

# Ensuring quality, safety and positive patient outcomes

Why investing in nursing  
makes \$ense

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*"No one runs hospitals: nurses hold the system together, but don't have any authority."*

*John Menadue, 2007*

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# 1 Introduction

The contribution of nurses to the health and wellbeing of any community, society or nation is almost incalculable.

From its inception, nursing has been a profession which has promoted public health, eased pain and suffering, advocated for the weak and the vulnerable, and educated the community, to achieve a better quality of life.

Economic productivity studies demonstrate the vital importance of health to national prosperity. There are profound economic costs to a society if policy and action do not deliver optimum well being. Evidence suggests that failing to prevent ill health by investing in health promotion and preventive health programs is costing Australia billions of dollars each year.<sup>1</sup>

Failing to invest in nursing has profound social and economic impacts too. As the largest health profession, and one with multiple specialties, nurses work everywhere health care is provided. No other health professional group offers the same capacity for health care delivery as nurses.

Care provided by qualified nurses has the capacity to save lives, prevent complications, prevent suffering, promote wellbeing, and save money. To understand how they do this, it is first important to understand exactly what nurses do.

American journalist and nursing advocate, Suzanne Gordon, offers this summary:

*"Using their considerable knowledge, [nurses] protect patients from the risks and consequences of illness, disability, and infirmity, as well as from the risks and consequences of the treatment of illness. They also protect patients from the risks that occur when illness and vulnerability make it difficult, impossible, or even lethal for patients to perform the activities of daily living - ordinary acts like breathing, turning, going to the toilet, coughing, or swallowing... Nurses, regular, ordinary, bedside nurses, not just nurse practitioners or advanced practice nurses, are constantly participating in the act of... diagnosis, prescription, and treatment and thus make a real difference in ...outcomes."*<sup>2</sup>

Across the globe, the contribution and significance of nursing to the wellbeing of the human population is recognised by many - demonstrated by the acknowledgement by the World Health Assembly of the importance of nursing and midwifery to "health systems, to the health of the people they serve, and to efforts to achieve the internationally agreed health-related development goals".<sup>3</sup>

A combined statement from the World Health Organisation, the International Council of Nurses (ICN) and the International Confederation of Midwives (ICM) in March 2007 declared that increasing nursing workforce capacity, improving skill mix and creating positive workplace environments were "critical... to the general health of all nations".<sup>4</sup>

However nurses are being forced to work with insufficient staffing, overwhelming workloads, and inadequate skill mix, resulting in avoidable deaths and injury, causing nurses to abandon the profession, and compromising the health of the entire community.

It is time governments and the community in Australia considered the risks of failing to invest in nursing, and the consequences of this as the economic costs are enormous and cannot be ignored.

The contribution of good health to the social and economic attributes of any nation cannot be underestimated. All individuals hope to remain free from illness or suffering and all governments must act to produce social and public policies to ensure their communities maintain optimum health and wellbeing. As the largest health profession in the world, the work of nurses is integral to achieving those aims.

Evaluating nurses' contribution to a nation's health, wellbeing and productivity is therefore vital social and public policy analysis. The subsequent development and implementation of public health policies to maximise the delivery of nursing care is essential.

## 2 Executive summary

Nurses work in every type of health setting, in widely dispersed geographical locations and in every kind of clinical practice area, caring for the health and wellbeing of people from gestation through to death. They are uniquely positioned then, to have a profound impact on the health and wellbeing of the people to whom they provide services. However recognition of the value and capacity of nursing care is substantially underestimated among governments, policymakers and health care institutions at local, national, and international levels.

This paper seeks to demonstrate to Australian governments, health policymakers, the nursing profession and the community, the value and contribution nurses make to positive patient outcomes. It presents a summary of the best available evidence on the effectiveness of nursing care and the contribution that nurses make to improving population health. The paper also highlights the economic and human costs associated with poor access to quality nursing care.

Nursing care can and does make substantial contributions to reductions in morbidity and mortality. Nursing interventions are cost-effective and as such, investing in more nursing will pay for itself. Through care and surveillance, education and interventions which prevent adverse outcomes and keep people well, nursing care contributes to the health of the community and the health of the nation.

