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Bridging the gap

The impact of quality of primary care on duration of hospital stay for people with dementia

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Abstract

Purpose – The purpose of this paper is to explore the link between one aspect of primary care in England – the annual review by general practitioners for dementia patients – and length of hospital stay (LoS). The annual review should identify the needs of both patients and carers and co-ordinate services across health and social care to address those needs. If this is done well, timely discharge from hospital may be facilitated.

Design/methodology/approach – The study uses linked national data from 2006/2007 to 2010/2011 on over 36,000 patients, employing sophisticated statistical techniques to isolate the effect of the annual dementia review on LoS.

Findings – Hospital patients discharged to the community have significantly shorter stays if they are cared for by practices that reviewed a higher percentage of their patients with dementia. However, this effect is small and is not evident for patients discharged to care homes or who died in hospital. Longer LoS is associated with a range of co-morbidities, markers of low availability of social care and with intensive provision of informal care.

Practical implications – Although the dementia review has only a modest effect on LoS, the components of the review could improve the health and well-being of those with dementia and their carers.

Originality/value – The study is the first to employ a robust methodology to investigate the impact of the annual dementia review on hospital LoS, an important aspect of the interface between primary and secondary care. There are implications for clinical and financial aspects of health and social care policy.

Keywords England, Care and support, Dementia, Primary care, Integrated care, LoS, Length of stay, Hospital stay

Paper type Research paper

Introduction

Dementia is a major social challenge, in terms of the health impact on those living with dementia and on their carers, as well as demands on health and social care services. It is estimated that over 44 million people are living with dementia worldwide with societal

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economic costs estimated to be 1 per cent of global GDP (Alzheimer's Disease International, 2013). The G8 "Dementia Summit" held in 2013, signalled the policy interest in ensuring that appropriate care and support is provided for those suffering from this condition. It has been noted that the three reasons why dementia is, and should be, a policy priority are: "Dementia has a large human cost. Dementia has a large financial cost. Both of these costs are increasing" (World Health Organization, 2015a).

A major policy focus (Department of Health, 2015; World Health Organization, 2015b) is to ensure that the wide range of support and services for those with dementia and their carers is not subject to the fragmentation, poor co-ordination and a one-size fits all approach, often seen in health and social care systems. The multiple and complex needs of this patient group can only effectively be met through an integrated approach to care which reflects the interdependence of different parts of the health and social care system (Morris, 2012). Good care "helps people to maintain their health and wellbeing and avoid unnecessary admissions to hospital or prolonged lengths of stay in acute care" (Care Quality Commission, 2014). Recent policy in England, such as the introduction of the Better Care Fund includes initiatives to support integrated care, e.g. around a quarter of the plans highlight improving dementia care as one of their priorities, involving local councils and the NHS working alongside the voluntary and independent sectors. However, despite improvements, care for dementia remains poor and fragmented (Care Quality Commission, 2013) and a lack of co-ordination, can lead to cost shifting and "problem dumping" – a major cause of poor care and inefficiency (Knapp *et al.*, 2013).

Integration of care has many dimensions, but one important element is the interface between the primary and secondary care sectors and in particular, the premise that providing better support in primary care setting may reduce hospital admissions or, where admissions occur, influence the length of stay (LoS) (Busby *et al.*, 2015). This is a crucial issue in the context of dementia because at any one time, people with dementia occupy a quarter of acute hospital beds (Royal College of Psychiatrists, 2013). Compared to similar patients without dementia, their hospital stays tend to be longer and costlier and their health outcomes are poorer (Care Quality Commission, 2013; Connolly and O'Shea, 2015; Dewing and Dijk, 2016). The longer people with dementia stay in hospital, the more likely it is that they will be discharged to a nursing home (Lakey, 2009), reducing opportunities for independent living. Hospital stays for these individuals are often prolonged, adversely impacting acute service capacity (Sampson *et al.*, 2013).

This paper explores the link between one aspect of primary care – the annual review that general practitioners (GPs) undertake for dementia patients – and the duration of hospital stay. Since 2006, GPs in England have been paid to identify and review their patients with dementia as part of the Quality and Outcomes Framework (QOF). The overall aim is to ensure that "potentially complex needs are addressed". The QOF dementia review is a face-to-face interview designed to support the patient and their carer. The review comprises four elements: physical and mental health of the patient; carer's need for information; effect of caring on the carer (e.g. the need for respite); and communication and coordination measures with secondary care. As the disease progresses, and more agencies become involved, the review should also assess communication between health and social care and non-statutory sectors (British Medical Association, NHS Employers, 2006).

