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Supplementary Material

Additional figures and tables

Figure 1: Construction of the cohort and datasets used.

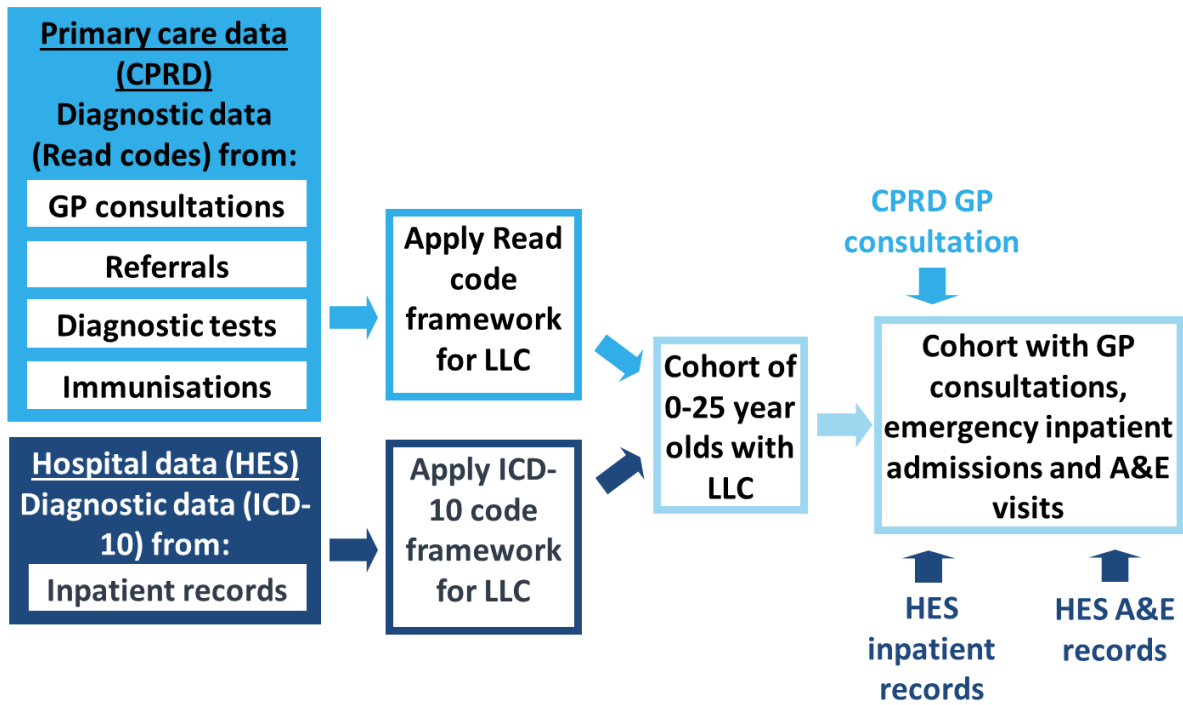


Figure 2: Face to face GP consultations per person year by age in the cohort, 2000-2015.

