

Supplementary Table 1. Long-term conditions used to define multimorbidity in Barking & Dagenham sample

1. Atrial fibrillation
2. Asthma
3. Cancer
4. Coronary heart disease (CHD)
5. Chronic obstructive pulmonary disease (COPD)
6. Diabetes
7. Depression
8. Mental health conditions (long term enduring mental health diagnosis including schizophrenia, psychosis and bipolar disorders)
9. Dementia
10. Epilepsy
11. Heart failure
12. Hypertension
13. Hypothyroidism
14. Learning difficulty
15. Palliative care
16. Stroke

A list of Read codes for each of the conditions is available on request.

Supplementary Table 2. Description of activity and cost of health and social care measures

	B & D sample	CPRD sample
Primary care consultations	<p>The activity data provided a count of GP and non-GP contacts per month, without a distinction between face-to-face consultations in the surgery, telephone consultations or home visits.</p> <p>Unit costs were applied to GP and non-GP contacts using unit cost figures from the Personal Social Services Research Unit (PSSRU).²⁸ Unit costs included qualifications. For non-GP contacts, the hourly cost of a practice nurse was used. It was assumed that a nurse would see four people per hour.</p>	<p>Practice consultations, consultations involving a visit, and telephone consultations with a GP, nurse or other clinical staff were counted. (30)</p> <p>Primary care costs were calculated by multiplying consultation duration by unit cost figures from the Personal Social Services Research Unit (PSSRU).(31)</p>
Outpatient activity	<p>The HRG national tariff for outpatient attendances was used. This varied according to the specialty the individual was visiting, whether it was a first appointment (new) or a follow-up and the commissioning threshold for new to follow-up ratios, which can lead to some appointments not having a reimbursement value.</p>	<p>Outpatient attendances with a valid HRG code were included. HRG4+ Reference Costs Groupers were used to identify the reference cost from the NHS Improvement Reference Costs for each year.</p>
Admitted patient activity	<p>Inpatient admissions and the corresponding HRG national tariff were used. Inpatient admissions were broken down into elective and non-elective.</p> <p>Number of bed days was counted with day cases contributing 1 day.</p>	<p>Inpatient admissions with a valid HRG code were included for all main and up to 10 unbundled HRG codes. HRG4+ Reference Costs Groupers were used to identify the reference cost from the NHS Improvement Reference Costs for each year. Costs for inpatient admissions were broken down into elective; emergency; and all other admissions, which included day cases, maternity, and regular admissions.</p> <p>Number of bed days was counted with day cases contributing 1 day.</p>
Emergency department activity	<p>The cost for each attendance varied depending on the type of emergency department (consultant-led emergency departments; consultant-led mono-specialty services; other types of minor injury departments; and NHS walk-in centres), whether the patient was admitted or not, and whether they arrived at the emergency department by</p>	<p>Emergency department attendances with a valid HRG code were included.</p> <p>HRG4+ Reference Costs Groupers were used to identify the reference cost from the NHS Improvement Reference Costs for each year.</p>

	ambulance. These adjustments were made by the HRG grouper and the unit costs of each individual level activity reflected these adjustments.	
Community and Mental health activity	Data from the patient level information and costing system from North East London NHS Foundation trust (the local provider of mental health and community services) were used to calculate unit costs for each component of activity.	N/A
Social care activity	Local authority social care costs were obtained from council data which lists the billed cost for each care package per week for each care recipient. This provided granularity on in-year changes to packages and resultant changes in costs. Data on self-funded social care was not available; neither was data on equipment, transport and home adaptation costs as these are held in different council departments.	N/A

Supplementary Table 3. Long-term conditions used to define multimorbidity in CPRD sample

1. Atrial fibrillation
2. Asthma
3. Cancer
4. Chronic obstructive pulmonary disease
5. Diabetes
6. Depression, anxiety and other neurotic, stress related and somatoform disorders
7. Other mental health conditions:
8. Alcohol problems
9. Other psychoactive substance misuse
10. Anorexia or bulimia
11. Schizophrenia (and related non-organic psychosis) or bipolar disorder
12. Dementia
13. Epilepsy
14. Heart failure
15. Hypertension
16. Thyroid disorders
17. Learning disability
18. Stroke and transient ischaemic attack
19. Irritable bowel syndrome
20. Inflammatory bowel disease

21. Diverticular disease of the intestine
22. Treated constipation
23. Peripheral vascular disease
24. Bronchiectasis
25. Parkinson's disease
26. Multiple Sclerosis
27. Viral hepatitis
28. Prostate disorders
29. Chronic liver disease
30. Chronic kidney disease
31. Migraine
32. Painful condition (on prescription-only pain medication)
33. Rheumatoid arthritis, other inflammatory polyarthropathies & systematic connective tissue disorders
34. Hearing loss
35. Blindness and low vision
36. Psoriasis or eczema

This list was adapted from (1). A list of Read codes and Gemscript codes is available at http://www.phpc.cam.ac.uk/pcu/cprd_cam/codelists/

Supplementary Table 4. Description of health and social care activity and cost

	% with no cost/activity	Mean activity (number of visits)	SD activity (number of visits)	Mean cost (£)	SD cost (£)
B & D sample					
Primary care	2.4	6.3	4.8	163.20	127.90
Outpatient care	37.5	3.2	4.5	233.20	351.60
ED care	65.4	0.3	0.9	64.10	159.40
Non-elective admissions	83.3	0.1	0.4	416.60	1525.20
Elective admissions	69.5	0.2	0.7	355.30	969.00
Days in hospital	82.3	1.1	4.7	-	-
Community care	76.6	-	-	297.8	1525.0
Mental health services	94.6	-	-	265.7	4212.5
Local government funded social care	96.4	-	-	263.7	2055.4
CPRD sample					
Primary care	5.5	7.4	7.8	192.80	219.30
Outpatient care	39.1	2.6	4.9	360.30	851.50
ED care	73.0	0.2	0.6	56.10	166.30
Non-elective admissions	92.0	0.1	0.3	236.01	1075.19
Elective admissions	88.5	0.1	0.3	429.18	1365.38
Days in hospital	68.9	0.6	3.5	-	-