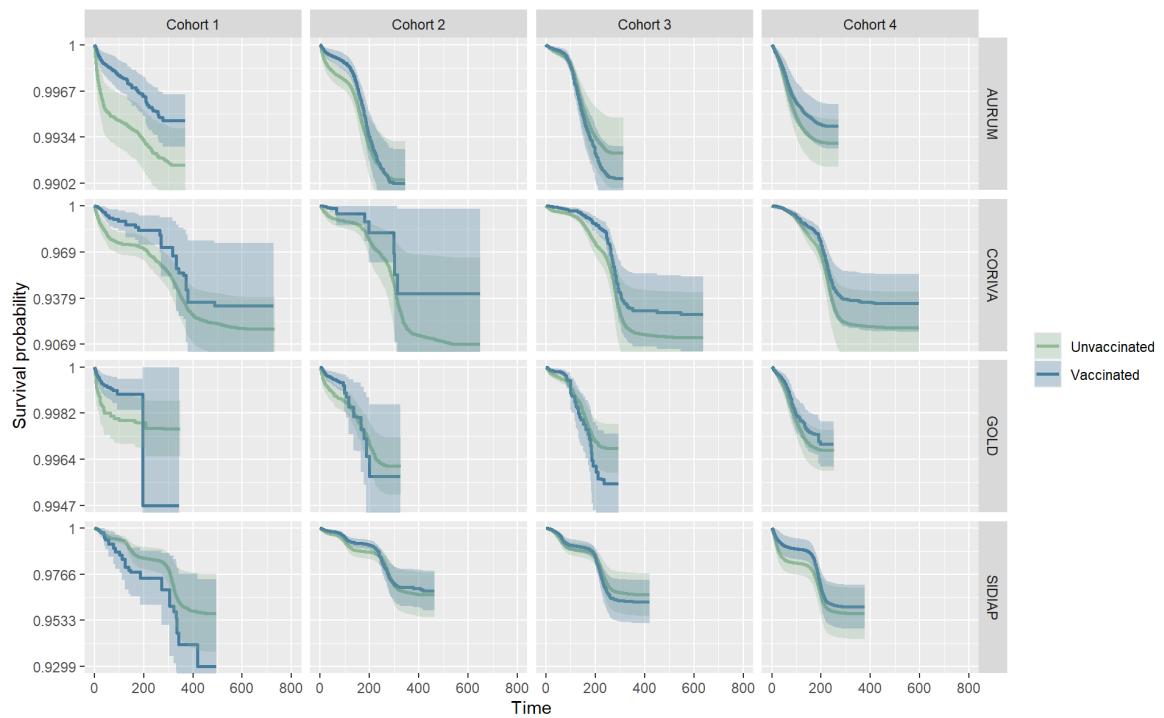
**Figure S21: Kaplan-Meier plots depicting survival for any long COVID symptoms between 90 and 365 days after SARS-CoV-2 across cohorts and databases, stratified by exposure status. Exposure is any COVID-19 vaccine.**



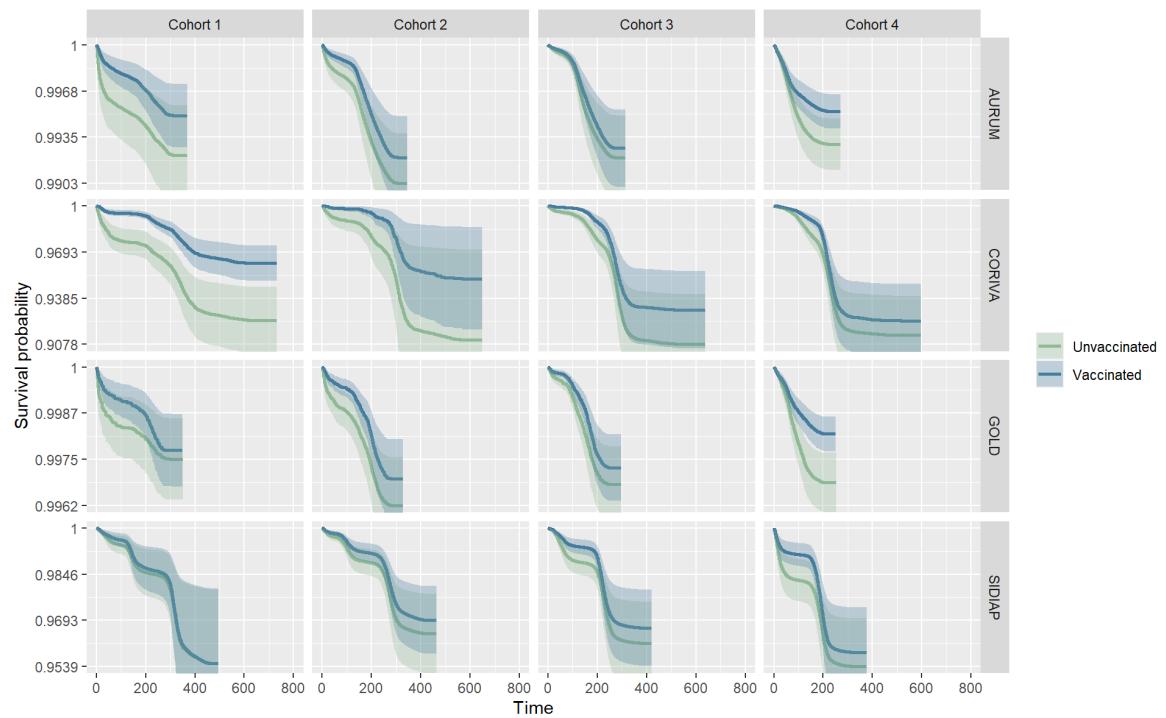
**Figure S22: Kaplan-Meier plots depicting survival for any long COVID symptoms between 90 and 365 days after SARS-CoV-2 across cohorts and databases, stratified by exposure status. Exposure is any COVID-19 vaccine. No censoring at second vaccine dose for vaccinated group.**



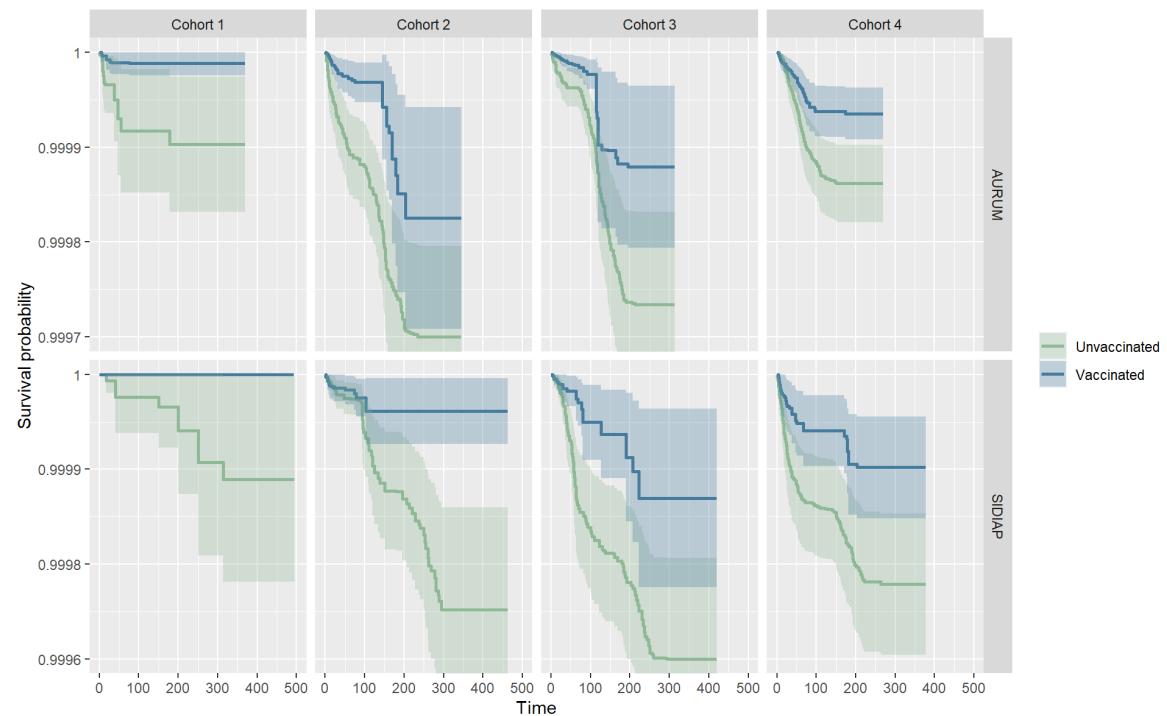
**Figure S23: Kaplan-Meier plots depicting survival for any long COVID symptoms between 28 and 365 days after SARS-CoV-2 across cohorts and databases, stratified by exposure status. Exposure is any COVID-19 vaccine.**