Investing in nursing care provides returns of better care outcomes and less use of expensive health care resources. These benefits extend well beyond the walls of health care settings, as those who have recovered from or avoided illness (and their carers) can contribute to national productivity through participation in the community and the workforce. The community's health and wellbeing depends on nurses.

There are significant risks for the community however if there is an ongoing failure to acknowledge the value of nursing's contribution. The risks posed to patients and nurses themselves when nurses are forced to work beyond the limits of safety with insufficient experience, not enough staff, and too many patients are considerable. There are also significant implications for health care budgets in choosing not to recognise the contribution of nursing care.

This paper presents strong evidence that failing to staff hospitals and health care services in Australia with sufficient numbers of appropriately qualified nurses is contributing to avoidable deaths and illness and injuries.

Safe quality care requires that health services have:

- an adequate number of nurses;
- an appropriate skill mix (proportion of registered nurses to enrolled nurses and nursing assistants);
- nurses who are educationally and clinically prepared;
- a manageable workload for nurses; and
- sufficient resources to enable nurses to deliver the best possible care.

Failing to provide these measures has significant impacts on the safety and quality of care and are key factors in the unacceptably high risks of errors and adverse events that occur in Australian hospitals and health care settings.

However nurses are continually faced with the challenge of justifying their demands for adequate staffing and manageable workloads. Failing to provide nurses with organisational support and the power necessary to influence the allocation of resources in their workplaces is affecting the safety and quality of care.

Nursing research has for several decades evaluated the effectiveness of nursing care across a range of health care settings. A large body of evidence now exists that demonstrates the value and capacity of nurses in the delivery of health care, and the risks to health and safety, as well as the economic costs, of failing to invest in nurses.

Risks to mortality, morbidity, and the occurrence of adverse events are all greatly increased when an inadequate number of nurses are available for the delivery of safe, quality care.

The evidence shows that there are significant relationships between nursing education levels and patient outcomes; nurse staffing and patient outcomes; nursing workload and patient outcomes; nurses' work environment and patient outcomes; and between the skill mix of nurses providing care and patient outcomes.

The provision of nursing care can avoid many adverse patient outcomes, such as urinary tract infections, pressure ulcers, pneumonia, deep vein thrombosis, falls, postoperative wound infections, medication errors, upper gastrointestinal bleeds, sepsis, increased length of stay (indicative of complications), and death.

There are also significant relationships between nurse staffing, nursing workload, and nurses' work environment and the wellbeing of nurses themselves: identified over and over again as stress, burnout, occupational injuries, and ultimately, a loss to the profession, the health sector and the community, when nurses are forced to choose to end their professional career.

Table 1 provides an overview of some of the evidence of the impact of nursing interventions on the quality and safety of health care.

**Table 1 - Effect of nursing interventions on quality and safety of health care**

<b>Nurse staffing</b>	Nurse staffing levels of health care settings have a significant effect on morbidity and mortality and the occurrence of adverse events, with higher staffing levels associated with lower mortality, lower incidence of infections, decubitus ulcers, <sup>5</sup> postoperative pulmonary complications, pneumonia, and septicaemia. <sup>6</sup>
<b>Nursing workload</b>	Each additional patient allocated to nursing workload increases the likelihood of patient death; <sup>7</sup> increased overtime is associated with urinary tract infections, decubitus ulcers, <sup>8</sup> and increased workload with patient falls, respiratory infections, and patient complaints. <sup>9</sup> Nurses working shifts of 12.5 hours or more are three times more likely to make an error; and working more than 40 hours a week increases the risk of error. <sup>10</sup>
<b>Nursing skill-mix</b>	An increase in registered nurse staffing is associated with decrease in pneumonia, <sup>11,12</sup> lower rates of "failure to rescue", and reduced incidence of death from shock or cardiac arrest, gastrointestinal bleeding, sepsis, deep vein thrombosis, or pneumonia. <sup>13</sup>
<b>Work environment</b>	Each additional patient allocated to nursing workload is associated with a 23% increase in nurse burnout and a 15% increase in nurses' job dissatisfaction. <sup>14</sup> Insufficient resources, inadequate support and inadequate equipment are all associated with an increase in injuries to nurses, <sup>15</sup> higher nurse turnover, <sup>16</sup> and an increase in errors. <sup>17</sup>

Table 2 provides an overview of some of the research on the financial costs associated with inadequate nurse staffing, inadequate skill mix, and an inadequate work environment for nurses.

