
Can home care reduce the risk of emergency readmissions of older people?

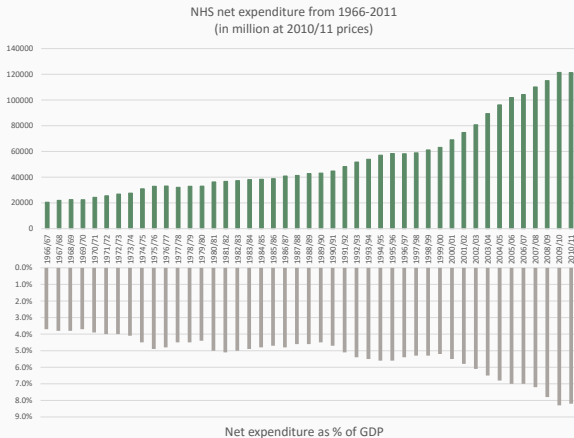
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Introduction



- In the UK, the population aged 65 and over has grown by 47% since mid-1974, making up nearly 18% of the total population in mid-2014; while the number of people aged 75 and over has increased by 89% over the period and now makes up 8% of the population (Office for National Statistics, 2015).

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- As population ageing, we will see an increase in the number of people with cognitive impairment. For example, it is estimated that there were 850,000 people living with dementia in the UK in 2015, which is projected to increase to over 1 million by 2025 and over 2 million by 2051 (Alzheimer's Society, 2014).

- To understand the dynamics of hospital service costs using longitudinal health costs data

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- To examine the differences in hospital service costs between patients with and without cognitive impairment

Data

Scottish Morbidity Record (SMR) Data

- SMR01 is an episode-based patient record relating to all inpatients and day cases admitted to and discharged from non-obstetric and non-psychiatric specialties.
- Episodes can be further grouped into continuous inpatient stays which are patients' entire stays in the hospital including transfers between consultants, specialties and sometimes hospitals.
- Study period: from 01/01/2012 to 31/12/2014
- Cohort: Fife patients that are 65+ and have had at least one eligible admission with an episode at Victoria hospital during the study period (and have had an emergency admission at a Fife hospital since 01/01/2008)

Patient Level Costing (PLICS) Data

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- An overhead proportion is calculated as allocated costs/direct costs (net) and is determined by the site and specialty (and patient type) costs.

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- An overhead proportion is calculated as allocated costs/direct costs (net) and is determined by the site and specialty (and patient type) costs.
- The direct costs total plus the overhead allocation gives total (net) cost.

Data Linkage: Example

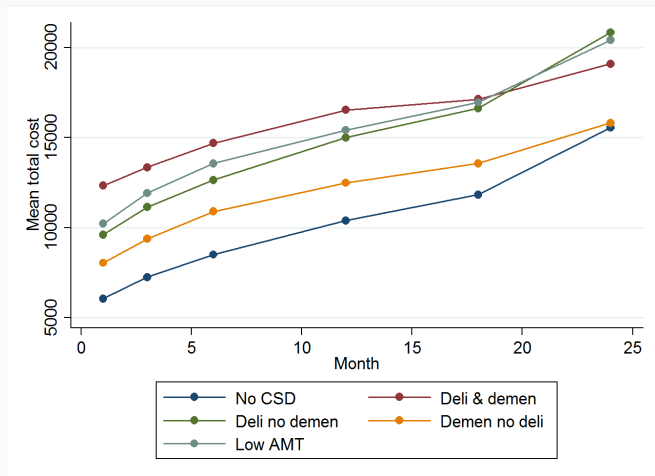
board id	doa	dodis	cis	epiorder	inp	spec	.....
1	1	01-May-10	15-May-10	1	1	A1	.....
1	1	15-May-10	16-May-10	1	2	A1	.....
1	1	01-Jun-10	05-Jun-10	2	1	A2	.....
1	1	05-Jun-10	05-Jun-10	2	2	A11	.....
1	2	25-Sep-10	25-Sep-10	1	1	A3	.....
1	2	11-Nov-10	15-Nov-10	2	1	A1	.....
1	2	12-Dec-10	15-Dec-10	3	1	C41	.....
1	3	28-Jul-10	28-Jul-10	1	1	0	A11
1	3	28-Jul-10	29-Aug-10	1	2	0	A2

Dummy Data

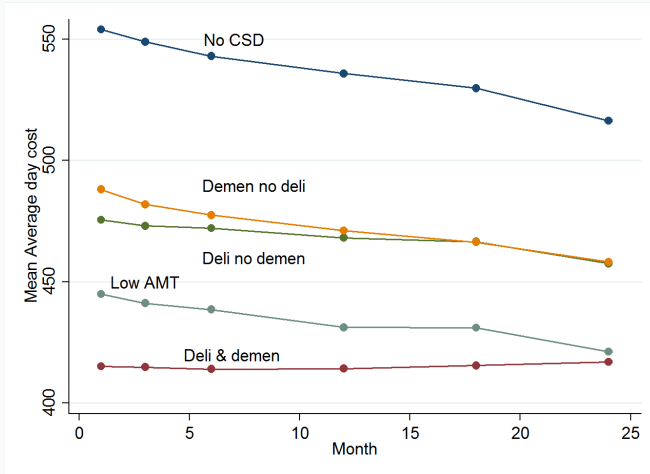
board	inp	spec	Medical cost per adm	Medical cost per day	Nursing cost per day	Lab cost per adm	Lab cost per day	.....	overhead
1	1	A1	£20	£20	£170	£25	£5	.....	47%
1	1	A3	£15	£15	£150	£78	£3	.....	72%
1	1	A4	£150	£150	£201	£264	£47	.....	17%
1	.....	.....	.....	.....	.....	.....	.....	.....	.....
1	0	A1	.....	£70	£24	.....	£1	.....	13%
1	0	A2	.....	£64	£31	.....	£2	.....	24%
1	.....	.....	.....	.....	.....	.....	.....	.....	.....

