NEW ZEALAND NURSES ORGANISATION | TŌPŪTANGA TAPUHI KAITIAKI O AOTEAROA

EVIDENCE FOR INVESTMENT IN NURSING

POLICIES THAT CAN TRANSFORM HEALTHCARE

Mandated nursing staff to resident ratios in aged care:

Summary of evidence

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Executive summary

This paper aims to describe the evidence base for the use of nursing staff to resident ratios in aged care in Aotearoa New Zealand. Background is provided on the changing nursing needs of ageing New Zealanders. Literature demonstrating the impact of staffing (especially numbers of registered nurses) on the quality of aged care, is discussed. Recommended international minimum staffing ratios in aged care are outlined and used as a reference point to assess how Aotearoa New Zealand measures up. Shortfalls in staffing, care processes and patient outcomes are highlighted as evidence of quality problems in aged care in Aotearoa New Zealand. NZNO (New Zealand Nurses Organisation) maintains that without the right mix of staff with appropriate clinical training and professional oversight and accountability, the quality of care is compromised, putting both staff and residents at risk. Further research is needed to better understand how mandated nursing staff to resident ratios might work in the aged care sector in Aotearoa New Zealand.

A review of the literature details the impact of United States (US) state staffing mandates on quality, as measured by structure (staffing) and patient outcomes in aged residential care. The position on staffing ratios of nursing unions and aged care organisations in Australia and Canada, and Aotearoa New Zealand is also discussed. While there is a growing body of evidence from California and Victoria, Australia, on the impact of ratios in hospital settings, following the introduction of mandated ratios, literature focusing solely on aged-care settings is limited to US research. However, there is some emerging research indicating that legislation introduced to enforce high minimum staffing levels across several states in the US has had a positive impact on the quality of aged care.

Methods

The review of literature focuses specifically on the impact of legislation regarding staffing levels on the quality of aged residential care and excludes research on other settings such as hospitals. The search included English language research studies from Canada, the United Kingdom (UK), the US, Europe, Australia and Aotearoa New Zealand published from 1999 onwards. An electronic search was undertaken on google scholar of articles published between 1999 and the present. The listed search terms from these publications also assisted in establishing search terms. Search terms included: mandate(s), mandated, mandatory, legislation, legislated, ratios(s), regulation, regulated, aged care, quality, quality of care, nursing home(s), staffing, impact, care, standards, outcomes, nurse, resident, nurse-to-patient and nurse-patient. Appropriate full text articles were sourced as required.

Introduction

Nurses (registered and enrolled) and caregivers in the aged care sector in are working to provide safe and quality patient care to older citizens in Aotearoa New Zealand. However, employers face the challenge of providing acceptable levels of quality care at low cost. A significant body of research demonstrates that a high minimum level of staff, particularly registered nurses (RNs), is associated with higher quality aged care. Currently, staffing levels in aged residential care in Aotearoa New Zealand fall below internationally recommended benchmarks (CMS, 2001). There is evidence of short-staffing, lack of time to care and staff being overworked (Human Rights Commission, 2012). Shortfalls in care quality (often related to staffing time) are also documented in complaints to the Health and Disability Commissioner (HDC) (HDC, 2016), and rest home audits (https://www.consumer.org.nz/articles/rest-homes). This calls into question whether the existing regulation of nurse staffing levels within the aged care sector is working to ensure safe staffing, quality care and resident safety. This is an increasingly pressing issue as the nursing needs of an ageing population and levels of acuity among residents grow.

A recognised way to influence quality and ensure appropriate working environments is to introduce and enforce regulations on the number of staff employed per resident in aged residential care. Legislation concerning minimum staffing standards has been introduced in the US as a response to the deterioration of quality of aged care. Many nursing and health-care unions (notably in Canada and Australia) are calling for the introduction of mandated ratios of hours of staffing per patient in aged care. These mandated hours are expressed as ratios of hours spent by staff per resident per day and /or week. In Aotearoa New Zealand there is continuing debate about how to best determine the number of staff employed in aged residential care. Currently, minimum staffing practice does not meet internationally recommended minimum staffing level standards of 4.1 worked hours per resident day (hprd). To avoid jeopardising the health and safety of residents NZNO recommends mandated ratios be explored as an answer to Aotearoa New Zealand’s current staffing crisis.

Part 1: The changing nursing needs of New Zealanders in aged residential care

Currently, population and workforce trends reinforce the importance of resolving how to address and effectively deliver aged care in Aoteaora New Zealand. Against this background, the crucial issue is finding ways to ensure “quality” of care in the sector .

Aotearoa New Zealand’s ageing population

The population of Aotearoa New Zealand is ageing. This current and future growth is placing and will continue to place, pressure on the aged care sector. The 2013 census showed that the population of those aged 65 and over is 607,032. The population of those 65+ has increased 22.5 per cent since 2006 (495,603 people), and nearly doubled since 1981 (309,795 people). Projections show the number of people aged 65+ will more than double to reach 1,285,800 by 2038 and by 2063 will reach 1,618,700 (Statistics New Zealand, Tatauranga Aotearoa, 2013).

The population of those in the 65 + age group is currently much less ethnically diverse than younger age groups, but this is projected to change. The 2013 census showed Māori made up 5.6 percent (32,181 people) of the 65+ population, compared with 16.5 percent of the under 65 population (Statistics New Zealand, Tatauranga Aotearoa, 2013). However, the population of Māori aged 65+ is projected to increase by 79 percent by 2026, and will comprise 9.5 percent of the older people’s population (Ministry of Health, 2011). The older Pacific population is expected to increase by 63 percent, and older Asian population by 125 per cent in this same period (Ministry of Health, 2016).

Aotearoa New Zealand’s ageing population living in aged residential care

Aotearoa New Zealand’s long-term aged care support is dominated by aged residential care facilties and the use of these services is high by international standards. Around 31,000 older people currently live in certified aged residential care facilties (Office for Senior Citizens, 2014). Broad et al’s recent research (Broad et al, 2015) showed the likelihood of aged residential care use in later life. This is the first known original study of lifetime use of aged residential care facilities in Aotearoa New Zealand and provides significant new findings, including estimating that lifetime use of aged residential care would be 48 percent in 2020, increasing to 53 percent by 2040. This level of lifetime use is nearly double the only previous rough estimate (based on non Aotearoa New Zealand data) of 25-30 percent. Estimates could be pushed up or down with changes to entry criteria, funding or service provision, social preferences and lifestyles (as may arise from ageing of new migrants), availability of informal caregivers and prevalence of disability or functional decline.

