

## Dementia in a regional hospital setting: contextual challenges and barriers to effective care

By *MICHAEL J. ANNEAR*<sup>1,2</sup> & *PETER LUCAS*<sup>2</sup>

### Abstract

Dementia is a growing public health problem, which may be under-recognised and poorly managed in regional hospitals. With projections of increasing dementia among older adults in regional and rural areas, knowledge about dementia and capacity of professionals to provide best-evidence care is paramount. This research investigates the challenges of dementia care in a publicly funded regional hospital in Australia. The study elucidates prevalence of dementia-related admissions, costs of treatment, length of stay and capacity for dementia care. A mixed methodology was employed in this study, including analysis of hospital records ( $N = 2405$ ), dementia knowledge surveys ( $n = 50$ ) and semi-structured interviews with clinical staff ( $n = 13$ ). Hospital records showed that dementia-related admissions were lower than population prevalence reported in regional Australia. Dementia patients, however, attracted significantly higher treatment costs and greater length of stay than age-matched admissions who did not have a diagnosis of dementia.

<sup>1</sup>*Michael J. Annear*, Department of Health and Physical Education, International Christian University, Tokyo, Japan

<sup>2</sup>*Michael J. Annear and Peter Lucas*, Faculty of Health, University of Tasmania, Hobart, Australia

Clinicians reported several obstacles to effective dementia care, including staff knowledge deficits, environmental challenges, resource constraints and organisational factors.

Keywords: dementia, barriers, care quality, regional hospital.

## Introduction

Dementia is the second leading cause of death among older Australians (Australian Bureau of Statistics 2015) and has been identified as an emerging global health and human rights priority (World Health Organization 2012) and an imperative for policy action (Organisation for Economic Cooperation and Development 2015). With no cure for common forms of the syndrome and a progressive trajectory of decline (Kurrle et al. 2012; Mitchell et al. 2009), the impact of this condition on the hospital sector is significant and costs to the health system are increasing (Australian Institute of Health and Welfare 2012). Dementia is commonly understood as a slow deterioration of cognitive faculties; however, the underlying pathology can prompt the emergence or exacerbation of acute concerns such as pneumonia, falls, urinary tract infections, medication overdoses, as well as behavioural and psychological symptoms (BPSD), including an impeded capacity to report pain (Kurrle et al. 2012; Takai et al. 2014). In many cases, dementia-related complications result in an unplanned visit to the emergency department and hospitalisation (Sampson et al. 2013). It has been reported that the distress and disorientation of acute hospital admission can exacerbate the effects of dementia as a result of unfamiliar environments, people and routines (Houghton et al. 2016). When admitted to hospital, people with dementia experience adverse outcomes at higher rates than individuals who do not have dementia, including increased mortality, unnecessary interventions, increased complications and higher rates of readmission (Alzheimer's Australia 2014). In the context of this research, an admission is a hospital visit requiring a stay of one night or more resulting from a pre-planned treatment or an emergency department visit.

Australian Government modelling forecasts the prevalence of dementia will triple within the next three decades to reach 900,000 diagnosed cases by 2050 (Australian Institute of Health and Welfare 2012).

Currently, dementia care attracts an annual expenditure of over 2 billion Australian dollars per year, with hospital-based care accounting for approximately 150 million dollars (Australian Institute of Health and Welfare 2012). Contemporaneously, dementia is known to be underdiagnosed within Australia and other developed countries (Connolly et al. 2011). With rising prevalence of dementia and increasing demand for acute sector services, regional hospitals (acute-care facilities outside the service area of larger metropolitan centres) are likely to be particularly affected. Issues that predispose regional areas to disproportionate impacts from dementia include rapid population ageing associated with outmigration of younger adults, growing preferences for “ageing in place” (remaining in familiar homes and communities) among the very old, higher rates of risk factors for dementia (such as obesity, smoking and high blood pressure) and limited access to diagnostic and treatment services (Alzheimer’s Australia 2007; Davis & Bartlett 2008).

Systematic reviews have identified that dementia care research focusses predominantly on the residential and primary care settings, with comparatively little consideration of acute care (Houghton et al. 2016; Moyle et al. 2008). The availability of skilled staff has been identified as one of the key barriers to the provision of appropriate, person-centred dementia care in the acute care environment (Bail et al. 2013; Moyle et al. 2008). Regional hospitals, in particular, play a key role in delivery of health-care and face many challenges, including resource constraints and staff retention (Buykx et al. 2010). Continuing education has been identified as a potentially useful approach to improving capacity for care and patient outcomes in hospital settings, particularly where resources and expertise are otherwise limited (Bloom 2005; Forsetlund et al. 2009).

Despite challenges to effective dementia care, few studies have been conducted to assess the dementia education and training needs of regional hospital staff, although some research suggests clinicians in these hospitals may be underprepared and under resourced for coping with patients who have complex cognitive conditions (Ellis & Philip 2010).

### *Research Aim*

This research addresses the existing gap in information about dementia care in regional hospitals and informs the development of hospital-based

dementia education interventions. Specifically, this research investigates the prevalence of dementia in a large publicly funded regional hospital, costs of care and length of stay, staff knowledge of the condition and the capacity for effective care and treatment.

## Methods

### *Setting and Participants*

A large publicly funded regional hospital in Tasmania, southern Australia, was selected as the sampling frame for this study. Tasmania is an appropriate location for this study due to its high proportion of older adults in relation to other Australian states and territories, high rates of health risk factors for dementia and its regional setting, which contributes to poorer access to health services (Davis & Bartlett 2008; Jackson 2002, 2007). The regional hospital that formed the sampling frame for this study is typical of facilities outside the major metropolitan areas in Australia. It provides emergency care and specialist surgical treatment, is moderately sized with 501 patient beds, provides a central hub for surrounding rural townships and serves as a training centre for medical interns. Participants included clinical staff members who were employed at the hospital during the winter of 2015. Clinical staff refer to all currently employed health professionals with a 3-year degree or higher in their specialised field. This cohort included doctors, specialists (including geriatricians), nurses, hospital interns (senior medical students), physiotherapists and other health professionals. Winter was selected as the most appropriate time frame for the analysis of admissions data as this is the period when the largest numbers of older adults are admitted to hospital for a stay of one night or more (Walker et al. 2016).

### *Design*

The research was designed as a mixed methods study. Methods of investigation included (1) analysis of de-identified hospital records; (2) administration of the Dementia Knowledge Assessment Scale (DKAS) among clinical staff (Annear et al. 2015); (3) administration of demographic questions; and (4) analysis of transcripts from semi-structured interviews.

