Figure A - Flow chart showing inclusion criteria and missing data. Abbreviations: Greater Manchester (GM), General Practice (GP), Lower-layer Super Output Area (LSOA) (LSOAs are neighbourhood-level administrative boundaries containing approx. 1000 residents).

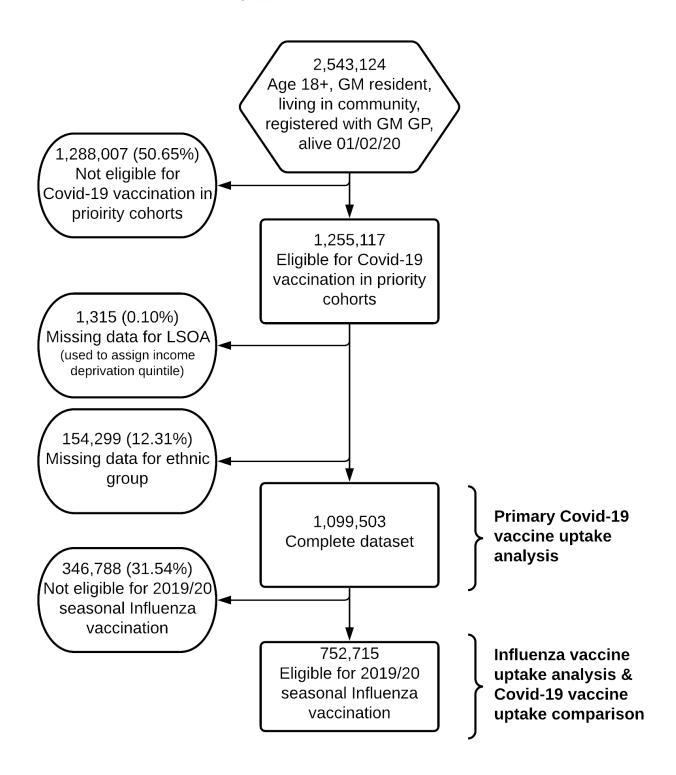
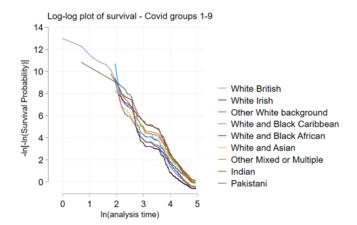
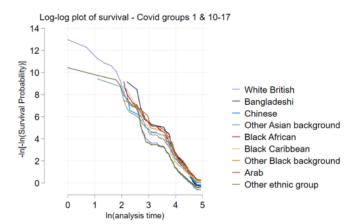
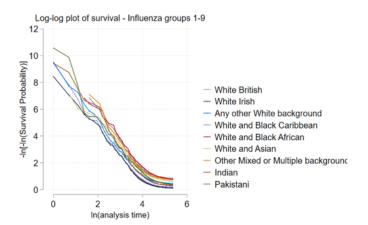


Figure B – log(-log(survival)) versus log(time) plots stratified by ethnic group for Covid-19 and Influenza vaccine uptake







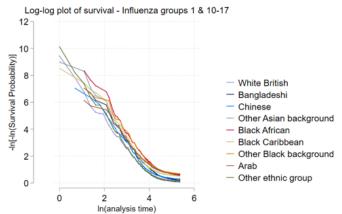
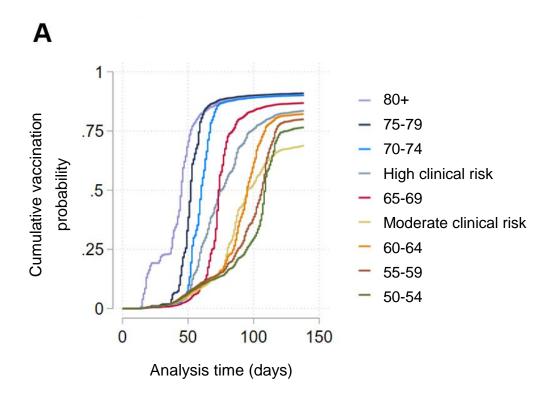


Figure C – Kaplan-Meier failure curves indicating the cumulative probability of vaccination over time for (A) Covid-19 and (B) Influenza vaccines, stratified by Covid-19 vaccination eligibility group. Individuals were assigned to the highest priority vaccine eligibility group for which they were eligible. Priority proceeded from those aged 80+ down the age brackets, with the high clinical risk group eligible at the same time as the 70-74 age group, and the moderate clinical risk group eligible between the 65-69 and 60-64 age groups, as indicated in the legend group order. Vaccine eligibility groups are mutually exclusive, such that (for example) an individual aged 80 with high clinical vulnerability would be in the 80+ age group, whereas an individual aged 65 with high clinical vulnerability would be in the high clinical vulnerability group.



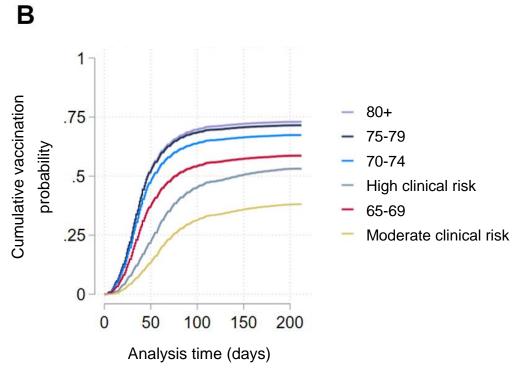


Table A – Vaccine uptake by population subgroup and vaccine type (percentage uptake and 95% ci)

	Covid-19 vaccine uptake 2020/2021			vaccine uptake 019/201
	Percentage	95% ci	Percentage	95% ci
Ethnic group ²				
White British	87.93	[87.86,88.00]	57.03	[56.90,57.16]
White Irish	86.40	[85.76,87.02]	59.07	[58.04,60.09]
Any other White background	69.97	[69.53,70.40]	47.32	[46.71,47.92]
White and Black Caribbean	64.31	[62.49,66.09]	35.13	[32.99,37.34]
White and Black African	67.05	[65.26,68.79]	37.10	[34.90,39.35]
White and Asian	77.35	[75.38,79.21]	41.70	[38.99,44.46]
Other Mixed or Multiple background	66.87	[65.34,68.37]	38.25	[36.32,40.22]
Indian	84.76	[84.22,85.29]	52.33	[51.45,53.22]
Pakistani	75.28	[74.90,75.66]	49.49	[48.99,49.99]
Bangladeshi	81.87	[81.08,82.64]	54.86	[53.75,55.96]
Chinese	75.47	[74.40,76.52]	52.12	[50.42,53.80]
Other Asian background	70.85	[70.04,71.64]	41.15	[40.07,42.23]
Black African	65.83	[65.15,66.51]	40.86	[40.00,41.73]
Black Caribbean	62.17	[61.04,63.28]	44.24	[42.84,45.64]
Other Black background	60.39	[58.78,61.99]	38.83	[36.83,40.86]
Arab	64.22	[61.67,66.69]	42.79	[39.63,46.02]
Any other ethnic group	82.84	[82.43,83.23]	59.54	[58.92,60.15]
Income deprivation ²				, ,
Least deprived	86.63	[86.47,86.78]	58.70	[58.41,58.98]
Q2	87.02	[86.86,87.17]	57.75	[57.47,58.03]
Q3	83.99	[83.83,84.15]	54.08	[53.80,54.35]
Q4	83.07	[82.91,83.22]	53.31	[53.06,53.56]
Most deprived	77.95	[77.83,78.07]	49.22	[49.04,49.40]
Gender				
Male	81.70	[81.60,81.80]	53.78	[53.62,53.94]
Female	83.24	[83.15,83.33]	52.93	[52.78,53.08]
Vaccine eligibility group				
High clinical risk	87.21	[87.02,87.40]	51.91	[51.63,52.20]
Moderate clinical risk	80.02	[79.87,80.17]	36.82	[36.64,37.00]
80+	87.47	[87.26,87.67]	70.18	[69.90,70.46]
75-79	89.34	[89.14,89.55]	69.00	[68.69,69.30]
70-74	88.23	[88.05,88.41]	64.47	[64.21,64.73]
65-69	84.64	[84.43,84.85]	55.39	[55.08,55.70]
60-64	78.87	[78.62,79.12]	N/A	_
55-59	78.34	[78.12,78.56]	N/A	_
50-54	76.20	[75.99,76.41]	N/A	-
Prior Influenza vaccination (2019/20)*		r / 1		
Not vaccinated	74.64	[74.55,74.74]	N/A	-
Vaccinated	95.46	[95.40,95.52]	N/A	_

¹ Sample restricted to those eligible for Influenza vaccination
² More income-deprived quintiles and most minority ethnic groups have younger population age structures relative to less income-deprived groups and the White British group respectively, so % uptake figures presented in this table should be interpreted with caution as trends are substantially confounded by age

Table B – Associations between ethnic group and Covid-19 vaccine uptake (results also in Figure 1A) Hazard ratios with 95% confidence intervals from Cox proportional hazards models estimating time-to-Covid-19 vaccination across ethnic groups, stratified by vaccine eligibility group

