

Supplementary Information

Supplementary Table 1. Characteristics of study participants stratified by age category

Characteristics of the participants in the study cohorts used for the primary analyses. Those in the general population were present in the database as of 01/01/2017. The MEDEA deprivation index is calculated at the census tract level in urban areas of Catalonia and is categorised in quintiles of deprivation. It also includes a rural category for individuals living in rural areas. *Conditions of interest: autoimmune disease, antiphospholipid syndrome, thrombophilia, asthma, atrial fibrillation, malignant neoplastic disease, diabetes mellitus, obesity, or renal impairment. †Medications of interest: non-steroidal anti-inflammatory drugs, Cox2 inhibitors, systemic corticosteroids, hormonal contraceptives, tamoxifen, and sex hormones and modulators of the genital system.

Participants aged 20 to 44

| | BNT162b2 first-dose | BNT162b2 second-dose | ChAdOx1 first-dose | COVID-19 diagnosis | General population (index date: 1st December) |
|------------------------------------|--------------------------------|---------------------------------|-------------------------------|---------------------------|--|
| N | 463,328 | 96,375 | 83,458 | 75,453 | 1,953,084 |
| Age | 40 [36 to 42] | 34 [27 to 40] | 35 [28 to 40] | 33 [26 to 39] | 35 [28 to 40] |
| Age: 20 to 29 | 41,288 (8.9%) | 32,011 (33.2%) | 25,029 (30.0%) | 27,629 (36.6%) | 572,054 (29.3%) |
| Age: 30 to 39 | 183,972 (39.7%) | 35,774 (37.1%) | 34,221 (41.0%) | 29,023 (38.5%) | 863,539 (44.2%) |
| Age: 40 to 49 | 238,068 (51.4%) | 28,590 (29.7%) | 24,208 (29.0%) | 18,801 (24.9%) | 517,491 (26.5%) |
| Sex: Male | 216,779 (46.8%) | 27,869 (28.9%) | 27,760 (33.3%) | 34,365 (45.5%) | 997,902 (51.1%) |
| Years of prior observation time | 15.5 [15.0 to 15.5] | 15.1 [15.1 to 15.2] | 15.2 [15.1 to 15.2] | 14.8 [13.1 to 15.0] | 11.0 [11.0 to 11.0] |
| Comorbidities | | | | | |
| Autoimmune disease | 5,229 (1.1%) | 1,535 (1.6%) | 906 (1.1%) | 752 (1.0%) | 15,365 (0.8%) |

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| Antiphospholipid syndrome | 346 (0.1%) | 103 (0.1%) | 66 (0.1%) | 33 (0.0%) | 360 (0.0%) |
| Thrombophilia | 812 (0.2%) | 243 (0.3%) | 152 (0.2%) | 88 (0.1%) | 1,170 (0.1%) |
| Asthma | 35,833 (7.7%) | 8,670 (9.0%) | 7,413 (8.9%) | 6,189 (8.2%) | 125,023 (6.4%) |
| Atrial fibrillation | 792 (0.2%) | 140 (0.1%) | 75 (0.1%) | 102 (0.1%) | 2,051 (0.1%) |
| Malignant neoplastic disease | 8,364 (1.8%) | 1,751 (1.8%) | 1,206 (1.4%) | 1,102 (1.5%) | 24,040 (1.2%) |
| Diabetes mellitus | 18,296 (3.9%) | 3,429 (3.6%) | 2,197 (2.6%) | 2,608 (3.5%) | 48,569 (2.5%) |
| Obesity | 61,129 (13.2%) | 13,786 (14.3%) | 8,305 (10.0%) | 11,096 (14.7%) | 190,526 (9.8%) |
| Heart disease | 17,169 (3.7%) | 4,047 (4.2%) | 2,602 (3.1%) | 2,496 (3.3%) | 47,673 (2.4%) |
| Hypertensive disorder | 22,392 (4.8%) | 3,868 (4.0%) | 2,164 (2.6%) | 2,903 (3.8%) | 62,390 (3.2%) |
| Renal impairment | 2,282 (0.5%) | 737 (0.8%) | 216 (0.3%) | 378 (0.5%) | 6,685 (0.3%) |
| COPD | 1,723 (0.4%) | 331 (0.3%) | 180 (0.2%) | 176 (0.2%) | 5,285 (0.3%) |
| Dementia | 94 (0.0%) | 54 (0.1%) | 5 (0.0%) | 11 (0.0%) | 267 (0.0%) |
| Medication use (183 days prior to four days prior) | | | | | |
| Non-steroidal anti-inflammatory drugs | 104,509 (22.6%) | 23,627 (24.5%) | 16,150 (19.4%) | 19,229 (25.5%) | 471,084 (24.1%) |
| Cox2 inhibitors | 2,043 (0.4%) | 434 (0.5%) | 232 (0.3%) | 206 (0.3%) | 4,003 (0.2%) |
| Systemic corticosteroids | 18,139 (3.9%) | 4,325 (4.5%) | 2,621 (3.1%) | 2,974 (3.9%) | 67,536 (3.5%) |