Preliminary Results

Descriptives: Total cost



Descriptives: Average day cost



Cost, Number of Admissions& Length of Stay

	Number of admissions	Number of hospital days (total)	Number of hospital days (per stay)
Delirium & Dementia	2	29	14
Delirium, No Dementia	2	30	12
No Delirium, Dementia	2	22	9
Only Low AMT	2	36	14
No CSD	2	15	6

Notes: Due to skewness, median values are used for the number of admissions and number of hospital days (total & per stay)

What Influence Hospital Service Costs



Cost & Mortality Rate

	Died within 30 days	Died within 90 days	Died within 1yr	Died within 2 yrs
Delirium & Dementia	14%	34%	44%	59%
Delirium, No Dementia	14%	31%	37%	48%
No Delirium, Dementia	13%	29%	43%	55%
Only Low AMT	12%	29%	39%	53%
No CSD	9%	20%	26%	34%

Total Hospital Cost

	Cost: 2yrs
Delirium & Dementia	0.22*** (0.06)
Delirium, No Dementia	0.24*** (0.04)
No Delirium, Dementia	0.15* (0.06)
Only Low AMT	0.17* (0.06)

Notes: Other control variables in the OLS model include: gender, age, activity of daily living (ADL), health condition (CCI) and deprivation level (SIMD)

Total Hospital Cost

	Cost: 2yrs	Cost: 1yr
Delirium & Dementia	0.22*** (0.06)	0.36*** (0.06)
Delirium, No Dementia	0.24*** (0.04)	0.26*** (0.04)
No Delirium, Dementia	0.15* (0.06)	0.23*** (0.06)
Only Low AMT	0.17* (0.06)	0.18* (0.06)

Notes: Other control variables in the OLS model include: gender, age, activity of daily living (ADL), health condition (CCI) and deprivation level (SIMD)

Total Hospital Cost

	Cost: 2yrs	Cost: 1yr	Cost: 180 days
Delirium & Dementia	0.22*** (0.06)	0.36*** (0.06)	0.39*** (0.06)
Delirium, No Dementia	0.24*** (0.04)	0.26*** (0.04)	0.27*** (0.04)
No Delirium, Dementia	0.15* (0.06)	0.23*** (0.06)	0.22*** (0.06)
Only Low AMT	0.17* (0.06)	0.18* (0.06)	0.15* (0.06)

Notes: Other control variables in the OLS model include: gender, age, activity of daily living (ADL), health condition (CCI) and deprivation level (SIMD)

Total Hospital Cost

	Cost: 2yrs	Cost: 1yr	Cost: 180 days	Cost: 90 days
Delirium & Dementia	0.22*** (0.06)	0.36*** (0.06)	0.39*** (0.06)	0.43*** (0.06)
Delirium, No Dementia	0.24*** (0.04)	0.26*** (0.04)	0.27*** (0.04)	0.29*** (0.04)
No Delirium, Dementia	0.15* (0.06)	0.23*** (0.06)	0.22*** (0.06)	0.23*** (0.05)
Only Low AMT	0.17* (0.06)	0.18* (0.06)	0.15* (0.06)	0.18** (0.06)

Notes: Other control variables in the OLS model include: gender, age, activity of daily living (ADL), health condition (CCI) and deprivation level (SIMD)

Next Step...

A Joint Modelling Approach

A joint modelling approach proposed by Liu, Huang and O'Quigley (2008), which is consisted of three sub-models including:

- A frailty model for the intensity of recurrent hospital admission times:

$$r_i(t) = \exp(W_i^R \beta + u_i) r_0(t) \quad (1)$$

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- A proportional hazards model for death:

$$\lambda_i(t) = \lambda_0(t) \exp(W_i^D) + \gamma_2 u_i + \gamma_3 v_i \quad (3)$$

Thank you!

Average Day Cost

	Cost: 2yrs	Cost: 1yr	Cost: 180 days	Cost: 90 days
Delirium & Dementia	-0.11*** (0.01)	-0.14*** (0.01)	-0.14*** (0.01)	-0.15*** (0.01)
Delirium, No Dementia	-0.06*** (0.01)	-0.06*** (0.01)	-0.07*** (0.01)	-0.07*** (0.01)
No Delirium, Dementia	-0.08* (0.01)	-0.08*** (0.01)	-0.08*** (0.01)	-0.08*** (0.01)
Only Low AMT	-0.09* (0.01)	-0.09* (0.02)	-0.09* (0.02)	-0.09** (0.01)

Notes: Other control variables in the OLS model include: gender, age, activity of daily living (ADL), health condition (CCI) and deprivation level (SIMD)