Professor Christine Duffield
Director
Centre for Health Services Management
[redacted]
NSW 2007 Australia
[redacted]
www.uts.edu.au

UTS CRICOS PROVIDER CODE 00099F

10 January 2016

Research Director
Health and Ambulance Services Committee
Parliament House
Brisbane Qld 4000

To whom it may concern,

RE: Submission to support the legislation of safe nurse-to-patient ratios in Queensland

Please find attached a submission demonstrating the importance of nurse staffing levels and skillmix (the proportion of Registered Nurses providing care) on patient outcomes, nurse satisfaction and workload.

The submission includes reference to published research from Australia and overseas.

Yours sincerely,

Professor Christine Duffield
Professor of Nursing and Health Services Management
UTS and Edith Cowan University

Table of Contents

Nurse Staffing

Two aspects of nurse staffing are critical to ensure patients receive quality nursing care. The first is that a ward/unit has enough staff (ratios) and secondly, the right 'mix' of staff, referred to as skillmix. Wards with a higher proportion of care provided by registered nurses are said to have a "richer skillmix" (Duffield, Roche et al. 2010).

The relationship between nurse staffing numbers/skillmix and patient outcomes in terms of morbidity (nurse sensitive indicators), mortality and length of stay is now well established. The quality of research in this field has reached the stage where systematic reviews have also been undertaken (Currie, Harvey et al. 2005, Estabrooks, Midodzi et al. 2005, Lankshear, Sheldon et al. 2005, Kane, Shamliyan et al. 2007, Griffiths, Ball et al. 2014, Stalpers, de Brouwer et al. 2015). Selected examples of research conducted in Australia and overseas demonstrating links between nurse staffing and patient and staff outcomes appear below:

Asia-Pacific

- In Australia, rates of pneumonia can be decreased by 11% with a 10% increase in the proportion of hours worked by registered nurses. In addition there are decreases in the following nurse sensitive indicators (adverse events) such as central nervous system complications 45%; GI bleed 37%; urinary tract infection (UTI) 34%; failure to rescue 27%; decubitus ulcers 19%; sepsis 15% (Duffield, Roche et al. 2009; Duffield, Diers et al. 2011).
- Also in Australia, Twigg and colleagues (2011, 2012) showed that nursing hours per patient day and skillmix (hours worked by RNs) can reduce the rates of nursing sensitive outcomes including decubitus ulcers, pneumonia, gastro-intestinal complications, sepsis, failure to rescue and mortality.
- South Korean research supports the studies undertaken in the U.S. and elsewhere: In that country risk of patient mortality increased by 5% in hospitals with higher nurse workloads (Cho, Sloane et al. 2015).

U.S. and Canada

- In the U.S., patient mortality rates differed by 31% between hospitals depending upon the number of patients cared for by RNs. Each additional patient added to a nurses' workload increased the risk of death by 7% (Aiken, Clarke et al. 2002).

- Nursing shifts with a high patient turnover from admissions, transfers and discharges and/or fewer targeted RN hours increased the risk of patient mortality by at least 2% (Needleman, Buerhaus et al. 2011).
- Canadian research has demonstrated correlations between staffing levels and emotional exhaustion with patient falls, medication errors and nosocomial infections (Spence Laschinger and Leiter 2006).
- An extensive meta-analysis of research undertaken in U.S. and Canadian hospitals determined that adding one additional Full-time Equivalent registered nurse each day, reduced the risk of patient mortality and the risk of adverse patient events such as failure to rescue and health care acquired infections (Kane, Shamliyan et al. 2007).

U.K. and Europe

- Supporting U.S. research, mortality was 26% higher in U.K. hospitals with lower staffing levels compared to hospitals with higher nurse staffing. Furthermore, nurses working in hospitals with the heaviest workloads were more likely to rate the quality of care delivered as low (Rafferty, Clarke et al. 2007).
- Also in the U.K., a systematic review found that higher levels of nurse staffing can positively affect patient falls, medication errors and missed nursing care (Griffiths, Ball et al. 2014).
- A retrospective study undertaken in nine European countries determined that every patient added to a nurse's workload is associated with 7% increase in hospital deaths following surgery (Aiken, Sloane et al. 2014).
- More recently, a systematic review and meta-analysis undertaken by Stalpers et al. (2015) from the Netherlands found evidence pointing towards an association between nurse staffing levels, educational attainment and collaborative relationships with patient falls and decubitus ulcers. Meta-analyses were however limited by the diversity in research methodologies and outcome measures.