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|---|-----------------|----------------|----------------|----------------|-----------------|
| Antithrombotic and anticoagulant therapies | 5,272 (1.1%) | 1,116 (1.2%) | 682 (0.8%) | 978 (1.3%) | 15,795 (0.8%) |
| Lipid modifying agents | 2,429 (0.5%) | 401 (0.4%) | 152 (0.2%) | 243 (0.3%) | 6,253 (0.3%) |
| Antineoplastic and immunomodulating agents | 7,211 (1.6%) | 2,720 (2.8%) | 1,622 (1.9%) | 1,827 (2.4%) | 27,194 (1.4%) |
| Hormonal contraceptives for systemic use | 10,205 (2.2%) | 3,604 (3.7%) | 2,221 (2.7%) | 2,672 (3.5%) | 33,797 (1.7%) |
| Tamoxifen | 70 (0.0%) | 18 (0.0%) | 11 (0.0%) | 9 (0.0%) | 251 (0.0%) |
| Sex hormones and modulators of the genital system | 11,583 (2.5%) | 3,998 (4.1%) | 2,470 (3.0%) | 2,946 (3.9%) | 39,262 (2.0%) |
| One or more condition of interest | 86,307 (18.6%) | 19,271 (20.0%) | 12,028 (14.4%) | 14,392 (19.1%) | 263,822 (13.5%) |
| One or more medication of interest | 116,986 (25.2%) | 27,350 (28.4%) | 18,711 (22.4%) | 21,753 (28.8%) | 512,550 (26.2%) |
| One or more condition/ medication of interest | 173,555 (37.5%) | 39,595 (41.1%) | 27,024 (32.4%) | 30,693 (40.7%) | 676,243 (34.6%) |

Participants aged 45 to 64

| | BNT162b2 first-dose | BNT162b2 second-dose | ChAdOx1 first-dose | COVID-19 diagnosis | General population (index date: 1st December) |
|------------------------------------|--------------------------------|---------------------------------|-------------------------------|---------------------------|--|
| N | 801,005 | 500,199 | 321,024 | 61,478 | 1,550,866 |
| Age | 52 [48 to 56] | 54 [51 to 57] | 61 [59 to 63] | 53 [48 to 58] | 53 [49 to 58] |
| Age: 40 to 49 | 289,700 (36.2%) | 77,075 (15.4%) | 23,937 (7.5%) | 19,270 (31.3%) | 461,887 (29.8%) |
| Age: 50 to 59 | 482,366 (60.2%) | 398,367 (79.6%) | 57,038 (17.8%) | 31,446 (51.2%) | 776,128 (50.0%) |
| Age: 60 to 69 | 28,939 (3.6%) | 24,757 (4.9%) | 240,049 (74.8%) | 10,762 (17.5%) | 312,851 (20.2%) |
| Sex: Male | 398,342 (49.7%) | 238,465 (47.7%) | 153,008 (47.7%) | 29,777 (48.4%) | 777,274 (50.1%) |
| Years of prior observation time | 15.4 [15.4 to 15.4] | 15.4 [15.3 to 15.5] | 15.3 [15.2 to 15.3] | 14.9 [14.8 to 15.1] | 11.0 [11.0 to 11.0] |
| Comorbidities | | | | | |
| Autoimmune disease | 14,174 (1.8%) | 10,141 (2.0%) | 8,151 (2.5%) | 1,389 (2.3%) | 28,810 (1.9%) |
| Antiphospholipid syndrome | 518 (0.1%) | 364 (0.1%) | 203 (0.1%) | 45 (0.1%) | 415 (0.0%) |

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|--|-----------------|-----------------|-----------------|----------------|-----------------|
| Thrombophilia | 1,034 (0.1%) | 669 (0.1%) | 347 (0.1%) | 103 (0.2%) | 916 (0.1%) |
| Asthma | 48,285 (6.0%) | 29,443 (5.9%) | 17,946 (5.6%) | 3,926 (6.4%) | 72,556 (4.7%) |
| Atrial fibrillation | 6,446 (0.8%) | 4,861 (1.0%) | 6,061 (1.9%) | 814 (1.3%) | 15,711 (1.0%) |
| Malignant neoplastic disease | 42,501 (5.3%) | 31,472 (6.3%) | 31,144 (9.7%) | 4,136 (6.7%) | 95,540 (6.2%) |
| Diabetes mellitus | 59,778 (7.5%) | 40,591 (8.1%) | 41,502 (12.9%) | 6,339 (10.3%) | 140,088 (9.0%) |
| Obesity | 165,182 (20.6%) | 109,441 (21.9%) | 87,616 (27.3%) | 15,824 (25.7%) | 308,574 (19.9%) |
| Heart disease | 61,830 (7.7%) | 44,040 (8.8%) | 44,163 (13.8%) | 6,011 (9.8%) | 129,787 (8.4%) |
| Hypertensive disorder | 148,009 (18.5%) | 107,453 (21.5%) | 107,140 (33.4%) | 13,813 (22.5%) | 360,110 (23.2%) |
| Renal impairment | 12,286 (1.5%) | 9,220 (1.8%) | 9,815 (3.1%) | 1,680 (2.7%) | 29,642 (1.9%) |
| COPD | 17,477 (2.2%) | 13,277 (2.7%) | 15,790 (4.9%) | 1,552 (2.5%) | 44,823 (2.9%) |
| Dementia | 1,118 (0.1%) | 961 (0.2%) | 482 (0.2%) | 148 (0.2%) | 2,175 (0.1%) |
| Medication use (183 days prior to four days prior) | | | | | |
| Non-steroidal anti-inflammatory drugs | 193,704 (24.2%) | 121,533 (24.3%) | 80,086 (24.9%) | 17,333 (28.2%) | 423,376 (27.3%) |
| Cox2 inhibitors | 7,521 (0.9%) | 5,249 (1.0%) | 3,847 (1.2%) | 542 (0.9%) | 12,001 (0.8%) |
| Systemic corticosteroids | 36,728 (4.6%) | 23,721 (4.7%) | 16,693 (5.2%) | 3,483 (5.7%) | 81,102 (5.2%) |