Patients who are regularly reviewed in this way may be better supported than those who do not receive a review, which may in turn facilitate timely discharge from hospital, should they be admitted. For example, if patients and carers are already linked

into the local community mental health team or are in receipt of appropriate support services, this may minimise delays in discharge arising from the need to organise the support required for care at home. Similarly, if as a result of the review, the GP ensures good communication and liaison between primary, secondary and community services, this will enable a timelier discharge than for patients whose needs are not known to local service providers. GPs who know and review the patients with dementia may also be able to liaise more effectively with hospital discharge teams and with the patient's carer. Achievement of GP practices in undertaking the QOF reviews is used as an indicator of the quality of primary care provided for dementia patients, albeit only one aspect of quality. The dementia review can be expected to influence what happens in secondary care and may be a marker of the potential integration of care if it incentivises GPs to be aware of the health and social care needs of their patients and their carers.

Methods

The analysis took the form of econometric modelling of LoS for an emergency admission in an acute hospital trust where the primary diagnosis was dementia, against the key explanatory variable: the QOF practice-level achievement scores in England from 2006 to 2010. The flow chart in Figure 1 illustrates the methods and data used.

To isolate the impact of the QOF dementia review on LoS, the analysis needed to take account of a range of other factors that affect LoS for people with dementia and, as far as practicable, incorporate these as additional explanatory variables in the model. The literature was reviewed to determine the main influencing factors (for details see Kasteridis *et al.*, 2015).

Modelling LoS raises a number of methodological challenges and the approach requires careful thought. Full details of the technical methodological issues, the choice

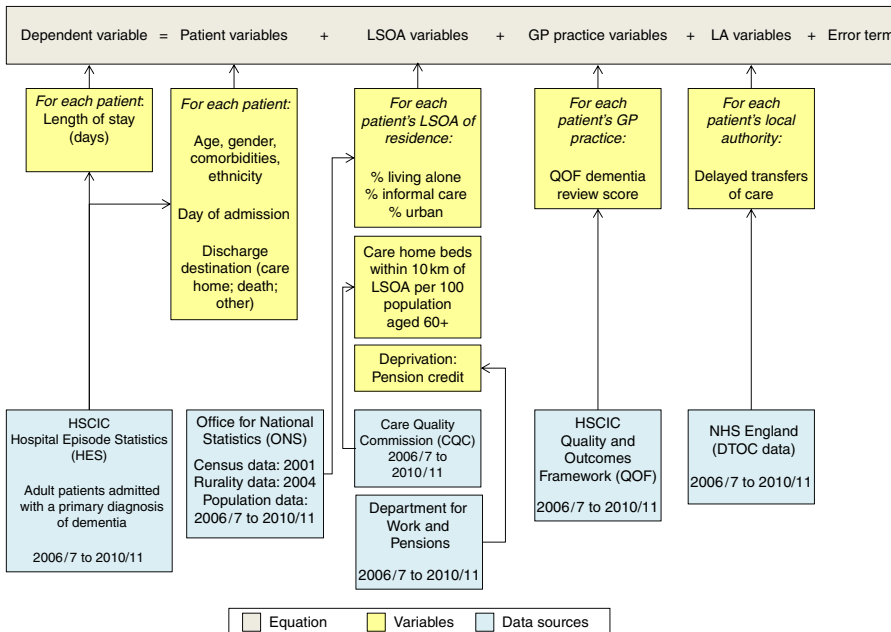


Figure 1. Methods and data sources

of model and the full range of sensitivity analyses undertaken to ensure the robustness of the analyses, are available elsewhere (Kasteridis *et al.*, 2015). An advantage of our approach when compared with other published studies of LoS, many of which are often small-scale cross-sectional studies, is that it utilised national longitudinal data on more than 36,000 patients with dementia which facilitated the use of robust methods, the analysis of sub-groups depending on destination discharge and produced results that are representative and generalisable. The main limitation is that the data only allows analysis of practice QOF scores and it is therefore not possible to relate an individual's receipt of the QOF review to their hospital stay.

Data

The data set included 36,744 adults (aged 18+) admitted over the period 2006/2007 to 2010/2011. Admissions data from Hospital Episode Statistics which comes from the Health and Social Care Information Centre were used to model LoS. There were three mutually exclusive subgroups of admissions, defined by the reason for discharge: those who died in hospital; those discharged to a care home; and those discharged elsewhere, i.e. to community, home or non-institutional setting[1]. Admissions data were merged with neighbourhood statistics and with practice-level data on the QOF dementia review. QOF achievement was modelled using the indicator achievement scores for dementia, available at practice level (<http://qof.hscic.gov.uk/>), but not published at patient level.