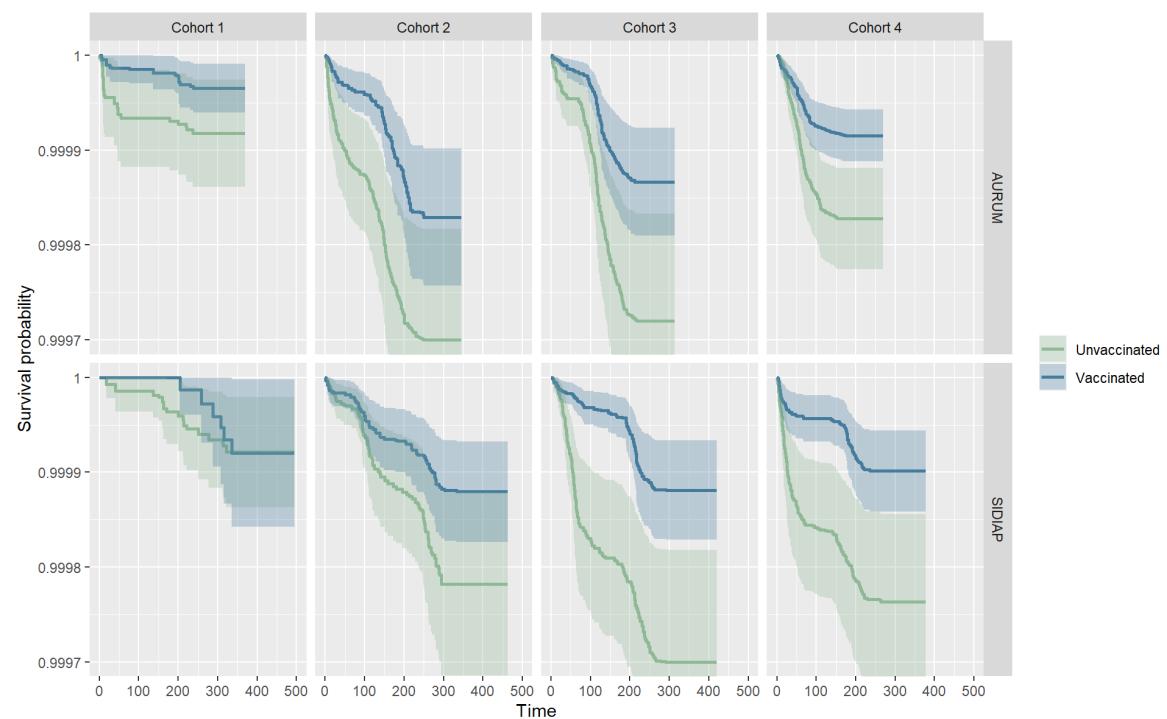
**Figure S24: Kaplan-Meier plots depicting survival for any long COVID symptoms between 28 and 365 days after SARS-CoV-2 across cohorts and databases, stratified by exposure status. Exposure is any COVID-19 vaccine. No censoring at second vaccine dose for vaccinated group.**



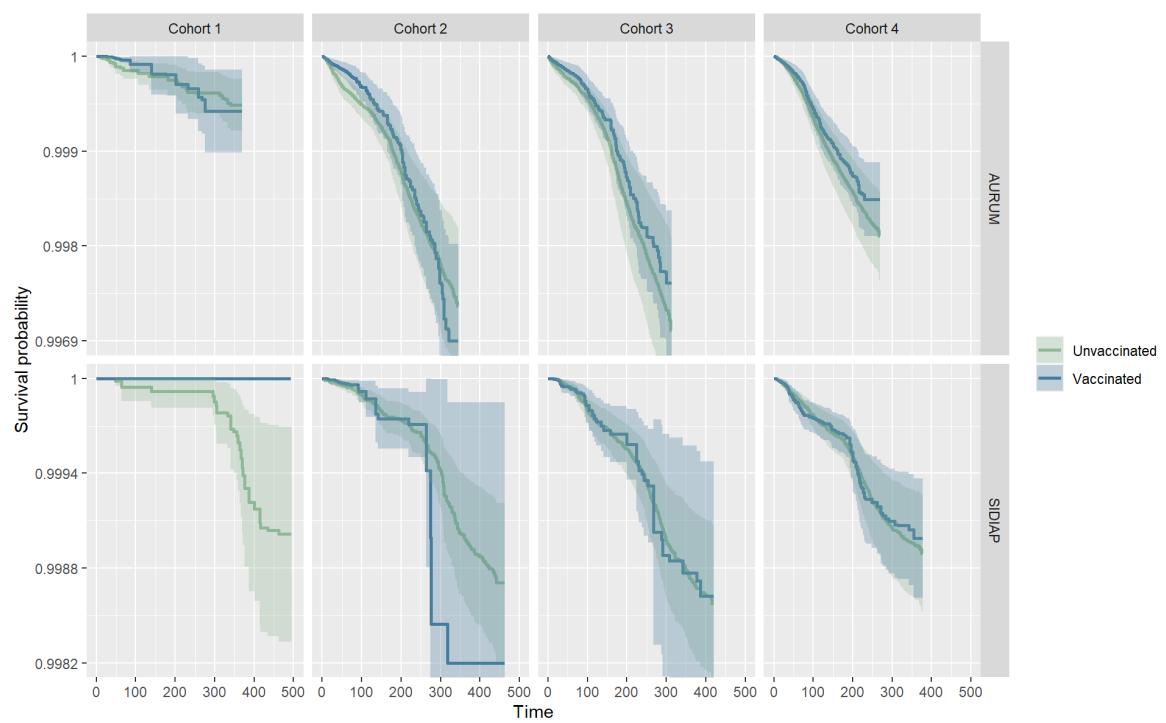
**Figure S25: Kaplan-Meier plots depicting survival for post-acute COVID-19 recorded between 90 and 365 days after SARS-CoV-2 across cohorts and databases, stratified by exposure status. Exposure is any COVID-19 vaccine.**



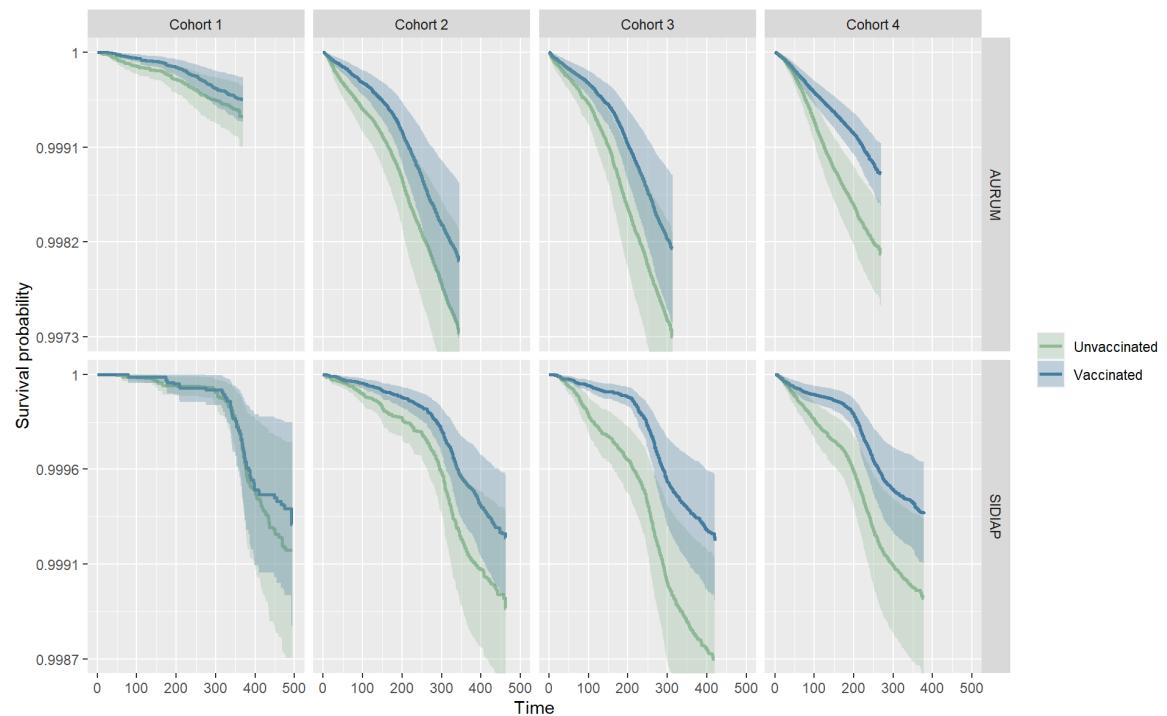
**Figure S26: Kaplan-Meier plots depicting survival for post-acute COVID-19 recorded between 90 and 365 days after SARS-CoV-2 across cohorts and databases, stratified by exposure status. Exposure is any COVID-19 vaccine. No censoring at second vaccine dose for vaccinated group.**



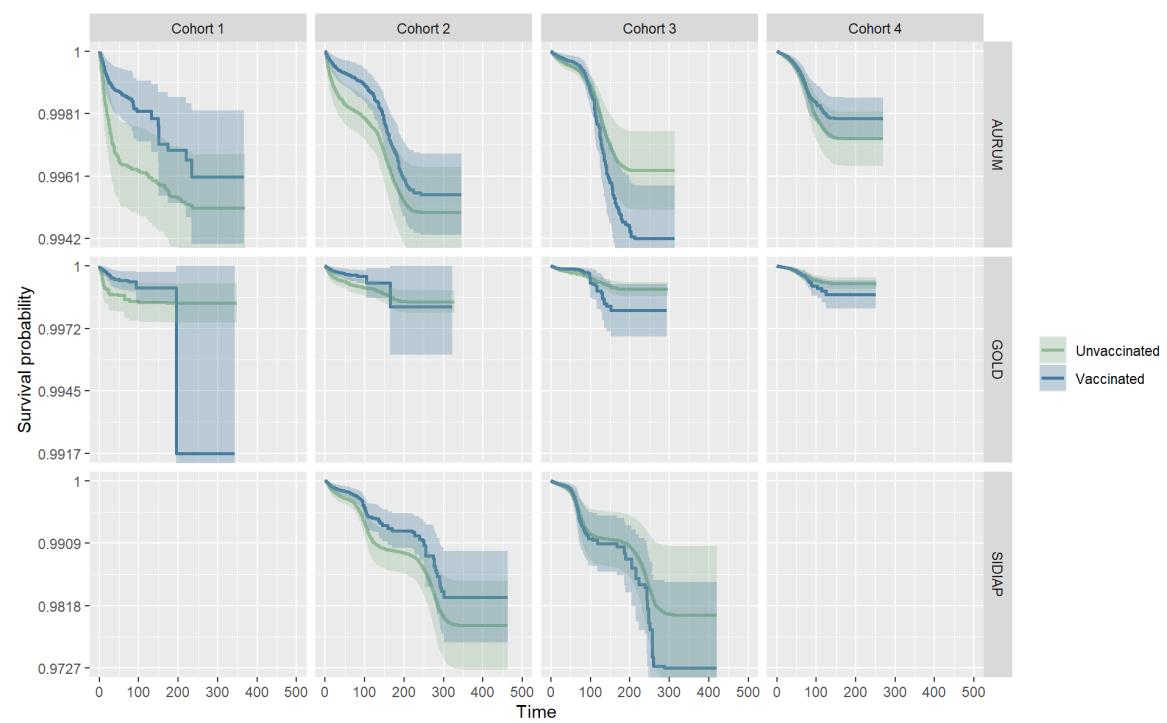
**Figure S27: Kaplan-Meier plots depicting survival for post-acute COVID-19 across cohorts and databases, stratified by exposure status. Exposure is any COVID-19 vaccine.**