	High clinical	Moderate clinical	80+	75-79	70-74	65-69	60-64	55-59	50-54
White British	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
	-	-	-	-	-	-	-	-	-
White Irish	0.908	0.975	0.940	1.096	1.062	0.923	0.876	0.872	0.817
	[0.829,0.995]	[0.920,1.033]	[0.900,0.982]	[1.041,1.155]	[1.006,1.120]	[0.870,0.980]	[0.806,0.952]	[0.804,0.946]	[0.756,0.882]
Other White background	0.578	0.581	0.844	0.796	0.749	0.621	0.542	0.553	0.522
151 1 6 111	[0.554,0.602]	[0.565,0.596]	[0.810,0.879]	[0.758,0.834]	[0.720,0.779]	[0.596,0.647]	[0.520,0.566]	[0.533,0.573]	[0.505,0.539]
White and Black Caribbean	0.437	0.489	0.536	0.622	0.631	0.640	0.488	0.462	0.505
100	[0.394,0.485]	[0.445,0.536]	[0.450,0.637]	[0.499,0.775]	[0.490,0.814]	[0.524,0.783]	[0.403,0.592]	[0.397,0.539]	[0.442,0.577]
White and Black African	0.468	0.525	0.387	0.471	0.513	0.455	0.481	0.428	0.504
	[0.430,0.510]	[0.477,0.577]	[0.269,0.557]	[0.302,0.732]	[0.399,0.659]	[0.358,0.578]	[0.393,0.589]	[0.364,0.504]	[0.448,0.566]
White and Asian	0.561	0.640	0.678	0.758	0.585	0.820	0.773	0.711	0.857
	[0.497,0.634]	[0.578,0.709]	[0.468,0.981]	[0.567,1.013]	[0.437,0.781]	[0.668,1.006]	[0.624,0.958]	[0.602,0.841]	[0.752,0.976]
Other Mixed or Multiple	0.454	0.518	0.511	0.562	0.505	0.690	0.477	0.526	0.528
	[0.415,0.498]	[0.479,0.561]	[0.411,0.635]	[0.442,0.716]	[0.417,0.612]	[0.585,0.813]	[0.403,0.565]	[0.467,0.593]	[0.476,0.586]
Indian	0.768	0.988	0.602	0.738	0.875	0.922	0.862	0.949	0.932
	[0.742,0.796]	[0.952,1.026]	[0.564,0.642]	[0.688,0.791]	[0.825,0.928]	[0.874,0.974]	[0.805,0.924]	[0.892,1.010]	[0.883,0.984]
Pakistani	0.485	0.626	0.461	0.484	0.564	0.608	0.512	0.522	0.557
	[0.475,0.495]	[0.614,0.638]	[0.440,0.482]	[0.457,0.513]	[0.538,0.591]	[0.586,0.632]	[0.484,0.541]	[0.499,0.547]	[0.539,0.576]
Bangladeshi	0.547	0.638	0.464	0.588	0.612	0.684	0.730	0.733	0.768
	[0.532,0.562]	[0.613,0.665]	[0.425,0.507]	[0.520,0.666]	[0.536,0.698]	[0.625,0.748]	[0.648,0.824]	[0.658,0.816]	[0.718,0.822]
Chinese	0.616	0.749	0.544	0.543	0.631	0.537	0.556	0.594	0.650
	[0.569,0.666]	[0.699,0.803]	[0.485,0.610]	[0.470,0.627]	[0.563,0.708]	[0.492,0.586]	[0.514,0.601]	[0.555,0.635]	[0.610,0.694]
Other Asian background	0.522	0.613	0.450	0.579	0.579	0.513	0.488	0.541	0.579
	[0.499,0.546]	[0.587,0.640]	[0.402,0.505]	[0.508,0.660]	[0.526,0.636]	[0.470,0.560]	[0.448,0.531]	[0.504,0.581]	[0.547,0.613]
Black African	0.448	0.468	0.276	0.291	0.329	0.386	0.401	0.435	0.471
	[0.435,0.462]	[0.449,0.489]	[0.241,0.317]	[0.251,0.338]	[0.295,0.366]	[0.349,0.426]	[0.367,0.439]	[0.408,0.465]	[0.450,0.494]
Black Caribbean	0.356	0.515	0.493	0.575	0.555	0.488	0.412	0.382	0.371
	[0.330,0.384]	[0.480,0.553]	[0.463,0.524]	[0.515,0.642]	[0.487,0.631]	[0.442,0.540]	[0.370,0.458]	[0.347,0.420]	[0.337,0.408]
Other Black background	0.398	0.456	0.409	0.378	0.411	0.462	0.477	0.419	0.419
	[0.367,0.432]	[0.415,0.500]	[0.330,0.506]	[0.286,0.500]	[0.325,0.521]	[0.383,0.558]	[0.396,0.575]	[0.368,0.477]	[0.374,0.470]
Arab	0.404	0.412	0.442	0.407	0.535	0.512	0.508	0.369	0.495
	[0.355,0.461]	[0.360,0.471]	[0.288,0.679]	[0.266,0.622]	[0.391,0.732]	[0.371,0.705]	[0.393,0.657]	[0.290,0.471]	[0.423,0.579]
Other ethnic group	0.679	0.839	1.087	1.064	0.965	0.881	0.804	0.721	0.695
	[0.655,0.703]	[0.817,0.861]	[1.050,1.124]	[1.027,1.101]	[0.935,0.997]	[0.849,0.914]	[0.766,0.844]	[0.691,0.752]	[0.668,0.723]
Observations	107879	251801	95177	79403	114478	101721	84850	114400	132840

Table C - Vaccine uptake standardised to GM vaccine eligibility group structure. Estimated percentage uptake with 95% confidence intervals

	Covid-19 vaccine	Covid-19 vaccine	Influenza vaccine
	(all population)	(Influenza vaccine	(Influenza vaccine
		eligible population)	eligible population)
White British	87.83	88.94	56.14
	[87.76,87.90]	[88.86,89.02]	[56.01,56.26]
White Irish	84.11	86.51	53.53
	[83.35,84.87]	[85.68,87.35]	[52.40,54.67]
Other White background	71.41	75.12	49.99
-	[70.99,71.83]	[74.61,75.63]	[49.41,50.57]
White and Black Caribbean	67.46	70.42	42.51
	[65.49,69.43]	[67.98,72.86]	[39.72,45.31]
White and Black African	65.91	67.22	41.15
	[63.37,68.45]	[63.81,70.63]	[37.58,44.72]
White and Asian	78.47	78.08	47.18
	[76.20,80.73]	[75.15,81.01]	[43.60,50.76]
Other Mixed or Multiple	68.15	69.74	45.85
·	[66.40,69.90]	[67.48,72.00]	[43.41,48.29]
Indian	84.16	85.30	55.26
	[83.58,84.73]	[84.63,85.96]	[54.36,56.15]
Pakistani	74.27	76.23	54.36
	[73.82,74.73]	[75.70,76.76]	[53.76,54.96]
Bangladeshi	80.88	79.96	59.37
3	[79.83,81.92]	[78.75,81.18]	[57.94,60.81]
Chinese	76.12	77.85	52.79
	[75.03,77.22]	[76.42,79.29]	[51.12,54.46]
Other Asian background	70.49	73.42	44.89
· ·	[69.59,71.40]	[72.27,74.57]	[43.61,46.17]
Black African	61.44	61.80	42.25
	[60.46,62.42]	[60.50,63.10]	[40.94,43.56]
Black Caribbean	62.61	66.60	43,55
	[61.46,63.76]	[65.20,68.01]	[42.08,45.02]
Other Black background	60.95	62.43	42.66
	[58.96,62.94]	[59.81,65.05]	[39.96,45.35]
Arab	65.24	67.51	48.73
	[62.06,68.41]	[63.34,71.68]	[44.40,53.06]
Other ethnic group	82.48	85.91	59.64
9.00p	[82.07,82.88]	[85.48,86.34]	[59.06,60.23]
	[02.07,02.00]	[OO. 10,00.0 T]	[50.00,00.20]

[%] vaccine uptake, 95% confidence intervals in brackets Sample restricted to those alive at end of follow-up period

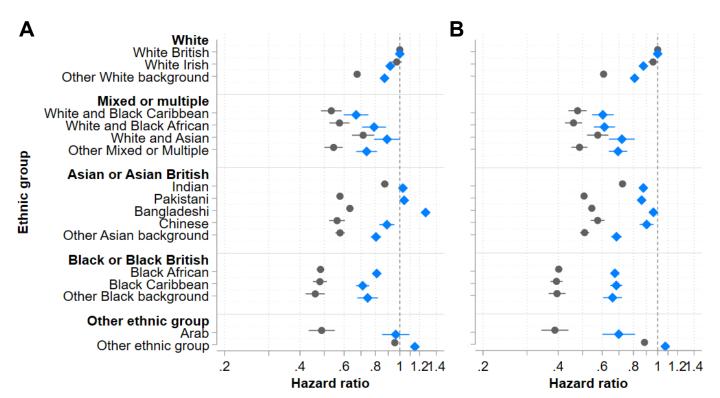
Table D – Associations between ethnic group and Influenza vaccine uptake (results also in Figure 1B) Hazard ratios with 95% confidence intervals from Cox proportional hazards models estimating time-to-Influenza vaccination across ethnic groups, stratified by vaccine eligibility group

