

## Supplementary Appendix

### IMPACT OF COVID-19 VACCINATION ON COVID-19 ADMISSIONS IN ENGLAND DURING 2021

#### An observational study

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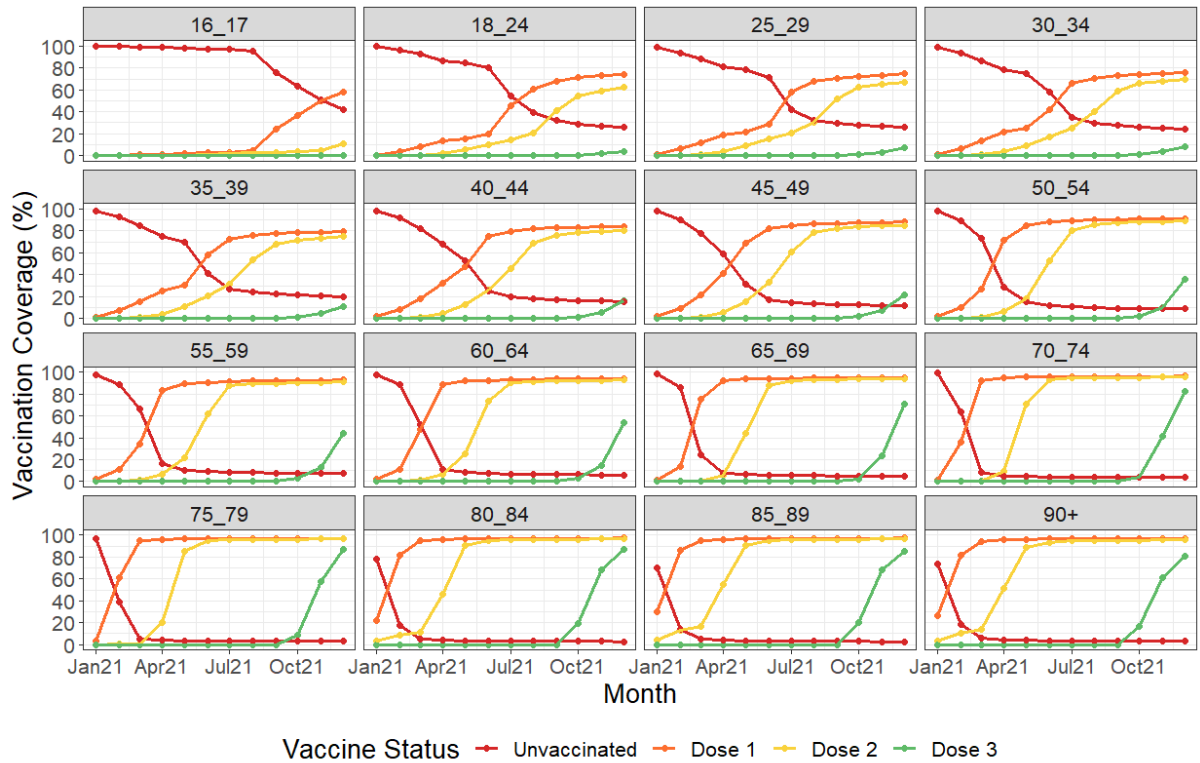
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## Supplementary Appendix