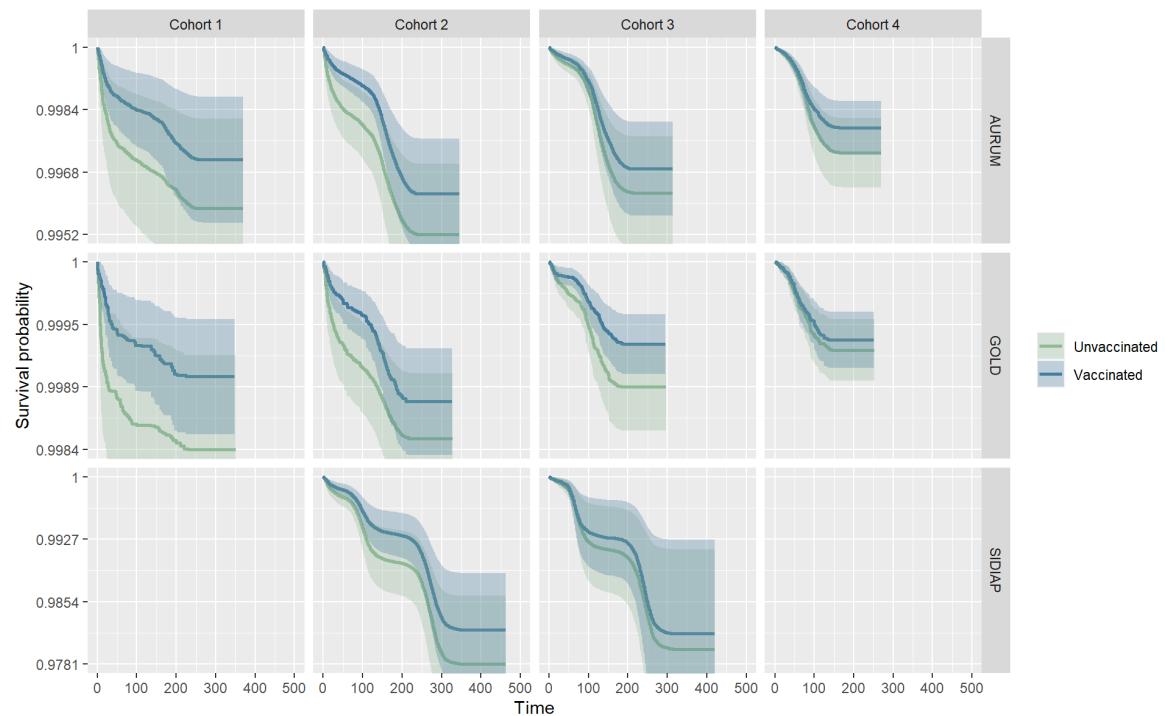
**Figure S28: Kaplan-Meier plots depicting survival for post-acute COVID-19 across cohorts and databases, stratified by exposure status. Exposure is any COVID-19 vaccine. No censoring at second vaccine dose for vaccinated group.**



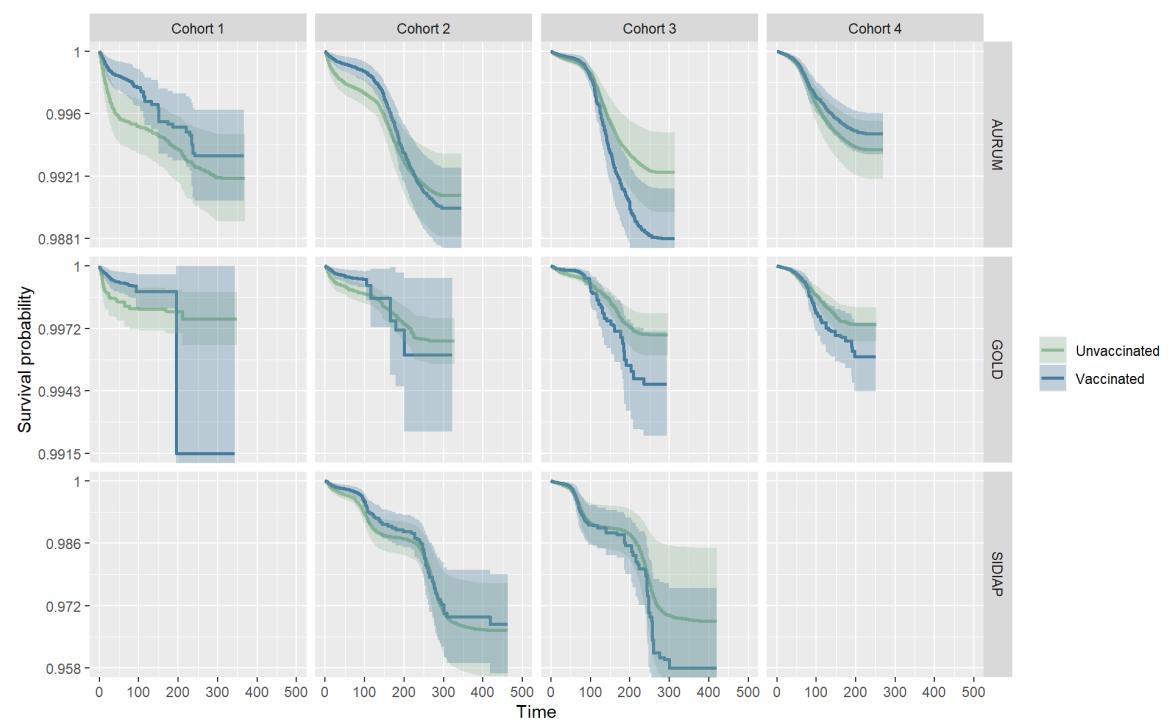
**Figure S29: Kaplan-Meier plots depicting survival for any long COVID symptoms between 90 and 365 days after SARS-CoV-2 across cohorts and databases, stratified by exposure status. Exposure is ChAdOx1 vaccine.**



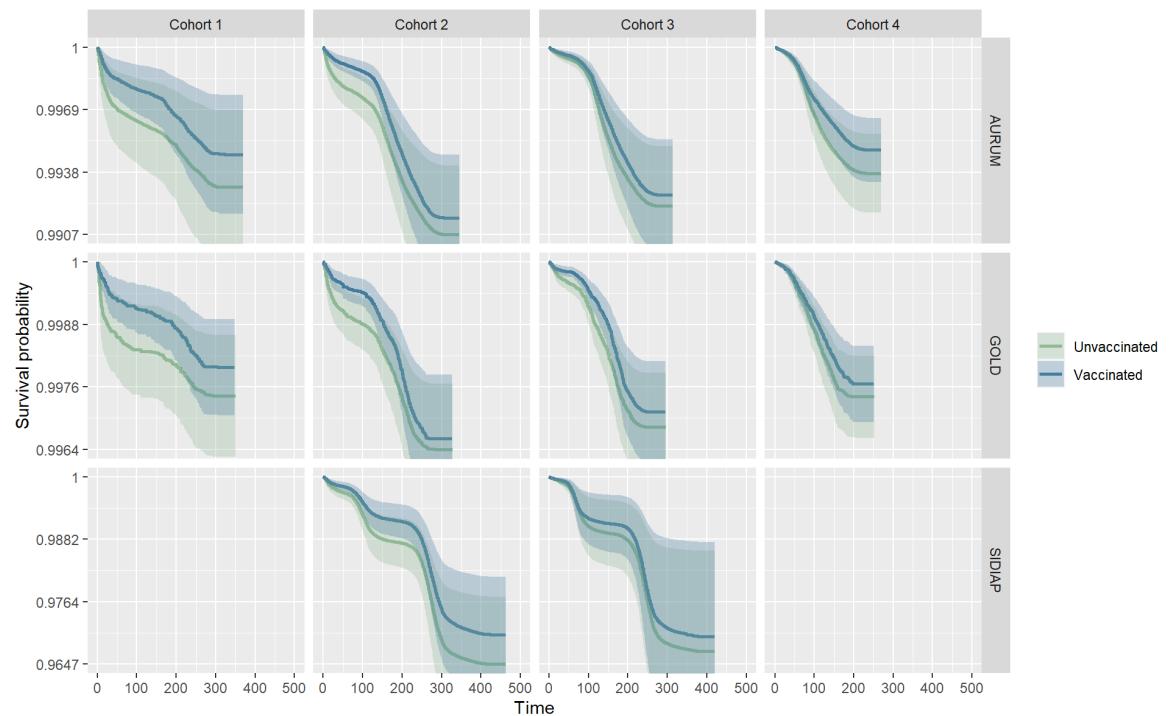
**Figure S30: Kaplan-Meier plots depicting survival for any long COVID symptoms between 90 and 365 days after SARS-CoV-2 across cohorts and databases, stratified by exposure status. Exposure is ChAdOx1 vaccine. No censoring at second vaccine dose for vaccinated group.**



