

Supplementary Material 9: Investigating the economic costs associated with models of medical generalism in smaller hospitals

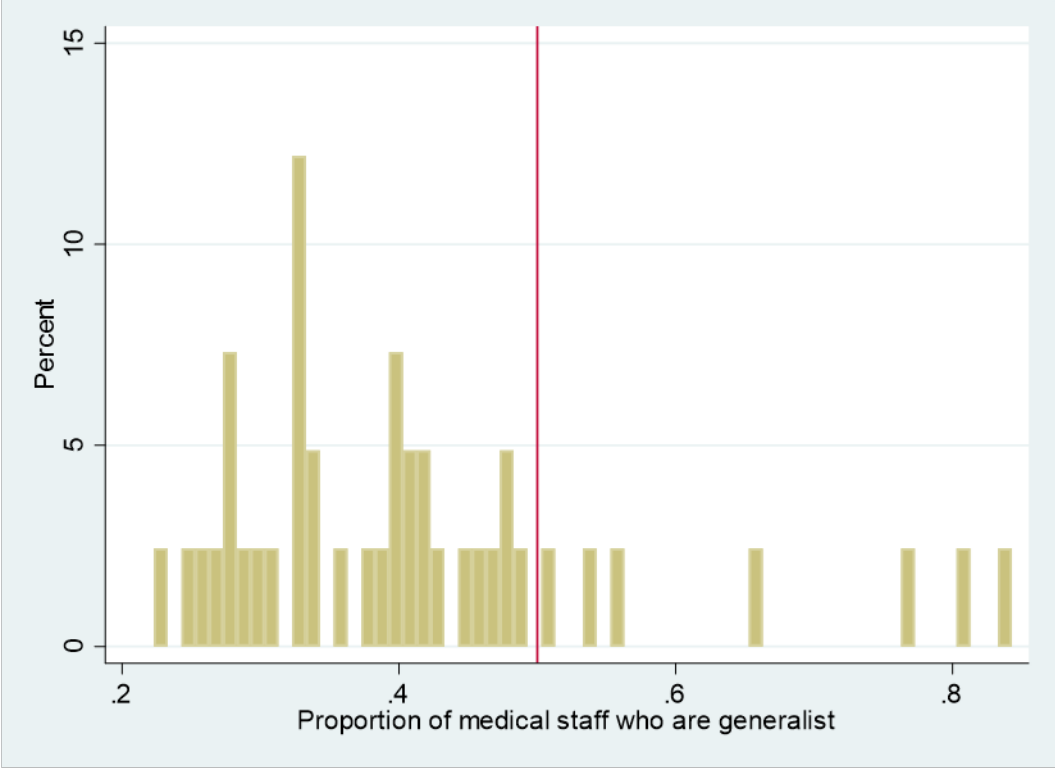
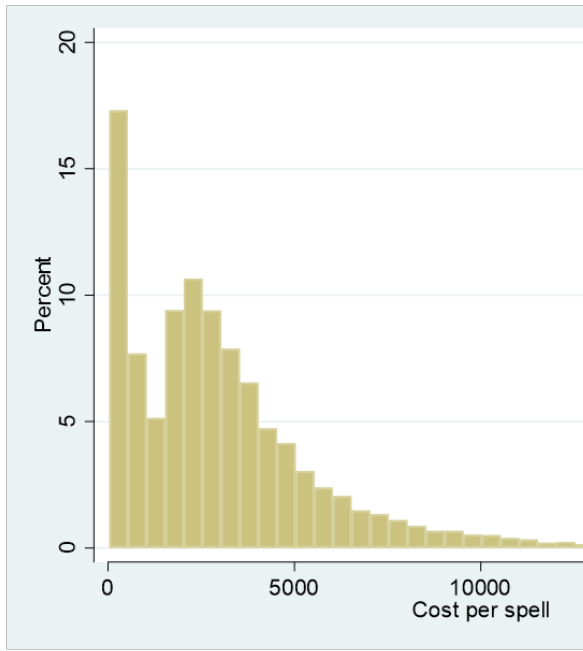
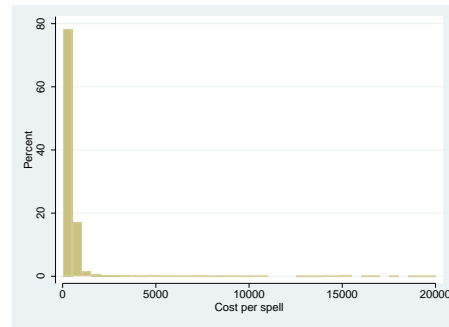