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|---|-----------------|-----------------|-----------------|----------------|-----------------|
| Antithrombotic and anticoagulant therapies | 15,410 (1.9%) | 10,190 (2.0%) | 8,929 (2.8%) | 1,479 (2.4%) | 31,153 (2.0%) |
| Lipid modifying agents | 16,518 (2.1%) | 12,138 (2.4%) | 10,385 (3.2%) | 1,171 (1.9%) | 35,894 (2.3%) |
| Antineoplastic and immunomodulating agents | 7,285 (0.9%) | 4,800 (1.0%) | 3,299 (1.0%) | 655 (1.1%) | 13,599 (0.9%) |
| Hormonal contraceptives for systemic use | 3,809 (0.5%) | 1,713 (0.3%) | 343 (0.1%) | 296 (0.5%) | 4,973 (0.3%) |
| Tamoxifen | 447 (0.1%) | 310 (0.1%) | 133 (0.0%) | 36 (0.1%) | 674 (0.0%) |
| Sex hormones and modulators of the genital system | 6,125 (0.8%) | 3,426 (0.7%) | 1,393 (0.4%) | 447 (0.7%) | 8,668 (0.6%) |
| One or more condition of interest | 241,118 (30.1%) | 162,284 (32.4%) | 134,534 (41.9%) | 22,865 (37.2%) | 480,938 (31.0%) |
| One or more medication of interest | 208,119 (26.0%) | 130,613 (26.1%) | 85,991 (26.8%) | 18,560 (30.2%) | 450,772 (29.1%) |
| One or more condition/ medication of interest | 367,114 (45.8%) | 238,432 (47.7%) | 176,719 (55.0%) | 32,812 (53.4%) | 747,873 (48.2%) |

Participants aged 65 or older

| | BNT162b2 first-dose | BNT162b2 second-dose | ChAdOx1 first-dose | COVID-19 diagnosis | General population (index date: 1st December) |
|------------------------------------|--------------------------------|---------------------------------|---------------------------|---------------------------|--|
| N | 757,033 | 730,457 | 187,926 | 37,625 | 1,069,544 |
| Age | 78 [73 to 84] | 78 [73 to 84] | 67 [66 to 68] | 77 [70 to 85] | 75 [69 to 82] |
| Age: 60 to 69 | 40,365 (5.3%) | 34,378 (4.7%) | 187,836 (100.0%) | 8,261 (22.0%) | 286,680 (26.8%) |
| Age: 70 to 79 | 401,584 (53.0%) | 389,924 (53.4%) | 86 (0.0%) | 13,797 (36.7%) | 428,023 (40.0%) |
| Age: 80 or older | 315,084 (41.6%) | 306,155 (41.9%) | <5 | 15,567 (41.4%) | 354,841 (33.2%) |
| Sex: Male | 313,787 (41.4%) | 302,951 (41.5%) | 89,627 (47.7%) | 16,581 (44.1%) | 457,916 (42.8%) |
| Years of prior observation time | 15.3 [15.2 to 15.3] | 15.3 [15.3 to 15.4] | 15.3 [15.3 to 15.3] | 14.9 [14.8 to 15.1] | 11.0 [11.0 to 11.0] |
| Comorbidities | | | | | |
| Autoimmune disease | 30,852 (4.1%) | 29,669 (4.1%) | 5,428 (2.9%) | 1,702 (4.5%) | 34,461 (3.2%) |
| Antiphospholipid syndrome | 540 (0.1%) | 525 (0.1%) | 99 (0.1%) | 26 (0.1%) | 213 (0.0%) |