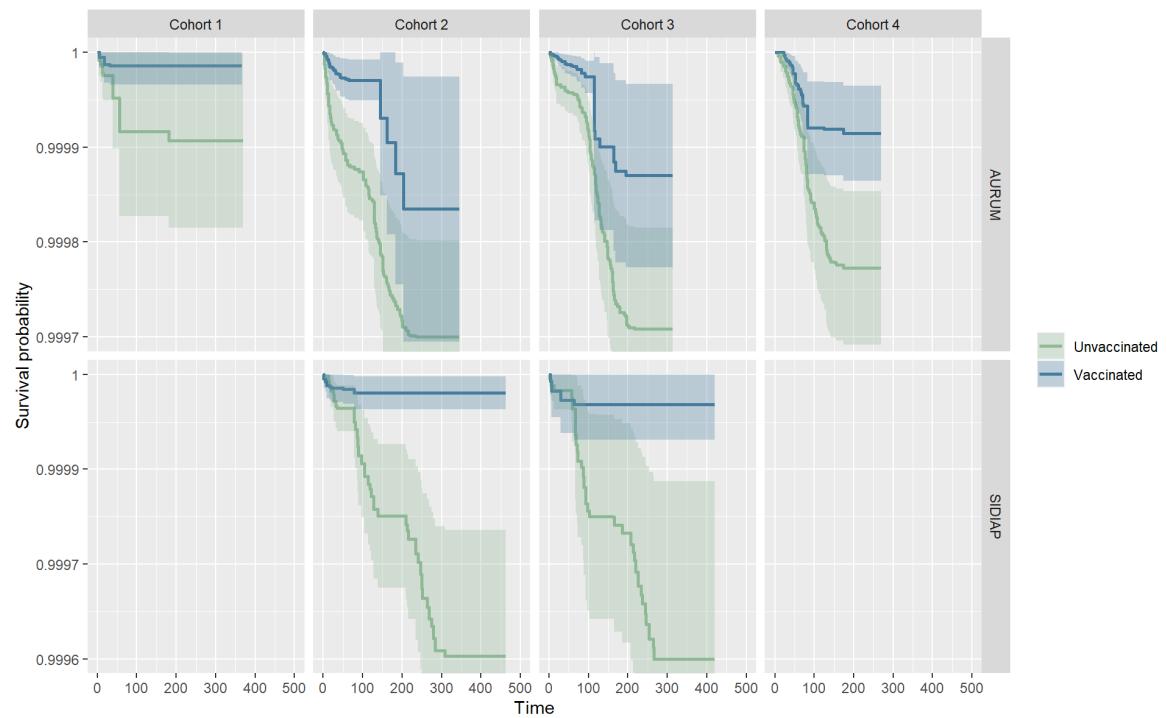
**Figure S31: Kaplan-Meier plots depicting survival for any long COVID symptoms between 28 and 365 days after SARS-CoV-2 across cohorts and databases, stratified by exposure status. Exposure is ChAdOx1 vaccine.**



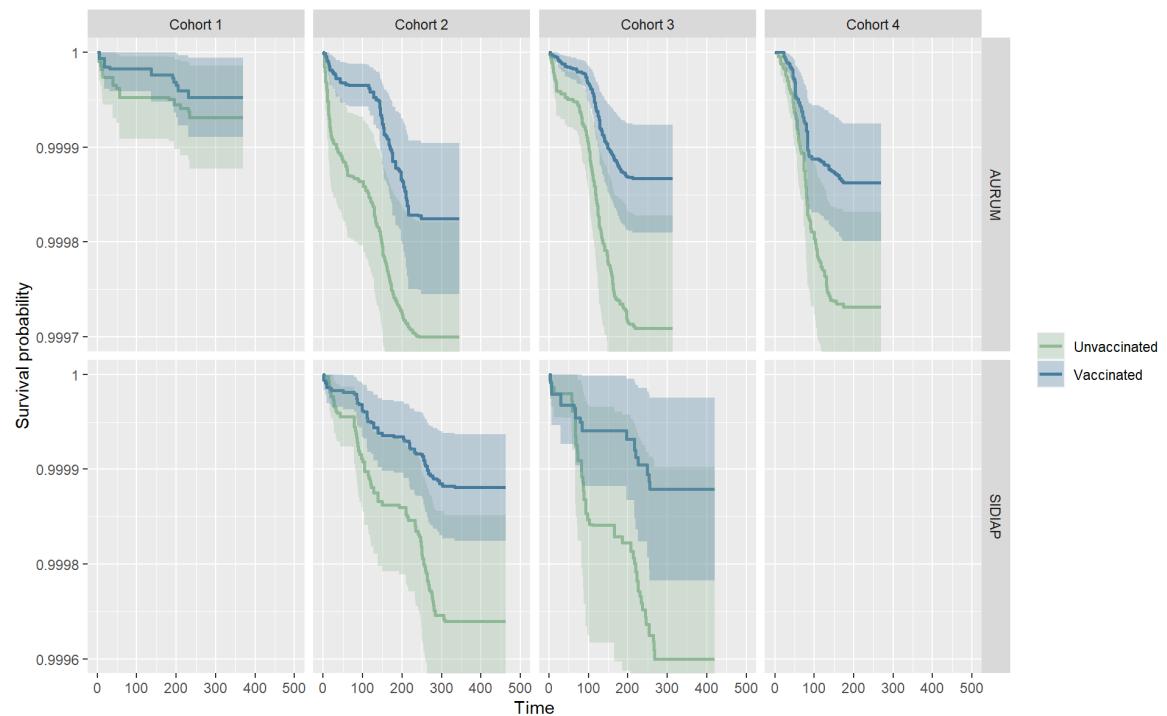
**Figure S32: Kaplan-Meier plots depicting survival for any long COVID symptoms between 28 and 365 days after SARS-CoV-2 across cohorts and databases, stratified by exposure status. Exposure is ChAdOx1 vaccine. No censoring at second vaccine dose for vaccinated group.**



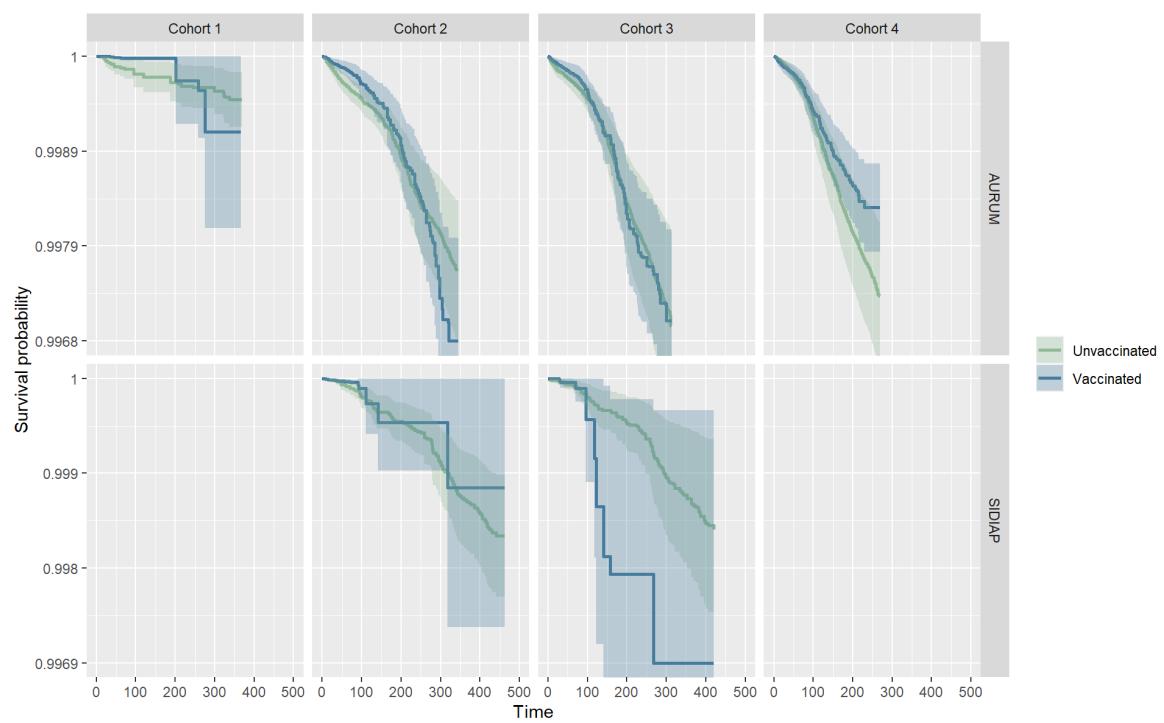
**Figure S33: Kaplan-Meier plots depicting survival for post-acute COVID-19 recorded between 90 and 365 days after SARS-CoV-2 across cohorts and databases, stratified by exposure status. Exposure is ChAdOx1 vaccine.**