The analyses took account of other factors that may influence LoS, including clinical and socio-demographic characteristics. To adjust for deprivation, living status and informal care, values were assigned based on the patient's residential neighbourhood as individual-level data were unavailable. Neighbourhoods are defined by census statistics and the analysis used lower layer super output areas (LSOAs) which typically cover 1,500 individuals. Rather than a generic measure of deprivation, we used a measure more relevant for this group of people, namely pension credit data from the Department for Work and Pensions. Pension credit is a benefit for older people on low incomes and has two parts: guarantee credit, which tops up income; and savings credit, available only to people who have saved something towards their retirement. The poorest individuals are likely to receive guarantee credit only. Data on whether individuals admitted to hospital have an informal (unpaid) carer were also unavailable, so three proxy measures based on census data from the Office of National Statistics were used instead: the percentage of the LSOA population providing some (1-19 hours/week), substantial (20-49 hours) or intensive (50+ hours) levels of informal care. The regressions also included a variable capturing the proportion of people aged 60 and over living alone.

The level of provision of support services outside of the hospital sector is likely to influence LoS and this was accounted for by including a measure of the number of care home beds within ten kilometres of the individual's LSOA and calculating the percentage of hospital discharges subject to a delay attributable to NHS, social services or both, based on data provided by NHS England.

The model also included a measure of rurality and a variable to capture the effects of day of admission.

Results

Preliminary analysis of the sample that included all patients regardless of their discharge destination (pooled) found that the calculated effects on LoS of being discharged to care home or of in-hospital death were large, suggesting further analysis by

destination-segmented subsamples was appropriate. Figure 2 depicts how LoS varies by discharge destination and over time, showing that patients discharged to a care home stay longer than the other groups. More detailed analysis showed that the probability of a stay lasting ten days or more was about 0.43 for discharges to the community, 0.69 for patients who died in hospital and 0.78 for discharges to a care home.

Results for the three models are shown in Table I (for descriptive statistics and results of additional analyses, see Kasteridis *et al.*, 2015). For the first set of variables listed in Table I (where variables are binary, i.e., they take a value of 0 or 1), the results isolate the impact on LoS if that particular variable is present, rather than absent, e.g. a person having urinary incontinence and who dies in hospital is predicted to have a LoS that is 4.26 days longer than a person similar in all other respects, but without urinary incontinence (column 1). The 4.26 extra days translates into a percentage change of 24.41 per cent (column 2).

For the second set of variables listed (where variables are continuous), the results show the independent impact on LoS if the variable increases by one unit (or by one-percentage point for those expressed as percentages), e.g. a person living in an area where there is a 1 per cent higher proportion of people aged over 60 living alone, when compared with another person similar on all other characteristics, is predicted to have a shorter LoS by 0.21 days (for those who died in hospital). The effects for each year are interpreted with respect to the “reference year” (2006/2007); and the effects for day of admission are referenced against Sunday admission.

When assessed as a practice-level indicator of quality, the QOF dementia review had no impact on LoS for those who died in hospital. However, those who were discharged to the community had significantly shorter stays if they were cared for by practices that scored relatively higher on the annual dementia review. This effect was small: a one-percentage point increase in QOF score was associated with a reduction in stay of 0.01 days. LoS for hospital patients who were discharged to a care home was longer (by 0.02 of a day) in practices with higher achievement on the QOF.

In all three subgroup analyses, older inpatients had significantly shorter stays: one additional year of age was associated with a decrease in LoS of between 0.03 days