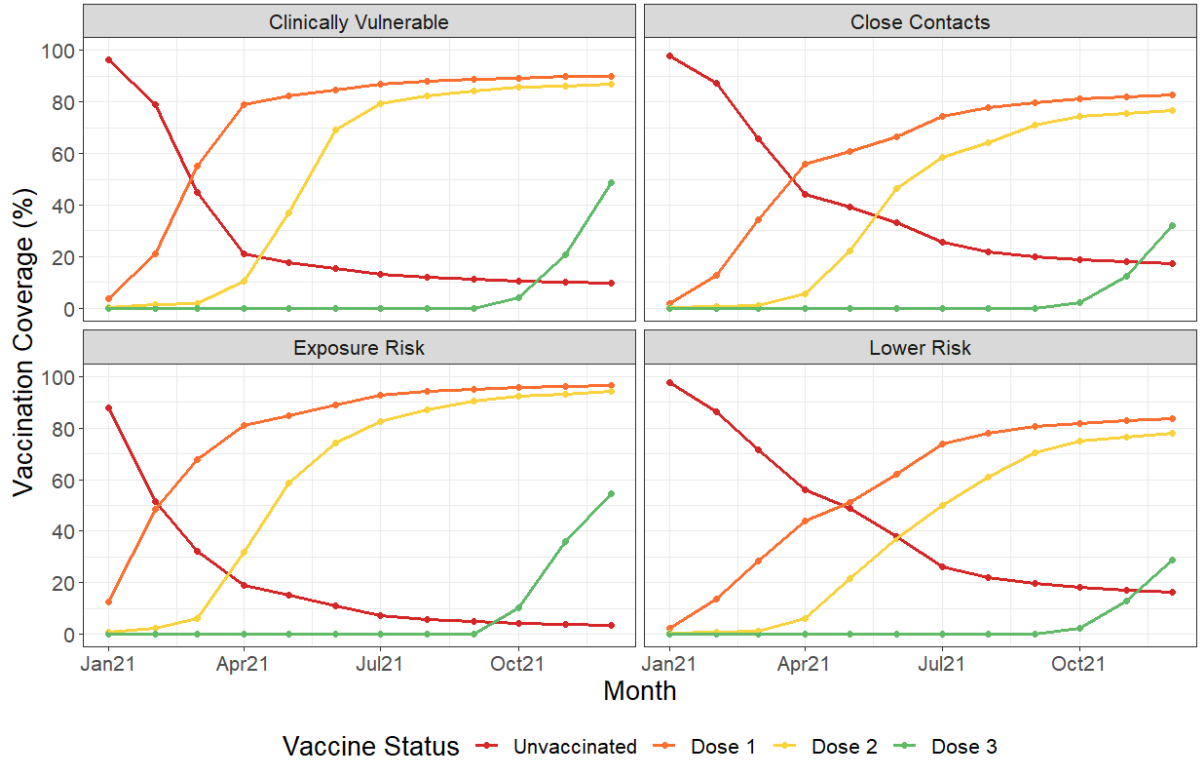
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**Supplementary Figure 1: Vaccination coverage of English population aged 16 and above by age group, January to December 2021.**



**Supplementary Figure 2: Vaccination coverage of English population aged 16 and above by risk group, January to December 2021.**



**Supplementary Table 1: NHS confirmed population adjustment population table**

This table shows how the number of registered patients in mid-2021, and the number of these that had recent NHS contact (the numerator used in the analysis), as compared to ONS estimates of the English population.

ONS estimates population estimates are mid-year estimates for the year 2020 (the most recent estimates available at the time of analysis) [18]. Age in the ONS data has been offset by +2 years to align with the age of patients in the GP-register data (which shows the age at the time of data extraction, in mid-2022).

Age Band	ONS Estimate	All Registered Patients	Patients with recent NHS contact
16-17	1,301,781	1,353,541	1,279,039
18-24	4,504,973	4,906,147	4,650,019
25-29	3,663,874	4,188,967	3,854,311
30-34	3,863,161	4,610,478	4,218,202
35-39	3,760,672	4,459,668	4,068,722
40-44	3,634,598	4,174,881	3,843,648
45-49	3,440,223	3,849,576	3,607,406
50-54	3,841,135	4,160,916	3,984,486
55-59	3,882,290	4,107,123	3,977,392
60-64	3,429,417	3,567,186	3,480,913
65-69	2,914,431	2,960,522	2,908,068
70-74	2,782,134	2,781,592	2,748,576
75-79	2,444,402	2,341,800	2,322,374
80-84	1,612,686	1,541,146	1,529,652
85-89	1,109,421	1,008,067	1,001,157
90+	814,481	647,706	640,304
<b>Total</b>	<b>46,999,679</b>	<b>50,659,316</b>	<b>48,114,269</b>

**Supplementary Table 2: Admission rates (AR) per 100,000 person-days by vaccination status, January to December 2021.**

Admission rates were directly standardised for age group, sex, and risk group.