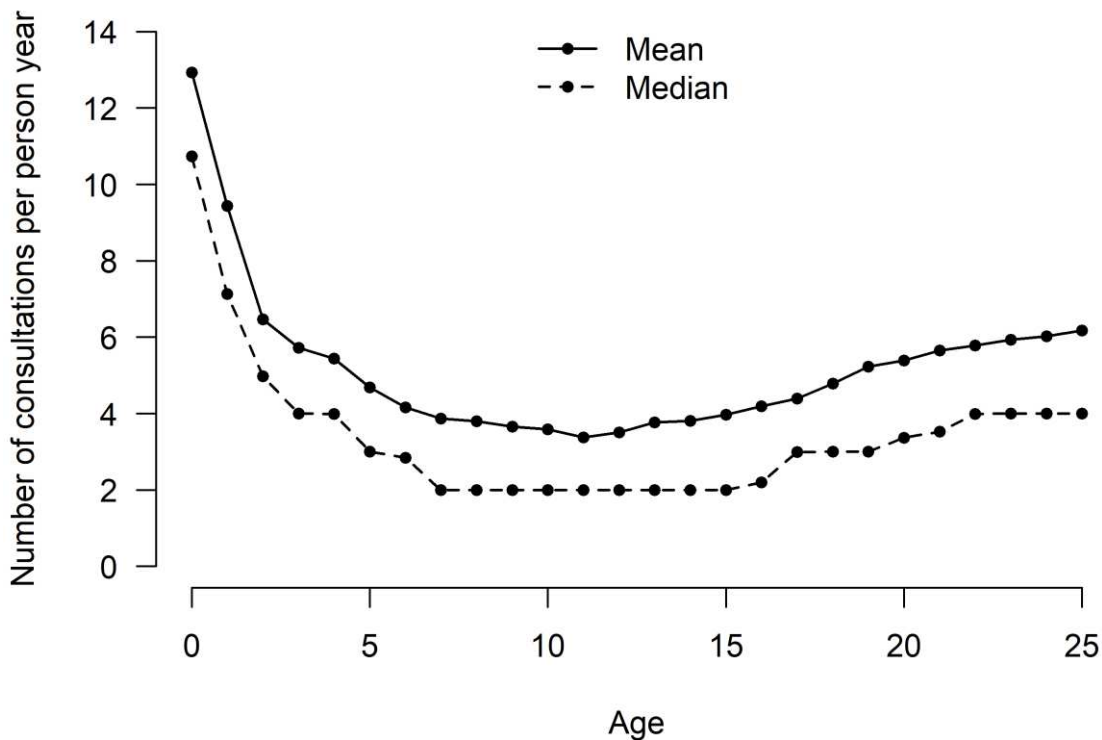


Table 1: Study cohort and demographics, emergency inpatient and A&E activity. Cell values of 10 or less are censored ('≤10') and some other cells with values over 10 are censored to prevent censored cells being determined by differencing ('*').

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
Individuals	2293	3184	3988	4668	5364	5969	6594	7257	7766	8237	8753	8985	9033	9055	8383	6963	19888
Gender																	
Female	996	1422	1794	2104	2378	2649	2912	3201	3470	3678	3937	4058	4035	4057	3731	3080	9222
Male	1297	1762	2194	2564	2986	3320	3682	4056	4296	4559	4816	4927	4998	4998	4652	3883	10666
Ethnic group																	
Black African	13	27	38	47	56	71	88	108	118	128	150	172	187	213	206	180	430
Black Caribbean	13	17	27	25	35	42	49	54	51	49	54	59	62	68	60	47	143
Black Other	≤10	13	22	22	30	38	40	41	42	52	55	57	61	64	54	46	147
Bangladeshi	≤10	≤10	≤10	14	23	23	30	35	39	37	37	45	50	57	44	40	94
Chinese	≤10	≤10	*	15	19	20	21	16	16	21	26	28	31	32	26	24	63
Indian	24	39	45	55	69	83	98	107	117	141	146	162	170	177	172	114	338
Pakistani	21	39	59	84	102	116	132	163	175	179	212	237	249	241	205	184	463
Other Asian	≤10	13	16	24	37	42	58	73	87	89	109	126	144	145	146	107	277
White	2030	2808	3473	4047	4585	5113	5607	6130	6556	6942	7329	7445	7395	7351	6800	5636	16228
Mixed	21	32	41	54	85	89	109	140	153	163	184	214	242	242	234	212	483
Other	27	32	40	55	59	65	81	92	105	130	157	162	168	177	173	141	377
Unknown	117	147	204	226	264	267	281	298	307	306	294	278	274	288	263	232	845
Age group																	
Under 1	107	128	123	126	148	181	182	209	198	233	223	218	224	241	158	110	N/A
1 to 5	618	868	1084	1239	1399	1509	1599	1701	1757	1792	1907	1962	1981	1936	1750	1376	N/A
6 to 10	511	674	835	977	1117	1290	1460	1587	1684	1781	1867	1868	1837	1868	1776	1507	N/A
11 to 15	426	554	718	835	957	1033	1179	1339	1433	1539	1654	1718	1738	1696	1651	1401	N/A
16 to 20	365	512	601	739	826	1002	1102	1242	1382	1462	1521	1613	1621	1639	1539	1315	N/A
21 to 25	266	448	627	752	917	954	1072	1179	1312	1430	1581	1606	1632	1675	1509	1254	N/A
Main diagnostic group																	
Circulatory	50	78	97	132	154	170	183	197	201	216	232	238	237	234	198	152	588
Congenital	845	1189	1521	1803	2109	2353	2570	2837	3022	3241	3434	3530	3559	3585	3328	2774	6741
Gastrointestinal	19	34	35	37	46	66	81	98	101	104	136	144	137	135	129	99	338
Genitourinary	106	167	202	233	255	285	316	356	376	396	425	442	450	452	423	361	1151
Haematology	75	107	134	173	209	251	298	335	363	400	443	476	496	519	481	398	1118