Table 2 - Financial costs of inadequate staffing, skill-mix and work environment

<b>Nurse staffing</b>	Decrease in nurse staffing is associated with increased health care costs of 40%; <sup>18</sup> and inadequate nurse staffing is positively associated with adverse events, which are estimated to cost AUD \$4 billion annually. <sup>19</sup> Short staffed units have higher costs and patients a longer length of stay. <sup>20</sup> It is estimated 26.7% of all infections could be avoided by appropriate nurse-to-patient ratios. <sup>21</sup>
<b>Nursing workload</b>	Reducing nursing workload by one patient per nurse (from five to four patients per nurse) is associated with one life saved per 1000 admissions, at a cost of US\$136,000 per life saved. Compared to the cost of other health care interventions, such as routine cervical screening (which costs \$432,000 per life saved) implementing nurse to patient ratios of 1:4 is cost-effective. <sup>22</sup> Increasing nurse staffing by one RN hour per patient day (HPPD) may cost \$US659 per case, but when compared with the cost per case of adverse events (US\$2,384 per case), investing in nurse staffing can lead to a saving. <sup>23</sup>
<b>Nursing skill-mix</b>	Registered nursing care is positively associated with reducing adverse events like pneumonia, a complication which adds five days to a patient's average length of stay and is estimated to cost US\$4,000 - \$5,000 per additional day. <sup>24</sup> Pneumonia is responsible for increasing length of stay by 75%, a 220% increase in the probability of death, and an 84% increase in costs. <sup>25</sup>
<b>Work environment</b>	Poor work environments contribute substantially to nursing turnover, with turnover estimated to cost AUD\$150,000 per nurse. <sup>26</sup>

Table 3 outlines the numbers of nurses in Australia, the annual health care budget, and expenditure by sector (latest available figures are from 2005).

Table 3 - Nursing workforce and health expenditure

<b>Number of nurses in Australia</b>	Registered nurses:	230,578
	Enrolled nurses:	55,042
	Nurse practitioners:	200 <sup>27</sup>
<b>Annual health budget</b>	\$86.8 billion <sup>28</sup> (NB: 2006 figure)	
<b>Annual expenditure on public hospitals</b>	\$31 billion <sup>29</sup>	
<b>Annual expenditure residential aged care</b>	\$7.5 billion <sup>30</sup>	

Improving the staffing and thus the workload of nurses in Australian health care settings is crucial to improving the health care outcomes of the approximately seven million people admitted to hospital each year, the 200,000 people in residential aged care facilities in Australia, and the many thousands regularly accessing the services of nurses and midwives in health care settings across the country.

It is the responsibility of government to ensure that the \$88 billion dollars spent each year on health care in Australia is allocated to interventions and services that are demonstrated to be effective. Nurses can and do contribute significantly to better health, but as outlined in the evidence that follows, this is largely underestimated and in too many instances nurses are constrained from providing the best possible nursing care.

Too often hospital and health care administrators and governments have viewed nurses as a cost, and failed to appreciate the benefits that result from good nursing practice. Failing to invest in nursing, by ensuring there are sufficient numbers of appropriately educated and experienced nurses in work environments that support and value their practice, represents a poor allocation of a valuable health care resource. This needs to be exposed for the poor economic management that it is.

There are also legal liability issues to be considered when failing to provide a safe environment through understaffing is corporate negligence.

The recommendations that follow include calls for: a cost-benefit analysis of nursing care to demonstrate its effectiveness; improvements in organisational support for nurses; investment by all governments in nursing care to ensure nurses are able to provide safe, quality care; and for hospital and health care performance measures to include indicators that demonstrate patient outcomes that are sensitive to nursing interventions.