Figure 1. Proportion of the medical staff in each hospital who were generalist (n=41 hospitals)



(a) Spells with at least one overnight stay
(507,655 observations)

Mean (SD) costs per spell: £3,170 (£3,033).
 Median (IQR) costs per spell: £2,530
 (£1,051 to £4,161). 10th and 90th percentile
 costs per spell: £412 and £6,517. 5th and
 95th percentile costs per spell: £322 and
 £8,613. 1st and 99th percentile costs per
 spell: £222 and £14,405.



(b) Spells with no overnight stay (199,399
observations)

Mean (SD) costs per spell: £592 (£1,413).
 Median (IQR) costs per spell: £396 (£301 to
 £507). 10th and 90th percentile costs per
 spell: £232 and £676. 5th and 95th
 percentile costs per spell: £190 and £965. 1st
 and 99th percentile costs per spell: £146 and
 £5,903.

Figure 2. Distribution of cost per spell values

Table 1. Distribution of lowest cost 1% spells by case-mix group

Case-mix group		Frequency	Per cent
R1	Pain in throat and chest	1614	22.84
D2	Sickle cell disorders	1575	22.29
T1	Poisoning	454	6.43
S5	Other injury	390	5.52
F4	Other mental and behavioural disorders	353	5.00
G3	Migraine and headache	255	3.61
S3	Serious injury usually treated by physicians	203	2.87
M1	Joints	189	2.67
Z1	Other	186	2.63
R4	Signs/symptoms not elsewhere classified	173	2.45
G4	Transient ischaemic attacks and dizziness and giddiness	161	2.28
F3	Mental and behavioural disorders due to use of alcohol	149	2.11
I12	Phlebitis and thrombophlebitis and hypotension	145	2.05
J8	Other respiratory and haemorrhage from respiratory passages and cough and abnormalities of breathing	136	1.92
S1	Head injury	110	1.56
T3	Other external injury	100	1.42
G2	Epilepsy and convulsions, not elsewhere classified	75	1.06
J5	Asthma	69	0.98

Case-mix group		Frequency	Per cent
R3	Abnormalities of gait and mobility	68	0.96
D1	Iron deficiency anaemia	45	0.64
E3	Other disorders of pancreatic internal secretion	44	0.62
C4	Malignant neoplasms, prior history of same cancer, without palliative care	43	0.61
N3	Other genitourinary and retention of urine	40	0.57
E5	Volume depletion and other fluid disorders	39	0.55
E6	Other metabolic diseases	33	0.47
G7	Other neurological and somnolence, stupor and coma	33	0.47
I14	Other circulatory	33	0.47
R2	Skin and cellulitis	29	0.41
D4	Other diseases of blood and blood-forming organs	27	0.38
T2	Complications of treatment	22	0.31
A3	Other infectious diseases not elsewhere classified and fever of unknown origin	21	0.3
H1	Ear, nose and throat	21	0.3
J3	Pneumonia (aspiration) and LRTI and pneumonitis due to solids and liquids	21	0.3
J4	Chronic lung disease inc. COPD	19	0.27
M2	Back pain	18	0.25
E4	Disorders of mineral metabolism	17	0.24

Case-mix group		Frequency	Per cent
J1	Diseases of the pharynx and larynx	14	0.2
J2	Acute upper respiratory infections of multiple and unspecified sites	13	0.18
J6	Interstitial lung disease and pleural effusion	13	0.18
K6	Other digestive and dysphagia	13	0.18
I7	Valve disorders	11	0.16
C8	Neoplasms of uncertain behaviour without palliative care	8	0.11
N1	Acute kidney disease and chronic kidney disease	8	0.11
I9	Heart failure and pulmonary oedema	7	0.1
K2	Crohn's and other intestinal diseases	7	0.1
C6	Malignant neoplasms, prior history of different cancer, without palliative care	6	0.08
J7	Respiratory failure, not elsewhere classified	6	0.08
C1	Benign and in-situ neoplasms	5	0.07
C2	Malignant neoplasms, no prior history, without palliative care	5	0.07
I3	Acute myocardial infarction	<5	<0.07
I10	Cerebrovascular haemorrhages/stroke/cerebral infarction	<5	<0.07
I4	Chronic ischaemic heart disease	<5	<0.07
I8	Conduction disorder, tachycardia arrhythmias atrial fibrillation and abnormalities of heart beat	<5	<0.07