Work Environment

More recently the work environment has also been found to play a critical role in staffing and patient outcomes (Aiken, Clarke et al. 2008), mediating the effects of an appropriate number of staff and better skillmix. Lowering patient:nurse ratios has virtually no effect on those hospitals with poor work environments (Aiken, Cimiotti et al. 2011). Strong and

effective leadership from the nurse/midwife unit manager supported by an equally strong nurse executive team play a significant role in ensuring a positive work environment (Duffield, Roche et al. 2009; Duffield, Roche et al. 2011; Duffield, Roche et al. 2011) and as a consequence, better patient (and staff) outcomes.

Missed care and workload:

The impact of increased nursing workload on the quality of patient care, and by extension negative patient outcomes, is well-established. Increased workload limits the time nurses have for patient contact (Duffield, Forbes et al. 2005; Williams, Dawson et al. 2008; Dabney and Kalisch 2015) and as a result, negatively impacts care quality (Duffield and Wise 2003; Williams, Dawson et al. 2008; Duffield, Diers et al. 2011). Nurses with a heavier patient load tend to report that they have insufficient time to provide care to patients (Kalisch, Tschannen et al. 2011), leaving critical tasks such as the administration of pain relief, hygiene, skin care (Duffield, Diers et al. 2011) and communicating and/or educating patients (Bekker, Coetzee et al. 2015; Dabney and Kalisch 2015) undone. Similarly, nurses have expressed concern for the well-being of their patients in an environment where they feel unable to deliver quality emotional-care because of high workloads (Williams, Dawson et al. 2008; Williams and Kristjanson 2009). Recent research undertaken in a Californian hospital in the U.S. demonstrated no relationship between missed nursing care and patient turnover. As the majority of nursing research into missed nursing care has been conducted in hospitals that do not have staffing ratios, the authors suggest that the findings possibly support the need for nurse:patient ratios relative to unit level patient turnover rates (Orique, Patty et al. 2016).

Staff satisfaction and workload

High workloads are known to contribute to nurses' job dissatisfaction and influence their decision to resign from their positions (Duffield, Roche et al. 2009; Carter and Tourangeau 2012; Alameddine, Bauer et al. 2015).

Job satisfaction is linked to two critical factors – a nurse manager or immediate supervisor who is a good manager and leader (also linked to intention to leave) and a senior nursing administrator who is highly visible and accessible to staff (Duffield, Roche et al. 2011; Spence Laschinger and Fida 2015). Good nursing leadership at the ward level will influence

the work environment. It is also a predictor of satisfaction with nursing, job satisfaction and intention to leave, all of which are critical to ensure there are sufficient staff every shift every day.

Australian work indicates that hospital acquired complications are estimated to add 17.3% to treatment costs (Ehsani, Jackson et al. 2006; Graves, Weinhold et al. 2007; Graves, Harbarth et al. 2010). The cost of hospital-acquired pneumonia has been estimated at $27.8M nationally – a nurse sensitive indicator associated with poor nurse staffing. Twigg (Twigg, Duffield et al. 2013; Twigg, Geelhoed et al. 2013) also found poor/inadequate staffing was costly to Australian hospitals.

References

Aiken, L. H., J. P. Cimiotti, D. M. Sloane, H. L. Smith, L. Flynn and D. F. Neff (2011). "Effects of Nurse Staffing and Nurse Education on Patient Deaths in Hospitals With Different Nurse Work Environments." Medical Care **49**(12): 1047-1053.

Aiken, L. H., S. P. Clarke, D. M. Sloane, E. T. Lake and T. Cheney (2008). "Effects of Hospital Care Environment on Patient Mortality and Nurse Outcomes." JONA: The Journal of Nursing Administration **38**(5): 223-229.

Aiken, L. H., S. P. Clarke, D. M. Sloane, J. Sochalski and J. H. Silber (2002). "Hospital Nurse Staffing and Patient Mortality, Nurse Burnout, and Job Dissatisfaction." JAMA: The Journal of the American Medical Association **288**(16): 1987-1993.

Aiken, L. H., D. M. Sloane, L. Bruyneel, K. Van den Heede, P. Griffiths, R. Busse, M. Diomidous, J. Kinnunen, M. Kózka, E. Lesaffre, M. D. McHugh, M. T. Moreno-Casbas, A. M. Rafferty, R. Schwendimann, P. A. Scott, C. Tishelman, T. van Achterberg and W. Sermeus (2014). "Nurse staffing and education and hospital mortality in nine European countries: a retrospective observational study." The Lancet **383**(9931): 1824-1830.