Changing needs of older Māori

Currently, Māori comprise only 3.3 percent of people aged 65+ years and living in aged residential care (Statistics New Zealand, Tatauranga Aotearoa 2013), due to a variety of health, cultural and socio-economic factors. There are marked differences in health status and life expectancy between Māori and non Māori in Aotearoa New Zealand and this disparity partly contributes to low numbers of Māori living in aged residential care. In 2012–2014, life expectancy at birth was 73.0 years for Māori males and 77.1 years for Māori females; it was 80.3 years for non-Māori males and 83.9 years for non-Māori females (Ministry of Social Development, 2016). Cultural and economic factors may also account for this under-representation and include a tradition of elders wanting their whānau to look after them (Central TAS, 2012), the prominent role of Māori grandparents in raising one or more mokopuna (grandchildren) (Families Commission, 2009) and lower income levels among older Māori, resulting in an inability to afford to retire (Hayman et al, 2012).

However, the number of Māori needing aged residential care is predicted to increase due to changing demographics and fragmentation of whānau. The proportion of older Māori in the population is growing and levels of dependency are higher among Māori than non- Māori, and set to increase. It is forecasted that by 2026 the number of older Māori needing care on a more than daily basis could have increased by more than 200 percent (Kerse et al, 2015). There has also been a cultural shift in Aotearoa New Zealand in recent years, with aged residential care becoming more necessary, as whānau and iwi have become more fragmented and spread around the country (Central TAS, 2012).

Any policy changes relating to aged care in Aotearoa New Zealand must positively respond to the cultural and spiritual needs of kaumātua (older Māori women and men), who in the past have been differentially affected by the process of colonisation (Dyall et al, 2011). Kaumātua are key to the well-being of Māori society, developing and supporting healthy whānau (extended family), hapū (extended families) and iwi (tribe), as well as protecting Māori beliefs and traditions, whakapapa and protecting the interests of Māori people (Dyall et al, 2013). A cohort study (LiLACS NZ) emphasies the significance of language and cultural practices to well-being and quality of life for Māori in their 80s. (Dyall et al, 2014). Further research is required to advance the future needs of Māori kaumātua.

Increased acuity

Evidence of increased dependency (acuity) in aged residential care facilties over the last 20 years, as indicated by mobility, continence and cognitive function, is detailed in the 2008 Older Persons Ability Level (OPAL) Study. This study showed that in 2008, 56 percent of residents in Auckland rest homes and private hospitals had high dependency, compared with just 36 percent 20 years ago (Boyd et al., 2008). The OPAL study also showed that between 1988 and 2008, the proportion of residents in the lowest category of dependence reduced from 16 per cent to four percent, while residents in hospital–level care increased from 13 to 20 percent. Therefore, those who enter aged residential care are doing so with higher levels of dependency and more complex health-care needs, multiple morbidities, and at a later stage of illness (HDC, 2016).

Increased long-term conditions

This pattern of increasingly high and complex needs in aged residential care is unlikely to change as the numbers of people living with long-term conditions are expected to increase. Currently, one in six older New Zealanders are living with three or more long-term conditions. For example, the numbers of New Zealanders with dementia is expected to rise to 78,000 by 2026, from an estimated 50,000 in 2016 (Ministry of Health, 2016). Chronic health conditions occur earlier for Māori, and lead to many other health issues, such as stroke, dementia and cardiovascular disease (Dyall et al, 2011). Higher rates and greater complexity of long-term conditions will increase demand for health services in general. Staffing levels are, therefore, a concern as they may not be increasing fast enough to meet the rising medical complexity of residents in aged care.

Higher level of care and skilled staff required

Rising acuity means qualified and experienced RNs able to assess, coordinate and provide expertise across the sector are required. Evidence from the Human Rights Commission (HRC) Inquiry into aged care *"Caring Counts"* found there had been an increase in the level of skill required for staff in aged residential care to safely meet the needs of the older people they cared for (HRC, 2012). The September 2016 Report on Residential Aged Care: Complaints to the Health and Disability Commissioner reinforces that the increase in levels of dependency demands a *"higher level of care and skills from facilities than may have been the case in the past and create a further imperative to ensure quality service delivery"* (HDC, 2016, p3*).*

Part 2: The relationship between staffing and quality of care

How is quality of aged care typically examined?

Much of the research on residential care quality has drawn on the Donabedian framework, which conceptualises quality of care as having inter-related structure (physical and organisational characteristics of facilities such as size and staffing levels), process (referring to the frequency of care-related activities such as toileting, feeding, catheterisation and use of restraints) and nursing-sensitive outcome components (for example the prevalence and incidence of pressure ulcers, hospitalisation rates, complaints, and unexplained weight loss) (Donebedian A, 2005). The majority of studies on quality in residential aged care focus on clinical outcomes that can be objectively assessed, such as the prevalence of pressure ulcers, infections, incontinence rates, falls rates, the use of restraints, unplanned weight loss, polypharmacy and hydration management, rather than using quality as defined by residents and their families in terms of patient satisfaction, which may include issues such as communication (HDC, 2016).

The relationship between staffing levels in aged care and quality of care- international evidence.

Higher levels of staffing, particularly by RNs, lie at the heart of quality of care. Whether a facility is adequately staffed may affect structure, process and outcome determinants of quality of care. Systematic reviews have documented more than 150 staffing studies, conducted mainly in the US, but also including studies in Canada, UK, Germany, Norway and Sweden. Bostick et al (2006) concluded that "*there is a proven positive association between higher total staffing levels and improved quality of care," (p 366).* Higher total staffing levels, especially among RNs, were associated with improved care processes and residential outcomes for functional ability, pressure ulcers and weight loss. The authors also found an association between a higher ratio of staff who were not RNs and a reduced level of quality of care. While Backhaus et al (2014) found *"no consistent evidence for a positive association between staffing and quality of care" (p. 383),* other research reviews found positive associations between staffing levels and quality of care outcomes, such as avoidable hospitalisations (Castle, 2008, Spilsbury et al., 2011).