	High clinical	Moderate clinical	80+	75-79	70-74	65-69
White British	Ref	Ref	Ref	Ref	Ref	Ref
	-	-	-	-	-	-
White Irish	0.932	0.980	0.862	0.920	0.880	0.888
	[0.845,1.029]	[0.909,1.057]	[0.820,0.906]	[0.870,0.972]	[0.830,0.932]	[0.820,0.962]
Other White background	0.757	0.739	0.939	0.916	0.916	0.823
	[0.721,0.794]	[0.714,0.765]	[0.902,0.978]	[0.872,0.961]	[0.879,0.955]	[0.783,0.864]
White & Black Caribbean	0.597	0.607	0.620	0.729	0.781	0.621
	[0.518,0.688]	[0.536,0.688]	[0.505,0.762]	[0.539,0.984]	[0.599,1.018]	[0.462,0.834]
White and Black African	0.648	0.756	0.573	0.455	0.660	0.558
	[0.579,0.726]	[0.671,0.852]	[0.380,0.864]	[0.278,0.746]	[0.499,0.875]	[0.408,0.763]
White and Asian	0.752	0.874	0.627	0.659	0.874	0.721
	[0.642,0.882]	[0.768,0.995]	[0.405,0.970]	[0.484,0.898]	[0.652,1.171]	[0.547,0.950]
Other Mixed or Multiple	0.739	0.621	0.692	0.785	0.836	0.860
	[0.660,0.826]	[0.557,0.693]	[0.539,0.889]	[0.597,1.032]	[0.694,1.006]	[0.691,1.072]
Indian	0.812	1.050	0.839	0.947	0.995	1.111
	[0.773,0.852]	[1.003,1.100]	[0.783,0.898]	[0.875,1.025]	[0.933,1.062]	[1.043,1.183]
Pakistani	0.884	1.080	0.775	0.794	0.902	0.991
	[0.861,0.907]	[1.055,1.106]	[0.737,0.815]	[0.746,0.844]	[0.859,0.948]	[0.949,1.035]
Bangladeshi	1.070	1.212	0.869	0.968	0.934	1.301
	[1.023,1.119]	[1.151,1.277]	[0.786,0.960]	[0.845,1.108]	[0.821,1.062]	[1.172,1.444]
Chinese	0.820	1.035	0.885	0.798	0.852	0.926
	[0.728,0.924]	[0.943,1.137]	[0.790,0.992]	[0.687,0.927]	[0.759,0.955]	[0.833,1.029]
Other Asian background	0.746	0.816	0.545	0.662	0.729	0.728
	[0.699,0.795]	[0.771,0.864]	[0.481,0.618]	[0.574,0.763]	[0.655,0.810]	[0.656,0.807]
Black African	0.769	0.738	0.547	0.534	0.619	0.632
	[0.740,0.798]	[0.700,0.778]	[0.477,0.628]	[0.463,0.617]	[0.553,0.692]	[0.560,0.714]
Black Caribbean	0.692	0.682	0.753	0.756	0.614	0.583
	[0.633,0.757]	[0.622,0.749]	[0.702,0.808]	[0.672,0.851]	[0.532,0.709]	[0.507,0.671]
Other Black background	0.695	0.748	0.595	0.636	0.599	0.649
_	[0.628,0.770]	[0.667,0.838]	[0.469,0.756]	[0.484,0.836]	[0.462,0.778]	[0.510,0.824]
Arab	0.823	0.878	0.944	0.564	0.612	0.943
	[0.697,0.972]	[0.754,1.022]	[0.629,1.417]	[0.315,1.009]	[0.430,0.872]	[0.676,1.314]
Other ethnic group	0.980	1.073	1.134	1.167	1.133	1.135
	[0.939,1.023]	[1.037,1.110]	[1.095,1.174]	[1.120,1.216]	[1.092,1.176]	[1.083,1.191]
Observations	109199	253000	102371	81786	116595	89043

Table E – Associations between ethnic group and vaccine uptake (results also in Figure 1C) Hazard ratios with 95% confidence intervals from Cox proportional hazards models estimating time-to-vaccination across ethnic groups, adjusted by vaccine eligibility group

	Covid-19 vaccine 2020/21	Influenza vaccine 2019/20	Covid-19 vaccine 2020/21 – excluding individuals who died during follow-up
White British	Ref	Ref	Ref
White Irish	-	-	-
	0.978	0.898	0.979
	[0.948,1.008]	[0.874,0.923]	[0.950,1.010]
Other White background	0.636	0.833	0.634
	[0.625,0.647]	[0.818,0.847]	[0.622,0.645]
White and Black Caribbean	0.496	0.626	0.495
	[0.466,0.528]	[0.581,0.675]	[0.465,0.527]
White and Black African	0.495	0.674	0.495
	[0.467,0.526]	[0.626,0.724]	[0.466,0.525]
White and Asian	0.627	0.788	0.627
	[0.585,0.672]	[0.725,0.857]	[0.585,0.672]
Other Mixed or Multiple	0.507	0.709	0.507
	[0.480,0.535]	[0.665,0.755]	[0.480,0.536]
Indian	0.788	0.943	0.788
	[0.770,0.806]	[0.921,0.966]	[0.770,0.806]
Pakistani	0.537	0.939	0.536
	[0.530,0.544]	[0.926,0.953]	[0.529,0.543]
Bangladeshi	0.577	1.082	0.576
	[0.564,0.591]	[1.051,1.113]	[0.562,0.589]
Chinese	0.575	0.897	0.573
	[0.549,0.603]	[0.856,0.941]	[0.547,0.601]
Other Asian background	0.540	0.736	0.539
	[0.524,0.556]	[0.711,0.762]	[0.523,0.555]
Black African	0.430	0.722	0.430
	[0.420,0.440]	[0.703,0.742]	[0.420,0.440]
Black Caribbean	0.435 [0.418,0.454]	0.695 [0.667,0.724] 0.690	0.434 [0.416,0.452]
Other Black background	0.419 [0.395,0.443]	[0.647,0.736]	0.418 [0.394,0.442]
Arab	0.434	0.824	0.434
	[0.399,0.473]	[0.748,0.907]	[0.399,0.473]
Other ethnic group	0.914	1.106	0.912
	[0.900,0.928]	[1.089,1.124]	[0.898,0.927]
High clinical	1.000	1.000	1.000
	[1.000,1.000]	[1.000,1.000]	[1.000,1.000]
Moderate clinical	0.529	0.630	0.528
	[0.526,0.533]	[0.624,0.636]	[0.525,0.532]
80+	2.535	1.874	2.563
75. 70	[2.501,2.569]	[1.854,1.894]	[2.528,2.598]
75-79	2.116	1.820	2.128
	[2.091,2.142]	[1.799,1.841]	[2.103,2.155]
70-74	1.525	1.596	1.529
	[1.511,1.539]	[1.579,1.613]	[1.515,1.543]
65-69	0.939	1.214	0.939
	[0.932,0.947]	[1.200,1.228]	[0.932,0.947]
Observations	737392	752494	728540

Figure D – Associations between ethnic group and vaccine uptake by gender (results also in Table S6) Hazard ratios with 95% confidence intervals from Cox proportional hazards models estimating time-to-vaccination across ethnic groups, adjusted by vaccine eligibility group, stratified by gender. (A) Male, (B) Female.



- Covid-19 vaccine 2020/21
- Influenza vaccine 2019/20

Table F – Associations between ethnic group and vaccine uptake by gender (results also in Figure S4) Hazard ratios with 95% confidence intervals from Cox proportional hazards models estimating time-to-vaccination across ethnic groups, adjusted by vaccine eligibility group, stratified by gender

	Male		Fen	 nale
	Covid-19 vaccine	Influenza vaccine	Covid-19 vaccine	Influenza vaccine
White British	Ref	Ref	Ref	Ref
White Irish	0.972	0.916	0.958	0.877
Other White background	[0.927,1.019] 0.676 [0.658,0.694]	[0.880,0.953] 0.869 [0.847,0.892]	[0.918,1.000] 0.607 [0.593,0.622]	[0.844,0.911] 0.808 [0.789,0.828]
White and Black Caribbean	0.533	0.670	0.478	0.603
White and Black African	[0.485,0.586] 0.575	[0.598,0.750] 0.790	[0.439,0.520] 0.460	[0.546,0.667] 0.612
White and Asian	[0.524,0.631] 0.714	[0.707,0.882] 0.889	[0.425,0.498] 0.575	[0.555,0.675] 0.719
Other Mixed or Multiple	[0.645,0.791] 0.544	[0.790,1.001] 0.738	[0.522,0.635] 0.486	[0.638,0.810] 0.694
	[0.500,0.592]	[0.670,0.812]	[0.452,0.524]	[0.638,0.756]
Indian	0.871 [0.840,0.903]	1.029 [0.994,1.065]	0.723 [0.701,0.746]	0.876 [0.847,0.906]
Pakistani	0.577 [0.566,0.589]	1.041 [1.021,1.063]	0.507 [0.498,0.516]	0.863 [0.845,0.880]
Bangladeshi	0.632 [0.610,0.655]	1.267 [1.217,1.320]	0.545 [0.527,0.563]	0.962 [0.924,1.001]
Chinese	0.562 [0.523,0.604]	0.888 [0.829,0.952]	0.575 [0.539,0.613]	0.903 [0.847,0.964]
Other Asian background	0.578 [0.553,0.604]	0.803 [0.766,0.843]	0.510 [0.489,0.532]	0.684 [0.651,0.719]
Black African	0.483	0.809	0.402	0.674
Black Caribbean	[0.466,0.501] 0.480	[0.778,0.842] 0.711	[0.389,0.415] 0.393	[0.650,0.699] 0.683
Other Black background	[0.450,0.512] 0.460	[0.669,0.756] 0.744	[0.372,0.416] 0.395	[0.646,0.722]
Arab	[0.421,0.503] 0.488	[0.676,0.819] 0.964	[0.366,0.427] 0.388	[0.605,0.720] 0.699
Other ethnic group	[0.433,0.550] 0.955	[0.850,1.092] 1.149	[0.342,0.439] 0.886	[0.601,0.812] 1.073
	[0.933,0.978]	[1.122,1.176]	[0.866,0.906]	[1.050,1.098]
High clinical	Ref	Ref	Ref	Ref
Mod. clinical	0.527	0.635	0.517	0.626
80+	[0.521,0.533]	[0.626,0.644] 1.987	[0.512,0.522]	[0.617,0.634] 1.865
75-79	[2.823,2.960]	[1.954,2.020] 1.830	[2.640,2.738]	[1.838,1.893] 1.875
70-74	[2.196,2.286] 1.585	[1.798,1.862] 1.584	[2.164,2.239] 1.585	[1.845,1.905] 1.672
65-69	[1.562,1.609] 0.928 [0.916,0.940]	[1.559,1.609] 1.172 [1.152,1.193]	[1.565,1.606] 0.984 [0.973,0.995]	[1.647,1.697] 1.312 [1.291,1.334]
Observations	336543	344801	400340	407176
Exponentiated coefficients: 95%			100040	107 170