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|--|-----------------|-----------------|----------------|----------------|-----------------|
| Thrombophilia | 1,076 (0.1%) | 1,027 (0.1%) | 180 (0.1%) | 73 (0.2%) | 622 (0.1%) |
| Asthma | 56,166 (7.4%) | 54,183 (7.4%) | 10,938 (5.8%) | 3,104 (8.2%) | 66,856 (6.3%) |
| Atrial fibrillation | 104,488 (13.8%) | 100,524 (13.8%) | 7,518 (4.0%) | 6,423 (17.1%) | 119,497 (11.2%) |
| Malignant neoplastic disease | 192,806 (25.5%) | 186,567 (25.5%) | 27,729 (14.8%) | 10,170 (27.0%) | 219,053 (20.5%) |
| Diabetes mellitus | 208,372 (27.5%) | 201,300 (27.6%) | 36,797 (19.6%) | 11,856 (31.5%) | 275,512 (25.8%) |
| Obesity | 293,724 (38.8%) | 284,056 (38.9%) | 64,993 (34.6%) | 15,616 (41.5%) | 352,441 (33.0%) |
| Heart disease | 329,182 (43.5%) | 318,215 (43.6%) | 40,652 (21.6%) | 17,686 (47.0%) | 388,899 (36.4%) |
| Hypertensive disorder | 538,892 (71.2%) | 521,136 (71.3%) | 91,685 (48.8%) | 26,838 (71.3%) | 716,377 (67.0%) |
| Renal impairment | 180,986 (23.9%) | 174,741 (23.9%) | 11,337 (6.0%) | 10,829 (28.8%) | 192,676 (18.0%) |
| COPD | 90,561 (12.0%) | 87,091 (11.9%) | 14,311 (7.6%) | 5,537 (14.7%) | 115,592 (10.8%) |
| Dementia | 54,058 (7.1%) | 51,778 (7.1%) | 711 (0.4%) | 5,136 (13.7%) | 69,729 (6.5%) |
| Medication use (183 days prior to four days prior) | | | | | |
| Non-steroidal anti-inflammatory drugs | 217,518 (28.7%) | 210,762 (28.9%) | 50,996 (27.1%) | 12,325 (32.8%) | 365,538 (34.2%) |
| Cox2 inhibitors | 7,800 (1.0%) | 7,659 (1.0%) | 2,407 (1.3%) | 351 (0.9%) | 10,818 (1.0%) |

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| Systemic corticosteroids | 73,841 (9.8%) | 71,755 (9.8%) | 12,862 (6.8%) | 4,163 (11.1%) | 106,964 (10.0%) |
| Antithrombotic and anticoagulant therapies | 49,912 (6.6%) | 47,079 (6.4%) | 7,353 (3.9%) | 3,428 (9.1%) | 63,349 (5.9%) |
| Lipid modifying agents | 27,228 (3.6%) | 26,445 (3.6%) | 7,802 (4.2%) | 1,322 (3.5%) | 38,379 (3.6%) |
| Antineoplastic and immunomodulating agents | 11,469 (1.5%) | 11,135 (1.5%) | 2,090 (1.1%) | 619 (1.6%) | 15,733 (1.5%) |
| Hormonal contraceptives for systemic use | 945 (0.1%) | 873 (0.1%) | 31 (0.0%) | 119 (0.3%) | 1,718 (0.2%) |
| Tamoxifen | 196 (0.0%) | 197 (0.0%) | 43 (0.0%) | 11 (0.0%) | 282 (0.0%) |
| Sex hormones and modulators of the genital system | 2,790 (0.4%) | 2,684 (0.4%) | 612 (0.3%) | 199 (0.5%) | 3,870 (0.4%) |
| One or more condition of interest | 553,175 (73.1%) | 534,669 (73.2%) | 102,943 (54.8%) | 28,692 (76.3%) | 704,720 (65.9%) |
| One or more medication of interest | 242,064 (32.0%) | 234,766 (32.1%) | 55,068 (29.3%) | 13,639 (36.2%) | 397,835 (37.2%) |
| One or more condition/ medication of interest | 608,146 (80.3%) | 588,107 (80.5%) | 123,975 (66.0%) | 31,290 (83.2%) | 820,101 (76.7%) |

Supplementary Table 2. Observed versus expected events among people vaccinated against SARS-CoV-2 or with a diagnosis of COVID-19, without requiring year of prior history

For each event of interest, the number of people contributing to the analysis from the target population, their person-years contributed, and the number of observed events are given. Expected events are estimated using indirect standardization to the general population. Standardized incidence ratios (SIRs) with 95% confidence intervals (CIs) were estimated. Events with fewer than 5 occurrences were omitted.

| | N | Person-years | Observed events | Expected events | SIR (95% CI) |
|--------------------------------|-----------|---------------------|------------------------|------------------------|---------------------|
| Deep vein thrombosis | | | | | |
| ChAdOx1 first-dose | 592,808 | 34,054 | 39 | 43.9 | 0.89 (0.65 to 1.22) |
| BNT162b2 first-dose | 2,030,008 | 100,883 | 184 | 177 | 1.04 (0.90 to 1.20) |
| BNT162b2 second-dose | 1,329,708 | 78,566 | 130 | 163 | 0.80 (0.67 to 0.95) |
| Immune thrombocytopenia | | | | | |
| ChAdOx1 first-dose | 593,128 | 34,073 | 12 | 24.9 | 0.48 (0.27 to 0.85) |
| BNT162b2 first-dose | 2,031,429 | 100,963 | 97 | 94.5 | 1.03 (0.84 to 1.25) |
| BNT162b2 second-dose | 1,330,920 | 78,639 | 61 | 89.1 | 0.68 (0.53 to 0.88) |
| Ischemic stroke | | | | | |
| ChAdOx1 first-dose | 592,072 | 34,010 | 107 | 96 | 1.11 (0.92 to 1.35) |
| BNT162b2 first-dose | 2,024,431 | 100,557 | 525 | 532.9 | 0.99 (0.90 to 1.07) |
| BNT162b2 second-dose | 1,324,691 | 78,260 | 516 | 513.1 | 1.01 (0.92 to 1.10) |
| Myocardial infarction | | | | | |