De-identified patient records of hospital admissions were collected to establish the prevalence of dementia-related admissions (categorised in admission records as *dementia* or *dementia with delirium*) and calculate costs of treatment and length of stay among admissions during a 3-month winter period. The primary quantitative outcome measure was knowledge of dementia recorded on the valid and reliable DKAS (Annear et al. 2015). The DKAS measures understanding of causes and characteristics, risk factors, communication and engagement, and care needs related to dementia. It contains 27 items that are rated on a 5-point Likert-type scale, which ask respondents to assess the veracity of statements about dementia that are verifiably true or false. Each item is scored out of 2 points (for a total score of 54) with a full mark awarded for correctly identifying the veracity of a statement, a half mark (1 point) awarded for an expression of uncertainty (probably true or probably false) and no marks for an incorrect response or an "I don't know" answer. The DKAS has demonstrated good reliability ( $\alpha = 0.89$ ) and validity and has previously been administered and pilot tested with large international populations (Annear et al. 2015). The DKAS has been validated for use with diverse populations of health professionals in Australia and Japan and has undergone confirmatory factor analysis (CFA) with large samples (Annear et al. 2017) and tests of concurrent validity (comparative analysis with the Alzheimer's Disease Knowledge Scale) (Annear et al. 2016). Semi-structured interviews focussed on four areas: (1) the prevalence and challenge of dementia-related admissions; (2) perceived capacity for management of people with dementia; (3) the experience of treating people with dementia in the regional hospital environment; and (4) organisational influences on dementia management. Data collection occurred after the study was reviewed and approved by a University Human Research Ethics Committee (Reference Number: H0014084).

### *Procedures*

As described earlier, a mixed methods design was used to explore the dementia care capacity of the regional hospital due to the multi-faceted nature of the research problem. All currently employed clinical staff ( $N = 150$ ) were approached via email and invited to participate in the study during September 2015. In addition to hospital staff participants, de-identified

hospital records ( $N = 2405$ ) for adults aged 55 years and older (including younger onset dementia that often has a more complicated trajectory and symptomatology) who attended the hospital in winter (June to August) 2015 were reviewed to assess dementia prevalence, costs of care and length of stay. An age of admission of 55 years (and older) was used to account for individuals who may have younger onset dementia. This is important as the initial pathology of dementia can begin decades before death in the common forms of dementia (including Alzheimer's Disease and Vascular Dementia). Staff interested in participating followed a web link from an invitation email to an information page about the study and then completed an online version of the DKAS (Annear et al. 2015) and demographic questionnaire. At the end of the questionnaire, respondents indicated their willingness to participate in a further 30-minute interview. Staff who consented to further research participation were then invited to attend a semi-structured interview with the lead researcher, which was recorded and transcribed to generate qualitative project data.

### *Data Analysis*

Descriptive statistics (including means and percentages) were used to describe the sample and report diagnosed dementia prevalence and staff dementia knowledge scores. Dementia prevalence information was ascertained by assessing primary admissions, nursing notes and electronic health histories. All patient records for individuals aged 55 years and older for the 3-month winter season in the year prior to the analysis were included in the study, with no patient records excluded. The records represent the full admissions, treatment and discharge history of an anonymised group of middle-aged and older patients. Treatment cost and length of stay information were calculated by linking individual diagnostic codes from patient records with national average costs (cost of treatment estimates provided by the Australian Government) and assessing patient records to identify admissions of individuals who had a diagnosis of dementia. Mann-Whitney U tests were employed to compare treatment and length of stay information. Spearman correlations were employed to assess potential associations between cost of treatment age and death during hospitalisation. SPSS (version 20) was used when conducting statistical analyses (IBM Corp. 2011).

A two-step coding procedure, employing NVIVO software (QSR International 2012), was used to analyse qualitative interview data (Charmaz 2014; Lofland & Lofland 1995). To enhance rigour in the qualitative analysis, transcribed data were coded independently by two researchers and inter-coder reliability was calculated. The first step involved a review of transcripts for categorical statements relating to barriers to effective dementia care. Following this, analytical coding was conducted to identify respondent statements that best reflected underlying themes. The second step involved the comparison of analytic coding (coding that aimed to draw out the latent or underlying meanings in interview data) across two researchers and the development of a thematic description for the commonly identified analytic codes (one overarching theme and five sub-themes). Each coder began with the raw set of qualitative interview data within NVIVO and worked independently through the first and second steps described above. Calculations of inter-coder reliability, performed within NVIVO, for descriptive codes resulted in an average kappa score of 0.52 and a high agreement level – suggesting that both coders agreed on the main thematic content within the data. The determination of inter-coder reliability was undertaken to ensure that the findings of qualitative analysis were reliable and free from perceptions of bias (Pope et al. 2000). Such measures are becoming more common in mixed methods and qualitative health research and are commonly included in international best-practice guidelines for the analysis of interview data (Morse 2015).

## Results

### *Dementia Prevalence and Costs*

An examination of electronic patient records ( $N = 2405$ ) identified 179 people aged 55 years and older who were admitted to the regional hospital over a 3-month period in 2014 with a diagnosis of dementia in their electronic health record (as either a primary admission or co-existing diagnosis). Despite a low recorded prevalence, people who were admitted with dementia attracted a significantly higher cost of treatment ( $Mdn = \text{AUD } \$9625$ ) when compared to age-matched individuals who did not have dementia ( $Mdn = \text{AUD } \$5879$ ),  $U = 95,505$ ,  $z = -7.25$ ,  $p < 0.001$ . There was also a statistically significant increase in length of stay between

**Table 1.** Demographic characteristics of 3-month hospital admissions for Tasmanian adults aged 55 years and older

Demographic characteristics	Winter 2014 ( <i>N</i> = 2405)
Mean age	73.48 years
Sex	
Male	50%
Female	50%
Dementia as primary admission (total sample)	24 records
Dementia as a previously diagnosed condition in electronic record (inclusive of primary admissions)	179 records
55–64 years of age	4 records
65–74 years of age	16 records
75–84 years of age	79 records
85 years of age and older	80 records
Most common presenting complaint (total sample)	Chest pain (undifferentiated)
Most common presenting complaint for people with pre-existing diagnosis of dementia	Pneumonia (lobar and aspiration)
Deaths during hospitalisation	85 records

people with a dementia diagnosis (*Mdn* = 5) and older people with no diagnosis (*Mdn* = 2) over the same period,  $U = 106,014$ ,  $z = -6.11$ ,  $p < 0.001$ . Neither age ( $r = -0.03$ ,  $p = 0.75$ ) nor death during hospitalisation ( $r = 0.05$ ,  $p = 0.58$ ) was associated with a higher cost of treatment for people with diagnosed dementia (Table 1).