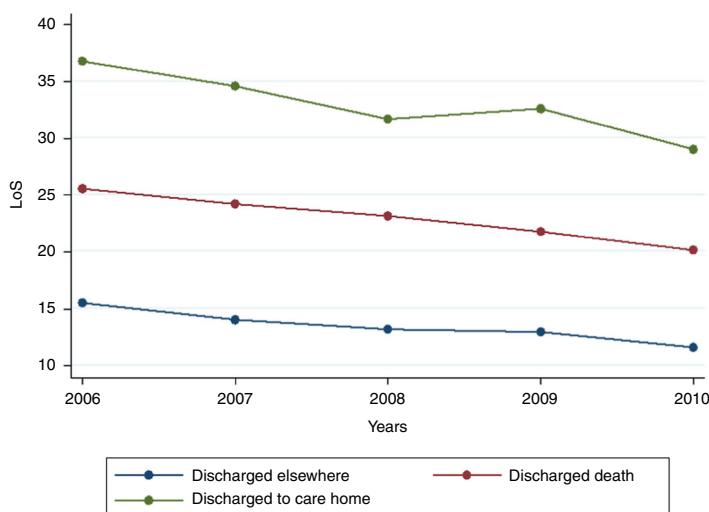


Figure 2.
Trends in mean
LoS by discharge
destination
subgroup, 2006-2010

Variable	Died in hospital		Discharged to care home		Discharged alive, not to care home	
	Change in no. of days	% change in no. of days	Change in no. of days	% change in no. of days	Change in no. of days	% change in no. of days
<i>Changes from 0 to 1</i>						
Male	-0.86***	-4.72***	2.95***	12.31***	-0.10**	-0.98**
White	0.80***	4.68***	-0.21	-0.82	0.40***	4.11***
Alzheimer's disease	-0.91***	-5.03***	0.20	0.79	-0.25***	-2.42***
Vascular dementia	0.46**	2.58**	2.08***	8.52***	1.33***	13.60***
Urinary incontinence	4.26***	24.41***	1.35***	5.44***	1.33***	13.21***
Faecal incontinence	-1.02**	-5.71**	-0.03	-0.10	0.87***	8.59***
Fall	4.77***	27.50***	2.55***	10.31***	1.79***	17.96***
Hip fracture	5.61***	31.66***	19.62***	79.11***	7.13***	70.65***
Cancer	1.49***	8.41***	0.01	0.03	1.78***	17.68***
Myocardial infarction	-0.90*	-5.07*	-1.58**	-6.31**	0.17	1.67
Peripheral vascular disease	-2.13***	-11.89***	1.05	4.21	-0.56***	-5.48***
Cerebrovascular disease	4.27***	24.91***	1.84***	7.44***	1.99***	20.29***
Delirium	1.85***	10.44***	-1.23***	-4.89***	1.26***	12.52***
Senility	1.05***	5.92***	3.02***	12.28***	1.75***	17.60***
Urban residential area	0.05	0.27	-0.91**	-3.53***	0.00	-0.01
Day of admission: Monday	2.02***	11.54***	3.21***	13.08***	0.64***	6.36***
Day of admission: Tuesday	1.62***	9.22***	1.75***	7.07***	0.71***	7.03***
Day of admission: Wednesday	3.41***	19.65***	4.48***	18.32***	1.18***	11.79***
Day of admission: Thursday	0.22	1.24	5.00***	20.58***	1.11***	11.10***
Day of admission: Friday	1.77***	10.07***	3.00***	12.21***	0.94***	9.41***
Day of admission: Saturday	0.95**	5.38**	1.63***	6.56***	0.74***	7.35***
Year = 2007/2008	-1.26***	-6.95***	-1.15***	-4.54***	-0.72***	-7.03***
Year = 2008/2009	-2.51***	-13.67***	-3.25***	-12.64***	-1.91***	-18.12***
Year = 2009/2010	-4.98***	-26.18***	-4.08***	-15.67***	-2.67***	-24.63***
Year = 2010/2011	-7.48***	-38.17***	-7.46***	-27.87***	-4.94***	-42.51***
<i>Unit change from x to x+1^a</i>						
Age	-0.12***	-0.66***	-0.24***	-0.94***	-0.03***	-0.29***
QOF achievement rate	0.00	0.00	0.02**	0.08**	-0.01***	-0.09***
% carers 1 to 19 h/w	-0.07	-0.39	-0.02	-0.09	0.00	0.01
% carers 20 to 49 h/w	-0.14	-0.80	2.67***	10.66***	0.22***	2.14***
% carers > = 50 h/w	0.33**	1.85**	1.42***	5.67***	0.39***	3.89***
% pop 60+ living alone	-0.21***	-1.18***	0.05	0.20	0.01	0.10
% guarantee credit	-0.19***	-1.05***	-0.05**	-0.20**	0.00	0.05
% saving credit	-0.27***	-1.49***	-0.36***	-1.44***	-0.05***	-0.47***
% guarantee and saving credit	0.23***	1.28***	-0.01	-0.06	-0.02***	-0.20***
CH beds/100 pop 60+	-0.52***	-2.93***	-0.46***	-1.85***	0.05*	0.51*
Total diagnoses	1.70***	9.53***	2.11***	8.44***	1.60***	15.73***
% LA daily discharges delayed (NHS)	0.39***	2.20***	-0.07	-0.27	0.08***	0.76***
% LA daily discharges delayed (social)	0.95***	5.36***	0.75***	2.99***	0.28***	2.78***
% LA daily discharges delayed (both)	-0.58**	-3.23**	0.03	0.13	-0.11**	-1.05**