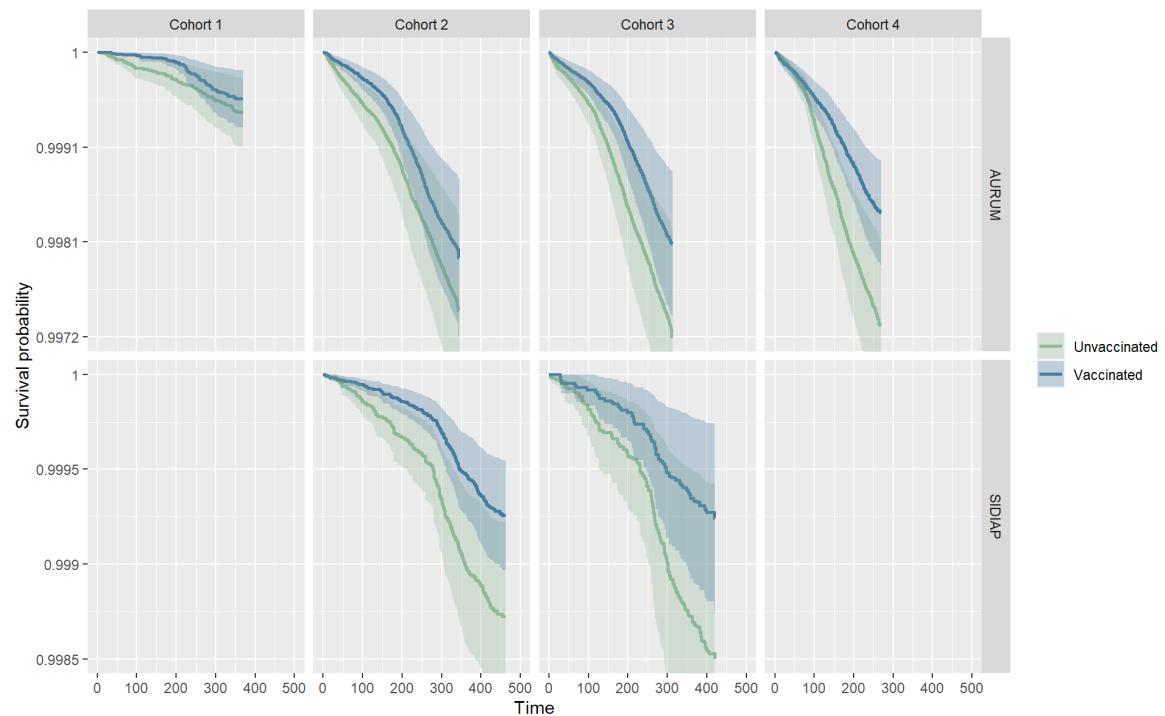
**Figure S34: Kaplan-Meier plots depicting survival for post-acute COVID-19 recorded between 90 and 365 days after SARS-CoV-2 across cohorts and databases, stratified by exposure status. Exposure is ChAdOx1 vaccine. No censoring at second vaccine dose for vaccinated group.**



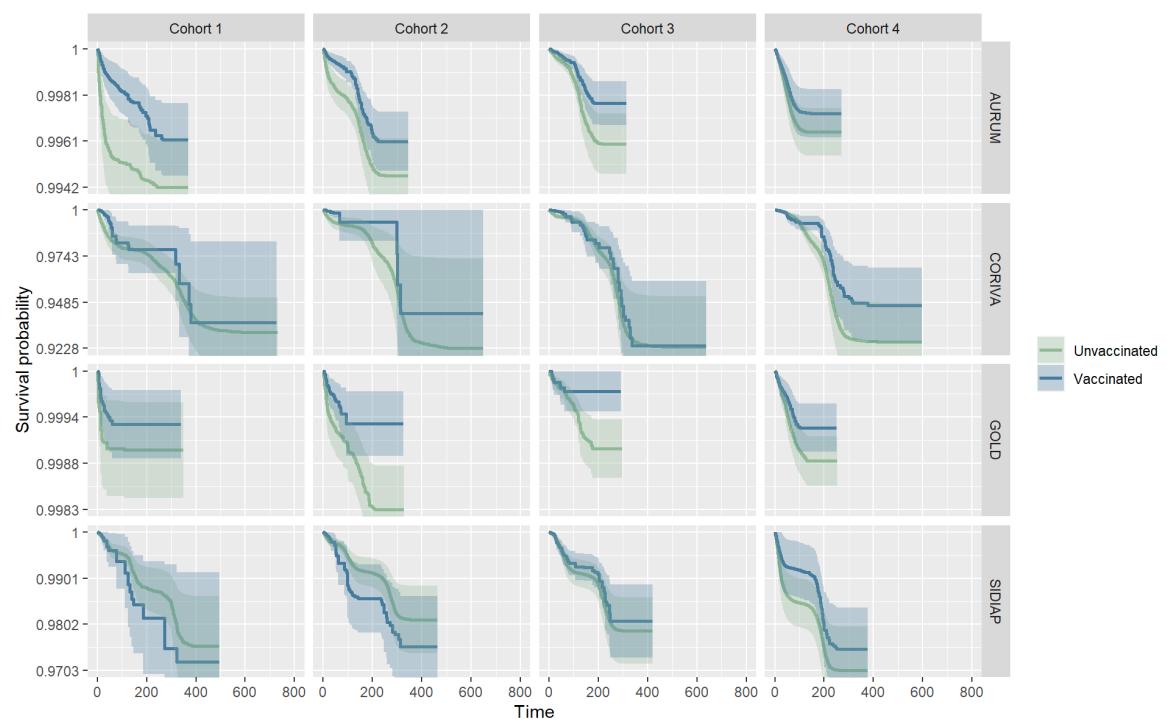
**Figure S35: Kaplan-Meier plots depicting survival for post-acute COVID-19 across cohorts and databases, stratified by exposure status. Exposure is ChAdOx1 vaccine.**



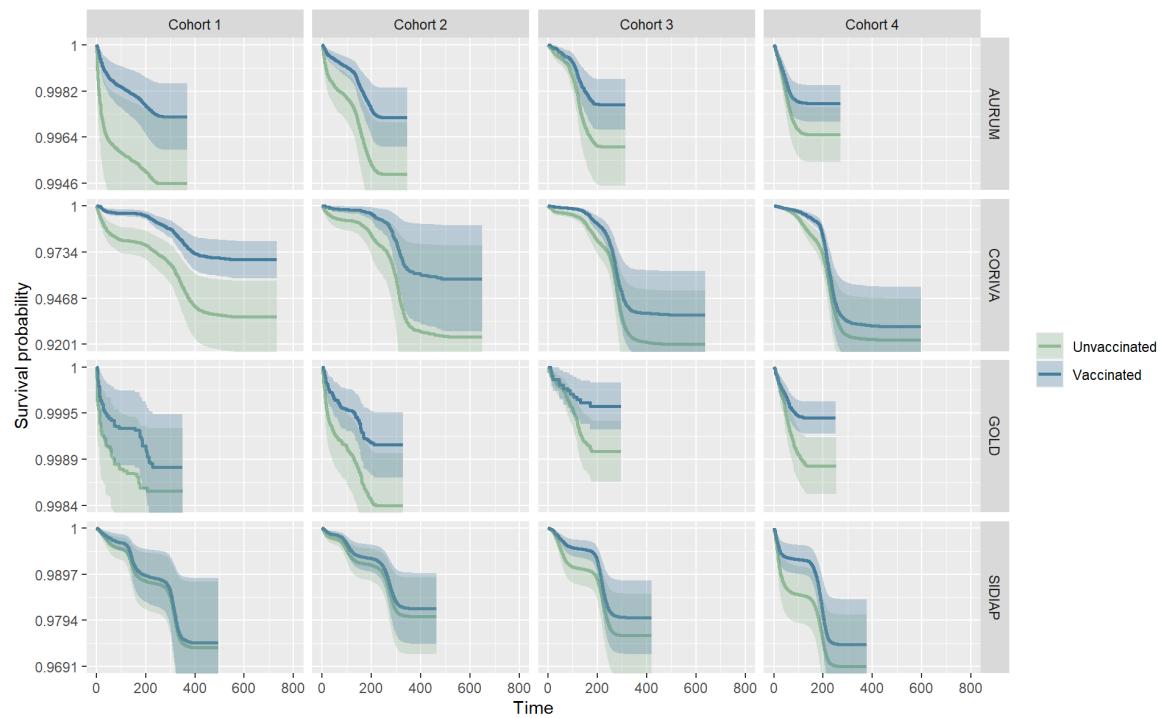
**Figure S36: Kaplan-Meier plots depicting survival for post-acute COVID-19 across cohorts and databases, stratified by exposure status. Exposure is ChAdOx1 vaccine. No censoring at second vaccine dose for vaccinated group.**