Figure E – Associations between ethnic group and Covid-19 vaccine uptake – sensitivity analysis adjusting by locality or income deprivation (results also in Table S6) Hazard ratios with 95% confidence intervals from Cox proportional hazards models estimating time-to-Covid-19 vaccination across ethnic groups, adjusted by vaccine eligibility group, plus additional adjustment by GM locality (10 local authority areas) or income domain quintile

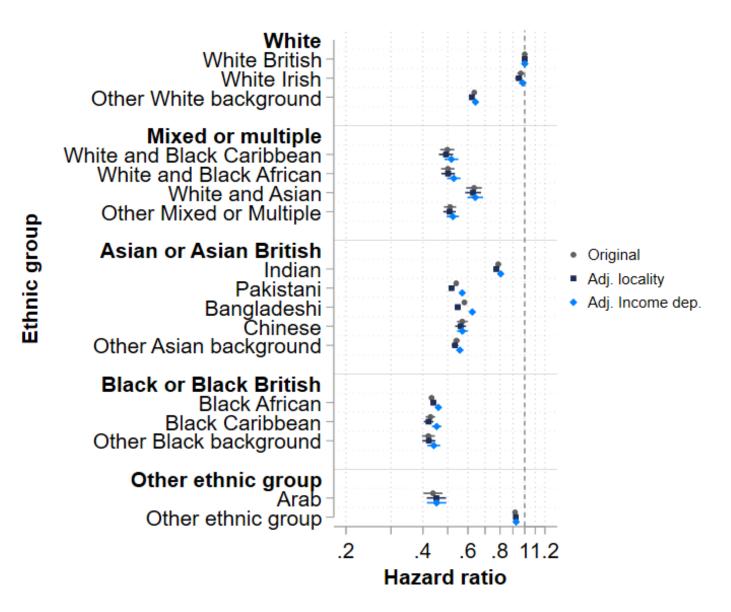


Table G – Associations between ethnic group and Covid-19 vaccine uptake – sensitivity analysis adjusting by locality or income deprivation (results also in Figure S4) Hazard ratios with 95% confidence intervals from Cox proportional hazards models estimating time-to-Covid-19 vaccination across ethnic groups, adjusted by vaccine eligibility group, plus additional adjustment by GM locality or income domain quintile