The most recent integrative review of the literature on the relationship between staffing and quality of care consistently reported that higher RN staffing and higher ratios of RNs in the nursing skill mix were related to better nursing home quality (Dellefield et al., 2015). The authors found the strongest evidence supporting a causal relationship between higher RN staffing levels, higher RN ratios within the skill mix, and quality indicators was found in several longitudinal studies. The review found that higher RN staffing in aged care was associated with fewer pressure ulcers, lower

restraint use, decreased probability of hospitalisation, fewer deficiency citations and decreased incidence of urinary tract infections (Dellefield et al., 2015).

Although there are some mixed findings in international literature, the benefits associated with high nurse staffing underlines the importance of staffing levels (Backhaus et al 2014; Bostick et al 20016; Castle, 2008; Dellefield et al, 2015; Spilsbury et al, 2011). The strongest positive relationships are found between RNs (with two to four years of training) and quality, which is stronger than the relationship between licensed vocational/practical nurses (LVNs/LPNs), who have less training than RNs, and quality. Total nurse staffing levels are also related to quality - including RNs, LVNs/LPNs, and certified nursing assistants (CNAs; with about two weeks of training) (Harrington et al., 2016).

Recommended minimum staffing levels – international benchmarks

While aged care research has established that higher levels of staffing are associated with improved resident outcomes, cost and efficiency concerns prevail. Staffing constitutes a major cost for providers, so profit-driven aged residential care facilities need to know the plausible minimum staffing level for providing quality care. However, establishing evidence-based minimum staffing ratios to inform standards has proved difficult (Zhang et al., 2006).

A useful starting point is provided by the large US Study in 2001 and 2002 by the US Centres for Medicare and Medicaid Services (CMS) and the US Congress, undertaken in response to widespread public concern about the quality of aged residential care. Two consecutive reports were published quantitatively analysing the appropriateness of minimum nurse staffing ratios in residential care. The CMS study (2001) has been recognised as the most comprehensive and academically sound research to date on the relationship between staffing levels and quality of care (CUPE, 2009). The researchers deployed a mix of observational empirical research and time-motion studies, in which the precise times required to perform certain tasks (eg, washing and dressing, toileting a resident) were measured.

The CMS report found that staffing levels for long-stay residents that are below 4.1 hours per resident day (hprd) result in harm or jeopardy for residents such as as unexplained weight loss and pressure ulcers (if below 1.3 hprd for licensed nurses and 2.8 hprd of nursing assistant (NA) time). NA time should range from 2.8 to 3.2 hprd, depending on the care residents need, just to carry out basic care activities (CMS, 2001). This amounts to 1 NA per 7 or 8 residents on the day and evening shifts and 1 NA per 12 residents at night.

Numerous studies published since the CMS report support the level of 4.1 nursing hprd as the benchmark below which residents are likely to experience harmful effects (CUPE, 2009). However, when this study was published in 2002, acuity levels had not reached current levels and the recommendations of this study are often thought to be too low to meet

current care needs, and certainly too low to meet needs into the future (CUPE, Manitoba, 2015). Other research finds a case for staffing beyond the CMS-recommended levels. The minimum level required to improve resident well-being, rather than merely prevent deterioration, was identified as 4.55 worked hprd in a 2000 study (Harrington et al., 2000) and somewhere between 4.5 to 4.8 worked hprd in a 2004 study (Schnelle et al., 2004).

Part 3: Current staffing levels in aged residential care and quality of care issues in Aotearoa New Zealand

Current contractual arrangements for aged care staffing

The need for staffing standards to ensure quality in aged residential care is intended to be addressed by existing standards, but these are not enforceable by law. Minimum staffing levels are set by District Health Boards (DHBs) under the Age Related Residential Care Service (ARRC) Services Agreement. Under the ARRC Services Agreement, aged residential care facilities are required to provide their residents with care that meets the Health and Disability Service Standards (the standards) in order to gain certification. Aged residential care facilities are audited by the Ministry of Health (MoH) to ensure they meet the criteria set out in the standards. DHBs also monitor the quality of care residents receive. The ARRC Services Agreement sets out service specifications for facilities. Facilities are able to develop their own staffing rationale on an ad-hoc basis provided they meet the requirements in the ARRC Agreement of a (one) registered nurse (RN) on duty at all times if hospital-based care is provided (Whitehead, 2010).

Standards in relation to staff-resident ratios are voluntary. Voluntary staffing recommendations were published in 2005 by the MoH in the handbook: *"Minimum Indicators for Safe Aged Care and Dementia Care for New Zealand Consumers SHNZ HB 8163:2005"*(Standards New Zealand, 2005), following concerns by a number of staff and consumer organisations. These set a higher threshold than the ARRC agreement and include recommended hours per consumer per week. Details outlined are a (one) RN on duty at all times if the facility provides hospital-level care and a minimum of 1.14 hours per resident per day increasing to two hours per resident per day when levels of acuity among residents is high (Standards New Zealand, 2005). However, the workbook is a guideline rather than a prescribed standard.

Recommendations are as follows:

- Rest-home level care-1.7 hours of caregiver time and 0.3 hours of RN time per day
- Dementia patients-two hours of caregiver and 0.5 hours of RN time per day
- Hospital residents-2.4 hours of caregiver and one hour of RN time, with a nurse to be on duty 24/7

How do staffing levels in Aotearoa New Zealand compare to international benchmarks for recommended staffing hours per resident day to ensure the basic safety of residents?

Aotearoa New Zealand falls well short of the staffing levels recommended by the CMS of "4.1 worked hours per resident day (hprd) as an "avoid harm" minimum. (CMS, 2001). Findings are summarised in the table below (Table 1).