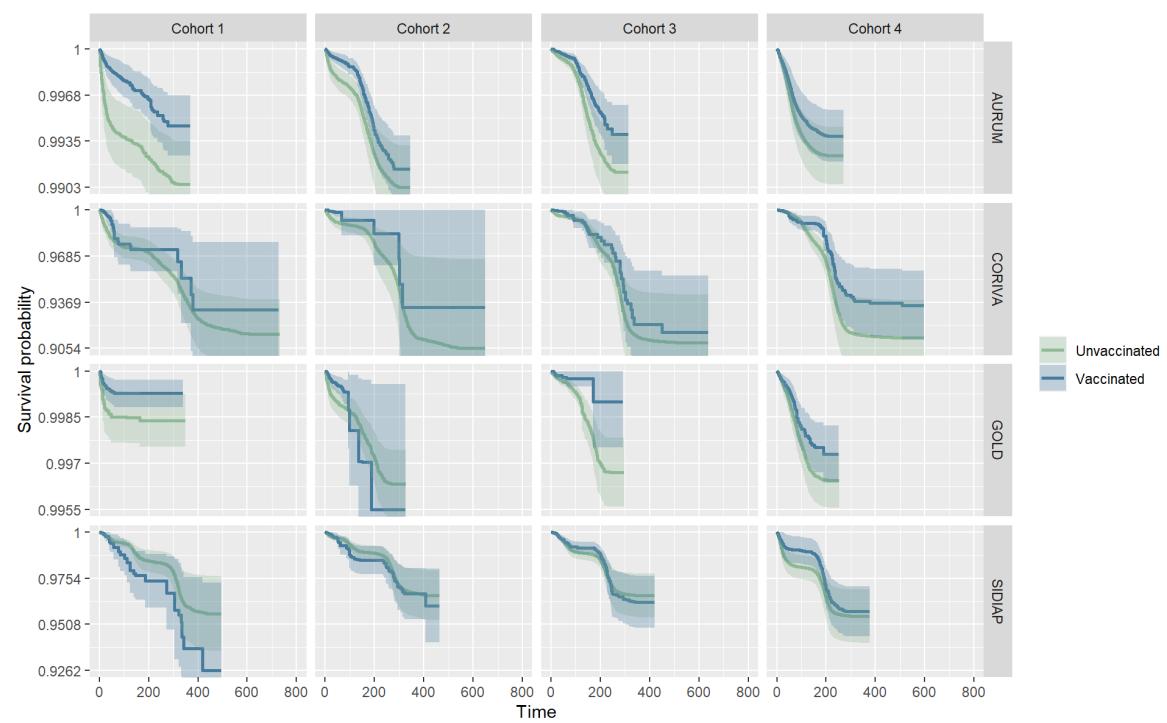
**Figure S37: Kaplan-Meier plots depicting survival for any long COVID symptoms between 90 and 365 days after SARS-CoV-2 across cohorts and databases, stratified by exposure status. Exposure is BNT162b2 vaccine.**



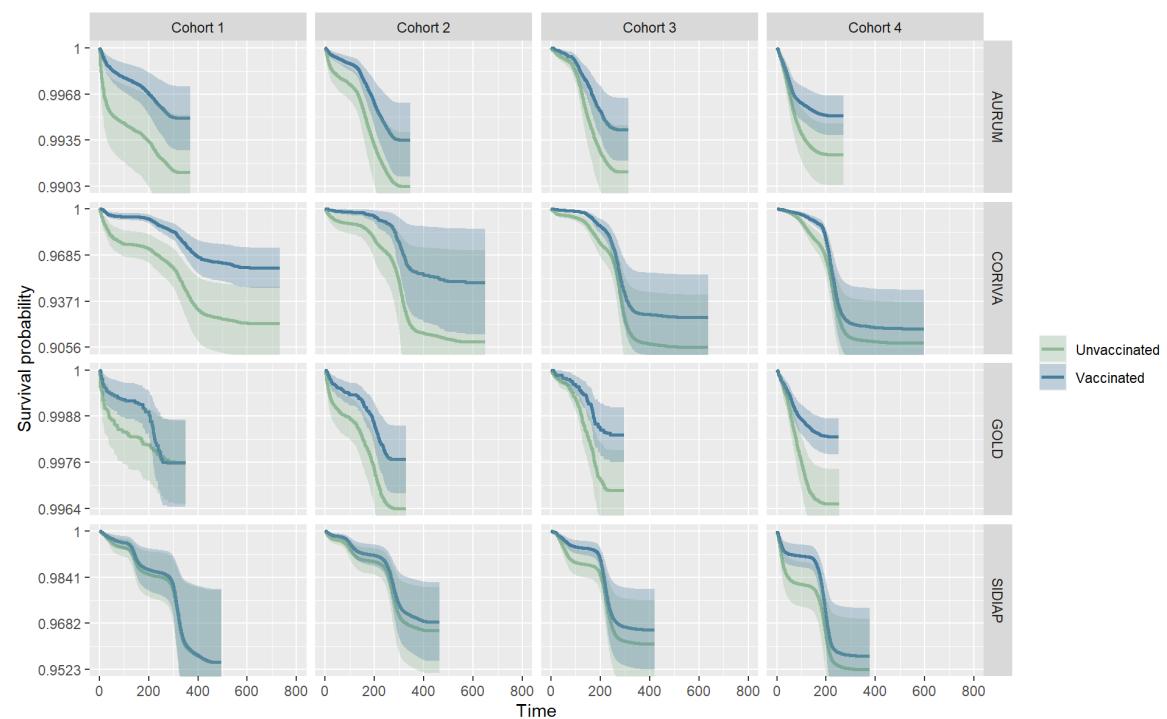
**Figure S38: Kaplan-Meier plots depicting survival for any long COVID symptoms between 90 and 365 days after SARS-CoV-2 across cohorts and databases, stratified by exposure status. Exposure is BNT162b2 vaccine. No censoring at second vaccine dose for vaccinated group.**



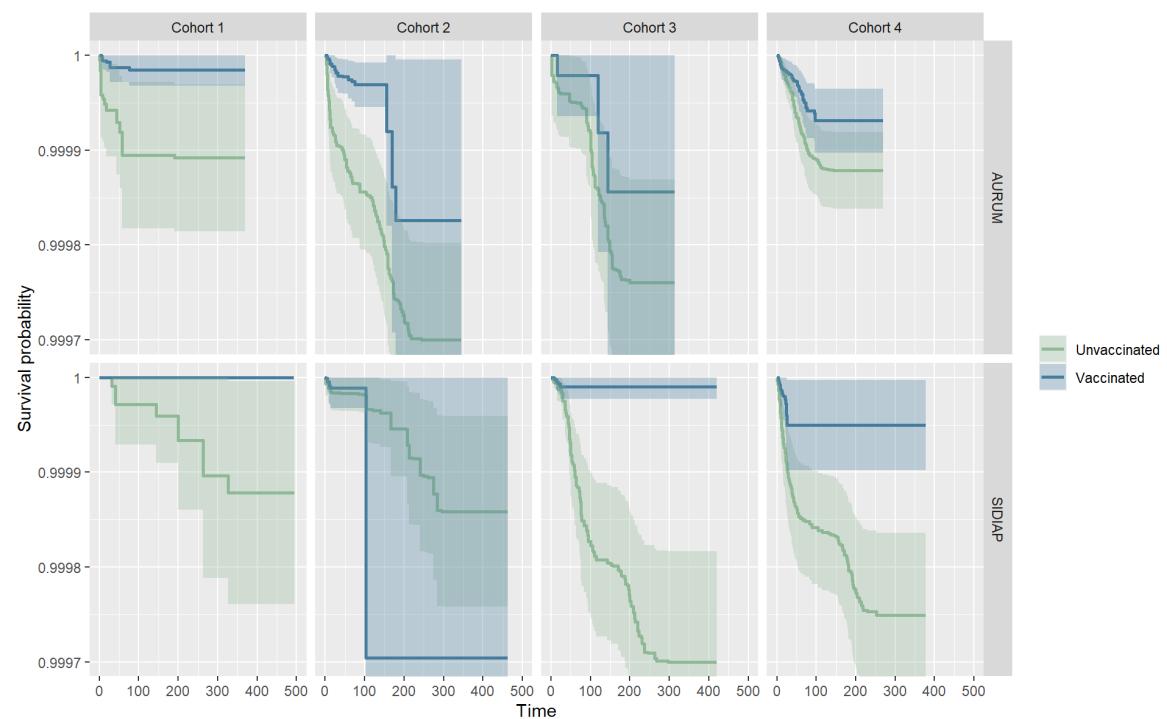
**Figure S39: Kaplan-Meier plots depicting survival for any long COVID symptoms between 28 and 365 days after SARS-CoV-2 across cohorts and databases, stratified by exposure status. Exposure is BNT162b2 vaccine.**



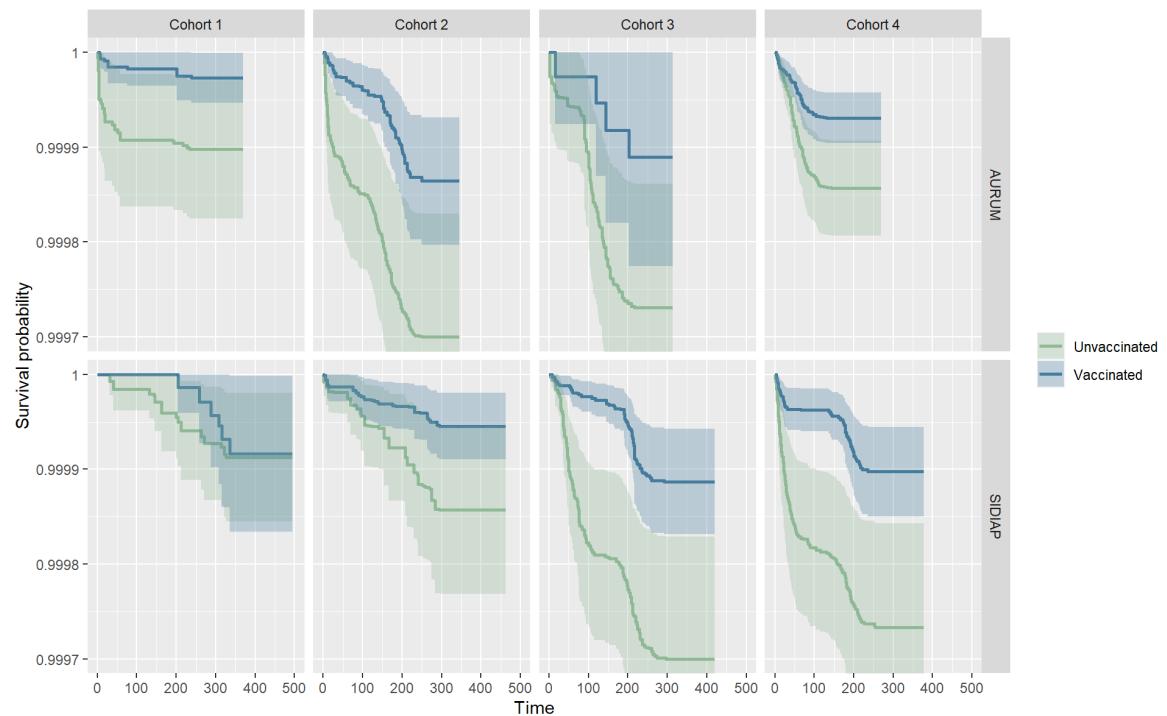
**Figure S40: Kaplan-Meier plots depicting survival for any long COVID symptoms between 28 and 365 days after SARS-CoV-2 across cohorts and databases, stratified by exposure status. Exposure is BNT162b2 vaccine. No censoring at second vaccine dose for vaccinated group.**