Case-mix group		Frequency	Per cent
F2	Delirium	<5	<0.07
F1	Dementia and senility	<5	<0.07
I1	Hypertension	<5	<0.07
E1	Insulin-dependent diabetes mellitus	<5	<0.07
A1	Intestinal infections and nausea and vomiting	<5	<0.07
C5	Malignant neoplasms, prior history of same cancer, with palliative care	<5	<0.07
E2	Non-insulin-dependent diabetes mellitus	<5	<0.07
D3	Other anaemias	<5	<0.07
G6	Other disorders of brain	<5	<0.07
I5	Pulmonary embolism	<5	<0.07
A2	Septicaemia	<5	<0.07
S2	Spine injury	<5	<0.07
L1	Ulcer of lower limb, not elsewhere classified	<5	<0.07
Total		7,066	100

Table 2. Descriptive statistics: unadjusted costs per spell

	Mean	SD	Median	25 th %	75 th %	Obs.
AMU1						
Closed	2614	3148	1728	466	3582	267661
Open	2331	2709	1423	459	3380	140511
Partial	2343	2790	1601	399	3287	298882
AMU2						
Acute physician dominant	2498	3078	1532	452	3515	242667
Mixed	2468	2878	1726	436	3443	385921
Specialist physician dominant	2152	2569	1265	396	3028	78466
Ward1						
Closed	2460	3049	1578	396	3395	387869
Open	2284	2882	1149	400	3270	37225
Partial	2441	2732	1744	473	3465	281960
Ward2						
General medical ward	2421	2957	1521	451	3342	305845
Specialist ward	2460	2888	1704	414	3474	401209
Proportion of medical staff who are generalist >0.5						
No	2421	2938	1558	424	3389	588814
Yes	2474	2712	1886	486	3336	88345

	Mean	SD	Median	25 th %	75 th %	Obs.
Case-mix group						
Fracture of femur	10085	4633	9657	7835	11802	2114
Delirium	5390	2817	5483	3971	7255	2746
Malignant neoplasms, no prior history, with palliative care	6182	4283	5035	3659	7763	1078
Dementia and senility	4758	3328	4921	1991	6996	2955
Neoplasms of uncertain behaviour with palliative care	5382	4021	4694	3041	5935	49
Malignant neoplasms, prior history of different cancer, with palliative care	5117	3635	4317	3172	6201	645
Angina pectoris and dyspepsia	5317	4549	4278	2501	6517	16721
Spine injury	4567	3405	4224	2609	5819	2319
Malignant neoplasms, prior history of same cancer, with palliative care	4468	2976	3921	2737	5599	3010
Malignant neoplasms, no prior history, without palliative care	4512	4383	3663	2101	5674	2655
Other circulatory	4007	2716	3588	2478	5066	14817
Ulcer of lower limb, not elsewhere classified	4263	3672	3561	1977	5676	1676
Pulmonary embolism	3995	2385	3559	2558	4655	207
Parkinson's disease	4452	6433	3552	2251	4830	866

	Mean	SD	Median	25 th %	75 th %	Obs.
Failing liver and alcoholic liver disease	4056	3200	3516	1862	5595	4270
Septicaemia	4137	3015	3449	2656	4696	11613
Phlebitis and thrombophlebitis and hypotension	3611	2669	3393	1651	4747	904
Respiratory failure, not elsewhere classified	4094	3564	3331	2146	5115	1289
Malignant neoplasms, prior history of different cancer, without palliative care	3635	3632	3034	1035	4864	1114
Acute myocardial infarction	3895	4163	3023	950	5190	588
Abnormalities of gait and mobility	3062	2798	2981	518	4206	15852
Other genitourinary and retention of urine	3308	2883	2949	813	4492	32141
Pneumonia (aspiration) and LRTI and pneumonitis due to solids and liquids	3311	2667	2942	1707	4244	71846
Acute kidney disease and chronic kidney disease	3412	2948	2850	1482	4505	12238
Conduction disorder, tachycardia arrhythmias atrial fibrillation and abnormalities of heart beat	3319	2399	2827	1935	4150	14027