Table 1. Comparison of current staffing levels in Aotearoa New Zealand against recommended international benchmarks

CMS Threshold (CMS, 2002)	Contractual obligations under ARRC Services Agreement (Whitehead, 2010)	Guidelines for NZ in Minimum Indicators for Safe Aged Care and Dementia Care for New Zealand Consumers (Standards New Zealand, 2005)	Opal study – snapshot of reported mean RN, enrolled **nurse** and caregiver hours per resident by type of care (over 24 hr period of 10.09.08) (Boyd et al., 2008)
4.1 hours per resident day (includes 2.8 nurse aide hours (ratio of 8 patients to 1 nurse aide) and 1.3 licensed nurse hours (ratio of 18:1), of which at least 0.75 should be RN hours.	0.5 hprd	1.14 hprd increasing to 2 hprd when levels of acuity are high	RNs Psychogeriatric 1.2 hprd Private hospital-0.9hprd Dementia- 0.6 hprd Rest home -0.3 hprd Enrolled nurses Dementia – 0.3 hprd Private hospitals and rest homes -0.1 hprd Caregivers Psychogeriatric -4.1 hprd Private hospital – 2.7 hprd Dementia care – 2.5 hprd Rest homes 1.8 hprd

Inadequate staffing levels in aged residential care

There is significant evidence the current standards are inadequate, with insufficient RN staffing to cope with increasing demands and acuity and delegation of RN tasks to carers identified. The HRC inquiry "*Caring Counts*" (HRC, 2012) suggests providers now keep their staffing levels to the bare minimum prescribed by the requirements of the ARRC agreement. Demands on lone RNs were reported as concerning by both workers and families, especially in cases of high resident to nurse ratios (1 RN to 60 patients). The HRC inquiry found that in the absence of sufficient RNs, support workers were given the task of distributing medication, a situation perceived as high risk and outside the scope of competence. Concern was expressed by inquiry participants about accountability in a situation like this. Greater dependency also places increased demands on staff workloads. Evidence from the HRC inquiry found that as patient requirements in aged residential care have intensified, demands on caregivers' and nurses' workloads have indeed increased (HRC, 2012). This is impacting on the ability of staff to have quality time to provide quality care. There are many examples illustrated in this report of short staffing, with critical care tasks being hurried or missed.

The Grant Thornton Aged Residential Care Service Review (Grant Thornton, 2010) reported a *"large variation in practice"* for staff-resident ratios among providers (p112). On average, it says, nurse care for a rest-home resident was *just over two hours per week* (p 110), with a variation from *one to four*

hours per week, while caregivers ranged from *eight to 13 hours per resident per week* (p112).

Evidence that staffing levels in the majority of aged residential care facilities fall well below the minimum levels indicated for safety was also highlighted in a survey of health-care assistants undertaken by NZNO (Walker, 2009), "*An examination of the perceptions, tasks, responsibilities and training needs of caregivers in New Zealand's aged care facilities".* The survey also found unregulated caregivers were frequently called on to undertake RNs tasks. "Medication is '*very frequently'* given out without clinical supervision, and both blood glucose monitoring and catheterisation are 'frequently undertaken'". Many caregivers reported anxiety about doing work they felt they were neither trained nor paid to take responsibility for, but often there was no alternative. NZNO maintains that without the right mix of staff with appropriate clinical training and professional oversight and accountability, the quality of care is compromised, putting both staff and residents at risk.

There is also much anecdotal evidence of inadequate staffing in Aotearoa New Zealand (Labour/Green/Grey Power New Zealand, 2010). The report, "*What does the future hold for aged New Zealanders?"*, stated that in many aged residential care facilties nurses said they were responsible for the care of as many as 60 patients on a shift, and this sometimes extended to the care of residents in retirement villas as well. Many said it was impossible to provide quality care with so few nurses and caregivers on duty. This was particularly evident on night shifts and at the weekends, when staff to patient ratios plummeted. Age Concern is frequently told of situations where there are insufficient staff available to meet the needs of residents in a timely manner, and that inadequate staffing levels are frequently cited in cases of institutional abuse that are referred to its Elder Abuse and Neglect Prevention Services (Labour/Green/Grey Power, New Zealand, 2010).

Current evidence of care processes and outcomes as measures of quality of care

Given the shortfalls in staffing as a structural measure of inadequate care quality, it is also interesting to look at evidence of care processes and patient outcomes, as inter-related measures of quality. Failings in care processes and outcomes are evident in complaints to the HDC. Between 2010 and 2013, the HDC received 502 complaints about care, with an average of 100 complaints each year (HDC, 2016). The latest report found common issues included inadequate communication between providers; inadequate response to the complaint by the facility; hygiene needs not being met; delayed/inadequate referral; and disrespectful manner/attitude. Other issues related to inadequate fluid/nutrition (16 percent of cases), inadequate pain management (15 percent of cases); falls (20 percent of cases) and wound care (15 percent of cases). Complaints regarding the recognition/management of a resident's deteriorating condition were common – present in 22 percent of cases. Inadequate assessment or monitoring of vital signs was present in 17 percent of these cases and often also involved inadequate care planning, inadequate communication between providers and

delayed/inadequate referrals. Failure to communicate effectively with families was present for over half of the cases. A common finding on assessment of complaints about aged residential care facilities was a failure by staff to follow policies and procedures as a contributing factor to care deficiencies. Impossibly high workloads could contribute to all of the above.

Despite a number of improvements in the audit process in aged residential care facilities over the last few years, including accreditation of auditors, combined DHB and HealthCERT audits, spot audits, and publishing audit summaries online, inquiries and reports have also found many aged residential care facilities have serious quality problems. Quality shortfalls are revealed in rest home audits carried out by the MoH. In July 2014, *Consumer New Zealand* (August 2014) reviewed surveillance audit reports for 123 rest homes. *Consumer* reported that of the 123 homes for which surveillance audits were available, only 14 met all the criteria they were assessed against. The audits showed some shortfalls were monitored but there were many instances of disturbing failures in basic care. Auditors assessed that the majority of homes had one or more shortfalls classified as of “moderate risk” to residents. The review of audits showed that 39 percent of all shortfalls were classified as either ”moderate” or “ high” risk, and that several facilities had recurring problems. Shortfalls directly related to staffing time were documented in the 123 surveillance audit reports and included basic failings in care (Consumer, August 2014). Among them, auditors reported:

- *“Staff report they struggle to get through their work because they are spending more time with the residents who are frail and becoming increasingly more dependent.”*

- *“The frequency of dressing changes is documented for a skin tear (every third day) [but] the resident has had one dressing change on the third day and the second six days later.”*

- *“One hospital level resident has a catheter that requires changing monthly. It has not been changed [for 45 days] and there is no documentation to explain why.”*

- *“Eighteen of the 44 wounds, including five of nine pressure areas, have not always been reviewed in the stated timeframe.”*

Part 4: The introduction of minimum staffing laws internationally

Given the impact of higher nurse staffing levels on resident outcomes in aged care, international calls have been made to raise minimum staffing standards through regulations. These ratios legislate for a minimum number of staff to patients or minimum nursing hprd. The introduction of ratios is advocated by many nursing and health-care unions (notably in Canada and Australia) as a key strategy for improving quality. This approach is used in other institutional contexts; eg many jurisdictions set minimum student-teacher ratios in education and minimum staff-child ratios in early childhood care. Similar minimums could be applied for this population of older people, which is arguably as vulnerable as the populations in schools and early childhood care.