### *Clinical Staff Respondents*

During 2015, 50 individuals completed the online dementia knowledge survey (33% response rate) to determine individual understanding about the condition. Among this cohort, 13 clinical staff consented to participate in a semi-structured interview by opting for follow-up communication with the researcher at the end of the survey. Compared to the overall population of regional hospital staff in Australia, the survey sample cohort



( $n = 50$ ) had a proportionally higher number of allied health professionals, including those who provided rehabilitation and support services for older adults in the hospital (occupational therapists, physiotherapists, social workers and support workers) (Table 2).

**Table 2.** Demographic characteristics of clinical hospital staff respondents ( $n = 50$ )

Demographic characteristics	Tasmanian study (2014)	Tasmanian publically funded hospitals (2014–2015)
Mean age	44 years	46 years
Sex		
Female	36 (72%)	8842 (75%)
Male	14 (28%)	2984 (25%)
Clinical occupation		
Nurse	12 (24%)	3641 (36%)
Medical (specialist or resident)	12 (24%)	921 (9%)
Allied health	21 (42%)	1247 (12%)
Occupational therapist	6 (12%)	4276 (42%)
Physiotherapist	6 (12%)	
Social worker	6 (12%)	
Support worker	3 (6%)	
Other (e.g. anaesthetist, radiotherapist)	5 (10%)	
Provides care to people with dementia as part of employment	43 (84%)	-
Has a family member with dementia	25 (50%)	-
Highest completed education		
Undergraduate degree	27 (54%)	
Post-graduate degree	15 (30%)	
Other completed education	4 (8%)	
Certificate or apprenticeship	3 (6%)	
High school graduate	1 (2%)	-
Completed formal dementia education	21 (41%)	-

### *Knowledge of Dementia*

On average, respondents answered 63% of DKAS items correctly. DKAS scores ranged from 18 to 54 (range = 36) with a median value of 36 out of a possible total score of 54 among clinical respondents. Only 1 out of 50 respondents achieved a perfect score on the DKAS. Inspection of the 5% trimmed mean (34.06) indicated that outlier values did not have an appreciable influence on the mean DKAS score ( $M = 34.30$ ,  $SD = 9.50$ ), which suggested that the results were unaffected by extreme high and low scores. Individual item scores were assessed to identify where knowledge was, on average, stronger or weaker among the sample of clinical staff within the regional hospital. Each item was scored out of 2.00 with higher scores indicating greater alignment with an ideal correct response. Item responses suggested that participants had low levels of knowledge in the specific areas of dementia typologies, symptoms, behaviours and risk factors. Item scores are presented in detail in Table 3.

### *Semi-Structured Interview Responses*

Five disciplines were represented among the 13 respondents who participated in a 30-minute, semi-structured interview. Participants included a geriatrician, a medical registrar, two occupational therapists, two social workers, three physiotherapists and four registered nurses. All respondents worked closely with older adults on geriatric wards, in the emergency department, or in rehabilitation and support services. Thematic analysis revealed one overarching theme referred to here as *obstacles to the provision of dementia care* and five sub-themes: *knowledge, training and attitudinal deficits; limited cognitive screening; dementia un-friendly environments; staff shortages and outsourcing care; and discontinuity of care.*

### *Obstacles to Dementia Care*

During the interviews, clinical hospital staff reported that dementia, while increasingly prevalent among older adults, is seldom a primary reason for admission in the hospital, which was reinforced by data obtained from in-patient electronic records (Table 1). Commonly articulated staff sentiment included the following:

**Table 3.** DKAS items ordered from lowest to highest by mean scores (0.00 – 2.00)

Scale items	Respondent scores
Blood vessel disease (vascular dementia) is the most common form of dementia [FALSE].	37% correct ( $M = 0.74$ ; $SD = 0.78$ )
Uncharacteristic behaviours in a person experiencing dementia are generally a response to unmet needs [TRUE].	42% correct ( $M = 0.84$ ; $SD = 0.65$ )
Movement is generally affected in the later stages of dementia [TRUE].	47% correct ( $M = 0.94$ ; $SD = 0.79$ )
Having high blood pressure increases a person's risk of developing dementia [TRUE].	49% correct ( $M = 0.98$ ; $SD = 0.80$ )
Maintaining a healthy lifestyle does not reduce the risk of developing the most common forms of dementia [FALSE].	54% correct ( $M = 1.08$ ; $SD = 0.60$ )
Alzheimer's disease is the most common form of dementia [TRUE].	55% correct ( $M = 1.10$ ; $SD = 0.81$ )
Medications are the most effective way of treating behavioural symptoms of dementia [FALSE].	58% correct ( $M = 1.16$ ; $SD = 0.68$ )
People experiencing advanced dementia often communicate through body language [TRUE].	59% correct ( $M = 1.18$ ; $SD = 0.69$ )
The sudden onset of cognitive problems is characteristic of common forms of dementia [FALSE].	60% correct ( $M = 1.20$ ; $SD = 0.64$ )
Most forms of dementia do not generally shorten a person's life [FALSE].	62% correct ( $M = 1.24$ ; $SD = 0.62$ )
It is important to correct a person with dementia when they are confused [FALSE].	63% correct ( $M = 1.26$ ; $SD = 0.66$ )
Symptoms of depression can be mistaken for symptoms of dementia [TRUE].	64% correct ( $M = 1.28$ ; $SD = 0.57$ )
Early diagnosis of dementia does not generally improve quality of life for people experiencing the condition [FALSE].	64% correct ( $M = 1.28$ ; $SD = 0.67$ )
Most forms of dementia reduce the length of a person's life [TRUE].	65% correct ( $M = 1.30$ ; $SD = 0.74$ )
Exercise is generally beneficial for people experiencing dementia [TRUE].	66% correct ( $M = 1.32$ ; $SD = 0.55$ )