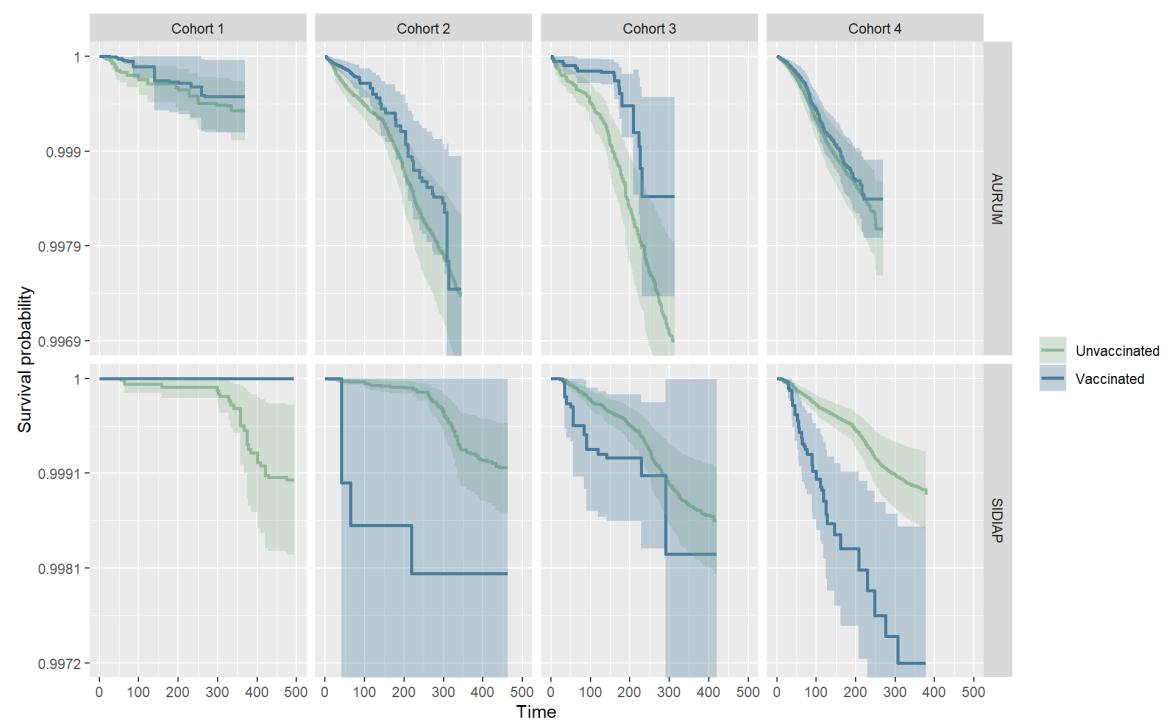
**Figure S41: Kaplan-Meier plots depicting survival for post-acute COVID-19 recorded between 90 and 365 days after SARS-CoV-2 across cohorts and databases, stratified by exposure status. Exposure is BNT162b2 vaccine.**



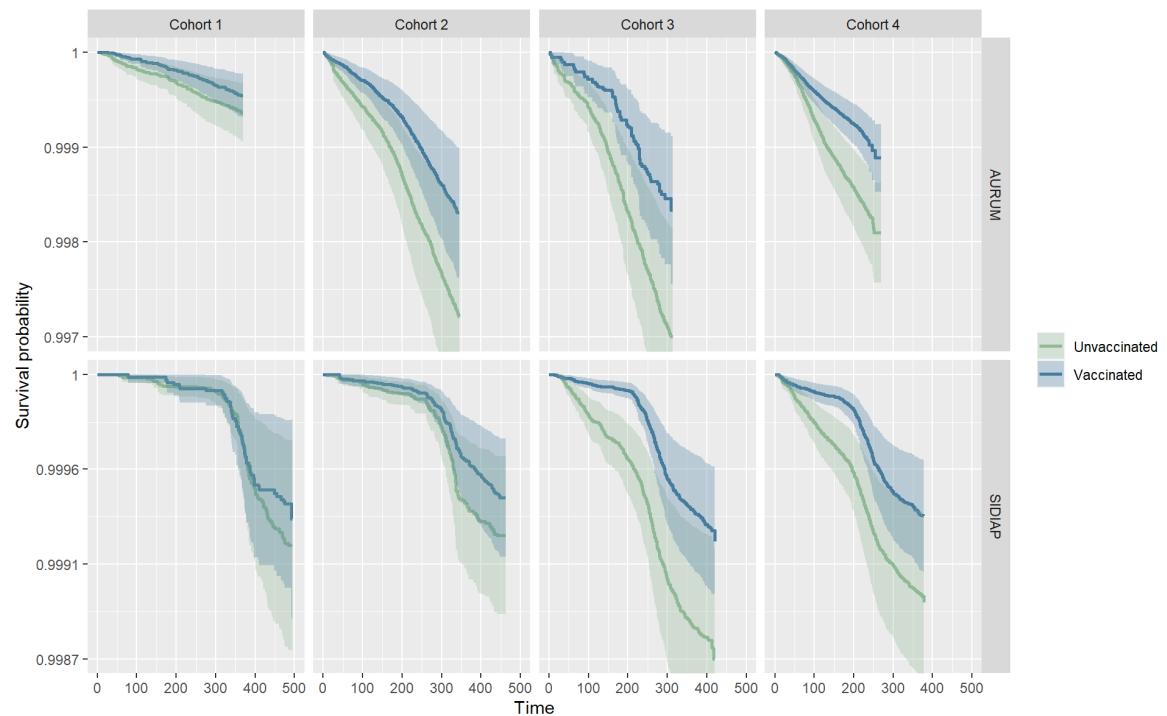
**Figure S42: Kaplan-Meier plots depicting survival for post-acute COVID-19 recorded between 90 and 365 days after SARS-CoV-2 across cohorts and databases, stratified by exposure status. Exposure is BNT162b2 vaccine. No censoring at second vaccine dose for vaccinated group.**



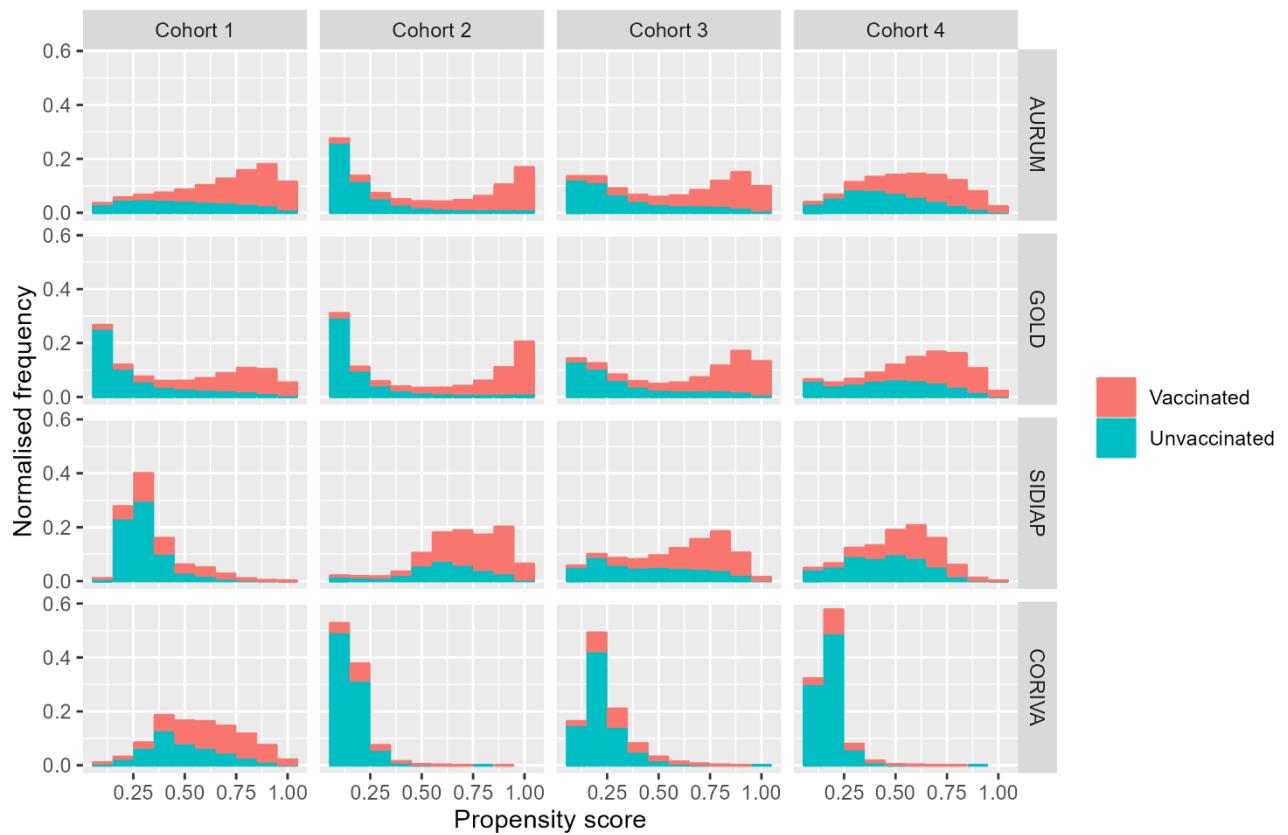
**Figure S43: Kaplan-Meier plots depicting survival for post-acute COVID-19 across cohorts and databases, stratified by exposure status. Exposure is BNT162b2 vaccine.**