Ratios in US aged care

Minimum nursing staff ratios have been implemented in US aged residential care facilties (referred to as nursing homes in the US) but vary in how they are described, and are difficult to compare across states. Tilly et al.'s (2003) review of US experiences with minimum nursing staff ratios for nursing facilities found 36 states with established minimum ratios, and these are expressed as hprd, a ratio of staff to resident or staff-to-bed, and in some cases, a mixture of requirements. By 2010, 41 states had implemented minimum staffing mandates (Harrington et al., 2016). Tilly et al (2003) found considerable variation across the study states in the type of ratio, measurement of the ratio, adjustment for case mix, monitoring and enforcement of the ratio, and payment for ratios, with substantial disagreement about the best approach among various stakeholder groups. California, for example, requires 3.2 hours of direct care by a RN per resident day. Maine maintains a direct care staff-to-resident ratio of 1 to 5 during the day, 1 to 10 in the evening, and 1 to 15 at night. Among the 36 states with minimum nursing staff ratio standards, 21 states expressed the ratio only as hours per resident day. This review of literature indicates there is very little information on why states decide to establish staffing ratios and how a state chooses the particular form and level of its ratio. The review indicates states believe ratios will promote quality, but there is less attention given to other factors such as costs, nursing home payment levels, or labour shortages that might affect the decision.

Ratios in hospital settings

Ratios have been introduced in hospital settings in Victoria, Australia, California and Japan (Gordon et al., 2008). However, comparisons between hospitals and aged-care settings are difficult so will not be explored in detail in this discussion. In 2001, Victoria implemented mandated nurse-patient ratios in medical and surgical units and emergency departments (triage and charge nurses not counted). This was a result of intense lobbying and political pressure from the Victorian Branch of the Australian Nursing Federation (ANF) branch (now the Australian Nursing and Midwifery Federation), the Victorian Ministry for Health. Nurse-patient ratios in Victoria

are based on a workload complexity model that incorporates the type of shift, such as morning or evening, and the level of the hospital (Heslop & Plummer, 2012). Mandated staff ratios have resulted in improved recruitment and retention of nurses, reduced reliance on expensive agency staff, improved patient care, increased job satisfaction for nurses, more workplace stability and reduced stress (Gordon et al., 2008). However, because of the nursing shortage and challenges in the volume and complexity of patient demands, *"the ratio experiment in Victoria could not be conducted under what scientists might describe as controlled conditions" (Gordon et al, 2008, p148)*.

Part 5: Literature review: The impact of introducing higher minimum staffing laws in aged care

A small sample of studies (n=7) directly assess the case for minimum nurse-to-patient ratios in aged care by evaluating the impact of such legislation in the US on quality of care. A search of literature reveals studies that specifically measure the impact of the introduction of minimum direct care staffing laws on staffing levels and turnover, as well as outcomes for residents in the US between 1998 and the present. The impact of changes in minimum staff requirements on staffing and resident outcomes are summarised in Table 2 below.

Table 2. The impact of changes in minimum staffing standards on quality (staffing levels and resident outcomes)

Author	Sample and Sample Size	Study Design	Structural Quality Indicator	Findings (Outcome Quality Indicator)
Park and Stearns (2009) Structural Quality Indicator) Structural Quality Indicator)	55, 248 facility – year observations from a national sample of 15, 217 freestanding nursing homes (1998-2001)	Cross sectional	Impact of 16 states that implemented or expanded staffing standards compared to those without new standards.	No significant associations of standards change and resident outcomes. Non-profits had statistically significant increase in RN HPRD. Increased standards were associated with small staffing increases for nursing homes below or close to new standards. Increased standards were associated with small reductions in restraint use and total number of deficiencies.
Tong (2011)	812 certified nursing homes (1995-2002)	Cross sectional	Impact of change in staffing regulations on employment and resident mortality.	Low staffed nursing homes increased overall nursing hours; no change in RN hours. Reduced resident mortality suggesting that benefits from increased overall staffing outweigh

				effects of reduced nurse skill mix.
Bowblis (2011)	94, 371 survey observations from 17, 552 nursing homes (1999-2004).	Cross sectional	RN as % of total nursing staff. Impact of minimum direct care staff (MDCS) requirements on staffing.	Outcome quality measure are mixed. Higher MDCS requirements are generally associated with improved resident outcomes (fewer restraints, pressure ulcers and rashes). However, also associated with worse quality in bowel incontinence and significant weight changes. Regulations increased staffing levels, although the effect on skill mix depended on the Medicaid share within the facility.
Chen and Grabowski (2014)	45, 738 nursing home -yearly survey observations in California, Ohio and control states from 1996- 2006.	Longitudinal	Impact of minimum staffing regulations introduced in California and Ohio in 2000 and 2002 on skill mix.	Total nurse hours increased by about 5% .Fewer RNs hired relative to nursing assistants (skill mix decreased). Reduced number of deficiency citations. Other measures of quality remained unchanged.
Lin (2014)	8 US states that experienced legislation changes between 200 and 2001	Instrumental Variable approach	Impact of legislation changes regarding minimum staffing levels, which act as exogenous shocks to nursing staffing levels.	RN staffing has a large and significant impact of quality of care, as measured by the count of deficiencies. There is no evidence of a significant association between nurse aide staffing and quality of care.
Zhang and Grabowski (2004)	State survey of data from 5092 nursing homes across 22 states	Cross sectional	Examined the effects of the Nursing Home Reform Act	Found a significant increase in staffing levels and

	between 1987 and 1993.		(NHRA) on staffing and quality of care (as measured by pressure ulcers, physical restraints, and urinary catheters).	a significant decrease in residents with pressure ulcers, physical restraints, and urinary catheters. The increase in staffing was not directly related to the improvement in quality, but there was a positive relationship between RN staffing and quality for facilities that were deficient prior to the NHRA.
Matsudaira (2014)	Outcome data collected on patient health characteristics and facility deficiency citations from Online Survey and Certification and Reporting System (OSCAR).v	Compares changes in quality of care outcomes for facilities with varying degrees of exposure to the minimum staffing law.	Examined the causal impact of a California law passed in 1999 that increased the number of required nurse from 2.7 h of care per resident day to 3.2 hprd. Nursing homes below the new standard were compared with those in compliance prior to the implementation of the new standard.	Legislation is effective in increasing staff ratios, as facilities with the lowest staffing levels increased their employment of nurse aides by 35 percent or more and on average increased nurse aide employment by about 10 percent. However, no evidence of improved patient outcomes demonstrated.