*(Continued)*

**Table 3.** (Continued)

Scale items	Respondent scores
Daily care for a person with advanced dementia is effective when it focusses on providing comfort [TRUE].	66% correct ( <i>M</i> = 1.32; <i>SD</i> = 0.55)
Difficulty eating and drinking generally occurs in the later stages of dementia [TRUE].	67% correct ( <i>M</i> = 1.34; <i>SD</i> = 0.66)
Dementia is a normal part of the ageing process [FALSE].	68% correct ( <i>M</i> = 1.36; <i>SD</i> = 0.48)
A person experiencing advance dementia will not generally respond to changes in their physical environment [TRUE].	68% correct ( <i>M</i> = 1.36; <i>SD</i> = 0.63)
It is impossible to communicate with a person who has advanced dementia [FALSE].	68% correct ( <i>M</i> = 1.36; <i>SD</i> = 0.63)
People experiencing dementia often have difficulty learning new skills [TRUE].	71% correct ( <i>M</i> = 1.42; <i>SD</i> = 0.54)
People with advanced dementia may have difficulty speaking [TRUE].	71% correct ( <i>M</i> = 1.42; <i>SD</i> = 0.57)
Dementia does not result from physical changes in the brain [FALSE].	75% correct ( <i>M</i> = 1.50; <i>SD</i> = 0.58)
People experiencing dementia do not generally have problems making decisions [FALSE].	75% correct ( <i>M</i> = 1.50; <i>SD</i> = 0.54)
People with dementia are unlikely to experience depression [FALSE].	76% correct ( <i>M</i> = 1.52; <i>SD</i> = 0.54)
People can recover from the most common forms of dementia [FALSE].	78% correct ( <i>M</i> = 1.56; <i>SD</i> = 0.50)
Planning for end of life care is generally not necessary following a diagnosis of dementia [FALSE].	82% correct ( <i>M</i> = 1.64; <i>SD</i> = 0.60)

Dementia as a presenting problem is very rare ... It's more common to see falls, acute confusion in addition to dementia, or it might be one of their other comorbidities that they're presenting with - then at the end you might also have dementia in the triage. (Jill, Female, Allied health worker)

As addressed above, rather than dementia being a primary admission, it is more common for a person with the condition to present to the emergency

department with an acute event potentially resulting from the progression or exacerbation of underlying dementia pathology. Addressing the complexity of dementia-related admissions a respondent stated, "In patients with dementia, pneumonia, urinary tract infections, falls, and unconscious episodes are very common ... A consequence of complex admissions is that these patients are often also delirious" (Rodney, Male, Medical Doctor).

The complexity and perceived resource requirements associated with dementia-related admissions meant that some hospital staff were either unaware of, or avoided engaging with, underlying cognitive impairment in their treatment of a vulnerable older person. Instead, clinicians appeared to focus predominantly on the presenting complaint without broader concern for underlying issues. Staff members stated,

We are so focussed on just treating what the person [with dementia] is admitted for. We treat them for the fractured hip, the hip gets fixed, and then we say, 'you can go home.' No one is considering other diagnoses [such as dementia] ... because that just opens so many doorways. (Nancy, Female, Allied Health Worker)

If you have someone admitted with dementia to one of the medical-surgical wards, nurses take very little time to engage with the individual to find out about them. They just see them as a problem...There's almost a culture that people with dementia don't belong anywhere else in the hospital and that then affects how they are treated. (William, Male, Nurse)

There was an overarching sentiment among hospital staff that dementia was not perceived as a major or imminent challenge, even when it created significant complexity and comorbidity among older adult admissions. Staff identified a range of interpersonal and organisational barriers that compounded care difficulties and resulted in potentially suboptimal care, poor discharge planning and limited engagement with the person living with dementia.

### *Knowledge, Training and Attitudinal Deficits*

Respondents who frequently worked with older adults reported gaps in dementia knowledge among general staff and poor attitudes during interpersonal communication with people who have dementia. Congruent with the DKAS results, respondents spoke about challenges identifying

dementia typologies and symptoms: "In terms of staff knowledge around dementia, there are certainly big gaps even around the different types of dementia and behaviours associated with it" (Jill, Female, Allied health worker). Clinical staff reported that an observed lack of knowledge among the regional hospital workforce was potentially underpinned by limited professional training opportunities for people to learn about dementia symptomatology and care: "There's no formal education about how to manage people with dementia or problems they might have" (Luke, Male, Medical Doctor). A lack of knowledge about dementia, particularly the diversity of symptoms, was reportedly associated with poor interpersonal communication between clinical staff members and people with dementia. In particular, staff members who were unfamiliar with dementia often reacted to cognitively impaired patients as though their behavioural symptoms were deliberately disruptive. Respondents asserted,

People [who work in the hospital] don't really understand dementia at all... you hear some of the language and you just cringe because [the staff member is] showing that they don't understand...When you hear them speaking to people, it's like [people with dementia] are being naughty children. (Tessa, Female, Nurse)

There's a lack of understanding [about dementia] by some staff...An example, we had a non-verbal patient who had delirium and I heard one of the older nurses saying, 'Talk to me properly. You know how to talk.' Those sorts of things really worry me. (Richard, Male, Allied health worker)

### *Limited Cognitive Screening*

The under-diagnosis of dementia poses problems for clinical staff within the hospital. If dementia is not explicitly identified upon admission, then the quality of the patient's hospital experience can be adversely affected. As one respondent noted,

As a group of geriatricians, we've identified that the emergency department is a great area of need [for improved cognitive care]. Cognitive impairment is often under-diagnosed, both dementia and delirium, in that environment and those people are probably at the greatest risk and aren't being picked up early. (Rodney, Male, Medical Doctor)

One of the aims of staff working in the emergency department is to identify older adults who might require additional or specialised care

because of age-related vulnerabilities, such as dementia. Screening for people with dementia was identified by clinical staff as an important action that should ideally be undertaken during initial admission as a means for improving hospital care and discharge planning. It was identified, however, that such screening did not occur routinely: "Cognitive screening isn't done as often as it could be and that can have a big impact on people's safety" (Luke, Male, Medical Doctor). Another interviewee reported, "It only takes five minutes just to do the Mini-Cog [cognitive assessment], but a lot of pre-admissions staff are very busy people and hospitals are very busy places, so it's hard to get that screening happening" (Ellen, Female, Nurse).

### *Dementia Un-Friendly Environments*

People with dementia who are admitted to hospital often present to the emergency department with an acute illness or injury, which may be associated with the underlying pathology of the syndrome. Clinical staff reported that neither the emergency department nor the general wards of the regional hospital were suitable care settings for people with dementia. A clinical staff member reported, "The environment isn't conducive to someone who might have difficult behaviours. It's a stimulating environment. It's noisy, open, and chaotic at times, and that has an impact on the patient" (Lisa, Female, Allied health worker). Another staff member stated, "The environmental factors aren't good in the Emergency Department ... I think the environment itself is probably the most challenging in terms of people with behavioural issues" (Jill, Female, Allied health worker).