Covid-19 vaccine (main analysis) Cadjusted by locality (adjusted by income deprivation quintilie) White British Ref		0 -	Covid-19 vaccine	Covid-19 vaccine
White British Ref				
White Irish 0,965 0,948 0,982		· ,		
White Irish 0.965 (0.936,0.996) (0.918,0.979) (0.952,1.014) Other White background (0.635 0.622 0.642) (0.642 0.642) (0.642 0.642) (0.642 0.642) (0.642 0.642) (0.642 0.642) (0.642 0.652) (0.642 0.653) (0.630,0.663) (0.630,0.663) (0.630,0.663) (0.611,0.633) (0.501 0.650) (0.502 0.529) (0.486,0.551] (0.486,0.551] (0.486,0.551] (0.486,0.561] (0.481,0.532) (0.481,0.551] (0.482,0.561] (0.481,0.531) (0.482,0.561] (0.481,0.531) (0.481,0.531) (0.482,0.561] (0.481,0.531) (0.484,0.561] (0.481,0.531) (0.481,0.531) (0.481,0.531) (0.481,0.531) (0.481,0.531) (0.481,0.531) (0.481,0.531) (0.481,0.532) (0.581,0.581) (0.581,0.583) (0.582,0.583) (0.582,0.583) (0.582,0.583) (0.582,0.583) (0.582,0.583) (0.582,0.583) (0.532,0.583) (0.532,0.583) (0.534,0.583) (0.534,0.583) (0.534,0.583) (0.534,0.583) (0.534,0.583) (0.534,0.583) (0.534,0.583) (0.534,0.583) (0.534,0.583) (0.534,0.583) (0.534,0.583) (0.534,0.583) (0.534,0.583) (0.534,0.583) (0.534,0.583) (0.534,0.	White British		Ref	Ref
Other White background [0.935,0.996] (0.622) [0.952,1.014] (0.623) (0.622) (0.641) (0.623) (0.641) (0.623) (0.641) (0.623) (0.641) (0.623) (0.641) (0.623) (0.641) (0.623) (0.641) (0.623) (0.641) (0.623) (0.641) (0.624) (0.621) (0.621) (0.642) (0.625) (0.6461) (0.620) (0.641) (0.620) (0.641) (0.620) (0.641) (0.629) (0.641) (0.629) (0.641) (0.641) (0.629) (0.641) (0.641) (0.629) (0.641) (0.641) (0.629) (0.641) (0.641) (0.629) (0.641) (0.641) (0.629) (0.641) (0.641) (0.641) (0.629) (0.641) (0.641) (0.629) (0.641) (0.641) (0.629) (0.641) (0.641) (0.629) (0.641) (0.641) (0.629) (0.641) (0.641) (0.629) (0.641) (0.641) (0.629) (0.641) (0.641) (0.641) (0.641) (0.641) (0.641) (0.641) (0.641) (0.641) (0.641) (0.641) (0.641) (0.641) (0.641) (0.642) (0.642) (0.642) (0.642) (0.642) (0.642) (0.642) (0.642) (0.642) (0.642) (0.642) (0.642) <	White Irish		- 0 948	- 0 982
Other White background 0.635 (0.623,0.646) 0.622 (0.611,0.633) 0.642 (0.630,0.653) White and Black Caribbean 0.498 (0.493) 0.517 White and Black African (0.601,0.631) (0.462,0.525) (0.486,0.551) White and Black African (0.501 (0.502) 0.529 0.641 White and Asian (0.634 (0.629) 0.641 0.629 0.641 White and Asian (0.502 (0.580,0.675) (0.590,0.680) (0.585,0.675) (0.597,0.688) Other Mixed or Multiple 0.511 (0.508,0.675) (0.580,0.675) (0.593,0.680) (0.585,0.675) (0.597,0.688) Indian 0.788 (0.774) 0.806 0.524 (0.562,0.577) (0.756,0.794) (0.786,0.825) Pakistani 0.540 (0.554) (0.517 (0.570,0.570) (0.562,0.577) (0.562,0.577) (0.562,0.577) (0.570,0.595) (0.534,0.561) (0.567,0.595) (0.534,0.591) (0.544,0.599) (0.544,0.599) (0.544,0.599) (0.544,0.599) (0.544,0.599) (0.544,0.599) (0.544,0.599) (0.544,0.599) (0.544,0.599) (0.544,0.599) (0.544,0.599) (0.544,0.599)	William India		0.0.0	
Commons	Other White background			
White and Black Caribbean 0.488 0.493 0.517 White and Black African [0.468.0.531] [0.462.0.525] [0.486.0.551] White and Black African 0.501 0.502 0.529 White and Asian 0.634 0.629 0.641 White and Asian [0.590,0.680] [0.585,0.675] [0.597,0.688] Other Mixed or Multiple 0.511 0.508 0.524 Indian 0.788 0.774 0.806 Indian 0.788 0.774 0.806 Indian 0.540 0.517 0.570 Pakistani 0.540 0.517 0.570 Indian 0.540 0.517 0.570 Pakistani 0.540 0.517 0.570 Bangladeshi 0.581 0.547 0.6224 Chinese 0.570 0.562 0.570 Otherse 0.570 0.562 0.570 Other Asian background 0.541 0.534 0.558 [0.542,0.443] [0.518,0.551] [0.	outer Trime background			
White and Black African [0.468,0.531] (0.502 (0.525) (0.529 (0.529 (0.529 (0.529 (0.471,0.532) (0.472,0.533) (0.498,0.561) (0.472,0.533) (0.498,0.561) (0.590,0.680) (0.585,0.675) (0.597,0.688) (0.590,0.680) (0.585,0.675) (0.597,0.688) (0.591 (0.483,0.540) (0.481,0.537) (0.590,0.680) (0.581 (0.481,0.537) (0.496,0.553) Indian 0.788 (0.744 (0.806 (0.769,0.807) (0.756,0.794) (0.769,0.807) (0.756,0.794) (0.576,0.794) (0.582,0.577) (0.540 (0.517 (0.570 (0.532,0.547) (0.510,0.524) (0.562,0.577) (0.570 (0.581 (0.547 (0.624 (0.591) (0.567,0.595) (0.534,0.561) (0.690,0.639) (0.543,0.598) (0.570 (0.543 (0.594) (0.543,0.598) (0.570 (0.543 (0.594) (0.543,0.598) (0.536,0.590) (0.544,0.599) (0.543,0.598) (0.525,0.558) (0.518,0.551) (0.541,0.575) [0.540 (0.543 (0.429,0.450) (0.449,0.471) (0.422,0.443) (0.422,0.443) (0.422,0.443) (0.429,0.450) (0.449,0.471) (0.422,0.443) (0.429,0.450) (0.449,0.471) (0.449,0.441) (0.434,0.472) (0.449,0.471) (0.440,0.440) (0.449,0.472) (0.449,0.471) (0.404,0.440) (0.449,0.472) (0.490,0.450) (0.441,0.498) (0.492,0.450) (0.441,0.498) (0.492,0.450) (0.441,0.498) (0.492,0.450) (0.441,0.498) (0.492,0.450) (0.441,0.498) (0.492,0.451) (0.492,0.492) (0.49	White and Black Caribbean			
White and Black African 0.501 (0.471,0.532) (0.472,0.533) (0.498,0.561) 0.629 (0.641) 0.624 (0.629) (0.641) 0.634 (0.629) (0.641) 0.641 (0.590,0.680) 0.629 (0.641) 0.641 (0.590,0.680) 0.629 (0.681) 0.641 (0.597,0.688) 0.629 (0.641) 0.641 (0.597,0.688) 0.508 (0.597,0.688) 0.508 (0.597,0.688) 0.524 (0.483,0.540) 0.508 (0.524) (0.481,0.537) 0.542 (0.483,0.541) 0.508 (0.524) (0.543,0.537) 0.608 (0.774 (0.806) (0.774 (0.806) (0.570 (0.560,0.794)) 0.766,0.825 (0.577) (0.560,0.794) 0.570 (0.560,0.794) (0.766,0.825) (0.570 (0.560,0.794) 0.570 (0.520,0.577) (0.560,0.794) 0.570 (0.520,0.577) (0.562 (0.577) (0.624 (0.593)) 0.534 (0.561) (0.534,0.561) 0.609,0.639] (0.544,0.599) 0.570 (0.562 (0.570) (0.562 (0.570) (0.562 (0.577) (0.562 (0.570) (0.562 (0.570) (0.544,0.599) (0.544,0.599) 0.544 (0.598) (0.534,0.561) 0.534 (0.598) (0.534,0.561) (0.534,0.575) 0.562 (0.570 (0.562 (0.570) (0.558) (0.570) (0.544,0.599) (0.544,0.599) 0.544 (0.598) (0.534,0.561) (0.534,0.575) 0.562 (0.570 (0.558) (0.558) (0.558,0.590) (0.544,0.599) (0.544,0.599) 0.544 (0.598) (0.534,0.551) (0.534,0.575) 0.544 (0.598) (0.534,0.551) (0.518,0.551) (0.518,0.551) (0.518,0.551) (0.518,0.551) (0.518,0.551) (0.518,0.551) (0.518,0.551) (0.518,0.551) (0.518,0.551) (0.518,0.551) (0.518,0.551) (0.410,0.447) (0.440,0.440) (0.444,0.440) (0.444,0.440) (0.444,0.440) (0.444,0.440) (0.444,0.440) (0.444,0.440) (0.444,0.440) (0.444,0.440) (0.444,0.440) (0.444,0.440) (0.444,0.440) (0.444,0.440) (0.				
White and Asian 0.634 [0.590,0.680] 0.629 [0.585,0.675] 0.641 [0.597,0.688] Other Mixed or Multiple 0.511 [0.483,0.540] 0.581 [0.788] 0.774 0.806 0.806 Indian 0.788 [0.769,0.807] [0.756,0.794] [0.756,0.794] [0.786,0.825] 0.770 0.5070 0.517 0.5270 0.517 0.524 0.624 0.517 0.624 Bangladeshi 0.581 0.581 0.570 0.547 0.562 0.570 0.624 0.570 0.562 0.570 0.562 0.570 0.562 0.570 0.562 0.541,0.591 0.541,0.591 0.440,0.491 0.442 0.422 0.421 0.442 0.422 0.421 0.443 0.420 0.422 0.421 0.441 0.494,0.4401 0.434 0.426 0.422 0.441 0.440,0.4401 0.440,0.4401 0.440,0.4401 0.440,0.4401 0.440,0.4401 0.44	White and Black African			
White and Asian 0.634 [0.590,0.680] 0.629 [0.585,0.675] 0.641 [0.597,0.688] Other Mixed or Multiple 0.511 [0.483,0.540] 0.581 [0.788] 0.774 0.806 0.806 Indian 0.788 [0.769,0.807] [0.756,0.794] [0.756,0.794] [0.786,0.825] 0.770 0.5070 0.517 0.5270 0.517 0.524 0.624 0.517 0.624 Bangladeshi 0.581 0.581 0.570 0.547 0.562 0.570 0.624 0.570 0.562 0.570 0.562 0.570 0.562 0.570 0.562 0.541,0.591 0.541,0.591 0.440,0.491 0.442 0.422 0.421 0.442 0.422 0.421 0.443 0.420 0.422 0.421 0.441 0.494,0.4401 0.434 0.426 0.422 0.441 0.440,0.4401 0.440,0.4401 0.440,0.4401 0.440,0.4401 0.440,0.4401 0.44		[0.471,0.532]	[0.472,0.533]	[0.498,0.561]