	Mean	SD	Median	25 th %	75 th %	Obs.
Gallbladder and biliary tree diseases	3373	2773	2740	1579	4567	4237
Heart failure and pulmonary oedema	3070	2678	2725	1461	3724	926
Acute pancreatitis	3063	2472	2606	1734	3618	679
Interstitial lung disease and pleural effusion	2979	2574	2526	847	4025	4395
Benign and in-situ neoplasms	3192	3083	2449	651	4180	367
Pericarditis	3466	4027	2438	526	4530	4641
Hemiplegia	3384	3598	2420	696	4505	297
Other disorders of brain	2998	3074	2376	600	3917	968
Malignant neoplasms, prior history of same cancer, without palliative care	2949	3053	2349	630	4048	4623
Other digestive and dysphagia	2905	3133	2192	514	3868	12717
Chronic lung disease inc. COPD	2511	2806	2190	634	2990	29427
Volume depletion and other fluid disorders	2594	2674	2054	476	3656	9730
Cerebrovascular haemorrhages/stroke/cerebral infarction	2264	2191	2016	570	3000	5530
Non-insulin-dependent diabetes mellitus	2887	3309	1991	539	3913	3627

	Mean	SD	Median	25 th %	75 th %	Obs.
Disorders of mineral metabolism	2391	2544	1958	457	3320	1593
Crohn's and other intestinal diseases	2566	3137	1943	491	3258	9460
Skin and cellulitis	2444	2723	1770	430	3458	18456
Intestinal infections and nausea and vomiting	2173	2460	1749	480	2821	16053
Other diseases of blood and blood-forming organs	2516	3076	1662	570	3224	2666
Neoplasms of uncertain behaviour without palliative care	2645	3213	1640	567	3539	776
Other neurological and somnolence, stupor and coma	2811	3725	1612	459	3842	5236
Other metabolic diseases	2467	2904	1597	437	3310	1840
Complications of treatment	2689	3845	1434	447	3312	4448
Asthma	1434	1154	1372	479	1949	7958
Other anaemias	2189	2417	1249	553	2882	3278
Insulin-dependent diabetes mellitus	1755	2112	1219	472	2116	3862
Other disorders of pancreatic internal secretion	2090	2428	1207	419	2976	2437
Other cerebrovascular diseases	1822	2244	1083	429	2560	1121

	Mean	SD	Median	25 th %	75 th %	Obs.
Serious injury usually treated by physicians	2637	3321	1063	380	4015	8232
Iron deficiency anaemia	1998	2285	1007	510	2766	3583
Other infectious diseases not elsewhere classified and fever of unknown origin	1881	2672	984	425	2405	8300
Mental and behavioural disorders due to use of alcohol	1601	1666	797	307	2496	7669
Epilepsy and convulsions, not elsewhere classified	1819	2176	672	395	2495	10640
Oesophageal varices	1982	2647	641	443	2606	24558
Pregnancy, childbirth and congenital or chromosomal conditions	1841	5550	591	452	1424	1903
Chronic ischaemic heart disease	1650	2235	588	398	2302	9284
Transient ischaemic attacks and dizziness and giddiness	1549	2054	564	387	2080	24274
Other injury	1969	2818	562	316	2731	9058
Signs/symptoms not elsewhere classified	2006	2785	554	357	2899	26333
Other respiratory and haemorrhage from respiratory passages and cough and abnormalities of breathing	1730	2286	542	352	2444	12106