Despite recognition of the inappropriateness of hospital environments for the well-being of vulnerable patients, staff reported that a best-practice dementia-friendly environment had previously been implemented in a section of the emergency department. This area, however, was subsequently discontinued for several reasons, with the space reassigned for other purposes. The dementia-friendly space had been designed to be non-threatening and familiar, with medical equipment hidden from view, pictures hung on the walls and comfortable chairs provided for patients and their relatives. This sort of environment is not just useful for behavioural management but also for quality of care,

reduction in stress and confusion and facilitating assessment. A clinical staff member stated,

We had a dedicated dementia unit for patients and staff ... It doesn't exist anymore, which is disappointing because that environment was much nicer and less distressing for individuals with dementia ... Some people thought they were in their homes. One older woman told me to go and make myself a cup of tea in the kitchen. It obviously was not clinical and it didn't look like a hospital and wasn't as noisy. (Jill, Female, Allied health worker)

### *Staff Shortages and Outsourcing Care*

Staff shortages and managerialism were identified by respondents as factors that increased pressure on clinicians and potentially threatened care provision for people with dementia. Respondents contended, "There's no additional staffing given for [people living with] complex, high-end dementias" (William, Male, Nurse), and "We are very understaffed now and we noticeably get more referrals with complex comorbidities, including dementias (Anna, Female, Allied health worker)."

Because of staff shortages and increasing admissions among people with dementia (either diagnosed or suspected), some respondents argued that the hospital recruited people with lower skill levels from external agencies to supervise people with cognitive impairment and reduce the risk they posed to themselves or other patients. This approach to hospital-based dementia care was itself perceived as a risk by some respondents. A staff member reported,

We normally use an outside agency. We call them 'sitters' ... They free the nurses up to have more time to do their clinical duties. It's not possible to have a nurse doing that [supervision], and that's where there's risk for older people in hospital. (Sally, Female, Nurse)

The low level of training among "sitters" was identified as a risk to patient safety and best-practice dementia management. One respondent spoke about the lack of understanding among low-skilled care staff from external agencies with regards to the management of behavioural symptoms of dementia:



I'm not sure what their [sitters'] level of training is because there was one experience a couple of weeks ago where somebody was wandering and the sitter was just following them around, but it actually needed the nursing care attendant to go and redirect [their behaviour]. (Dannielle, Female, Allied health worker)

### *Discontinuity of Care*

One of the factors that can make a hospital admission challenging for an older person is the diversity of clinicians and settings that a person with dementia is confronted with during his or her stay. The potential for multiple and repetitive assessments across diverse departments combines to make the hospital experience uncomfortable and confusing for a person with dementia. A clinical staff member noted, “[The hospital experience] is hard for those with cognitive decline. They need consistency and familiarity. Different people coming in and retelling the same clinical information is obviously not a good patient journey for them” (Dannielle, Female, Allied health worker).

One of the challenges affecting continuity of care is the limited clinical history taking and information sharing that could improve a patient journey through the hospital system. If information is not obtained during initial assessment and early admission, time pressures and imperatives to free bed space for more conventional acute care patients may contribute to clinicians' not adequately investigating a patient's health history. One respondent described the problematic patient journey:

If a person with dementia is admitted, they could arrive at the ward at any time and sometimes the handover doesn't state whether they've had anything to eat or drink, and they get moved around, especially people who have dementia - it's dreadful. They get moved from ward to ward ... It's really confusing. (Tessa, Female, Nurse)

Another staff member spoke about a failure of some clinicians to seek out or access clinical history and goals of care, which could improve care quality for the person with dementia:

Sometimes we don't get information about [a patient's] level of dementia. It could be anything from early dementia to severe ... Sometimes the doctors in the team won't ring the nursing home and that makes it difficult to look at goals of care as soon as [people with dementia] hit the hospital. (Ellen, Female, Nurse)

## Discussion

In this study, the recorded prevalence of dementia as a primary reason for admission at a large regional hospital was found to be low among adults aged 55 years and older (<1% of admissions over a 3-month period). Due to the under-diagnosis of dementia in the community, however, and the capacity for the condition to act as a precursor for an acute event (fall) or exacerbation of a chronic condition (aspiration pneumonia) (Kurrle et al. 2012), the true prevalence of dementia-related conditions is potentially greater than admissions data indicate. Internationally, it has been reported that the prevalence of diagnosed dementia is at least 50% lower than the prevalence reported in epidemiological studies (Connolly et al. 2011) or in research that involves direct cognitive assessments of older adults (Sampson et al. 2009). Further, it has been estimated that a quarter of older people accessing acute hospitals are likely to have some form of dementia, although this is often unrecognised (Houghton et al. 2016). Population estimates of dementia suggest that the syndrome is present in at least 5% of the older adult population within Tasmania (Deloitte Access Economics 2011), so there appears to be a discordance between recorded hospital admissions data and estimated population prevalence. Under-diagnosis of dementia was supported by qualitative comments from clinical staff who identified that dementia could be overlooked in the emergency department and hospital wards. Furthermore, it was sometimes viewed as problematic due to the increased demand on limited resources that best-practice management of dementia patients requires.

Despite the low level of recorded prevalence of dementia, costs of treatment and length of stay for a person with dementia were 39% higher for people with a diagnosis of dementia when compared to those who had no diagnosis. National health data reinforce that, across diverse settings, dementia imposes a significantly greater cost and resource burden on the health sector when compared to other conditions (Australian Institute of Health and Welfare 2012). The additional costs imposed by people with dementia in hospital settings are typically due to increased complexity (e.g. challenges imposed by multiple comorbidities and altered behaviours), greater number of investigative procedures, the need for additional human resources to support the person with dementia (such as the “sitters” described in the results section above) and an

increased length of stay that is often associated with the complexity of the admission (Sampson et al. 2006; Zweifel et al. 1999). The present research also found no correlation with either age or death during admission and diagnosis of dementia. This suggests that proximity to death (interpreted by age and death rate during hospital admission) is not confounding the higher costs of dementia-related admissions. The additional costs associated with dementia-related acute care admissions, potential under-diagnosis within the hospital and broader community, and growing prevalence of the condition associated with population ageing, indicate the potential for increases in hospital costs associated with management of the syndrome if current care and treatment practices do not change.