Metabolic	89	107	135	172	192	222	258	271	298	316	352	372	359	339	305	285	783
Neurology	381	514	653	757	859	931	1011	1116	1198	1227	1279	1285	1262	1233	1124	911	2863
Oncology	430	603	773	867	988	1074	1219	1307	1410	1476	1528	1511	1476	1452	1316	1103	4051
Perinatal	14	27	31	38	47	65	74	92	104	121	136	151	169	196	214	184	347
Respiratory	264	332	372	409	454	487	511	564	606	660	707	747	796	812	767	616	1667
Other	20	26	35	47	51	65	73	84	87	80	81	89	92	98	98	80	241
Deprivation category																	
1 (least deprived)	475	667	801	940	1065	1158	1311	1444	1573	1698	1825	1837	1826	1791	1722	475	3774
2	485	650	822	948	1104	1229	1370	1525	1577	1693	1803	1810	1768	1738	1629	485	3845
3	480	650	806	932	1066	1165	1281	1385	1474	1552	1634	1670	1690	1697	1551	480	3825
4	428	605	774	922	1061	1196	1319	1444	1570	1640	1745	1840	1864	1914	1740	428	4203
5 (most deprived)	420	606	779	919	1061	1217	1307	1453	1565	1647	1740	1822	1879	1908	1737	420	4222
Unknown	≤10	≤10	≤10	≤10	≤10	≤10	≤10	≤10	≤10	≤10	≤10	≤10	≤10	≤10	≤10	≤10	19
Face to face GP consultations (mean per person)	12868 (7.12)	15427 (6.04)	18794 (5.61)	22830 (5.67)	24537 (5.30)	26934 (5.18)	29017 (5.01)	30394 (4.79)	32444 (4.73)	35574 (4.87)	36473 (4.74)	37309 (4.75)	38498 (4.82)	36936 (4.75)	31591 (4.55)	25020 (4.43)	45464 6
Usual provider of care index																	
< 1/2	578	716	899	1154	1319	1568	1690	1825	2040	2371	2494	2545	2648	2486	2189	1716	N/A
≥1/2, <2/3	501	718	853	1069	1117	1287	1381	1552	1556	1735	1749	1860	1852	1795	1661	1291	N/A
≥ 2/3	542	720	870	893	992	1040	1124	1258	1324	1312	1314	1267	1313	1291	1113	891	N/A
Undefined^	672	1030	1366	1552	1936	2074	2399	2622	2846	2819	3196	3313	3220	3483	3420	3065	N/A
Coefficient of variation of gaps between consultations																	
< 0.75	483	757	837	1019	1082	1215	1341	1405	1547	1524	1682	1663	1693	1674	1497	1124	N/A
≥0.75, < 0.95	336	483	603	691	752	905	946	1000	1064	1194	1251	1298	1316	1256	1047	834	N/A
≥0.95, < 1.20	294	419	552	647	730	895	913	1006	1063	1232	1287	1286	1272	1263	1153	914	N/A
≥1.20	224	321	455	566	686	689	804	1014	1013	1272	1114	1229	1300	1177	1091	912	N/A
Undefined ^	956	1204	1541	1745	2114	2265	2590	2832	3079	3015	3419	3509	3452	3685	3595	3179	N/A
Emergency inpatient admissions (mean per person)	1691 (0.94)	2394 (0.94)	2661 (0.79)	2900 (0.72)	3074 (0.66)	3774 (0.73)	4089 (0.71)	4286 (0.68)	4628 (0.67)	4499 (0.62)	4732 (0.61)	4855 (0.62)	4796 (0.60)	4441 (0.57)	3893 (0.56)	3117 (0.55)	59830
A&E attendances (mean per person)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	4104 (0.60)	5064 (0.69)	5144 (0.67)	5701 (0.73)	5867 (0.73)	5845 (0.75)	5522 (0.80)	4318 (0.76)	41565

^Undefined due to having fewer than two consultations/gaps between consultations in the year

Table 2: Univariable analyses of variation in face to face GP consultations, emergency inpatient admissions and A&E attendances with cohort demographics.