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| ChAdOx1 first-dose | 592,221 | 34,019 | 72 | 76.5 | 0.94 (0.75 to 1.19) |
| BNT162b2 first-dose | 2,028,962 | 100,822 | 281 | 268.1 | 1.05 (0.93 to 1.18) |
| BNT162b2 second-dose | 1,328,821 | 78,509 | 272 | 247.9 | 1.10 (0.97 to 1.24) |
| Myocardial infarction or ischemic stroke | | | | | |
| ChAdOx1 first-dose | 590,888 | 33,940 | 179 | 169 | 1.06 (0.91 to 1.23) |
| BNT162b2 first-dose | 2,020,172 | 100,314 | 796 | 784 | 1.02 (0.95 to 1.09) |
| BNT162b2 second-dose | 1,321,026 | 78,037 | 775 | 744.6 | 1.04 (0.97 to 1.12) |
| Myocardial infarction or ischemic stroke with thrombocytopenia | | | | | |
| ChAdOx1 first-dose | 593,223 | 34,078 | 9 | 11.7 | 0.77 (0.40 to 1.48) |
| BNT162b2 first-dose | 2,032,104 | 101,001 | 53 | 62.2 | 0.85 (0.65 to 1.12) |
| BNT162b2 second-dose | 1,331,472 | 78,671 | 59 | 60 | 0.98 (0.76 to 1.27) |
| Pulmonary embolism | | | | | |
| ChAdOx1 first-dose | 592,968 | 34,063 | 24 | 30.8 | 0.78 (0.52 to 1.16) |
| BNT162b2 first-dose | 2,030,489 | 100,909 | 154 | 123.7 | 1.25 (1.06 to 1.46) |
| BNT162b2 second-dose | 1,330,172 | 78,593 | 117 | 116.2 | 1.01 (0.84 to 1.21) |
| Stroke | | | | | |

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| ChAdOx1 first-dose | 591,940 | 34,002 | 111 | 112.3 | 0.99 (0.82 to 1.19) |
| BNT162b2 first-dose | 2,023,548 | 100,506 | 583 | 620.7 | 0.94 (0.87 to 1.02) |
| BNT162b2 second-dose | 1,323,945 | 78,214 | 588 | 595.9 | 0.99 (0.91 to 1.07) |
| Stroke with thrombocytopenia | | | | | |
| BNT162b2 first-dose | 2,032,387 | 101,017 | 39 | 46.5 | 0.84 (0.61 to 1.15) |
| BNT162b2 second-dose | 1,331,736 | 78,687 | 41 | 45 | 0.91 (0.67 to 1.24) |
| Thrombocytopenia | | | | | |
| ChAdOx1 first-dose | 579,728 | 33,281 | 756 | 589.9 | 1.28 (1.19 to 1.38) |
| BNT162b2 first-dose | 1,964,102 | 97,139 | 3,198 | 2,152.70 | 1.49 (1.43 to 1.54) |
| BNT162b2 second-dose | 1,270,019 | 74,987 | 2,760 | 1,968.70 | 1.40 (1.35 to 1.46) |
| Venous thromboembolism | | | | | |
| ChAdOx1 first-dose | 592,514 | 34,037 | 60 | 65.6 | 0.91 (0.71 to 1.18) |
| BNT162b2 first-dose | 2,028,012 | 100,768 | 315 | 265.5 | 1.19 (1.06 to 1.32) |
| BNT162b2 second-dose | 1,328,020 | 78,463 | 228 | 246.8 | 0.92 (0.81 to 1.05) |
| Venous thromboembolism with thrombocytopenia | | | | | |
| ChAdOx1 first-dose | 593,305 | 34,083 | 8 | 6.2 | 1.28 (0.64 to 2.56) |

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|----------------------|-----------|---------|----|------|---------------------|
| BNT162b2 first-dose | 2,032,684 | 101,034 | 27 | 21.7 | 1.24 (0.85 to 1.81) |
| BNT162b2 second-dose | 1,332,016 | 78,704 | 20 | 20.4 | 0.98 (0.63 to 1.52) |

Supplementary Table 3. Observed versus expected events among people vaccinated against SARS-CoV-2 or with a diagnosis of COVID-19, stratified by calendar time

For each event of interest, the number of people contributing to the analysis from the target population, their person-years contributed, and the number of observed events are given. Expected events are estimated using indirect standardization to the general population. Standardized incidence ratios (SIRs) with 95% confidence intervals (CIs) were estimated. Events with fewer than 5 occurrences were omitted.