The challenge of managing dementia-related hospital admissions is compounded by limited staff knowledge about the syndrome. Hospital staff displayed a higher level of knowledge about dementia (DKAS Mean = 34.3) than cohorts of family care givers, health students and the general population who have previously completed the DKAS in other studies (Annear et al. 2015). Hospital respondents scored poorly, however, on items that addressed dementia typology, symptoms and optimal care. The DKAS Mean score was also considerably lower than scores recorded among a large population of community nurses ( $N = 918$ ; DKAS Mean = 37.9) who previously completed the 27-item DKAS (Annear et al. 2017). This discrepancy indicates that there is room for improvement in relation to dementia knowledge among hospital staff. Of concern, only 42% of clinical staff correctly identified that uncharacteristic behaviours in a person experiencing dementia are generally a response to unmet needs (Whall & Kolanowski 2004), while only 47% understood that movement can be affected in the later stages of dementia (O'Connor et al. 2010). Such responses indicate that more education is required for hospital staff on the psychosocial and physiological aspects of care for people with dementia. These findings were supported by qualitative reports from staff members who stated that there was a lack of systematic workplace training opportunities to inform care and treatment for people with dementia at a time of increasing community prevalence. Worryingly, staff identified that poor attitudes stemming from a lack of understanding negatively impacted communication with people with dementia, which led to perceptions of poorer clinical care. Evidence from international studies

indicates that negative attitudes towards acute care provision for older adults among hospital staff are often related to low levels of knowledge and, therefore, amenable to educational intervention (MacDowell et al. 1998). Although few studies have examined the efficacy and outcomes of dementia education in acute care settings, research into education programmes for other age-related chronic conditions show positive effects. For example, a systematic Cochrane review of 81 randomised controlled trials that included health professional education examined the impacts of knowledge change and reported significant and positive effects on practice and patient outcomes independent of other influences (Forsetlund et al. 2009).

Environmental and organisational culture factors were also highlighted as barriers to dementia care, with clinical respondents reporting a lack of dementia-friendly environments, outsourcing care for people with dementia, lack of care continuity and limited cognitive screening. The hospital setting presents a confusing and confronting environment for a person with dementia. Admissions to the acute sector often increase the risks of additional cognitive and physical deterioration (Alzheimer's Australia 2014). Dementia-friendly environments are typically defined as systems of support that recognise the experience of the person with dementia and provide assistance to remain meaningfully engaged in everyday life (Davis et al. 2009). Such settings aim to reduce confusion and anxiety, enhance patient understanding of their surroundings, reduce behavioural symptoms and promote optimal physical and cognitive functioning for a person with dementia (Marquardt & Schmiege 2009). Dementia-friendly environments create a milieu that is more inclusive of individuals with serious cognitive problems, which overtly acknowledge the centrality of the broader social contexts that the person with dementia lives and experiences care within (Nolan et al. 2002). The concept of the dementia-friendly hospital includes not only a physical environment that is familiar and supportive but also a well-trained and empathetic staff who understand dementia and person-centred approaches to care. Although the conceptualisation and implementation of dementia-friendly and inclusive environments is a relatively new phenomenon, qualitative evidence suggests that people with dementia and their family members value clinical hospital

environments that are private, quiet, homely, and which provide amenities and comfort (Digby & Bloomer 2014). Moreover, recent research from the United Kingdom has shown that dementia-friendly hospital interventions (changes to ward design, social spaces and sensory gardens) can significantly reduce stress and agitation for older and cognitively impaired patients (Waller & Masterson 2015). The discontinuation of a dementia-friendly space in the emergency department of the regional hospital in this study, which had acknowledged positive effects, suggests that person-centred and best-practice dementia care may not be regarded as a current priority by hospital management.

Lack of care continuity and outsourcing of supervisory responsibilities within the hospital were also reported as disruptive to the patient journey for people with dementia. Respondents expressed concerns about interactions with multiple clinicians, lack of familiar and expert carers, and inconsistent information-gathering procedures during an admission for a person with dementia. Of particular concern, respondents spoke about how reduced staffing levels associated with managerialism (Germov 2005) often left people with dementia under the supervision of poorly qualified “sitters” who were unaware of best-evidence dementia management. Similarly, other studies have identified that hospitals often lack the person-centred care at the clinician or organisational level that is required by people with dementia to ensure appropriate quality of care during a hospital admission (Clissett et al. 2013). In a situation where the environment itself is a source of potential confusion and stress, exposure to an unfamiliar care team may exacerbate the cognitive and physical health of people admitted with dementia.

Suboptimal patient journeys (experiences of hospital care that are less than best-practice expectations) and poor interpersonal care are potentially reinforced by the under-diagnosis of dementia within the hospital and wider health care system. Clinical staff reported there was no systematic approach to screening for people with dementia in the hospital and this was perceived as a threat to the quality of care during admissions and subsequent discharge planning. A lack of screening was compounded by limited information received about a patient from both community doctors and residential aged care facilities. In addition, the sentiment among some respondents was that some staff were not inclined

to address health concerns beyond immediate presenting symptoms that an older adult was admitted for in case it increased admission time and reduced beds available for other patients. Cognitive screening for dementia within hospital settings has been identified as clinically difficult and operationally inefficient by health systems researchers (Laurila et al. 2004), with recorded incidence of the condition seldom matching assessment findings. Deficiencies in cognitive assessment in acute settings are potentially associated with a lack of systematic organisational guidelines, inappropriate clinician expectations or knowledge or views that dementia is not a serious problem requiring immediate attention (even when it may be an underlying cause of the admission) (Laurila et al. 2004). While cognitive screening based on age alone is not appropriate (Boustani et al. 2003), clinical staff felt their colleagues needed to be more attuned to the signs and symptoms of dementia during initial admission. This was considered a particularly important skill among the small multidisciplinary assessment team operating in the emergency department. Among such work teams, rapid triage and cognitive assessment of individuals with suspected dementia was considered to improve patient care and outcomes, although more research is required to substantiate this. Research into multidisciplinary triage and assessment teams should ideally involve a range of clinical stakeholders, including paramedics who may be involved in the transport and initial evaluation of older patients.