Other Mixed or Multiple 0.511 (0.483,0.540) [0.481,0.537] [0.496,0.553] 0.524 (0.483,0.540) [0.481,0.537] [0.496,0.553] Indian 0.788 (0.774 0.806) (0.769,0.807] (0.756,0.794] (0.786,0.825) 10.780,0.807] (0.510,0.524] (0.562,0.577) (0.570 0.570 0.570 0.562) Pakistani 0.540 0.517 0.517 0.570 (0.562,0.577] Bangladeshi 0.581 0.547 0.624 (0.609),0.639] (0.509,0.639] Chinese 0.570 0.562 0.570 0.562 0.570 (0.544,0.599) Other Asian background 0.541 0.534 0.534 0.551 (0.544,0.599) Other Asian background 0.541 0.534 0.534 0.551 (0.544,0.599) Other Asian background 0.432 0.439 0.460 (0.544) (0.540) (0.544,0.575) Black African 0.422 0.439 0.460 (0.442) (0.440) (0.449,0.471) Black Caribbean 0.428 0.421 0.453 (0.449,0.472) (0.441) (0.440,0.440) (0.434,0.472) (0.441) (0.396,0.445) (0.398,0.448) (0.416,0.468) Arab 0.438 0.452 0.453 (0.452 0.453) (0.416,0.468) (0.402,0.477) (0.414,0.493) (0.415,0.494) (0.926 0.926 0.9026) (0.902,0.932) (0.909,0.940) (0.911,0.941) High clinical 1.000 1.000 1.000 1.000 (0.400,0.401) (0.911,0.941) High clinical 0.522 0.518 0.518 0.510 (0.566,0.514) (0.514,0.522) (0.566,0.514) (0.514,0.522) (0.566,0.514) (0.514,0.522) (0.566,0.514) (0.514,0.522) (0.566,0.514) (0.514,0.522) (0.566,0.514) (0.514,0.525) (0.566,0.514) (0.516,0.514) (0.516,0.514) (0.516,0.512) (0.516,0.514) (0.516,0.512) (0.516,0.514) (0.51	White and Asian	0.634	0.629	
D.483,0.540 D.481,0.537 D.496,0.553 D.496,0.553 D.788 D.774 D.806 D.788 D.756,0.794 D.786,0.825 D.756,0.794 D.786,0.825 D.756,0.794 D.786,0.825 D.756,0.794 D.570 D.562 D.570 D.570 D.562 D.570 D.562 D.570 D.562 D.570 D.562 D.570 D.584 D.534 D.558 D.543,0.598 D.535,0.590 D.544,0.599 D.558 D.543,0.598 D.535,0.590 D.544,0.575 D.584 D.534 D.558 D.518,0.551 D.541,0.575 D.584 D.525,0.558 D.518,0.551 D.541,0.575 D.584 D.422 D.439 D.460 D.422 D.439 D.460 D.422 D.439 D.441 D.453 D.428 D.421 D.453 D.428 D.421 D.453 D.441 D.453 D.428 D.421 D.453 D.441 D.453 D.441 D.453 D.441 D.453 D.441 D.453 D.452 D.441 D.453 D.452 D.441 D.453 D.452 D.441 D.453 D.452 D.454		[0.590,0.680]	[0.585,0.675]	[0.597,0.688]
Indian 0.788 0.774 0.806 Pakistani (0.769,0.807) [0.756,0.794] [0.786,0.825] Pakistani 0.540 0.517 0.570 [0.532,0.547] [0.510,0.524] [0.562,0.577] Bangladeshi 0.581 0.547 0.624 (0.567,0.595) [0.534,0.561] [0.609,0.639] Chinese 0.570 0.5622 0.570 Other Asian background 0.541 0.534 0.599 Other Asian background 0.541 0.534 0.558 [0.525,0.558] [0.518,0.551] [0.544,0.599] Other Asian background 0.432 0.439 0.460 [0.422,0.443] [0.429,0.450] [0.449,0.471] Black Caribbean 0.428 0.421 0.453 Other Black background 0.428 0.421 0.453 Other Black background 0.420 0.422 0.441 Other Black background 0.438 0.452 0.453 Other Black background 0.917 0.924 0.9	Other Mixed or Multiple	0.511	0.508	0.524
Pakistani [0.769,0.807] [0.756,0.794] [0.786,0.825] Bangladeshi 0.540 0.517 0.570 Bangladeshi 0.581 0.547 0.624 (D.567,0.595] [0.534,0.561] [0.609,0.639] Chinese 0.570 0.562 0.570 Other Asian background 0.541 0.534 0.558 Other Asian background 0.541 0.534 0.558 Black African 0.432 0.439 0.460 Black Caribbean 0.428 0.421 0.453 Black Caribbean 0.428 0.421 0.453 Other Black background 0.420 0.422 0.441 Other Black background 0.420 0.422 0.441 Other ethnic group 0.917 0.924 0.926 Other ethnic group 0.917 0.924 0.926 Oback 0.902,0932 [0.909,0940] [0.911,094] High clinical 1.000 1.000 1.000 Mod. clinical 0.522 0.		[0.483,0.540]	[0.481,0.537]	[0.496,0.553]
Pakistani 0.540 0.517 0.570 Bangladeshi 0.581 0.547 0.624 (0.567,0.595] (0.534,0.561] (0.609,0.639] Chinese 0.570 0.562 0.570 Other Asian background 0.541 0.534 0.558 Other Asian background 0.541 0.534 0.558 Black African 0.432 0.439 0.460 (0.422,0.443) (0.429,0.450) (0.449,0.471) Black Caribbean 0.428 0.421 0.453 Other Black background 0.420 0.422 0.441 Other Black background 0.438 0.452 0.453 Arab 0.438 0.452 0.453 Other ethnic group 0.917 0.924 0.926 Other ethnic group 0.917 0.924 0.926 Oberaction of the properties of the pr	Indian		-	
Bangladeshi				
Bangladeshi 0.581 [0.567,0.595] 0.547 [0.534,0.561] 0.624 [0.090,639] Chinese 0.570 [0.543,0.598] [0.534,0.561] [0.090,639] Other Asian background 0.541 [0.525,0.558] [0.518,0.551] [0.544,0.599] Other Asian background 0.432 [0.432] 0.439 [0.422,0.443] 0.439 [0.429,0.450] 0.449,0.471] Black Caribbean 0.428 [0.410,0.447] 0.404,0.440] [0.449,0.471] Other Black background 0.420 [0.396,0.445] 0.422 [0.398,0.448] 0.411 [0.398,0.448] 0.416,0.468] Arab 0.438 [0.402,0.477] 0.414,0.493] 0.415,0.494] Other ethnic group 0.917 [0.902,0.932] 0.909,0.940] [0.911,0.941] High clinical 1.000 [1.000,1.000] 1.000 [1.000,1.000] 1.000 [1.000,1.000] Mod. clinical 0.522 [0.519,0.526] 0.518 [0.514,0.522] [0.506,0.514] 80+ 2.776 [2.736,2.816] 2.271 [2.736,2.816] 2.271 [2.736,2.816] 2.271 [2.131,2.708] 75-79 2.225 [2.236,2.816] [2.773,2.855] [2.631,2.708] 76-69 0.959 [0.951,0.968] [0.949,0.965]	Pakistani			
Chinese 0.570 0.562 0.570 0.558 0.581 0.534 0.558 0.558 0.534 0.558 0.534 0.558 0.558 0.534 0.534 0.558 0.558 0.534 0.534 0.558 0.534 0.534 0.558 0.534 0.534 0.558 0.439 0.460 0.432 0.439 0.460 0.428 0.421 0.453 0.453 0.421 0.453 0.453 0.420 0.422 0.441 0.453 0.420 0.422 0.441 0.420 0.422 0.441 0.396,0.445 0.396,0.445 0.398,0.448 0.452 0.453 0.452 0.453 0.452 0.453 0.452 0.453 0.452 0.453 0.452 0.453 0.452 0.453 0.452 0.453 0.452 0.453 0.510 0.502 0.504 0.502 0.502 0.504 0.502 0.502 0.502 0.504 0.502 0.502 0.502 0.502 0.502 0.502 0.502 0.502 0.502 0.50				
Chinese 0.570 [0.543,0.598] 0.562 [0.544,0.599] 0.570 [0.544,0.599] Other Asian background 0.541 [0.525,0.558] 0.534 [0.518,0.551] 0.544,0.579] Black African 0.432 [0.439 [0.439 0.460] 0.460 Black Caribbean 0.428 [0.429,0.450] [0.449,0.471] Black Caribbean 0.428 [0.404,0.440] 0.453 [0.404,0.447] Other Black background 0.420 [0.396,0.445] 0.398,0.448] [0.416,0.468] Arab 0.438 [0.402,0.477] 0.414,0.493] [0.415,0.494] Other ethnic group 0.917 [0.924 [0.924 [0.926] 0.926 [0.902,0.932] [0.909,0.940] [0.911,0.941] High clinical 1.000 [1.000,1.000] 1.000 Mod. clinical 0.522 [0.518 [0.514,0.522] [0.506,0.514] 80+ 2.776 [2.814 [2.669] 2.214 [2.301] [2.103,2.159] 75-79 2.225 [2.271 [2.311 [2.031,2.708] 2.271 [2.131 [2.131 [1.573,1.604] [1.588 [1.601 [1.586,1.617] [1.510,1.540] 65-69 0.959 [0.951,0.968] [0.949,0.965] [0.914,0.930] Stockport Ref Trafford 1.213 [1.195,1.231] 1.323	Bangladeshi			
Other Asian background [0.543,0.598] (0.535,0.590] (0.534,0.599] (0.558) (0.525,0.558] [0.525,0.558] (0.518,0.551] (0.541,0.575] Black African 0.432 (0.439) (0.429,0.450] (0.449,0.471] Black Caribbean 0.428 (0.421) (0.449,0.471] Black Dackground 0.428 (0.421) (0.434,0.472] (0.404,0.401] Other Black background 0.420 (0.422) (0.441) (0.434,0.472] Other Black background 0.420 (0.398,0.448] (0.416,0.468] Arab 0.438 (0.452) (0.444,0.493) (0.415,0.494) Other ethnic group 0.917 (0.944) (0.926) (0.909,0.940) (0.911,0.941) High clinical 1.000 (1.000) (1.000) (1.000) (1.000) (1.000) Mod. clinical 0.522 (0.518) (0.514,0.522) (0.506,0.514] 80+ 2.776 (2.816) (2.773,2.855) (2.631,2.708) 75-79 (2.225 (2.271) (2.131) (2.196,2.254) (2.241,2.301) (2.103,2.159) 70-74 (1.588) (1.598) (1.598) (0.999,0.965) (0.914,0.930) Stockport Ref Trafford Ref Trafford 1.213 (1.195,1.231) (1.195,1.231) Bury 1.323				
Other Asian background 0.541 [0.525,0.558] 0.534 [0.518,0.551] 0.541,0.575] Black African 0.432 (0.439) 0.439 (0.429,0.450) [0.449,0.471] Black Caribbean 0.428 (0.421) 0.453 Black Caribbean 0.428 (0.421) 0.453 Cother Black background 0.420 (0.422) 0.441 Dayson, 0.445 (0.398,0.448) [0.416,0.468] Arab 0.438 (0.452) 0.453 [0.402,0.477] [0.414,0.493] [0.415,0.494] Other ethnic group 0.917 (0.924) 0.926 [0.902,0.932] [0.909,0.940] [0.911,0.941] High clinical 1.000 (1.000) [1.000,1.000] [1.000,1.000] Mod. clinical 0.522 (0.518) 0.510 Mod. clinical 0.522 (0.518) 0.510 80+ 2.776 (2.814) 2.669 12.736,2.816] [2.736,2.855] [2.631,2.708] 75-79 2.225 (2.271) 2.131 1.588 (1.617) 1.510,1.540] 65-69 (0.959) (0.959) (0.959) (0.949,0.965) [0.914,0.930] Stockport	Chinese			