Month	Vaccine Status	Admissions	Days Alive	AR per 100,000 person-days	
				AR	95% CI
<b>01/01/2021</b>	Unvaccinated	66,833	1,452,271,240	4.930	(4.892 to 4.967)
	Dose 1	3,092	42,274,683	3.763	(3.409 to 4.144)
	Dose 2	62	4,831,144	0.131	(0.095 to 0.176)
	All Vaccinated	3,154	47,105,827	3.507	(3.174 to 3.865)
<b>01/02/2021</b>	Unvaccinated	17,886	1,116,316,702	2.653	(2.601 to 2.706)
	Dose 1	4,858	222,879,380	1.122	(1.062 to 1.184)
	Dose 2	63	13,374,486	0.175	(0.065 to 0.377)
	All Vaccinated	4,921	236,254,283	1.073	(1.015 to 1.134)
<b>01/03/2021</b>	Unvaccinated	3,991	949,637,071	1.007	(0.952 to 1.065)
	Dose 1	2,142	522,461,639	0.249	(0.234 to 0.266)
	Dose 2	46	23,894,017	0.049	(0.017 to 0.109)
	All Vaccinated	2,188	546,359,441	0.238	(0.223 to 0.254)
<b>01/04/2021</b>	Unvaccinated	1,111	667,447,146	0.451	(0.410 to 0.496)
	Dose 1	754	654,378,201	0.090	(0.082 to 0.098)
	Dose 2	82	124,720,026	0.043	(0.027 to 0.064)
	All Vaccinated	836	779,117,425	0.074	(0.068 to 0.081)
<b>01/05/2021</b>	Unvaccinated	872	595,861,740	0.344	(0.302 to 0.391)
	Dose 1	305	493,851,560	0.078	(0.065 to 0.093)
	Dose 2	166	403,822,623	0.025	(0.018 to 0.033)
	All Vaccinated	471	897,728,144	0.042	(0.037 to 0.046)
<b>01/06/2021</b>	Unvaccinated	2,367	451,952,153	0.980	(0.920 to 1.044)
	Dose 1	520	322,123,695	0.307	(0.260 to 0.359)
	Dose 2	809	670,108,143	0.079	(0.071 to 0.087)
	All Vaccinated	1,329	992,336,913	0.115	(0.108 to 0.122)
<b>01/07/2021</b>	Unvaccinated	7,891	332,313,334	4.326	(4.192 to 4.464)
	Dose 1	1,091	287,105,944	1.366	(1.232 to 1.510)
	Dose 2	4,661	871,641,389	0.384	(0.371 to 0.398)
	All Vaccinated	5,752	1,158,945,706	0.435	(0.423 to 0.446)
<b>01/08/2021</b>	Unvaccinated	7,410	281,160,474	5.213	(5.053 to 5.376)
	Dose 1	765	210,239,413	1.587	(1.428 to 1.759)
	Dose 2	6,933	998,435,034	0.523	(0.510 to 0.536)
	All Vaccinated	7,698	1,208,674,447	0.560	(0.547 to 0.573)
<b>01/09/2021</b>	Unvaccinated	4,926	243,938,596	4.057	(3.912 to 4.207)
	Dose 1	459	120,675,906	1.380	(1.221 to 1.554)
	Dose 2	7,685	1,076,001,940	0.584	(0.570 to 0.597)
	All Vaccinated	8,144	1,196,677,846	0.605	(0.592 to 0.619)
<b>01/10/2021</b>	Unvaccinated	4,758	235,202,058	3.981	(3.833 to 4.133)
	Dose 1	461	89,330,139	1.601	(1.419 to 1.800)
	Dose 2	9,430	1,117,173,092	0.758	(0.742 to 0.773)
	Dose 3	295	46,100,120	0.328	(0.269 to 0.396)
	All Vaccinated	10,186	1,252,603,351	0.731	(0.717 to 0.745)
<b>01/11/2021</b>	Unvaccinated	4,899	214,861,977	4.623	(4.446 to 4.804)
	Dose 1	414	79,470,564	1.779	(1.565 to 2.014)
	Dose 2	7,159	916,008,348	0.984	(0.959 to 1.009)

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	Dose 3	1,059	228,284,932	0.245	(0.223 to 0.269)
	All Vaccinated	8,632	1,223,763,844	0.644	(0.631 to 0.658)
<b>01/12/2021</b>	Unvaccinated	6,243	211,523,315	6.082	(5.878 to 6.291)
	Dose 1	662	75,077,602	2.599	(2.344 to 2.874)
	Dose 2	5,188	683,769,600	1.501	(1.451 to 1.553)
	Dose 3	3,699	514,919,908	0.464	(0.440 to 0.489)
	All Vaccinated	9,549	1,273,767,110	0.702	(0.688 to 0.716)
<b>01/01/2022</b>	Unvaccinated	3,742	199,550,875	4.476	(4.297 to 4.661)
	Dose 1	664	64,124,286	3.205	(2.898 to 3.535)
	Dose 2	3,507	338,205,008	2.606	(2.503 to 2.712)
	Dose 3	9,646	882,379,012	0.854	(0.836 to 0.873)
	All Vaccinated	13,817	1,284,708,306	1.004	(0.988 to 1.021)
<b>01/02/2022</b>	Unvaccinated	1,116	173,148,049	1.630	(1.469 to 1.803)
	Dose 1	271	53,127,215	1.414	(1.199 to 1.656)
	Dose 2	1,077	243,043,590	1.049	(0.974 to 1.128)
	Dose 3	6,399	870,720,809	0.600	(0.585 to 0.615)
	All Vaccinated	7,747	1,166,891,614	0.621	(0.607 to 0.635)