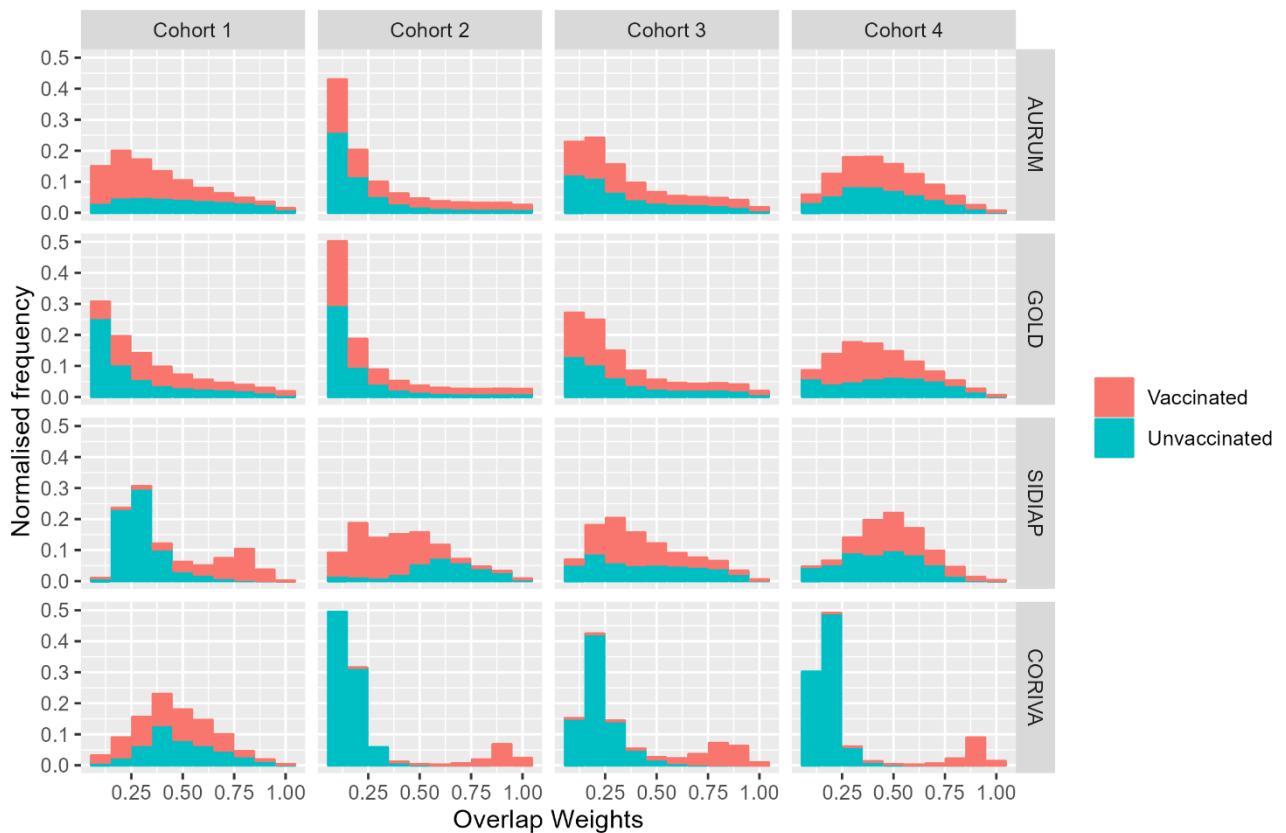
**Figure S44: Kaplan-Meier plots depicting survival for post-acute COVID-19 across cohorts and databases, stratified by exposure status. Exposure is BNT162b2 vaccine. No censoring at second vaccine dose for vaccinated group.**



**Figure S45: Distribution of Propensity Scores** across databases and cohorts stratifying by exposure status ((any) COVID-19 vaccinated vs. unvaccinated).

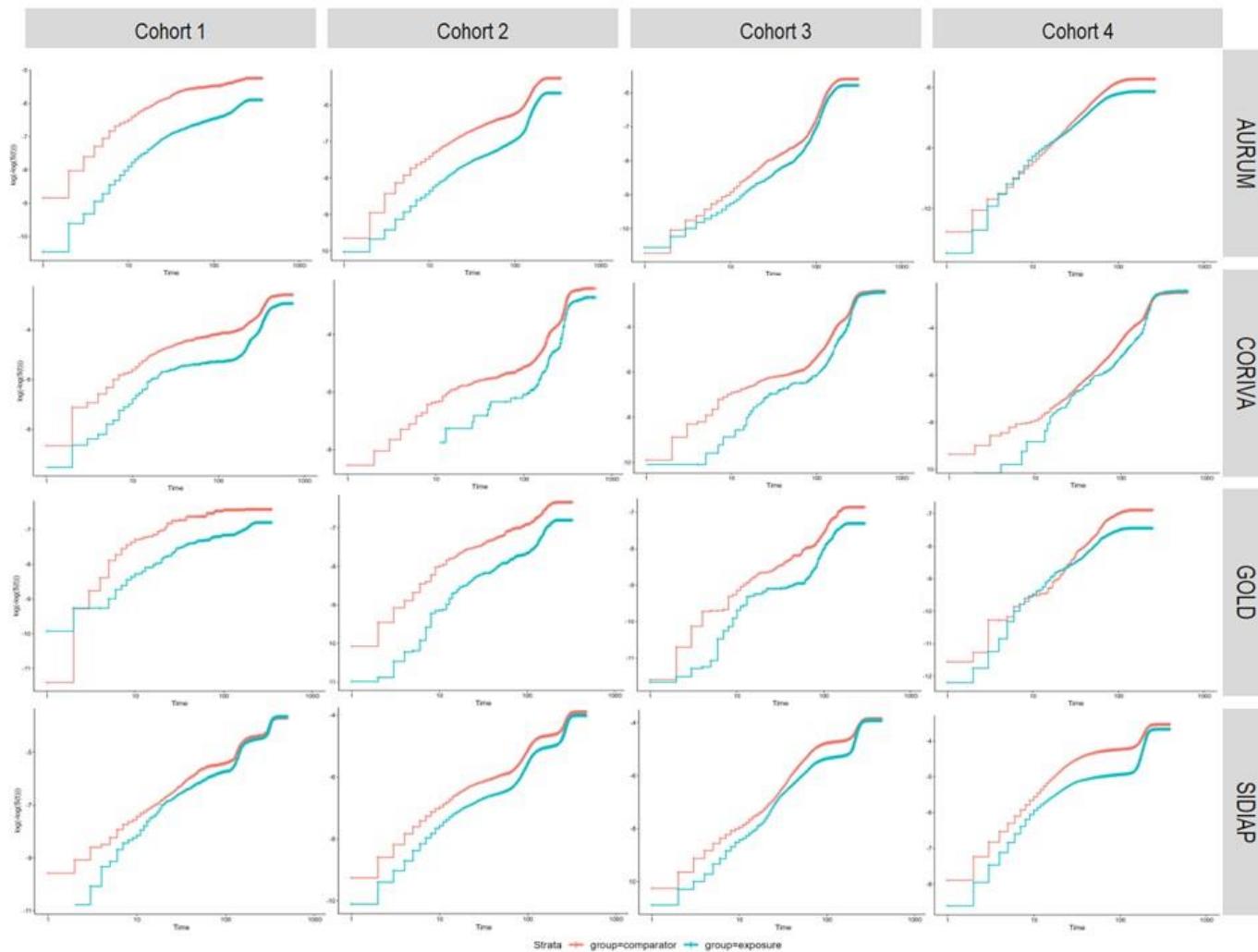


**Figure S46: Distribution of Overlap Weights across databases and cohorts stratifying by exposure status ((any) COVID-19 vaccinated vs. unvaccinated).**



Overlap Weights (OW) are derived from the propensity score (PS) and the exposure group (T). The formula is the following:  $OW(T=0) = PS$ ,  $OW(T=1) = 1-PS$ , where T=1 indicated vaccinated and T=0 unvaccinated.

**Figure S47: Log(-Log) Plots for vaccine effectiveness any long COVID symptoms between 90 and 365 days after SARS-CoV-2 across cohorts and databases (vaccinated vs. unvaccinated). No censoring at second vaccine dose for vaccinated group.**



**Figure S48: Log(-Log) Plots for vaccine effectiveness any long COVID symptoms between 90 and 365 days after SARS-CoV-2 across cohorts and databases (vaccinated vs. unvaccinated).**