Discription				
Black African 0.432 [0.422,0.443] 0.439 (0.429,0.450) 0.449,0.471] Black Caribbean 0.428 (0.421) 0.453 (0.410,0.447) 0.463 (0.420) 0.422 (0.441) Other Black background 0.420 (0.422) 0.441 (0.4441) 0.434,0.472] 0.422 (0.441) Arab 0.438 (0.4052) 0.453 (0.415,0.494) 0.453 (0.415,0.494) 0.453 (0.415,0.494) Other ethnic group 0.917 (0.902,0.932) 0.909,0.940) 0.911,0.941 High clinical 1.000 (1.000) 1.000 (1.000) 1.000 (1.000) Mod. clinical 0.522 (0.518 (0.514)) 0.510 (0.514) 80+ (2.776 (2.816) (0.514,0.522) (0.506,0.514) 0.506,0.514) 80+ (2.736,2.816) (2.773,2.855) (2.631,2.708) (2.669 (2.736,2.816) (2.773,2.855) (2.631,2.708) 75-79 (2.225 (2.271 (2.131) (2.103,2.159)) 1.588 (1.601 (1.525) (1.510,1.540) 1.525 (2.631,2.708) 70-74 (1.586,1.604) (1.586,1.617) (1.510,1.540) 0.959 (0.957 (0.922) 0.957 (0.922) 65-69 (0.951,0.968) (0.949,0.965) (0.914,0.930) Stockport Ref Trafford 1.213 (1.195,1.231) 1.1213 (1.195,1.231) Bury 1.323 1.323	Other Asian background			
Description	DI LAC:			
Black Caribbean 0.428 [0.410,0.447] 0.421 [0.404,0.440] 0.434,0.472] Other Black background 0.420 [0.396,0.445] [0.398,0.448] [0.416,0.468] Arab 0.438 [0.402,0.477] [0.414,0.493] [0.415,0.494] Other ethnic group 0.917 [0.902,0.932] [0.909,0.940] [0.911,0.941] High clinical 1.000 [1.000] 1.000 1.000 Mod. clinical 0.522 [0.518 [0.514,0.522] [0.506,0.514] 80+ 2.776 [2.814 [2.773,2.855] [2.631,2.708] 75-79 2.225 [2.271 [2.131] 2.131 70-74 1.588 [1.573,1.604] [1.586,1.617] [1.510,1.540] 1.525 65-69 0.959 [0.951,0.968] [0.949,0.965] [0.914,0.930] Stockport Ref Trafford 1.213 [1.195,1.231] Bury 1.323	Black African			
Other Black background [0.410,0.447] (0.420 (0.422 (0.441) (0.396,0.445) (0.396,0.445) (0.398,0.448) (0.416,0.468) [0.396,0.445] (0.398,0.448) (0.416,0.468) Arab 0.438 (0.402,0.477) (0.414,0.493) (0.415,0.494) (0.917 (0.902,0.932) (0.909,0.940) (0.911,0.941) [0.902,0.932] (0.909,0.940) (0.911,0.941) High clinical 1.000 (1.000) (1.000) (1.000) (1.000,1.000) [1.000,1.000] (1.000,1.000) Mod. clinical 0.522 (0.518 (0.514,0.522) (0.506,0.514) 80+ 2.776 (2.814 (2.669) (2.773,2.855) (2.631,2.708) 75-79 (2.225 (2.271 (2.131) (2.131) (2.196,2.254) (2.241,2.301) (2.103,2.159) 70-74 (1.588 (1.601 (1.525) (1.573,1.604) (1.588) (1.601 (1.525) (1.510,1.540) (0.959 (0.957) (0.922) (0.951,0.968) (0.949,0.965) (0.914,0.930) Stockport Ref Trafford 1.213 (1.195,1.231) (1.195,1.231) Bury 1.323	Dia il Carlli ann			
Other Black background 0.420 [0.396,0.445] 0.422 [0.398,0.448] 0.416,0.468] Arab 0.438 [0.402,0.477] [0.414,0.493] [0.415,0.494] Other ethnic group 0.917 [0.902,0.932] [0.909,0.940] [0.911,0.941] High clinical 1.000 [1.000] 1.000 [1.000] 1.000 Mod. clinical 0.522 [0.518 [0.514,0.522] [0.506,0.514] 80+ 2.776 [2.736,2.816] [2.773,2.855] [2.631,2.708] 75-79 2.225 [2.271 [2.131 [2.103,2.159] 70-74 1.588 [1.588 [1.601 [1.573,1.604] 1.586,1.617] [1.510,1.540] 65-69 0.959 [0.951,0.968] [0.949,0.965] [0.914,0.930] Stockport Ref Trafford 1.213 [1.195,1.231] Bury 1.323	Black Caribbean			
[0.396,0.445] [0.398,0.448] [0.416,0.468] Arab	Other Black background			
Arab 0.438 [0.402,0.477] 0.414,0.493] 0.453 [0.415,0.494] Other ethnic group 0.917 [0.902,0.932] 0.924 [0.909,0.940] 0.926 [0.911,0.941] High clinical 1.000 1.000 [1.000,1.000] 1.000 1.000 1.000,1.000] Mod. clinical 0.522 0.518 0.510 [0.506,0.514] 0.510 [0.519,0.526] [0.514,0.522] [0.506,0.514] 80+ 2.776 2.814 2.669 [2.773,2.855] [2.631,2.708] 75-79 2.225 2.271 2.131 [2.103,2.159] 70-74 1.588 1.601 1.525 [1.573,1.604] [1.586,1.617] [1.510,1.540] 65-69 0.959 0.957 0.922 [0.951,0.968] [0.949,0.965] [0.914,0.930] Stockport Ref Trafford 1.213 [1.195,1.231] [1.195,1.231] Bury 1.323	Other black background			
Other ethnic group [0.402,0.477] [0.414,0.493] [0.415,0.494] High clinical 0.917 0.924 0.926 High clinical 1.000 1.000 1.000 Mod. clinical 0.522 0.518 0.510 Mod. clinical 0.522 0.518 0.510 80+ 2.776 2.814 2.669 75-79 2.225 2.271 2.131 70-74 1.588 1.601 1.525 70-74 1.588 1.601 1.525 65-69 0.959 0.957 0.922 [0.951,0.968] [0.949,0.965] [0.914,0.930] Stockport Trafford 1.213 Bury 1.323	Λrah			
Other ethnic group 0.917 [0.902,0.932] 0.924 [0.909,0.940] 0.926 [0.911,0.941] High clinical 1.000 [1.000 1.000] 1.000 [1.000,1.000] [1.000,1.000] [1.000,1.000] Mod. clinical 0.522 0.518 0.510 0.510 [0.514,0.522] [0.506,0.514] [0.506,0.514] 80+ 2.776 2.814 2.669 2.814 2.669 [2.631,2.708] [2.631,2.708] 75-79 2.225 2.271 2.131 [2.196,2.254] [2.241,2.301] [2.103,2.159] [2.103,2.159] [2.774 1.588 1.601 1.525 [1.573,1.604] [1.586,1.617] [1.510,1.540] [65-69 0.959 0.957 0.922 [0.951,0.968] [0.949,0.965] [0.914,0.930] Stockport Ref Trafford 1.213 [1.195,1.231] [1.195,1.231] Bury 1.323 1.323 1.323 1.323 1.323 1.323 1.323 1.323 1.324	Alab			
[0.902,0.932] [0.909,0.940] [0.911,0.941] High clinical	Other ethnic group			
High clinical 1.000 [1.000,1.000] 1.000 [1.000,1.000] 1.000 [1.000,1.000] Mod. clinical 0.522 [0.518 0.510] 0.510 [0.514,0.522] [0.506,0.514] 80+ 2.776 2.814 2.669 2.814 2.669 75-79 2.225 2.271 2.131 [2.131 2.225 2.271 2.131 2.131 2.131 70-74 1.588 1.601 1.525 [1.573,1.604] [1.586,1.617] [1.510,1.540] 1.525 [1.573,1.604] [1.586,1.617] [1.510,1.540] 65-69 0.959 0.957 0.922 [0.951,0.968] [0.949,0.965] [0.914,0.930] Stockport Trafford 1.213 [1.195,1.231] [1.195,1.231] Bury 1.323	Other cumo group			
Trafford	High clinical			
Mod. clinical 0.522 0.518 0.510 [0.519,0.526] [0.514,0.522] [0.506,0.514] 80+ 2.776 2.814 2.669 [2.736,2.816] [2.773,2.855] [2.631,2.708] 75-79 2.225 2.271 2.131 [2.196,2.254] [2.241,2.301] [2.103,2.159] 70-74 1.588 1.601 1.525 [1.573,1.604] [1.586,1.617] [1.510,1.540] 65-69 0.959 0.957 0.922 [0.951,0.968] [0.949,0.965] [0.914,0.930] Stockport Ref Trafford 1.213 Bury 1.323	r ngr om noar			
[0.519,0.526] [0.514,0.522] [0.506,0.514] 80+ 2.776 2.814 2.669 [2.736,2.816] [2.773,2.855] [2.631,2.708] 75-79 2.225 2.271 2.131 [2.196,2.254] [2.241,2.301] [2.103,2.159] 70-74 1.588 1.601 1.525 [1.573,1.604] [1.586,1.617] [1.510,1.540] 65-69 0.959 0.957 0.922 [0.951,0.968] [0.949,0.965] [0.914,0.930] Stockport Ref Trafford 1.213 [1.195,1.231] Bury 1.323	Mod. clinical			
80+ 2.776 2.814 2.669 [2.736,2.816] [2.773,2.855] [2.631,2.708] 75-79 2.225 2.271 2.131 [2.196,2.254] [2.241,2.301] [2.103,2.159] 70-74 1.588 1.601 1.525 [1.573,1.604] [1.586,1.617] [1.510,1.540] 65-69 0.959 0.957 0.922 [0.951,0.968] [0.949,0.965] [0.914,0.930] Stockport Ref Trafford 1.213 [1.195,1.231] Bury 1.323				
75-79 [2.736,2.816] [2.773,2.855] [2.631,2.708] 75-79 2.225 2.271 2.131 [2.196,2.254] [2.241,2.301] [2.103,2.159] 70-74 1.588 1.601 1.525 [1.573,1.604] [1.586,1.617] [1.510,1.540] 65-69 0.959 0.957 0.922 [0.951,0.968] [0.949,0.965] [0.914,0.930] Stockport Ref Trafford 1.213 Bury	80+			
75-79				
70-74	75-79			
[1.573,1.604] [1.586,1.617] [1.510,1.540] 65-69 0.959 0.957 0.922 [0.951,0.968] [0.949,0.965] [0.914,0.930] Stockport Ref Trafford 1.213 [1.195,1.231] Bury 1.323		[2.196,2.254]	[2.241,2.301]	[2.103,2.159]
65-69 0.959 0.957 0.922 [0.951,0.968] [0.949,0.965] [0.914,0.930] Stockport Ref Trafford 1.213 [1.195,1.231] Bury 1.323	70-74	1.588	1.601	1.525
[0.951,0.968] [0.949,0.965] [0.914,0.930] Stockport Ref Trafford 1.213 [1.195,1.231] Bury 1.323		[1.573,1.604]	[1.586,1.617]	[1.510,1.540]
Stockport Ref Trafford 1.213 [1.195,1.231] 1.323	65-69	0.959	0.957	
Trafford 1.213 [1.195,1.231] Bury 1.323		[0.951,0.968]	[0.949,0.965]	[0.914,0.930]
Trafford 1.213 [1.195,1.231] Bury 1.323	Stockport		Ref	
[1.195,1.231] Bury 1.323				
Bury 1.323	Trafford			
	_			
[1.302,1.344]	Bury			
			[1.302,1.344]	