	Mean	SD	Median	25 th %	75 th %	Obs.
Back pain	1640	2293	542	348	2402	7970
Ear, nose and throat	1275	1692	535	344	1751	4170
Oesophagitis and ulcers of the digestive system and gastritis	1770	2582	521	409	2404	8844
Valve disorders	1216	1522	518	402	1664	9489
Migraine and headache	965	1428	501	340	1194	14962
Head injury	1724	2442	494	344	2464	21212
Hypertension	1054	1363	451	369	1580	2704
Poisoning	976	1739	450	326	1169	20383
Acute upper respiratory infections of multiple and unspecified sites	950	1354	429	340	972	1291
Calculus of kidney or urinary tract	721	1136	429	276	638	1285
Joints	1735	2803	426	322	2324	24991
Diseases of the pharynx and larynx	925	1180	422	302	1223	1854
Other external injury	1272	2111	420	293	1130	3020
Pain in throat and chest	962	2041	397	302	579	48631
Other	1054	1696	364	263	809	2153
Other mental and behavioural disorders	1274	2026	359	234	1116	6424

	Mean	SD	Median	25 th %	75 th %	Obs.
Sickle cell disorders	908	1358	155	155	1895	2643
Procedure flag						
No	1609	2029	572	377	2394	449882
Yes	3901	3587	3110	1538	5192	257172
Frailty flag						
No	1934	2445	811	401	2732	522418
Yes	3885	3590	3227	1151	5279	184636
Secondary cancer flag						
No	2363	2875	1498	427	3307	647418
Yes	3309	3233	2726	673	4479	59636
Hospital/trust (anonymised)						
1	3994	3799	3137	1179	5337	6004
2	3511	3564	2901	787	4753	10383
3	3100	2914	2553	826	4163	19680
4	2642	1324	2494	2052	3055	8703
5	3383	3802	2441	525	4501	7797
6	3096	3205	2438	557	4302	21401
7	2903	3187	2398	398	3982	9642
8	3178	3369	2392	447	4602	11291
9	3324	4086	2310	466	4271	13215

	Mean	SD	Median	25 th %	75 th %	Obs.
10	2788	2916	2129	557	3865	13907
11	2603	2467	2056	718	3324	14752
12	2401	2437	1975	412	3344	20143
13	2622	3288	1826	337	3611	16699
14	2725	3230	1821	370	3934	19560
15	2471	3018	1818	321	3613	21040
16	2785	3672	1765	326	3792	10838
17	2621	3267	1756	418	3624	15672
18	2487	2598	1746	528	3515	11337
19	2225	2480	1688	480	3084	23385
20	2463	2798	1658	421	3593	10396
21	2590	3268	1651	237	3344	18935
22	2204	2543	1641	266	3061	11810
23	4353	5648	1634	947	5543	13620
24	2230	2202	1579	652	3037	18059
25	2027	2125	1543	502	2928	15516
26	2315	2734	1539	410	3359	15416
27	2088	2147	1525	529	2804	24778
28	2193	2381	1517	417	3366	21229
29	2173	2306	1509	409	3197	20035

	Mean	SD	Median	25 th %	75 th %	Obs.
30	2173	2285	1373	585	2848	11164
31	2611	3248	1357	392	3823	25824
32	2018	2509	1235	237	2991	18441
33	2529	3219	1187	345	3794	19376
34	2446	2928	1020	432	3645	23586
35	2268	2798	986	365	3317	11826
36	1872	2047	887	529	2475	20535
37	2520	3311	766	377	3764	9794
38	1926	2458	575	315	2684	13710
39	1843	2109	566	501	2801	31126
40	2210	3341	521	297	3166	10215
41	1594	2324	480	268	2267	13524
42	1880	2244	475	273	2990	29955
43	1646	2121	361	250	2629	22735

Case-mix groups and hospital/trust ranked by median value.

Table 3. Association between covariates and mean cost per spell (adjusted)