	Face to face GP consultations per person year (95% CI)	Emergency inpatient admissions per person year (95% CI)	A&E attendances per person year (95% CI)	Mean usual provider of care index (SD)	Mean coefficient of variation for gaps between GP consultations (SD)
Gender					
Female	5.48 (5.45-5.50)	0.67 (0.66-0.68)	0.72 (0.71-0.73)	0.51 (0.22)	0.92 (0.37)
Male	4.54 (4.52-4.56)	0.64 (0.63-0.64)	0.71 (0.70-0.72)	0.52 (0.22)	0.92 (0.39)
Ethnic group					
Black African	4.42 (4.32-4.53)	0.62 (0.58-0.66)	0.81 (0.76-0.86)	0.50 (0.21)	0.90 (0.37)
Black Caribbean	4.58 (4.41-4.75)	0.85 (0.78-0.92)	1.08 (0.98-1.19)	0.50 (0.22)	0.87 (0.39)
Black Other	4.65 (4.46-4.83)	0.80 (0.72-0.88)	0.97 (0.87-1.08)	0.53 (0.22)	0.88 (0.39)
Bangladeshi	5.26 (5.04-5.47)	0.89 (0.80-0.98)	0.70 (0.61-0.80)	0.51 (0.21)	0.91 (0.36)
Chinese	5.02 (4.76-5.28)	0.48 (0.40-0.56)	0.61 (0.49-0.72)	0.50 (0.21)	0.92 (0.40)
Indian	4.70 (4.59-4.81)	0.67 (0.63-0.71)	0.64 (0.59-0.69)	0.51 (0.22)	0.91 (0.38)
Pakistani	6.13 (6.02-6.24)	0.91 (0.87-0.95)	0.85 (0.80-0.90)	0.52 (0.21)	0.92 (0.36)
Other Asian	5.78 (5.63-5.93)	0.91 (0.85-0.97)	1.08 (1.01-1.15)	0.51 (0.21)	0.91 (0.37)
White	5.03 (5.01-5.04)	0.66 (0.65-0.66)	0.71 (0.71-0.72)	0.51 (0.22)	0.92 (0.38)
Mixed	5.32 (5.22-5.43)	0.81 (0.77-0.85)	0.83 (0.78-0.88)	0.49 (0.21)	0.91 (0.38)
Other	4.65 (4.54-4.77)	0.78 (0.73-0.83)	0.96 (0.90-1.02)	0.53 (0.22)	0.92 (0.37)
Unknown	2.64 (2.58-2.69)	0.11 (0.10-0.12)	0.18 (0.16-0.19)	0.55 (0.22)	0.91 (0.41)
Age group					
Under 1	12.93 (12.72-13.15)	3.30 (3.19-3.41)	2.14 (2.02-2.26)	0.49 (0.21)	0.82 (0.33)
1 to 5	6.21 (6.18-6.24)	1.08 (1.06-1.09)	0.94 (0.93-0.96)	0.48 (0.21)	0.91 (0.35)
6 to 10	3.82 (3.80-3.85)	0.48 (0.47-0.49)	0.50 (0.49-0.51)	0.53 (0.22)	0.91 (0.38)
11 to 15	3.68 (3.65-3.71)	0.49 (0.48-0.50)	0.57 (0.56-0.58)	0.53 (0.22)	0.93 (0.40)
16 to 20	4.78 (4.74-4.81)	0.48 (0.47-0.49)	0.68 (0.67-0.70)	0.53 (0.22)	0.93 (0.40)
21 to 25	5.92 (5.88-5.96)	0.49 (0.48-0.50)	0.84 (0.82-0.85)	0.52 (0.22)	0.93 (0.39)
Main diagnostic group					
Circulatory	5.30 (5.20-5.39)	0.53 (0.50-0.56)	0.73 (0.69-0.78)	0.52 (0.22)	0.91 (0.38)
Congenital	4.57 (4.55-4.59)	0.41 (0.40-0.42)	0.59 (0.58-0.60)	0.50 (0.22)	0.92 (0.38)
Gastrointestinal	5.13 (5.00-5.26)	0.67 (0.63-0.72)	0.79 (0.73-0.85)	0.50 (0.21)	0.94 (0.40)
Genitourinary	6.01 (5.94-6.08)	0.92 (0.89-0.95)	1.23 (1.19-1.27)	0.52 (0.22)	0.94 (0.39)
Haematology	4.81 (4.74-4.87)	0.72 (0.69-0.74)	0.70 (0.67-0.73)	0.52 (0.22)	0.92 (0.39)