Observations	736898	736898	736898
			[0.799,0.815]
Most deprived			[0.909,0.929] 0.807
Q4			0.919
			[0.919,0.940]
Q3			0.929
~-			[0.986,1.010]
Q2			0.998
Least deprived			Ref
Land dancing d		[0.941,0.965]	Def
Manchester		0.953	
		[1.086,1.116]	
Oldham		1.101	
255		[0.986,1.013]	
Bolton		0.999	
Sallord		[0.969,0.998]	
Salford		[1.129,1.161] 0.984	
Rochdale		1.144	
		[1.103,1.135]	
Tameside		1.119	
3		[0.768,0.788]	
Wigan		0.778	

Table H – Associations between ethnic group and vaccine uptake by income deprivation (results also in Figure 2) Hazard ratios with 95% confidence intervals from Cox proportional hazards models estimating time-to-vaccination across ethnic groups, adjusted by vaccine eligibility group, stratified by income deprivation

	IMD income quintile	e 1 (least deprived)	IMD income quintile 5 (most deprived)		
	Covid-19 vaccine	Influenza vaccine	Covid-19 vaccine	Influenza vaccine	
White British	Ref	Ref	Ref	Ref	
	-	-	-	-	
White Irish	0.952	0.861	1.024	0.942	
	[0.869,1.043]	[0.794,0.935]	[0.975,1.076]	[0.901,0.984]	
Other White background	0.669	0.927	0.569	0.734	
White and Disch Could be an	[0.636,0.704]	[0.887,0.968]	[0.554,0.585]	[0.712,0.757]	
White and Black Caribbean	0.647	0.662	0.469	0.656	
White and Black African	[0.520,0.805] 0.754	[0.484,0.906] 0.880	[0.431,0.511] 0.475	[0.594,0.725] 0.670	
White and black African	[0.550,1.033]	[0.642,1.207]	[0.441,0.511]	[0.613,0.732]	
White and Asian	0.763	0.042,1.207	0.573	0.779	
Wille and Asian	[0.642,0.908]	[0.756,1.180]	[0.512,0.641]	[0.683,0.890]	
Other Mixed or Multiple	0.696	0.765	0.460	0.721	
Other Mixed of Manapie	[0.594,0.817]	[0.629,0.931]	[0.425,0.498]	[0.658,0.789]	
Indian	0.802	0.830	0.811	1.010	
	[0.743,0.866]	[0.771,0.894]	[0.786,0.837]	[0.976,1.045]	
Pakistani	0.674	0.783	0.547	1.001	
	[0.627,0.724]	[0.723,0.848]	[0.538,0.556]	[0.984,1.020]	
Bangladeshi	0.596	0.974	0.610	1.148	
	[0.489,0.725]	[0.801,1.185]	[0.594,0.626]	[1.112,1.185]	
Chinese	0.484	0.781	0.620	1.001	
	[0.430,0.545]	[0.693,0.881]	[0.575,0.668]	[0.928,1.081]	
Other Asian background	0.592	0.744	0.522	0.746	
	[0.530,0.661]	[0.665,0.832]	[0.502,0.544]	[0.711,0.783]	
Black African	0.430	0.661	0.456	0.750	
	[0.358,0.517]	[0.545,0.803]	[0.443,0.468]	[0.727,0.774]	
Black Caribbean	0.635	0.914	0.438	0.725	
Other Black hardens at	[0.516,0.782]	[0.751,1.113]	[0.415,0.461]	[0.688,0.764]	
Other Black background	0.435	0.792	0.407	0.706	
Arab	[0.316,0.600] 0.323	[0.593,1.056] 0.660	[0.378,0.438]	[0.651,0.766] 0.855	
Alab	[0.208,0.500]	[0.440,0.990]	[0.413,0.513]	[0.753,0.971]	
Other ethnic group	1.085	1.194	0.769	1.009	
Other ethnic group	[1.041,1.131]	[1.146,1.243]	[0.749,0.790]	[0.980,1.038]	
High clinical	Ref	Ref	Ref	Ref	
r ngri om noar	-	-	-	-	
Mod. clinical	0.461	0.649	0.527	0.608	
	[0.451,0.472]	[0.628,0.671]	[0.521,0.533]	[0.600,0.617]	
80+	2.373	1.972	2.267	1.781	
	[2.291,2.458]	[1.908,2.038]	[2.215,2.320]	[1.750,1.813]	
75-79	1.774	1.916	2.052	1.681	
	[1.721,1.830]	[1.852,1.982]	[2.007,2.099]	[1.648,1.715]	
70-74	1.263	1.728	1.546	1.459	
	[1.232,1.295]	[1.673,1.785]	[1.521,1.571]	[1.434,1.485]	
65-69	0.779	1.349	0.962	1.107	
	[0.761,0.797]	[1.303,1.396]	[0.949,0.976]	[1.086,1.128]	
Observations Exponentiated coefficients: 95%	100272	101966	278963	285088	

Table I – Associations between ethnic group and vaccine uptake by prior Influenza vaccine uptake (results also in Figure 3) Hazard ratios with 95% confidence intervals from Cox proportional hazards models estimating time-to-Covid-19 vaccination across ethnic groups, adjusted by vaccine eligibility group, stratified by prior Influenza vaccine uptake

	Had Influenza vaccine 2019/20	Did not have Influenza vaccine
		2019/20
White British	Ref	Ref
White Irish	1.002	1.013
	[0.957,1.048]	[0.970,1.059]
Other White background	0.589	0.657
	[0.574,0.603]	[0.638,0.678]
White and Black Caribbean	0.483	0.571
140.0	[0.445,0.523]	[0.510,0.640]
White and Black African	0.496	0.528
VALLEY I A - I	[0.458,0.538]	[0.480,0.581]
White and Asian	0.608	0.688
Other Mixed on Multiple	[0.552,0.670]	[0.619,0.765]
Other Mixed or Multiple	0.498	0.553
ladion	[0.463,0.535]	[0.506,0.605]
Indian	0.792	0.776
Dekistoni	[0.767,0.818]	[0.748,0.805]
Pakistani	0.535	0.494
Pangladashi	[0.525,0.545] 0.562	[0.484,0.504] 0.512
Bangladeshi	[0.541,0.584]	[0.495,0.531]
Chinese	0.523	0.495,0.551
Crimese	[0.489,0.560]	[0.569,0.656]
Other Asian background	0.519	0.636
Other Asian background	[0.499,0.540]	[0.607,0.665]
Black African	0.427	0.435
DIACK AITICALL	[0.414,0.442]	[0.419,0.452]
Black Caribbean	0.444	0.411
Diack Calibbean	[0.420,0.470]	[0.383,0.441]
Other Black background	0.389	0.486
Other black background	[0.359,0.421]	[0.444,0.532]
Arab	0.397	0.450
Alab	[0.349,0.451]	[0.395,0.512]
Other ethnic group	0.796	0.914
Caron carmio group	[0.775,0.817]	[0.893,0.934]
High clinical	Ref	Ref
	•	•
Moderate clinical	0.531	0.556
	[0.526,0.537]	[0.550,0.561]
80+	1.086	4.449
	[1.062,1.110]	[4.364,4.536]
75-79	1.184	3.124
	[1.158,1.210]	[3.075,3.175]
70-74	1.067	1.961
	[1.050,1.085]	[1.938,1.984]
65-69	0.847	0.999
	[0.835,0.859]	[0.989,1.010]
Observations	327440	409458