Studies, therefore, consistently show implementation of higher minimum staffing standards does result in a modest improvement in quality of care, as measured by structure (minimum staffing numbers) and outcomes (eg fewer deficiencies).

The impact of changes in minimum staffing standards on staffing levels and skill mix quality

Studies found staffing levels (a structural measure of quality) improve with the introduction of mandated staffing levels, especially in facilities with previously low staff levels. Effective studies of regulation changes in individual states show that the introduction of minimum standards has been successful in increasing staffing ratios. In Ohio and California minimum standards appear to have increased the amount of direct care provided to patients in facilities with low staffing, mainly through hiring a greater number of certified nurse aides (CNAs) (Chen and Grabwoski 2015, Matsudaira

2014) and licensed practical nurses (LPNs), though some facilities with high levels of staff decreased staffing levels (Chen and Grabowski 2015).

Other studies used a national sample of nursing homes and estimated how changes in regulation affected staffing levels. Park and Stearn (2009) examined any change in regulation that affected staffing levels and found small increases in staffing for nursing homes initially below or close to the new standard. Bowblis (2011) examined how the magnitude of the increase in the standards impacted on staffing. More stringent standards were found to cause overall staffing levels to increase, mostly through the hiring of CNAs. Similarly, Tong et al.'s (2011) study demonstrates that low staffed facilities responded to the regulation by increasing total staffing by 10 percent, mostly through increasing numbers of nurse aides.

The impact of changes in minimum staffing standards on resident outcomes

The majority of studies also show legislation impacts favourably on resident outcomes, especially by reducing deficiencies. Deficiencies in US nursing homes are based on state surveyor evaluations of the process and outcomes of care in the facilities and include data related to food; quality of care; incomplete records; lack of respect for dignity; unnecessary drugs; incomplete care plans; hazards; infection control; pharmacy and housekeeping (Harrington et al., 2006). Higher levels of staffing (following legislation) were associated with better care quality, where the following outcome quality indicators were examined:

- fewer deficiencies citations (Park & Stearns, 2009), (Chen and Grabowksi, 2014),(Lin, 2014)
- lower restraint use (Zhang & Grabowski, 2004), (Park & Stearns, 2009), (Chen and Grabowski, 2014)
- lower pressure ulcers incidence (Zhang & Grabowski, 2004), (Bowblis, 2011)
- lower urinary catheter use (Zhang & Grabowski, 2004)
- decreased mortality/ patients discharged due to death (by 4.6%)(Tong, 2011).

Improvements in resident outcomes were seen only following an increase in RNs, but not with an increase in nurse aides, in two of these studies (Zhang and Grabowski, 2004; Lin, 2014).

Discussion

The existing literature suggests a modest positive quality response to the introduction of minimum staffing standards. Evidence also suggests overall nurse staffing has increased in response to the introduction of minimum staffing standards. However, this response has largely resulted in a lower nursing skill mix, as nursing homes have responded to these broad staffing standards by hiring more nursing assistants. Literature also suggests nursing

homes decrease indirect care staff as a response to minimum direct care staffing standards. Possible explanations for the modest impact on quality care are that the effect of staffing on outcomes is heterogonous across facilities and depends on initial staffing levels. For example, facilities with low staffing levels may be of poorer quality overall and lack the resources to productively use new nursing staff. Another explanation is that the staffing law induces a decline in the skill mix of nurses and that this has adverse effects on quality of care (Matsudaira, 2012). It is suggested that policies to improve quality should focus on other policy levers if not other inputs besides staffing. A shift to regulating or incentivising outputs (eg patient outcomes) is the trend in the area of education policy, and may more effectively improve quality of care, though more research on such policies is needed (Matsudaira, 2012).

Limitations

Most of the above studies rely on cross-sectional evidence, which makes causal inference problematic and policy recommendations difficult. Omitted variable bias may not reflect a causal relationship. For example, it is likely that nursing homes with a higher level of staffing also have relatively higher levels of other inputs that affect quality of care, such as medical equipment and efficient care management. Cross-sectional analyses lacking controls for these factors would lead to overestimates of the effect of staffing on quality of care. Ascribing causal relationships between staffing and quality of care is also problematic. Decisions about staffing and quality of care are subject to confounding by other factors such as regulation, limited budget, and patient case mix. So a higher level of staffing might be a result of an increased patient acuity level (Lin, 2014).

It is also notable that there is a gap in the literature on the link between the costs and quality benefits of a minimum staffing standard. There have not been rigorous, comprehensive evaluations of the cost-effectiveness of the regulation of the quality of the nursing home industry in the US (Mukamel et al., 2012). Harrington et al (2000) noted that some savings may occur as a result of higher staffing, including fewer hospitalisations, fewer on-the-job injuries that result in higher worker compensation costs, lower spending on supplies and drugs that often substitute for staff time, lower staff turnover resulting in lower training and hiring costs, and fewer poor resident outcomes that can result in costly treatment. For example, the costs associated with treating a pressure ulcer can be far greater than additional staff time necessary to prevent the pressure ulcer from occurring in the first place (Zhang & Grabowski, 2004). Further research is needed to establish a better link between the costs and benefits of higher staffing to facilitate policymakers in making an informed decision on whether further regulations in the aged-care industry are warranted.

Part 6: Staffing ratios in aged residential care facilties: position of nursing and aged care organisations in Australia and Canada

Evidence from nursing and health-care unions and organisations from Canada and Australia suggests a growing consensus that mandated staff-to-resident ratios are the only way to ensure quality in aged care. In Canada only Alberta and Saskatchewan have a legislated minimum staffing standard. In Saskatchewan the standard is two hours per resident day – below levels recommended by the CMS study (CUPE, 2009).