Case-mix group	Model 1: not including proportion of medical staff who are generalist			Model 2: including proportion of medical staff who are generalist		
	Predictive margin	Std. Err.	(95% CI)	Predictive margin	Std. Err.	(95% CI)
Fracture of femur	5451	273	(4916, 5986)	5427	313	(4814, 6040)
Malignant neoplasms, no prior history, with palliative care	4807	219	(4378, 5235)	4769	222	(4334, 5205)
Malignant neoplasms, prior history of same cancer, with palliative care	4570	194	(4191, 4949)	4533	199	(4143, 4923)
Malignant neoplasms, prior history of different cancer, with palliative care	4425	231	(3972, 4878)	4384	226	(3942, 4826)
Neoplasms of uncertain behaviour with palliative care	4296	575	(3168, 5423)	4216	616	(3008, 5424)
Dementia and senility	4054	192	(3678, 4430)	4041	201	(3647, 4434)
Failing liver and alcoholic liver disease	3876	209	(3465, 4286)	3862	210	(3451, 4273)
Septicaemia	3873	150	(3579, 4167)	3867	147	(3578, 4156)
Ulcer of lower limb, not elsewhere classified	3849	164	(3528, 4171)	3844	160	(3530, 4157)
Delirium	3841	180	(3488, 4195)	3847	189	(3477, 4218)
Parkinson's disease	3824	257	(3321, 4328)	3798	258	(3293, 4304)
Angina pectoris and dyspepsia	3737	179	(3386, 4088)	3622	164	(3300, 3943)
Spine injury	3703	160	(3390, 4016)	3670	165	(3347, 3993)

Case-mix group	Model 1: not including proportion of medical staff who are generalist			Model 2: including proportion of medical staff who are generalist		
	Predictive margin	Std. Err.	(95% CI)	Predictive margin	Std. Err.	(95% CI)
Acute pancreatitis	3672	163	(3351, 3992)	3637	167	(3309, 3965)
Malignant neoplasms, no prior history, without palliative care	3640	190	(3266, 4013)	3633	195	(3251, 4015)
Other circulatory	3609	135	(3345, 3873)	3593	139	(3321, 3865)
Pregnancy, childbirth and congenital or chromosomal conditions	3459	725	(2038, 4881)	3447	717	(2042, 4852)
Pulmonary embolism	3434	202	(3038, 3830)	3402	204	(3003, 3802)
Pericarditis	3359	144	(3077, 3641)	3353	150	(3059, 3647)
Pneumonia (aspiration) and LRTI and pneumonitis due to solids and liquids	3338	106	(3129, 3546)	3327	107	(3118, 3537)
Phlebitis and thrombophlebitis and hypotension	3327	202	(2932, 3723)	3275	203	(2877, 3673)
Acute kidney disease and chronic kidney disease	3327	127	(3078, 3575)	3313	131	(3057, 3569)
Respiratory failure, not elsewhere classified	3172	147	(2884, 3460)	3183	141	(2906, 3460)
Malignant neoplasms, prior history of different cancer, without palliative care	3126	182	(2768, 3483)	3126	186	(2761, 3492)
Gallbladder and chole	3125	126	(2878, 3372)	3101	130	(2846, 3356)
Non-insulin-dependent diabetes mellitus	3109	133	(2848, 3370)	3137	131	(2881, 3393)
Conduction disorder, tachycardia arrhythmias atrial fibrillation and abnormalities of heart beat	3048	114	(2825, 3271)	3048	119	(2814, 3282)

Case-mix group	Model 1: not including proportion of medical staff who are generalist			Model 2: including proportion of medical staff who are generalist		
	Predictive margin	Std. Err.	(95% CI)	Predictive margin	Std. Err.	(95% CI)
Insulin-dependent diabetes mellitus	3021	184	(2661, 3381)	3058	183	(2700, 3416)
Malignant neoplasms, prior history of same cancer, without palliative care	2962	131	(2705, 3218)	2952	135	(2686, 3217)
Other genitourinary and retention of urine	2895	107	(2686, 3104)	2878	105	(2671, 3084)
Heart failure and pulmonary oedema	2869	187	(2503, 3234)	2879	191	(2505, 3253)
Chronic lung disease inc. COPD	2861	117	(2631, 3090)	2857	117	(2627, 3087)
Skin and cellulitis	2852	98	(2660, 3043)	2843	102	(2644, 3043)
Acute myocardial infarction	2841	245	(2361, 3322)	2840	250	(2350, 3330)
Other disorders of brain	2839	135	(2575, 3103)	2803	135	(2539, 3067)
Hemiplegia	2744	189	(2373, 3115)	2767	185	(2405, 3130)
Other diseases of blood and blood-forming organs	2712	150	(2419, 3005)	2706	154	(2403, 3009)
Other metabolic diseases	2698	120	(2463, 2932)	2709	123	(2468, 2951)
Benign and in-situ neoplasms	2683	182	(2326, 3040)	2662	182	(2305, 3019)
Crohn's and other intestinal diseases	2682	102	(2482, 2882)	2656	103	(2453, 2859)
Other neurological and somnolence, stupor and coma	2676	110	(2461, 2890)	2653	111	(2434, 2871)
Asthma	2617	123	(2376, 2859)	2629	123	(2388, 2870)