The evidence presented in this paper demonstrates a strong economic case for investing in nursing care. It discusses the potential and actual contribution of nursing to national productivity and argues that investing in nursing, through employment of more registered nurses in health and aged care, with better working conditions, can lead not only to financial savings for the health system but also contribute significantly to national economic growth.

# Recommendations

Based on strong evidence the ANF recommends that:

1. The federal government commissions a cost-benefit analysis to determine the cost-effectiveness of nursing and midwifery care as a matter of priority.
2. The federal government funds a national research project to develop a set of agreed national nursing indicators against which health care services can be evaluated.
3. A national system of indicators to evaluate the performance of all health care services (both public and private) include nurse sensitive outcome indicators as well as indicators for nursing workload, staffing and skill-mix.
4. These indicators require the utilisation of an appropriate staffing methodology that considers patient acuity and "churn", as well as workload measures to ensure safe nurse to patient ratios.
5. The contribution of nursing interventions to positive patient outcomes be recognised in organisational budgetary allocations and risk management plans, and reflected in nursing salaries.
6. The federal government fund a national project to develop evidence-based skill-mix ratios of registered nurses (RN), enrolled nurses (EN), assistants in nursing (AIN), and others who assist with the provision of nursing services in a range of settings, and these be included in national health care services performance indicators.
7. Residential aged care providers should ensure a registered nurse is available on duty and accessible 24 hours a day, seven days a week, and a registered nurse employed as the director of nursing.
8. Health care providers must ensure a safe skill-mix which includes experienced nurses working each shift to ensure that graduate and beginner nurses are adequately mentored and supervised.
9. Health care organisations should implement strategies which ensure that:
  - nurses occupy significant positions of authority in every organisation;
  - nurses are supported to exercise professional autonomy and control over their practice;
  - strategies are implemented to ensure effective, collaborative and egalitarian interdisciplinary and intra-organisational communication;
  - nurses are supported and encouraged to participate in policy decisions at all levels of the organisation;
  - the organisation demonstrates and promotes its recognition of the value of nursing work;
  - nurses have access to and are supported to participate in regular, high quality professional development activities;
  - nurses are provided with supportive work environments, which include adequate remuneration, manageable workloads, and access to child care.

10. The federal government must:

- establish a mechanism to ascertain workforce figures that can usefully predict current and future workforce shortages;
- invest further in nursing education by increasing undergraduate nursing places (including funding for clinical placements and clinical supervision);
- provide significant additional postgraduate scholarships; and
- increase the funding for nursing education to reflect the true cost of course delivery.

### 3 Nurse staffing, skill-mix and patient outcomes

The effectiveness of nursing care can be demonstrated by its effect on patient outcomes. Much evidence exists to demonstrate links between nurse staffing and skill-mix and adverse patient outcomes. There are significant risks to patients of understaffing and inadequate skill-mix, including compromised safety and diminished quality of care; increasing morbidity (incidence of disease) and mortality (death rate); and an increased occurrence of adverse or sentinel events (injury or death resulting from a health care intervention, not the underlying condition of the patient). These factors can also increase the length of stay for patients in health care settings.

#### Nurse staffing

Nurse staffing levels (i.e. the number of nurses available to provide nursing care) have obvious and demonstrable effects on the ability of nurses to provide safe, quality care, resulting in positive patient outcomes. With more nurses available, patients receive better care and nurses report greater job satisfaction.

Improving nurse staffing in Australian health care settings is crucial to improving the health care outcomes of the approximately seven million people admitted to hospital each year<sup>33</sup> and the 200,000 people in residential aged care facilities in Australia.<sup>34</sup> An estimated fifty Australians die every day, and another 140 sustain permanent injury as a result of their health care,<sup>35</sup> so the need for urgent action to ensure patients' receive safe, high quality health care is impossible to deny. Nurses are intrinsic to this goal.

Many more specific effects outlining the impact of nursing factors on the safety and wellbeing of patients and the associated costs to individuals, health care providers, and the community, have been demonstrated by research and are outlined below.