Victoria is the first Australian state to legislate nurse-to-resident ratios in state-owned aged residential care facilities. The state government was committed to enshrining in law the ratios in nurses' four-year enterprise agreement ending 2016. (Australian Ageing Agenda, 2015). Mandated nurse-patient ratios are supported by the ANMF (Australian Nursing and Midwifery Association), which says ratios guarantee the minimum number of qualified nurses on each shift to ensure high quality patient care and safety (Australian Ageing Agenda, 2015). However, the Australian Productivity Commission decided against recommending ratios in its 2011 report into aged care, emphasising the lack of evidence (Australian Government Productivity Commission, 2011). It found a staff ratio in aged care would be a "relatively blunt instrument" given the resident profile would be ever-changing. The Productivity Commission found that "such ratios become particularly problematic for small facilities and a rigid application of ratios could create operational difficulties for these facilities." It also noted the accreditation process provided a means for "encouraging providers to apply an appropriate skill mix and staffing level in the delivery of community and residential aged are services".

The position of nursing and health-care unions on mandated staffing ratios in aged care in different Canadian and Australian states is summarised in Table 3 below.

Table 3. Staffing in aged care: the position of Canadian and Australian nursing and health care unions

State/ source	Staffing recommendations (eg mandated hprd, minimum staffing standards)
Manitoba (CUPE Manitoba, 2015)	That the Government ensure that all LTC facilities are legally bound to minimum staffing levels. That the province put in place a plan to reach staffing levels between 4.55 and 4.8 hrpd. In the meantime the Province should immediately set staff levels at 4.1 hrpd to ensure the basic safety of residents
British Columbia (BCNU position statement, 2015)	That total nursing staff hours are to be 4.55 per resident day. Mandated minimum staffing levels to be one regulated nurse for every 25 residents. A minimum of one full-time RN director of nursing and one

	RN supervisor on site for residential care facilities, providing direct care supervision, at all times (24 hours per day, 7 days per week). In facilities with 100 or more beds, a full-time RN assistant director of nursing and a full time RN director of in-service education should be mandatory. In facilities with less than 100 beds, these positions are to be proportionally adjusted for size.
Alberta (United Nurses of Alberta, 2016)	Continue to include minimum nursing and personal care hours in regulations: Minimum threshold for total nursing and personal care staffing of 4.1 hprd Minimum threshold for direct care registered nursing of 0.75 hours-per-resident-day Also recommends: Continue to include the requirement for an RN on-site 24 hours a day; increase monitoring of RN, LPN and HCA staffing hours; ensure data collected distinguishes between RN and LPN hours. Note that Alberta currently has regulations that LTC facilities are required to provide an average of at least 1.9 paid hours of combined nursing and personal services per resident per day. Alberta backs up this regulation with funding that goes well beyond the minimum: enough for 3.6 hours of care per resident-day, plus an additional 0.4 hours per day for paraprofessional services such as physical therapy and social work (downloaded from http://purplevotes.ca/2016/02/05/just-the-facts-workload-issues-in-long-term-care/.)
Ontario (Ontario Council of Hospital Unions, 2014)	Implement mandatory minimum staffing ratios – 1 personal support worker (PSW) per 8 residents – based on acuity level of residents. The union is also pushing for enough staff to provide each resident with 4 hours (average) of care per day. Maintain current legislation that requires a nurse in duty at all times.
New Brunswick (Canadian Healthcare Association 2009).	New Brunswick has a model of funding for care staff based on 3.1 hours of care per resident. 2.5 of the assigned hours are based on a ratio of 20 percent RN, 40 percent licensed practical nurse (LPN) and 40 percent PSW. The balance is assigned to LPN Rehabilitation (0.08 hours per resident); clerical support for nursing (0.13 hours per resident) and PSW peak workload hours (0.39 hours per resident).
Nova Scotia (Nova Scotia Nurses Union, 2015)	That residents of long term care facilities should receive a minimum average of 1.3 hours of nursing care per day (RN and Licensed Practical Nurses), as well as 2.8 care from caregivers for a total of 4.1 care hours per resident day. This is an average, and staffing plans should take into consideration the varying levels of acuity and complexity of care.
Victoria (Australian Ageing Agenda, 2015)	Introduce ratios of one nurse for every seven residents plus a nurse in charge on morning shifts; one nurse for every eight residents plus a nurse in charge on afternoon shifts and one nurse for every 15 residents for the evening shift (Australian Ageing Agenda, 2015).
Queensland,	A minimum of one RN rostered on for every 20 residents;

(Queensland Nurses Union, 2015)	a minimum of one enrolled nurse rostered on for every two RNs and a “like for like” replacement of nursing staff. The union suggests the senior nurse on duty will use their professional judgement to determine staffing numbers and skill mix requirement in relation to resident complexity and that Assistants in Nursing are included in the direct care hours.
New South Wales http://www.australianageingagenda.com.au/2015/11/04/aged-care-staffing-requirements-too-vague-nsw-inquiry-finds/	Parliamentary report calls for staff-to-resident ratios and licensing of personal care workers. Nurse unions and some seniors groups have welcomed the inquiry’s findings, but aged care providers said they were disappointed with the report.

Part 7: Staffing ratios in aged care: the position of aged care sector in Aotearoa New Zealand

In Aotearoa New Zealand, there is considerable agreement on the need for appropriate staffing levels which reflect the higher needs of care recipients. Given that the skill mix of the workforce is linked to the complexity of the need, how appropriate staffing levels are subsequently assured is the critical issue and remains the subject of divided opinion. Affordability is also recognised as impacting significantly on staffing levels (HRC, 2012). However, regarding the introduction of mandatory staffing ratios, concern focuses on the lack of evidence of effectiveness that would be relevant to the situation in Aotearoa New Zealand, and that ratios would restrict decision-making ability and can't be adjusted according to staff mix and patient acuity (HRC, 2012).