Table I. Results from the core model for all three discharge destinations

Notes: CH, care home; LA, local authority; QOF, Quality and Outcomes Framework; h/w, hours per week.
^aFor percentages a unit change is equivalent to one-percentage point change. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

(community) and 0.24 (care home). Longer stays were predicted by a diagnosis of vascular dementia, urinary incontinence, cerebrovascular disease, hip fracture, fall or senility. Of these conditions, the largest effects were for hip fracture which prolonged LoS by almost 20 days for people who were discharged to a care home. Urinary incontinence, sometimes considered to be a marker for frailty (Holroyd-Leduc *et al.*, 2004), was associated with an additional inpatient stay of between 1.3 days (for those discharged to the community) and 4.3 days (for those who died in hospital).

Higher levels of other comorbidity (i.e. additional to conditions modelled individually in the analyses) were also predictive of longer stays – for each additional comorbidity, the effects ranged from 1.60 days for those discharged to the community to 2.11 days for those discharged to a care home.

People admitted from deprived neighbourhoods had significantly shorter stays, but the effect was small – a one-percentage point increase in uptake of the dementia review was associated with a reduced LoS of around one-third of a day for both those who died in hospital and those who were discharged to a care home.

Amongst patients who were discharged to a care home, those who were from areas with a higher concentration of care home beds had shorter stays. For every additional bed per 100 population, stays were reduced by around half a day. The effects of informal care on LoS depended on the intensity of caring. When the proportion of people in the local area providing over 50 hours a week of informal care increased by 1 per cent, LoS was prolonged by between one-third of a day (discharge to community or died) and 1.4 days (discharged to care home). The effects of less intensive informal care (20-49 hours/week) varied by discharge group, and there was no significant relationship between the prevalence of low-intensity informal care (less than 19 hours/week) and LoS.

In all analyses, stays were significantly longer in localities with higher rates of delayed transfers of care for which social services were responsible. On average, a 1 per cent increase in the delayed transfer rate was linked to an extension in hospital stay of 3 per cent for two subgroups, those discharged to the community or care home and of 5.4 per cent for those who died in hospital. Where delayed transfers were due wholly or in part to the NHS, the effect was smaller and there was no statistically significant effect for patients who were discharged to a care home.

Discussion and policy implications

What are the implications of the results in terms of the potential impact of quality of primary care for dementia patients on their LoS? On the one hand, we find the effects of the QOF dementia review are modest as only a slightly shorter LoS is apparent for those in practices with higher QOF achievement scores, and only for those who were discharged to the community. But even a modest impact may well be important for this patient group given future dementia prevalence. Whilst for individual patients the reduction may not be substantive, it is noted that the clinical, social and economic consequences – for patients, carers and society – of shorter stays for dementia patients, are important (Mitchell *et al.*, 2010).

The results also suggest that links between secondary care and social care may be important in facilitating timely discharge from hospital and indicate potential substitutability between services. In all the analyses, mean LoS was consistently longer for individuals whose local authority of residence had higher rates of delayed transfers of care – but only for delays that were attributable solely to social services. This confirms other studies that find a shortage of social care in the community (e.g. intermediate care facilities) does give rise to “bed blocking”: health and social care

are substitutes in this context (e.g. Gaughan *et al.*, 2015). The finding is consistent with the effect of care home bed supply, where higher provision was linked to shorter hospital stays for people who were discharged to care homes. This reflects the views of nurses about the challenges in discharging people with dementia, which focus on the lack of available options for discharging those requiring support services at home or to care home placements (Lakey, 2009). It also supports findings from qualitative studies that identify the lack of intermediate care as a barrier to discharge (Mitchell *et al.*, 2010).