Alameddine, M., J. M. Bauer, M. Richter and A. Sousa-Poza (2015). "Trends in job satisfaction among German nurses from 1990 to 2012." Journal of Health Services Research & Policy.

Bekker, M., S. K. Coetzee, H. C. Klopper and S. M. Ellis (2015). "Non-nursing tasks, nursing tasks left undone and job satisfaction among professional nurses in South African hospitals." Journal of Nursing Management **23**(8): 1115-1125.

Carter, M. R. and A. E. Tourangeau (2012). "Staying in nursing: what factors determine whether nurses intend to remain employed?" Journal of Advanced Nursing **68**(7): 1589-1600.

Cho, E., D. M. Sloane, E.-Y. Kim, S. Kim, M. Choi, I. Y. Yoo, H. S. Lee and L. H. Aiken (2015). "Effects of nurse staffing, work environments, and education on patient mortality: An observational study." International Journal of Nursing Studies **52**(2): 535-542.

Currie, V., G. Harvey, E. West, H. McKenna and S. Keeney (2005). "Relationship between quality of care, staffing levels, skill mix and nurse autonomy: literature review." Journal of Advanced Nursing **51**(1): 73-82.

Dabney, B. W. and B. J. Kalisch (2015). "Nurse Staffing Levels and Patient-Reported Missed Nursing Care." Journal of Nursing Care Quality **30**(4): 306-312.

Duffield, C., D. Diers, L. O'Brien-Pallas, C. Aisbett, M. Roche, M. King and K. Aisbett (2011). "Nursing staffing, nursing workload, the work environment and patient outcomes." Appl Nurs Res **24**(4): 244-255.

Duffield, C., D. Diers, L. O'Brien-Pallas, C. Aisbett, M. Roche, M. King and K. Aisbett (2011). "Nursing staffing, nursing workload, the work environment and patient outcomes." Applied Nursing Research **24**(4): 244-255.

Duffield, C., D. Diers, L. O'Brien-Pallas, C. Aisbett, M. A. Roche, M. King and K. Aisbett (2011). "Nursing staffing, nursing workload, the work environment and patient outcomes." Applied Nursing Research **24**(4): 244-255.

Duffield, C., J. Forbes, A. Fallon, M. Roche, W. Wise and E. T. Merrick (2005). "Nursing skill mix and nursing time: the roles of registered nurses and clinical nurse specialists." Aust J Adv Nurs **23**(2): 14-21.

Duffield, C., M. Roche, N. Blay, D. Thoms and H. Stasa (2011). "The consequences of executive turnover." Journal of Research in Nursing **16**(6): 503-514.

Duffield, C., M. Roche, D. Diers, C. Catling-Paull and N. Blay (2010). "Staffing, skill mix and the model of care." Journal of Clinical Nursing **19**(15-16): 2242-2251.

Duffield, C., M. Roche, L. O'Brien-Pallas, D. Diers, C. Aisbett, K. Aisbett and C. Homer (2009). Nursing Workload and Staffing: Impact on Patients and Staff. Broadway, Australia, University of Technology Sydney.

Duffield, C., M. Roche, L. O'Brien-Pallas, C. Catling-Paull and M. King (2009). "Staff satisfaction and retention and the role of the Nursing Unit Manager." Collegian (Royal College of Nursing, Australia) **16**(1): 11-17.

Duffield, C. and W. Wise (2003). "Tell me what we do. Using work sampling to find the answer." Australian Journal of Advanced Nursing **20**(3): 19-23.

Duffield, C. M., M. A. Roche, N. Blay and H. Stasa (2011). "Nursing unit managers, staff retention and the work environment." Journal of Clinical Nursing **20**(1-2): 23-33.

Ehsani, J., T. Jackson and S. J. Duckett (2006). "The incidence and cost of adverse events in Victorian hospitals 2003–04." Medical Journal of Australia **184**(11): 551-555.

Estabrooks, C. A., W. K. Midodzi, G. G. Cummings, K. L. Ricker and P. Giovannetti (2005). "The Impact of Hospital Nursing Characteristics on 30-Day Mortality." Nursing Research **54**(2): 74-84.

Graves, N., S. Harbarth, J. Beyersmann, A. Barnett, K. Halton and B. Cooper (2010). "Estimating the Cost of Health Care-Associated Infections: Mind Your p's and q's." Clinical Infectious Diseases **50**(7): 1017-1021.