Case-mix group	Model 1: not including proportion of medical staff who are generalist			Model 2: including proportion of medical staff who are generalist		
	Predictive margin	Std. Err.	(95% CI)	Predictive margin	Std. Err.	(95% CI)
Intestinal infections and nausea and vomiting	2612	85	(2445, 2780)	2607	89	(2433, 2781)
Disorders of mineral metabolism	2564	118	(2332, 2796)	2556	123	(2315, 2798)
Other digestive and dysphagia	2542	79	(2388, 2697)	2530	80	(2372, 2687)
Mental and behavioural disorders due to use of alcohol	2529	123	(2289, 2770)	2498	128	(2248, 2748)
Volume depletion and other fluid disorders	2507	93	(2325, 2689)	2500	95	(2314, 2686)
Other infectious diseases not elsewhere classified and fever of unknown origin	2430	99	(2236, 2624)	2432	103	(2230, 2633)
Abnormalities of gait and mobility	2421	96	(2233, 2609)	2400	98	(2209, 2591)
Interstitial lung disease and pleural effusion	2402	92	(2222, 2583)	2406	91	(2228, 2584)
Sickle cell disorders	2368	609	(1174, 3561)	2384	613	(1182, 3586)
Complications of treatment	2367	83	(2203, 2530)	2348	88	(2175, 2521)
Neoplasms of uncertain behaviour without palliative care	2311	177	(1963, 2658)	2290	183	(1931, 2649)
Other disorders of pancreatic internal secretion	2214	99	(2019, 2409)	2230	97	(2041, 2420)
Serious injury usually treated by physicians	2212	91	(2035, 2390)	2184	93	(2002, 2366)
Other cerebrovascular diseases	2012	108	(1800, 2225)	2013	112	(1793, 2232)
Oesophageal varices	2012	78	(1860, 2164)	2019	78	(1866, 2171)

Case-mix group	Model 1: not including proportion of medical staff who are generalist			Model 2: including proportion of medical staff who are generalist		
	Predictive margin	Std. Err.	(95% CI)	Predictive margin	Std. Err.	(95% CI)
Other anaemias	1966	100	(1771, 2161)	1969	99	(1775, 2163)
Signs/symptoms not elsewhere classified	1957	76	(1807, 2106)	1939	78	(1785, 2092)
Iron deficiency anaemia	1948	109	(1734, 2162)	1985	99	(1791, 2179)
Cerebrovascular haemorrhages/stroke/cerebral infarction	1925	86	(1757, 2093)	1907	89	(1733, 2080)
Epilepsy and convulsions, not elsewhere classified	1909	61	(1790, 2028)	1888	60	(1770, 2007)
Other respiratory and haemorrhage from respiratory passages and cough and abnormalities of breathing	1848	63	(1725, 1972)	1839	65	(1711, 1968)
Oesophagitis and ulcers of the digestive system and gastritis	1837	91	(1659, 2015)	1824	94	(1639, 2009)
Other mental and behavioural disorders	1816	121	(1578, 2053)	1780	122	(1542, 2018)
Joints	1785	80	(1628, 1942)	1770	80	(1613, 1928)
Chronic ischaemic heart disease	1757	73	(1613, 1900)	1742	77	(1592, 1893)
Poisoning	1752	110	(1537, 1967)	1709	110	(1494, 1924)
Other injury	1745	79	(1591, 1900)	1713	77	(1562, 1863)
Back pain	1720	74	(1574, 1865)	1703	77	(1552, 1854)
Other external injury	1596	63	(1473, 1719)	1591	67	(1460, 1722)
Diseases of the pharynx and larynx	1580	82	(1420, 1741)	1553	82	(1391, 1714)