The actual content of the QOF review in terms of each of the four individual components the GP carries out, may also play an important indirect role in influencing duration of hospital stay and, more importantly, in maintaining the health of patients and their carers. First, the analysis highlights that the presence of co-morbidities is associated with longer hospital days, potentially adding more than two days. The reality for many people with dementia is that they will have complex needs compounded by a range of co-morbidities. A recent survey found that 72 per cent of respondents were living with another medical condition or disability as well as dementia (Dowrick and Southern, 2014) and it has been noted that many of the conditions most prevalent in those with dementia could be prevented, recognised earlier or managed in other settings (Connolly and O'Shea, 2015). The QOF reviews involve physical health checks which may indeed allow GPs to detect and treat co-morbidities, or their risk factors, in a timely way.

Second, as higher intensity of informal care provision is associated with longer hospital stays, the review may play a role in ensuring that the needs of carers are taken into account by the GP who may advise or arrange for respite or additional health or social care inputs, as well as investigating the impact on the well-being of the carer. The number of hours providing care has been reported as a significant predictor of caregiver burden for those looking after relatives with dementia (van der Lee *et al.*, 2014). Spouses caring for dementia patients are likely to themselves be elderly, and it is clear that caring generally is very prevalent in older age groups: national survey data (The NHS Information Centre, Social Care Team, 2010) suggests that 16 per cent of people aged 65-75 and 13 per cent of those aged 75+ are carers, mainly for someone living in the same household. The intensity of caring is also high in the older age groups: carers aged 65 or more were much more likely to be providing care for over 20 hours a week than other age groups – 57 per cent caring for more than 20 hours a week and 40 per cent more than 35 hours. If the intensity of informal care provision to some degree reflects the frailty of the person with dementia or the extent of the disease, this suggests that GPs should target those particular patients and carers for more regular follow-up and care and also highlights the need for wider policy to support carers of those with dementia to be targeted at this group.

Third, the QOF review explicitly covers the carers' needs for information and the vital role of health care professionals in guiding and signposting carers to sources of information and support, has been highlighted as a major influence on avoiding the breakdown of those with such responsibilities (National Institute for Health and Clinical Excellence (NICE), 2010). The lack of adequate support for the family and carers of those in hospital has been identified as a barrier to discharge (Lakey, 2009).

Focusing in this way on the potential impact of the content of the individual components that make up the review, suggests that incentives could potentially be sharpened by altering the reward mechanism. Rather than payment being contingent only on the QOF review having taken place, separating out payment for each of the four components, might encourage GPs to cover each aspect of the review in detail.

One of the QOF review indicators for people with serious mental illness (MH9) was subsequently separated into a set of individual indicators covering the key preventative aspects of the review that were seen as important to incentivise (NICE, 2010), although some of the components were later dropped. Although the dementia review components could similarly be disaggregated, this may be counter-productive, since the overarching objective of the review is to consider the needs of the patient and carers holistically. From April 2015, a new QOF indicator will measure the percentage of patients diagnosed with dementia whose care plan has been reviewed in a face-to-face review in the preceding 12 months (National Institute for Health and Care Excellence, 2015). This is based on guidance that suggests the co-ordination of health and social care services is essential to high-quality care for dementia patients and also the recognition that assessment of the emotional, psychological and social needs of carers, is crucial. The care plan should address the needs of both groups and incentivising the regular review of the plan may help to focus attention on specific elements of care, without the need for separating out payments for each.

Policy attention often focuses on the resource consequences of caring for those with dementia – unsurprisingly, given not only the current economic climate but also the grim predictions of future prevalence (Lewis, 2015). It is important to note that studies, including this one, that suggest shorter hospital stays may be achieved through better or more targeted care provided in other sectors or in social care, do not necessarily imply that “savings” will be released in the system. Beds vacated earlier than otherwise by dementia patients will simply be filled by other patients. However, it is worth considering whether, in the case of dementia, where patients occupy such a large proportion of bed-days, a significant impact on the hospital sector could actually be achieved if sustained reductions in both hospital admissions and LoS were delivered. The results of our analysis highlight the important influence of the availability of social care services, so relieving pressure in the acute sector will hinge on whether investments are made elsewhere in both the health and social care sector, which in the current environment seems highly improbable. Closer working between sectors may therefore be the most realistic approach in terms of achieving economic as well as health gains, although whether this can deliver the magnitude of impact required in the face of the challenge that dementia poses to society, remains to be seen. The policy imperative to find more cost-effective ways of caring for this group is not matched by research efforts in relation to policy or service development, which are very modest in comparison with medical research (Marjanovic *et al.*, 2015), hence there is a key role for studies such as this one, which focus on the organisation and quality of care.

Note

1. This category included a small number of patients transferred to another hospital, but referred to as “community” in the text to denote the largest group.

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