#### *Limitations and Future Research*

This research was designed to inform a dementia education intervention for clinical hospital staff across regional and remote Australia. Because of this, a large regional hospital was selected as the sampling frame for the initial exploratory study. The convenience sampling approach may have resulted in the selection and recruitment of a motivated sample that had a higher level of dementia knowledge and different experiences of dementia when compared to a large random sample of hospital employees. Moreover, the dominance of allied health professionals in the response cohort contrasts with the broad structure of clinical health service providers in Australia where qualified nurses are the largest workforce group. This is potentially explained by older adult requirements for rehabilitation

and support services following illness or injury necessitating hospital treatment and the associated interest in this research among those who provide this type of care. To address both limitations and verify the current findings, future investigations of hospital staff knowledge and outcomes of admissions for people with dementia should be undertaken employing cluster randomised sampling across multiple regional hospitals in Australia. Work is also currently ongoing to establish normative benchmark scores for the DKAS among different populations (health professionals, students and laypeople). At present, scoring of the DKAS involves an analysis of total score (out of 54), item scores (out of 2) and comparisons with other cohorts of scale completers.

### *Implications and Recommendations*

Although the concept of age-friendly environments has been in use since the early 21st Century (World Health Organization 2007), the notion of dementia-friendly hospitals has only recently emerged as a salient health management issue. Previous international research has reported that creating age-friendly environments in hospitals potentially provides a variety of salient benefits for older patients and the organisation. Potential benefits include reductions in patient anxiety and discomfort, reductions in burdensome and unnecessary medical procedures and tests, improved interpersonal communication between professional staff and patients, better patient handovers and hospital branding and marketing opportunities (Chiou & Chen 2009; Huang et al. 2011).

This research identified several individual, organisational and environmental barriers to the implementation of best-practice models of dementia care. Data derived from this study may help to inform the development of strategies to support better dementia care and treatment and overcome challenges to implementation. Several recommendations can be surmised that aim to improve dementia care and treatment in public health facilities. Firstly, regional and rural hospitals should provide professional development for all clinical staff to improve their knowledge about and attitudes towards dementia, particularly in the areas of best-evidence care strategies and symptom identification. Secondly, it is recommended that a randomised controlled trial be undertaken to explore the efficacy of a dementia-friendly admissions department in relation to

patient stress and agitation, symptom severity, length of stay and treatment outcomes. Finally, to address problems with patient hospital experiences, it is recommended that each new dementia admission be assigned a care manager to plan and guide their hospital stay and ensure that there is good continuity of care and contact with staff who are well-trained in the management of patients with dementia.

### Conclusion

Dementia-related admissions comprise a small, but growing, component of care in a large regional hospital. Admissions for people with dementia are complicated by communication challenges and multiple comorbidities that challenge clinician competence during initial assessment and admission. Prevailing under-diagnosis, high costs of current treatment approaches and longer admission periods also necessitate consideration of the obstacles to effective dementia care in such settings. Within the participating regional hospital, clinical staff displayed a moderate level of knowledge about dementia, but specific deficiencies in their understanding of psychosocial care. It is possible that a lack of knowledge about the psychosocial aspects of care influenced staff attitudes towards people with dementia. Barriers to optimal dementia care are a result of environmental factors, organisational culture, and individual clinician knowledge and attitudes. Future studies should evaluate the efficacy of educational interventions with clinical hospital staff as an option for improving care experiences and outcomes.

### Acknowledgements

This research was funded by a Royal Hobart Hospital Research Foundation (RHHRF) grant awarded to the first author.

### Corresponding Author

*Michael J. Annear*, Department of Health and Physical Education, International Christian University, 3-10-2, Osawa 3-chome, Mitaka, Tokyo 181-8585, Japan. Email: michael.annear@gmail.com



## References

- Alzheimer's Australia (2007). *Support Needs of People Living with Dementia in Rural and Remote Australia*. Canberra, Australia: Alzheimer's Australia.
- Alzheimer's Australia (2014). *Dementia care in the Acute Hospital Setting: Issues and Strategies*. Canberra, Australia: Alzheimer's Australia.
- Annear, M., Eccleston, C., Elliott, K. E., Toye, C. & Tranter, B. (2016). A new standard in dementia knowledge measurement: Comparative validation of the Dementia Knowledge Assessment Scale and the Alzheimer's Disease Knowledge Scale. *Journal of the American Geriatrics Society* 64(6): 1329–1334.
- Annear, M. J., Toye, C., Elliott, K. & Eccleston, C. (2017). Dementia knowledge assessment scale (DKAS): Confirmatory factor analysis and comparative subscale scores among an international cohort. *BMC Geriatrics* 17(1): 168.
- Annear, M. J., Toye, C., Eccleston, C., Elliott, K., Tranter, B. & Hartley, T. (2015). Dementia knowledge assessment scale: Development and preliminary psychometric properties. *Journal of the American Geriatrics Society* 63(11): 2375–2381.
- Australian Bureau of Statistics (2015). *Dementia and Alzheimer's Disease now Australia's Second Leading Cause of Death*. Canberra, Australia: Australian Bureau of Statistics.
- Australian Institute of Health and Welfare (2012). *Dementia in Australia*. Canberra, Australia: Australian Government.
- Bail, K., Hudson, C., Grealish, L., Shannon, K., Ehsen, S., Peut, A., Gibson, D., Draper, B. & Karmel, R. (2013). Characteristics of rural hospital services for people with dementia: Findings from the Hospital Dementia Services Project. *Australian Journal of Rural Health* 21(4): 208–215.
- Bloom, B. S. (2005). Effects of continuing medical education on improving physician clinical care and patient health: A review of systematic reviews. *International Journal of Technology Assessment in Health Care* 21(3): 380–385.
- Boustani, M., Peterson, B., Hanson, L., Harris, R. & Lohr, K. (2003). Screening for dementia in primary care: A summary of the evidence for the US Preventive Services Task Force. *Annals of Internal Medicine* 138(11): 927–937.