| | Study period | N | Person-years | Observed events | Expected events | SIR (95% CI) |
|--------------------------------|---------------------|-----------|---------------------|------------------------|------------------------|---------------------|
| Deep vein thrombosis | | | | | | |
| ChAdOx1 first-dose | From March | 523,617 | 30,078 | 37 | 41.9 | 0.88 (0.64 to 1.22) |
| BNT162b2 first-dose | Before March | 255,401 | 14,654 | 36 | 26 | 1.38 (1.00 to 1.92) |
| BNT162b2 first-dose | From March | 1,762,585 | 85,726 | 146 | 150.4 | 0.97 (0.83 to 1.14) |
| BNT162b2 second-dose | Before March | 134,172 | 8,080 | 7 | 10.7 | 0.65 (0.31 to 1.37) |
| BNT162b2 second-dose | From March | 1,190,254 | 70,172 | 123 | 151.8 | 0.81 (0.68 to 0.97) |
| Immune thrombocytopenia | | | | | | |
| ChAdOx1 first-dose | From March | 523,915 | 30,096 | 12 | 24.1 | 0.50 (0.28 to 0.88) |
| BNT162b2 first-dose | Before March | 255,509 | 14,661 | 28 | 13.2 | 2.13 (1.47 to 3.08) |
| BNT162b2 first-dose | From March | 1,763,886 | 85,799 | 69 | 81.1 | 0.85 (0.67 to 1.08) |
| BNT162b2 second-dose | From March | 134,201 | 8,082 | 7 | 5.3 | 1.31 (0.62 to 2.75) |
| Ischemic stroke | | | | | | |

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|---|--------------|-----------|--------|-----|-------|---------------------|
| ChAdOx1 first-dose | Before March | 67,000 | 3,851 | 5 | 9 | 0.56 (0.23 to 1.34) |
| ChAdOx1 first-dose | From March | 522,870 | 30,034 | 101 | 93.2 | 1.08 (0.89 to 1.32) |
| BNT162b2 first-dose | Before March | 253,789 | 14,560 | 112 | 84.7 | 1.32 (1.10 to 1.59) |
| BNT162b2 first-dose | From March | 1,758,645 | 85,495 | 409 | 445.8 | 0.92 (0.83 to 1.01) |
| BNT162b2 second-dose | Before March | 133,432 | 8,036 | 31 | 31.5 | 0.98 (0.69 to 1.40) |
| BNT162b2 second-dose | From March | 1,185,997 | 69,912 | 484 | 479.5 | 1.01 (0.92 to 1.10) |
| Myocardial infarction | | | | | | |
| ChAdOx1 first-dose | From March | 523,018 | 30,043 | 71 | 73.3 | 0.97 (0.77 to 1.22) |
| BNT162b2 first-dose | Before March | 255,458 | 14,658 | 41 | 38.8 | 1.06 (0.78 to 1.44) |
| BNT162b2 first-dose | From March | 1,761,492 | 85,663 | 239 | 228.5 | 1.05 (0.92 to 1.19) |
| BNT162b2 second-dose | Before March | 134,279 | 8,086 | 18 | 16.2 | 1.11 (0.70 to 1.77) |
| BNT162b2 second-dose | From March | 1,189,264 | 70,111 | 254 | 231.1 | 1.10 (0.97 to 1.24) |
| Myocardial infarction or ischemic stroke | | | | | | |
| ChAdOx1 first-dose | Before March | 66,990 | 3,850 | 6 | 14 | 0.43 (0.19 to 0.95) |
| ChAdOx1 first-dose | From March | 521,699 | 29,965 | 172 | 163.1 | 1.05 (0.91 to 1.22) |
| BNT162b2 first-dose | Before March | 253,263 | 14,529 | 150 | 120.7 | 1.24 (1.06 to 1.46) |
| BNT162b2 first-dose | From March | 1,754,933 | 85,285 | 643 | 660 | 0.97 (0.90 to 1.05) |

| | | | | | | |
|---|--------------|-----------|--------|-----|-------|---------------------|
| BNT162b2 second-dose | Before March | 133,302 | 8,028 | 46 | 46.6 | 0.99 (0.74 to 1.32) |
| BNT162b2 second-dose | From March | 1,182,475 | 69,698 | 728 | 695.3 | 1.05 (0.97 to 1.13) |
| Myocardial infarction or ischemic stroke with thrombocytopenia | | | | | | |
| ChAdOx1 first-dose | From March | 524,007 | 30,101 | 8 | 11.4 | 0.70 (0.35 to 1.40) |
| BNT162b2 first-dose | Before March | 255,692 | 14,672 | 17 | 9.7 | 1.75 (1.09 to 2.82) |
| BNT162b2 first-dose | From March | 1,764,382 | 85,826 | 36 | 52.3 | 0.69 (0.50 to 0.95) |
| BNT162b2 second-dose | From March | 1,191,875 | 70,269 | 56 | 56.2 | 1.00 (0.77 to 1.29) |
| Pulmonary embolism | | | | | | |
| ChAdOx1 first-dose | From March | 523,765 | 30,087 | 22 | 29.7 | 0.74 (0.49 to 1.12) |
| BNT162b2 first-dose | Before March | 255,440 | 14,657 | 31 | 18 | 1.72 (1.21 to 2.45) |
| BNT162b2 first-dose | From March | 1,763,026 | 85,750 | 123 | 105.2 | 1.17 (0.98 to 1.40) |
| BNT162b2 second-dose | Before March | 134,183 | 8,081 | 9 | 7.2 | 1.25 (0.65 to 2.40) |
| BNT162b2 second-dose | From March | 1,190,707 | 70,199 | 107 | 108.5 | 0.99 (0.82 to 1.19) |
| Stroke | | | | | | |
| ChAdOx1 first-dose | Before March | 66,996 | 3,850 | 5 | 10.7 | 0.47 (0.19 to 1.12) |
| ChAdOx1 first-dose | From March | 522,745 | 30,026 | 105 | 108.8 | 0.97 (0.80 to 1.17) |