Graves, N., D. Weinhold, E. Tong, F. Birrell, S. Doidge, P. Ramritu, K. Halton, D. Lairson and M. Whitby (2007). "Effect of Healthcare-Acquired Infection on Length of Hospital Stay and Cost." Infection Control and Hospital Epidemiology **28**(3): 280-292.

Griffiths, P., J. Ball, J. Drennan, L. James, J. Jones, A. Recio-Saucedo and M. Simon (2014). The association between patient safety outcomes and nurse / healthcare assistant skill mix and staffing levels & factors that may influence staffing requirements., University of Southampton.

Kalisch, B. J., D. Tschannen and K. Hee Lee (2011). "Do staffing levels predict missed nursing care?" International Journal for Quality in Health Care **23**(3): 302-308.

Kane, R. L., T. Shamliyan, A., C. Mueller, S. Duval and T. Wilt (2007). "The Association of Registered Nurse Staffing Levels and Patient Outcomes: Systematic Review and Meta-Analysis." Medical Care **45**(12): 1195-1204.

Lankshear, A. J., T. A. Sheldon and A. Maynard (2005). "Nurse Staffing and Healthcare Outcomes: A Systematic Review of the International Research Evidence." Advances in Nursing Science **28**(2): 163-174.

Needleman, J., P. Buerhaus, S. Pankratz, C. L. Leibson, S. R. Stevens and M. Harris (2011). "Nurse Staffing and Inpatient Hospital Mortality." New England Journal of Medicine **36**(4): 1037-1045.

Orique, S. B., C. M. Patty and E. Woods (2016). "Missed Nursing Care and Unit-Level Nurse Workload in the Acute and Post-Acute Settings." Journal of Nursing Care Quality **31**(1): 84-89.

Rafferty, A. M., S. P. Clarke, J. Coles, J. Ball, P. James, M. McKee and L. H. Aiken (2007). "Outcomes of variation in hospital nurse staffing in English hospitals: Cross-sectional analysis of survey data and discharge records." International Journal of Nursing Studies **44**(2): 175-182.

Spence Laschinger, H. K. and R. Fida (2015). "Linking Nurses' Perceptions of Patient Care Quality to Job Satisfaction: The Role of Authentic Leadership and Empowering Professional Practice Environments." Journal of Nursing Administration **45**(5): 276-283.

Spence Laschinger, H. K. and M. P. Leiter (2006). "The Impact of Nursing Work Environments on Patient Safety Outcomes: The Mediating Role of Burnout Engagement." Journal of Nursing Administration **36**(5): 259-267.

Stalpers, D., B. J. M. de Brouwer, M. J. Kaljouw and M. J. Schuurmans (2015). "Associations between characteristics of the nurse work environment and five nurse-sensitive patient outcomes in hospitals: A systematic review of literature." International Journal of Nursing Studies **52**(4): 817-835.

Twigg, D., C. Duffield, A. Bremner, P. Rapley and J. Finn (2011). "The impact of the nursing hours per patient day (NHPPD) staffing method on patient outcomes: A retrospective analysis of patient and staffing data." International Journal of Nursing Studies **48**(5): 540-548.

Twigg, D., C. Duffield, A. Bremner, P. Rapley and J. Finn (2012). "Impact of skill mix variations on patient outcomes following implementation of nursing hours per patient day staffing: a retrospective study." Journal of Advanced Nursing **68**(12): 2710-2718.

Twigg, D. E., C. Duffield and G. Evans (2013). "The critical role of nurses to the successful implementation of the National Safety and Quality Health Service Standards." Australian Health Review **37**(4): 541-546.

Twigg, D. E., E. A. Geelhoed, A. P. Bremner and C. M. Duffield (2013). "The economic benefits of increased levels of nursing care in the hospital setting." Journal of Advanced Nursing **69**(10): 2253-2261.

Williams, A. M., S. S. Dawson and L. J. Kristjanson (2008). "Translating theory into practice: using Action Research to introduce a coordinated approach to emotional care." Patient Educ Couns **73**(1): 82-90.

Williams, A. M., S. S. Dawson and L. J. Kristjanson (2008). "Translating theory into practice: Using Action Research to introduce a coordinated approach to emotional care." Patient Education & Counseling **73**: 82-90.

Williams, A. M. and L. J. Kristjanson (2009). "Emotional care experienced by hospitalised patients: development and testing of a measurement instrument." J Clin Nurs **18**(7): 1069-1077.