Case-mix group	Model 1: not including proportion of medical staff who are generalist			Model 2: including proportion of medical staff who are generalist		
	Predictive margin	Std. Err.	(95% CI)	Predictive margin	Std. Err.	(95% CI)
Acute upper respiratory infections of multiple and unspecified sites	1509	67	(1377, 1641)	1492	69	(1357, 1626)
Valve disorders	1501	70	(1365, 1638)	1517	73	(1373, 1660)
Transient ischaemic attacks and dizziness and giddiness	1463	49	(1367, 1558)	1455	49	(1360, 1551)
Ear, nose and throat	1431	48	(1337, 1525)	1412	47	(1320, 1504)
Hypertension	1350	50	(1252, 1448)	1353	51	(1253, 1453)
Head injury	1330	62	(1208, 1452)	1304	63	(1182, 1427)
Pain in throat and chest	1273	150	(980, 1566)	1280	152	(983, 1577)
Other	1221	87	(1050, 1392)	1224	90	(1047, 1401)
Migraine and headache	1155	64	(1029, 1281)	1150	66	(1020, 1280)
Calculus of kidney or urinary tract	958	80	(802, 1113)	947	82	(786, 1108)
Procedure flag						
No	1696	52	(1594, 1798)	1678	54	(1572, 1783)
Yes	3777	123	(3537, 4018)	3754	124	(3511, 3997)

	Model 1: not including proportion of medical staff who are generalist			Model 2: including proportion of medical staff who are generalist		
Case-mix group	Predictive margin	Std. Err.	(95% CI)	Predictive margin	Std. Err.	(95% CI)
Frailty flag						
No	2152	60	(2034, 2271)	2135	61	(2015, 2254)
Yes	3345	100	(3148, 3541)	3335	102	(3135, 3535)
Secondary cancer flag						
No	2501	69	(2366, 2636)	2488	70	(2350, 2625)
Yes	2946	87	(2775, 3117)	2932	88	(2759, 3105)
Patient died in hospital						
No	2550	70	(2413, 2688)	2536	71	(2397, 2676)
Yes	2449	108	(2238, 2660)	2450	112	(2230, 2670)

Case-mix groups ranked by predictive margin from Model 1.

Table 4. Association between typology and mean cost per spell (adjusted) - Model 1: not including proportion of medical staff who are generalist

	Spells with cost per spell \geq £168			Spells with at least one overnight stay		
	Predictive margin	Std. Err.	(95% CI)	Predictive margin	Std. Err.	(95% CI)
AMU1						
Closed	2685	121	(2448, 2922)	3268	94	(3083, 3453)
Open	2723	203	(2325, 3122)	3392	124	(3149, 3635)
Partial	2387	81	(2228, 2546)	3068	84	(2903, 3232)
AMU2						
Acute physician dominant	2511	131	(2254, 2767)	3148	95	(2961, 3335)
Mixed	2607	89	(2432, 2782)	3263	78	(3110, 3416)
Specialist physician dominant	2571	130	(2316, 2826)	3093	101	(2895, 3291)
Ward1						
Closed	2682	147	(2394, 2970)	3248	92	(3068, 3428)
Open	1811	171	(1475, 2147)	2798	138	(2527, 3070)

	Spells with cost per spell \geq £168			Spells with at least one overnight stay		
	Predictive margin	Std. Err.	(95% CI)	Predictive margin	Std. Err.	(95% CI)
Partial	2541	80	(2383, 2698)	3205	74	(3060, 3349)
Ward2						
General medical ward	2630	143	(2349, 2911)	3102	95	(2916, 3288)
Specialist ward	2520	78	(2367, 2673)	3285	69	(3150, 3421)
Observations	699988			507655		
AIC	17.12931			17.84055		
BIC	-8899568			-6365011		

Covariates also included in models (but not reported): case-mix groups; procedure flag; frailty flag; secondary cancer flag; patient age; patient gender; patient ethnic group; admission source; urban/rural indicator for patient's small area of residence; whether or not the patient died in hospital; population covered by hospital; hospital distance to nearest A&E; trust operating revenue; approximate number of beds on main hospital site; hospital A&E attendances 2015/16; hospital emergency admissions 2015/16; urban/rurality indicator; hospital size; CQC rating. Standard errors adjusted for clustering at hospital level.