| | | | | | | |
|-------------------------------------|--------------|-----------|--------|-------|----------|---------------------|
| BNT162b2 first-dose | Before March | 253,562 | 14,547 | 127 | 98.4 | 1.29 (1.08 to 1.54) |
| BNT162b2 first-dose | From March | 1,757,992 | 85,458 | 450 | 519.5 | 0.87 (0.79 to 0.95) |
| BNT162b2 second-dose | Before March | 133,361 | 8,032 | 36 | 36.8 | 0.98 (0.71 to 1.36) |
| BNT162b2 second-dose | From March | 1,185,324 | 69,871 | 551 | 556.7 | 0.99 (0.91 to 1.08) |
| Stroke with thrombocytopenia | | | | | | |
| BNT162b2 first-dose | Before March | 255,749 | 14,675 | 13 | 7.5 | 1.74 (1.01 to 2.99) |
| BNT162b2 first-dose | From March | 1,764,605 | 85,839 | 26 | 38.9 | 0.67 (0.46 to 0.98) |
| BNT162b2 second-dose | From March | 1,192,127 | 70,285 | 39 | 42 | 0.93 (0.68 to 1.27) |
| Thrombocytopenia | | | | | | |
| ChAdOx1 first-dose | Before March | 66,560 | 3,825 | 29 | 50.2 | 0.58 (0.40 to 0.83) |
| ChAdOx1 first-dose | From March | 510,974 | 29,331 | 725 | 559.4 | 1.30 (1.21 to 1.39) |
| BNT162b2 first-dose | Before March | 242,978 | 13,927 | 612 | 315.7 | 1.94 (1.79 to 2.10) |
| BNT162b2 first-dose | From March | 1,709,196 | 82,714 | 2,574 | 1,829.70 | 1.41 (1.35 to 1.46) |
| BNT162b2 second-dose | Before March | 129,268 | 7,783 | 244 | 134.8 | 1.81 (1.60 to 2.05) |
| BNT162b2 second-dose | From March | 1,135,530 | 66,895 | 2,505 | 1,828.50 | 1.37 (1.32 to 1.42) |
| Venous thromboembolism | | | | | | |
| ChAdOx1 first-dose | From March | 523,332 | 30,061 | 56 | 62.9 | 0.89 (0.69 to 1.16) |

| | | | | | | |
|---|--------------|-----------|--------|-----|-------|---------------------|
| BNT162b2 first-dose | Before March | 254,999 | 14,631 | 63 | 39.1 | 1.61 (1.26 to 2.06) |
| BNT162b2 first-dose | From March | 1,761,000 | 85,636 | 250 | 225.5 | 1.11 (0.98 to 1.25) |
| BNT162b2 second-dose | Before March | 134,008 | 8,070 | 14 | 15.9 | 0.88 (0.52 to 1.48) |
| BNT162b2 second-dose | From March | 1,188,739 | 70,081 | 213 | 230.2 | 0.93 (0.81 to 1.06) |
| Venous thromboembolism with thrombocytopenia | | | | | | |
| ChAdOx1 first-dose | From March | 524,089 | 30,106 | 7 | 6.1 | 1.15 (0.55 to 2.41) |
| BNT162b2 first-dose | From March | 1,764,790 | 85,849 | 23 | 18.6 | 1.24 (0.82 to 1.86) |
| BNT162b2 second-dose | From March | 1,192,373 | 70,300 | 19 | 19.1 | 0.99 (0.63 to 1.56) |

Supplementary Table 4. Observed versus expected events among people vaccinated against SARS-CoV-2 or with a diagnosis of COVID-19, excluding vaccinated persons with a history of COVID-19

For each event of interest, the number of people contributing to the analysis from the target population, their person-years contributed, and the number of observed events are given. Expected events are estimated using indirect standardization to the general population. Standardized incidence ratios (SIRs) with 95% confidence intervals (CIs) were estimated. Events with fewer than 5 occurrences were omitted.