Metabolic	5.71 (5.63-5.79)	0.90 (0.87-0.93)	0.80 (0.76-0.84)	0.52 (0.23)	0.91 (0.38)
Neurology	5.56 (5.52-5.59)	0.72 (0.71-0.74)	0.83 (0.81-0.85)	0.52 (0.22)	0.91 (0.37)
Oncology	4.30 (4.27-4.34)	0.93 (0.92-0.95)	0.67 (0.66-0.69)	0.54 (0.22)	0.94 (0.40)
Perinatal	4.48 (4.37-4.59)	0.52 (0.48-0.56)	0.70 (0.65-0.75)	0.49 (0.21)	0.90 (0.38)
Respiratory	6.08 (6.03-6.14)	0.89 (0.87-0.91)	0.84 (0.82-0.87)	0.51 (0.22)	0.91 (0.36)
Other	5.20 (5.05-5.35)	0.50 (0.45-0.54)	0.76 (0.69-0.83)	0.52 (0.23)	0.91 (0.40)

Deprivation category

1 (least deprived)	4.93 (4.90-4.96)	0.60 (0.59-0.61)	0.56 (0.54-0.57)	0.50 (0.21)	0.93 (0.39)
2	4.91 (4.88-4.94)	0.60 (0.58-0.61)	0.58 (0.57-0.60)	0.52 (0.22)	0.92 (0.38)
3	4.94 (4.91-4.97)	0.67 (0.66-0.68)	0.73 (0.71-0.74)	0.51 (0.22)	0.92 (0.38)
4	5.00 (4.97-5.03)	0.69 (0.68-0.71)	0.80 (0.78-0.81)	0.52 (0.22)	0.92 (0.38)
5 (most deprived)	5.00 (4.96-5.03)	0.70 (0.69-0.71)	0.92 (0.90-0.94)	0.52 (0.22)	0.91 (0.38)

Data for figures in the main text

Figure 1

Gender	cohort age 0-4	cohort age 0-4 95%CI		population 0-4	cohort age 5-14	cohort age 5-14 95%CI		population age 5-14	cohort age 15-24	cohort age 15-24 95% CI		population age 15-24
Both	7.00	6.90	7.11	3.39	3.84	6.97	7.25	1.45	5.10	6.74	7.02	2.13
Male	7.11	3.79	3.89	3.51	3.76	3.69	3.82	1.39	4.12	3.88	4.03	1.34
Female	6.87	5.03	5.17	3.27	3.96	4.04	4.21	1.51	6.24	6.13	6.35	2.93

Figure 2

age	usual provider of care index		coefficient of variation	
	mean	median	mean	median
0	0.49	0.50	0.82	0.81
1	0.45	0.40	0.91	0.90
2	0.48	0.48	0.90	0.89
3	0.48	0.50	0.92	0.90
4	0.49	0.50	0.90	0.89
5	0.50	0.50	0.91	0.90
6	0.51	0.50	0.91	0.90
7	0.52	0.50	0.90	0.88
8	0.53	0.50	0.92	0.91
9	0.53	0.50	0.92	0.90
10	0.54	0.50	0.93	0.92
11	0.54	0.50	0.93	0.91
12	0.54	0.50	0.93	0.91
13	0.53	0.50	0.93	0.92
14	0.54	0.50	0.94	0.92
15	0.53	0.50	0.94	0.93
16	0.53	0.50	0.93	0.92
17	0.53	0.50	0.92	0.90
18	0.53	0.50	0.94	0.93
19	0.53	0.50	0.93	0.91
20	0.54	0.50	0.93	0.91
21	0.52	0.50	0.94	0.93
22	0.52	0.50	0.93	0.90
23	0.53	0.50	0.93	0.91
24	0.53	0.50	0.93	0.91
25	0.52	0.50	0.92	0.89

Figure 3

Age group	Emergency inpatient admissions per person year				A&E visits per person year			
	cohort	cohort 95% CI		population	cohort	cohort 95% CI		population
Under 1	4.02	3.12	5.21	0.33	2.23	1.92	2.56	0.74
1-4	1.27	1.10	1.43	0.10	1.20	1.14	1.27	0.51
5-9	0.42	0.35	0.49	0.04	0.61	0.57	0.65	0.29
10-14	0.36	0.29	0.44	0.04	0.57	0.53	0.60	0.34
15-19	0.36	0.30	0.43	0.05	0.67	0.57	0.80	0.38
20-24	0.45	0.37	0.54	0.06	0.84	0.75	0.93	0.45