- Buykx, P., Humphreys, J., Wakerman, J. & Pashen, D. (2010). Systematic review of effective retention incentives for health workers in rural and remote areas: Towards evidence-based policy. *Australian Journal of Rural Health* 18(3): 102–109.
- Charmaz, K. (2014). *Constructing grounded theory*. Thousand Oaks, CA: Sage.
- Chiou, S. & Chen, L. (2009). Towards age-friendly hospitals and health services. *Archives of Gerontology and Geriatrics* 49: 3–6.
- Clissett, P., Porock, D., Harwood, R. & Gladman, J. (2013). The challenges of achieving person-centred care in acute hospitals: A qualitative study of people with dementia and their families. *International Journal of Nursing Studies* 50(11): 1495–1503.
- Connolly, A., Gaehl, E., Martin, H., Morris, J. & Purandare, N. (2011). Underdiagnosis of dementia in primary care: Variations in the observed prevalence and comparisons to the expected prevalence. *Aging & Mental Health* 15(8): 978–984.
- Davis, S. & Bartlett, H. (2008). Healthy ageing in rural Australia: Issues and challenges. *Australasian Journal on Ageing* 27(2): 56–60.
- Davis, S., Byers, S., Nay, R. & Koch, S. (2009). Guiding design of dementia friendly environments in residential care settings: Considering the living experiences. *Dementia* 8(2): 185–203.
- Delloite Access Economics (2011). *Dementia across Australia: 2011–2050*. Canberra, Australia: Alzheimer's Australia.
- Digby, R. & Bloomer, M. (2014). People with dementia and the hospital environment: The view of patients and family carers. *International Journal of Older People Nursing* 9(1): 34–43.
- Ellis, I. K. & Philip, T. (2010). Improving the skills of rural and remote generalists to manage mental health emergencies. *Rural & Remote Health* 10(3): 1503.
- Forsetlund, L., Bjordal, A., Rashidian, A., Jamtvedt, G., O'Brien, M., Wolf, F., Davis, D., Odgaard-Jensen, J. & Oxman, A. (2009). Continuing education meetings and workshops: Effects on professional practice and health care outcomes. *Cochrane Database for Systematic Reviews* 2(2): 1–99.
- Germov, J. (2005). Managerialism in the Australian public health sector: Towards the hyper-rationalisation of professional bureaucracies. *Sociology of Health & Illness* 27(6): 738–758.

- Houghton, C., Murphy, K., Brooker, D. & Casey, D. (2016). Healthcare staffs' experiences and perceptions of caring for people with dementia in the acute setting: Qualitative evidence Synthesis. *International Journal of Nursing Studies* 61: 104–116.
- Huang, A. R., Larente, N. & Morais, J. (2011). Moving towards the age-friendly hospital: A paradigm shift for the hospital-based care of the elderly. *Canadian Geriatrics Journal* 14(4): 100.
- IBM Corp. (2011). *IBM SPSS Statistics for Windows, Version 20.0*. Armonk, NY: IBM Corp.
- Jackson, N. (2002). When the population clock stops ticking: An indicative study of population ageing in Tasmania. *Australasian Journal of Regional Studies* 8(1): 3–19.
- Jackson, N. (2007). Population ageing in a nutshell: A phenomenon in four dimensions. *People and Place* 15(2): 12.
- Kurrle, S., Brodaty, H. & Hogarth, R. (2012). *Physical comorbidities of dementia*. Cambridge, UK: Cambridge University Press.
- Laurila, J. V., Pitkala, K., Strandberg, T. & Tilvis, R. (2004). Detection and documentation of dementia and delirium in acute geriatric wards. *General Hospital Psychiatry* 26(1): 31–35.
- Lofland, J. & Lofland, L. (1995). *Analysing social settings: A guide to qualitative observaion and analysis*. Belmont, CA: Wadsworth Publishing Company.
- MacDowell, N. M., Proffitt, C. & Frey, R. (1998). Effects of educational intervention in gerontology on hospital employees' knowledge of and attitudes about the older adult. *Journal of Allied Health* 28(4): 212–219.
- Marquardt, G. & Schmieg, P. (2009). Dementia-friendly architecture: Environments that facilitate wayfinding in nursing homes. *American Journal of Alzheimer's Disease and Other Dementias* 24(4): 333–340.
- Mitchell, S. L., Teno, J., Kiely, D., Shaffer, M., Jones, R., Prigerson, H., Vollicer, L., Givens, J. & Hamel, M. (2009). The clinical course of advanced dementia. *New England Journal of Medicine* 361(16): 1529–1538.
- Morse, J. M. (2015). Critical analysis of strategies for determining rigor in qualitative inquiry. *Qualitative Health Research* 25(9): 1212–1222.
- Moyle, W., Olorenshaw, R., Wallis, M. & Borbasi, S. (2008). Best practice for the management of older people with dementia in the acute care setting: A review of the literature. *International Journal of Older People Nursing* 3(2): 121–130.

- Nolan, M., Ryan, T., Enderby, P. & Reid, D. (2002). Towards a more inclusive vision of dementia care practice and research. *Dementia* 1(2): 193–211.
- O'Connor, M. L., Edwards, J., Wadley, V. & Crowe, M. (2010). Changes in mobility among older adults with psychometrically defined mild cognitive impairment. *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences* 65(3): 306–316.
- Organisation for Economic Cooperation and Development (2015). *Addressing Dementia: The OECD Response*. Paris, France: OECD Publishing.
- Pope, C., Ziebland, S. & Mays, N. (2000). Analysing qualitative data. *British Medical Journal* 320(7227): 114–116.
- QSR International (2012). *NVivo qualitative data analysis software – Version 10*. Doncaster, UK: QSR International Pty Ltd.
- Sampson, E., Blanchard, M., Jones, L., Tookman, A. & King, M. (2009). Dementia in the acute hospital: Prospective cohort study of prevalence and mortality. *The British Journal of Psychiatry* 195(1): 61–66.
- Sampson, E. L., Gould, V., Lee, D. & Blanchard, M. (2006). Differences in care received by patients with and without dementia who died during acute hospital admission: A retrospective case note study. *Age and Ageing* 35(2): 187–189.
- Sampson, E., Leurent, B., Blanchard, M., Jones, L. & King, M. (2013). Survival of people with dementia after unplanned acute hospital admission: A prospective cohort study. *International Journal of Geriatric Psychiatry* 28(10): 1015–1022.
- Takai, Y., Yamamoto, N. & Ko., A. (2014). Prevalence of and factors related to pain among elderly Japanese residents in long-term healthcare facilities. *Geriatrics & Gerontology International* 14(2): 481–489.
- Walker, N., Van Woerden, H., Kiparoglou, V. & Yang, Y. (2016). Identifying seasonal and temporal trends in the pressures experienced by hospitals related to unscheduled care. *BMC Health Services Research* 16(1): 307.
- Waller, S. & Masterson, A. (2015). Designing dementia-friendly hospital environments. *Future Hospital Journal* 2(1): 63–68.
- Whall, A. L. & Kolanowski, A. (2004). The need-driven, dementia-compromised behavior model: A framework for understanding the behavioral symptoms of dementia. *Ageing & Mental Health* 8(2): 106.

- World Health Organization (2007). *Global age-friendly cities: A guide*. Geneva, Switzerland: World Health Organization.
- World Health Organization (2012). *Dementia: A public health priority*. Geneva, Switzerland: World Health Organization.
- Zweifel, P., Felder, P. & Meiers, M. (1999). Ageing of population and health care expenditure: A red herring? *Health Economics* 8(6): 485–496.