| | N | Person-years | Observed events | Expected events | SIR (95% CI) |
|--------------------------------|-----------|---------------------|------------------------|------------------------|---------------------|
| Deep vein thrombosis | | | | | |
| ChAdOx1 first-dose | 592,808 | 34,054 | 39 | 43.9 | 0.89 (0.65 to 1.22) |
| BNT162b2 first-dose | 2,030,008 | 100,883 | 184 | 177 | 1.04 (0.90 to 1.20) |
| BNT162b2 second-dose | 1,329,708 | 78,566 | 130 | 163 | 0.80 (0.67 to 0.95) |
| Immune thrombocytopenia | | | | | |
| ChAdOx1 first-dose | 593,128 | 34,073 | 12 | 24.9 | 0.48 (0.27 to 0.85) |
| BNT162b2 first-dose | 2,031,429 | 100,963 | 97 | 94.5 | 1.03 (0.84 to 1.25) |
| BNT162b2 second-dose | 1,330,920 | 78,639 | 61 | 89.1 | 0.68 (0.53 to 0.88) |
| Ischemic stroke | | | | | |
| ChAdOx1 first-dose | 592,072 | 34,010 | 107 | 96 | 1.11 (0.92 to 1.35) |
| BNT162b2 first-dose | 2,024,431 | 100,557 | 525 | 532.9 | 0.99 (0.90 to 1.07) |
| BNT162b2 second-dose | 1,324,691 | 78,260 | 516 | 513.1 | 1.01 (0.92 to 1.10) |

| | | | | | |
|---|----------------------|-----------|---------|-------|---------------------|
| Myocardial infarction | | | | | |
| ChAdOx1 first-dose | 592,221 | 34,019 | 72 | 76.5 | 0.94 (0.75 to 1.19) |
| BNT162b2 first-dose | 2,028,962 | 100,822 | 281 | 268.1 | 1.05 (0.93 to 1.18) |
| BNT162b2 second-dose | 1,328,821 | 78,509 | 272 | 247.9 | 1.10 (0.97 to 1.24) |
| Myocardial infarction or ischemic stroke | | | | | |
| ChAdOx1 first-dose | 590,888 | 33,940 | 179 | 169 | 1.06 (0.91 to 1.23) |
| BNT162b2 first-dose | 2,020,172 | 100,314 | 796 | 784 | 1.02 (0.95 to 1.09) |
| BNT162b2 second-dose | 1,321,026 | 78,037 | 775 | 744.6 | 1.04 (0.97 to 1.12) |
| Myocardial infarction or ischemic stroke with thrombocytopenia | | | | | |
| ChAdOx1 first-dose | 593,223 | 34,078 | 9 | 11.7 | 0.77 (0.40 to 1.48) |
| BNT162b2 first-dose | 2,032,104 | 101,001 | 53 | 62.2 | 0.85 (0.65 to 1.12) |
| BNT162b2 second-dose | 1,331,472 | 78,671 | 59 | 60 | 0.98 (0.76 to 1.27) |
| Pulmonary embolism | | | | | |
| ChAdOx1 first-dose | ChAdOx1 first-dose | 592,968 | 34,063 | 24 | 30.8 |
| BNT162b2 first-dose | BNT162b2 first-dose | 2,030,489 | 100,909 | 154 | 123.7 |
| BNT162b2 second-dose | BNT162b2 second-dose | 1,330,172 | 78,593 | 117 | 116.2 |
| Stroke | | | | | |

| | | | | | |
|---|-----------|---------|-------|----------|---------------------|
| ChAdOx1 first-dose | 591,940 | 34,002 | 111 | 112.3 | 0.99 (0.82 to 1.19) |
| BNT162b2 first-dose | 2,023,548 | 100,506 | 583 | 620.7 | 0.94 (0.87 to 1.02) |
| BNT162b2 second-dose | 1,323,945 | 78,214 | 588 | 595.9 | 0.99 (0.91 to 1.07) |
| Stroke with thrombocytopenia | | | | | |
| BNT162b2 first-dose | 2,032,387 | 101,017 | 39 | 46.5 | 0.84 (0.61 to 1.15) |
| BNT162b2 second-dose | 1,331,736 | 78,687 | 41 | 45 | 0.91 (0.67 to 1.24) |
| Thrombocytopenia | | | | | |
| ChAdOx1 first-dose | 579,728 | 33,281 | 756 | 589.9 | 1.28 (1.19 to 1.38) |
| BNT162b2 first-dose | 1,964,102 | 97,139 | 3,198 | 2,152.70 | 1.49 (1.43 to 1.54) |
| BNT162b2 second-dose | 1,270,019 | 74,987 | 2,760 | 1,968.70 | 1.40 (1.35 to 1.46) |
| Venous thromboembolism | | | | | |
| ChAdOx1 first-dose | 592,514 | 34,037 | 60 | 65.6 | 0.91 (0.71 to 1.18) |
| BNT162b2 first-dose | 2,028,012 | 100,768 | 315 | 265.5 | 1.19 (1.06 to 1.32) |
| BNT162b2 second-dose | 1,328,020 | 78,463 | 228 | 246.8 | 0.92 (0.81 to 1.05) |
| Venous thromboembolism with thrombocytopenia | | | | | |
| ChAdOx1 first-dose | 593,305 | 34,083 | 8 | 6.2 | 1.28 (0.64 to 2.56) |
| BNT162b2 first-dose | 2,032,684 | 101,034 | 27 | 21.7 | 1.24 (0.85 to 1.81) |

| | | | | | |
|----------------------|-----------|--------|----|------|---------------------|
| BNT162b2 second-dose | 1,332,016 | 78,704 | 20 | 20.4 | 0.98 (0.63 to 1.52) |
|----------------------|-----------|--------|----|------|---------------------|