No analysis of nurse staffing and workload can be complete without acknowledging the work of Linda Aiken, the US nurse academic who is responsible for the original and landmark studies of the relationship between patient outcomes and nursing workforce and workload undertaken since the 1980s.

Aiken's work has documented the effect of nurse staffing on patient mortality; of the relationship of inadequate staffing to nurse "burnout" and job dissatisfaction;<sup>36</sup> the effect of positive work environments (such as those found in "magnet" hospitals) on patient outcomes;<sup>37</sup> and compared nurse staffing across five countries to demonstrate how working conditions and workload can affect quality of care, medical errors and adverse patient outcomes.<sup>38</sup>

Simply put, Aiken's research over several decades, demonstrates that more nurses equals fewer deaths.<sup>39</sup>

This is well supported by a recent UK study (Rafferty et al, 2007) which found patients and nurses in hospitals with the highest nurse-to-patient ratios had consistently better outcomes than those in hospitals with less favourable staffing. Patients in the hospitals with the lowest nurse to patient ratios had 26% higher mortality; and the nurses in those hospitals were twice as likely to be dissatisfied with their jobs, to show high burnout levels, and to report low or deteriorating quality of care on their wards and hospitals.<sup>40</sup>

Another study (Hugonnet, 2007) found that the availability of sufficient numbers of nurses was a 'key determinant' of health care associated infections. Researchers from this Swiss study of 1,883 patients admitted to one intensive care unit over four years found 26.7% of all infections could be avoided if nurse-to-patient ratios were maintained.<sup>41</sup>

The care of fragile infants requires a high level of skill and expertise, as well as the availability of nurses with sufficient resources and time to deliver the best possible care. Failure to do so risks the recovery and the lives of this vulnerable group of patients, and the impact of failing to staff appropriately is evident in a large US study (Ream et al, 2007).<sup>42</sup>

This study of almost 2,000 admissions to a paediatric intensive care unit found that the occurrence of unplanned extubations, the most frequently occurring adverse event in paediatric intensive care, is greatly increased when nurse staffing is inadequate and nurses' workload is increased. An unplanned extubation is when an infant dislodges or removes their breathing tube, which greatly increases their risk of developing respiratory complications and the duration ventilation is required, which is itself a risk factor for respiratory complications. There is also an increase in the infant's length of stay in intensive care, and in the risk of them dying. The study demonstrated a four-fold increase in unplanned extubations associated with the patient acuity level assigned per nurse as well as a three-fold increase in the risk of unplanned extubations associated with a low nurse to patient ratio.

Another study of 2531 patients across 17 different settings found nurse to patient ratio was significantly related to in-hospital mortality, with the ratio of total nursing staff to patients found to be the best predictor of in-hospital mortality.<sup>43</sup>

Cho et al (2003) examined the relationship between nurse staffing and adverse events, and the effect of those adverse events on morbidity, mortality and health care costs. This study of 124,204 patients from 232 Californian hospitals found statistically significant relationships between nurse staffing and patient outcomes. An increase of one hour worked by registered nurses was associated with an 8.9% decreased risk of pneumonia and a 10% increase in the proportion of registered nurses decreased the risk of pneumonia by 9.5%. The findings in relation to costs concluded that all adverse events resulted in an increased length of stay, with adverse events such as pneumonia responsible for increasing length of stay by 75%.

In addition, pneumonia was associated with a 220% increase in the probability of death, and an 84% increase in costs (associated with length of stay), estimated at an additional \$22,390-\$28,905 per patient.<sup>44</sup>

The strong relationship demonstrated between registered nurse staffing and pneumonia underscores the importance of the high level of skill and knowledge registered nurses bring to caring for the lungs of postoperative patients. Having enough registered nurses to provide good infection control and avoid retained secretions and pain, can clearly provide considerable economic benefits as well as prevent a significant number of avoidable infections and deaths.