Opposition

The New Zealand Aged Care Association claims there is little research evidence to support the need for mandatory staff-resident ratios. The association claims that to date there have been no reports or research from HealthCERT or DHBs to show a problem with current practices and procedures into how nurse managers set rosters in the sector (HRC, 2012). Industry opposition to ratios is also evident. Employers require flexibility. Many providers are reluctant to support mandatory staffing on the basis they want to retain the ability to determine the level and staffing mix to meet the needs of the people they care for. Ratios are perceived as a blunt instrument and don't enable the right skill mix according to different needs. Employers believe ratios obstruct their decision-making ability and cannot be adjusted to the need of constantly changing patients and the experience levels of nurses and other staff. Chief executives of aged residential care facilities support a review of current standards, which needs to be redone to reflect rising acuity and provide reasonable workloads (HRC, 2012).

Support for compulsory standards

As a result of its inquiry into the aged care sector, the HRC has come to the view that the voluntary standards developed by the sector (SNZ HB 8163:2005) relating to staffing should become compulsory. The inquiry found that, in practice, funding constraints meant that if the guidelines became a prescription, then the options for many facilities would be to cut staff or pay less. The HRC maintains that flexibility can be achieved on top of the minimum levels set in the standards but that a basic floor is required to protect older people, their families and the workforce. The HRC believes a minimum floor does not defeat employers' requirements for flexibility (HRC, 2012). NZNO's and E tū's positions are outlined in the aged-care charter launched in 2011. The charter asked for "compulsory safe staffing levels and skill mix so that every resident gets the care they need, when they need it" (downloaded at http://www.nzdoctor.co.nz/ media/1496608/2011-05-24_aged_care_charter_factsheet.pdf).

Other initiatives to improve quality of care

Other initiatives have been introduced with the aim of improving the quality of care for older people. InterRAI is a clinical assessment tool being rolled out nationally and is designed to help staff assess the medical, rehabilitation and support requirements of the older person. It is an online tool that produces an individual care plan/case mix. The aim is to establish the use of a standardised assessment tool that uses software, designed to improve the care of older people in aged residential care. Developed by the interRAI network of health researchers in over 30 countries, this tool is a comprehensive clinical assessment of medical, rehabilitation and support needs and abilities such as mobility and self-care. This information helps nurses to write tailor-made care plans which, when implemented, benefit both residents and staff. Aotearoa New Zealand is the first country in the world to implement this tool nationally. This means this country will soon have detailed statistical information about the needs of older people in the community and in care (http://healthitboard.health.govt.nz/our-programmes/shared-health-information/common-clinical-information/comprehensive-clinical). A care capacity demand management (CCDM) tool which measures patient acuity and matches staffing to those needs and is being implemented by a number of DHBs could be adapted for aged residential care (downloaded at http://www.nzno.org.nz/get_involved/campaigns/care_point/what_is_ccdm).

Staffing ratios: considerations for the aged care sector

Legislated staffing levels in residential care are insufficient on their own to improve quality of care. Setting a mandated staffing standard has major implications in terms of cost to set up and establish (and periodically recalibrate), as well as in terms of mechanisms needed to monitor compliance and deal with non-compliance. Adequate funding to support these minimum nurse staffing benchmarks must be available and ongoing. The cost of this could be offset, in part, by reduced costs related to hospitalisations, pressure ulcers and higher staff turnover associated with lower staffing. It also important to recognise that quality aged care is a result of a complex interplay of factors (structural, process and outcomes). Many elements are at play including staff mix, patient acuity and the way an operation is managed. A critical success factor in introducing ratios is that minimum staffing plans are flexible and take into account staffing mix and patient acuity. The financial impact of staffing mandates remains an open question. They might strengthen profits through enhanced quality of care, but may also decrease profits, due to higher labour costs. Further research is needed on how mandated staffing would affect the financial performance of aged residential care facilities.

Conclusion

A review of literature shows that the introduction of mandated nurse-to-patient ratios has been successful in increasing staffing hours in aged care facilities in the US. The impact on patient outcomes is less clear but there is evidence that the subsequent lower caseloads are related to improved quality of care, including fewer deficiencies (Park & Stearns, 2009; Chen and Grabowksi, 2014; Lin, 2014); lower restraint use (Zhang & Grabowski, 2004; Park & Stearns, 2009; Chen and Grabowski); lower incidence of pressure ulcers and urinary catheter use (Zhang & Grabowski, 2004) and decreased mortality (Tong, 2011). However, ratios can result in increasing the number of non–RNs, resulting in a reduced skill mix.

Several nursing and health care unions in Canada and Australia recognise the impact of staffing levels on the quality of aged care and are calling for the introduction of mandated nursing staff to resident ratios, although their use continues to be contentious. Meanwhile in Aotearoa New Zealand, it is striking that aged residential care facilties are able to develop their own staffing rationale on an ad-hoc-basis and miniumum staff- to- resident ratios remain low, falling well short of the internationally recommended benchmark of 4.1 worked hours per resident day (hprd) as an “avoid harm” minimum. A number of recent reports and inquiries show that the quality of care has indeed been compromised, with evidence of shortfalls in staffing (particularly numbers of RNs) (HRC, 2012; Walker, 2009; Labour/Green/Grey Power, 2010) and failings in care reported in compaints to the HDC (HDC, 2016) and a review of surveillance audit reports by the MoH (Consumer, 2014).

To ensure the basic safety of residents in aged care facilties in Aotearoa New Zealand, staffing regulations need to change. At the very least, NZNO calls for the staff-to-resident ratios in the voluntary guidelines to be mandatory (Standards New Zealand, 2005), a view endorsed by the HRC (2012) and Consumer New Zealand (2014). While the government has moved to increase caregivers’ wages by $2 billion following a successful pay equity case in early 2017, there are no plans to boost staffing levels (Consumer New Zealand, 2017). There is a need to look at overall staffing levels in aged care and the skill mix of the nursing team. Patient need in aged care is relatively unpredictable and inconsistent, so minimum standards would need to be adjusted for resident acuity. Research on the generalisability of international benchmarks in the Aotearoa New Zealand context would be a useful starting point. A pilot project to test the use of mandatory staffing levels, setting a standard of 4.1 hours per resident per day, could be a reasonable first step and provide crucial evidence to inform this debate.

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Mission statement
NZNO is committed to the representation of members and the promotion of nursing and midwifery. NZNO embraces Te Tiriti o Waitangi and works to improve the health status of all peoples of Aotearoa/ New Zealand through participation in health and social policy development.

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