A huge US study (Marks et al, 2007) investigating the link between nurse staffing and adverse events in the care of children involved an analysis of 3.65 million paediatric patients in 286 Californian hospitals. This study found a greater number of registered nurse hours was associated with “significantly reduced occurrences of postoperative pulmonary complications, postoperative pneumonia, postoperative septicaemia, and urinary tract infections”.<sup>45</sup>

The magnitude of these effects is demonstrated by the researchers' assessment that over the period of the study, from 1996 to 2001, an incremental increase in nurse staffing of one hour per patient day could have avoided:

- between 425 and 596 complications;
- between 95 and 124 postoperative pneumonia complications; and
- between 719 and 787 postoperative cases of septicaemia or other infections.

Most recently, Stone et al (2007) supported many other studies when it found higher staffing was linked to a lower incidence of bloodstream infections, pneumonia, decubitus ulcers (pressure sores) and urinary tract infections, with increased overtime worked by nurses also a risk factor for the two latter outcomes.

Stone uses the example of a postoperative patient in a vulnerable physical and psychological condition where there can be complications associated with their operation and recovery. Even just their presence in hospital puts them at risk of infection.<sup>46</sup> The evidence provided here demonstrates that increased nurse staffing levels can prevent complications which lead to an increased length of stay and additional human and economic costs.

One of the roles of the nurse is to plan the patient's path through the hospital stay, navigating their journey through admission to discharge and into the community. However there are many variables that prevent care being provided as planned, indeed much of nursing is about dealing with the unpredictable. It is a combination of the care plans nurses create, the constant observation and assessment that nurses undertake, and the interventions they perform when things don't go according to plan that makes the difference to patient outcomes. Potential problems need to be identified and acted upon quickly before they become more serious. It is the skills, experience and humanity that nurses bring to their clinical role that makes the difference.

## Nursing skill-mix

Many studies which support the research findings with regard to staffing and its effect on patient outcomes also emphasise the importance of skill-mix. Skill-mix refers to the proportions of different levels of nurse; for example, the proportion of registered nurses to enrolled nurses in a given health care setting.

To understand the implications of skill-mix it is necessary to understand how nurses are educated in Australia.

Registered nurses in Australia (Division 1 in Victoria) are educated through an undergraduate bachelor degree in the university sector following which they are eligible to apply for registration with one of the jurisdictional nursing and midwifery regulatory bodies. Postgraduate education in a range of practice areas is available in the form of Postgraduate Certificates, Postgraduate Diplomas, Masters and Postdoctoral (PhD) degrees. Nurse practitioners are authorised advanced registered nurses who work in an extended clinical role, and in most jurisdictions, nurse practitioner education is undertaken to Masters level.

Enrolled nurses (Division 2 in Victoria) are educated to two different levels in either the Technical and Further Education (TAFE) or Vocational Education and Training (VET) sectors; (Certificate IV in Victoria, New South Wales, Tasmania and the Northern Territory and Diploma in other states and territories), each of which enables enrollment with the relevant jurisdictional nursing and midwifery regulatory authority (NMRA). Enrolled nurses may also undertake further education in the form of an Advanced Diploma.

Once registered, authorised, or enrolled, nurses are then legally able to use the title for which they were educated, and which prescribes their scope of practice. A set of national competency standards relevant to their educational level further defines the standards to which their practice must comply in order to remain registered, authorised or enrolled, and thus able to practise.

A thirty year program of academic inquiry and scholarship in Australia has led to a highly qualified and skilled professional nursing workforce, educated within a framework that offers the opportunity for nurses to apply their high level critical thinking skills to deliver effective, evidence-based interventions, as well as evaluate their practice, and build on the significant body of knowledge that informs nursing practice through investigation and research.

The proportion of registered nurses and enrolled nurses in the nursing skill mix of the Australian health care sector has declined in recent decades. These changes to the mix of workers doing nursing work have occurred with little evaluation of the effect on patient care or outcomes.

The application of economic principles from outside the health sector have been applied to health with no consequent evaluation of the purported efficiencies of reducing nursing staffing levels or skill mix. Much of the research presented in this paper has been carried out in the USA as a result of the implementation of such restructures of their health services in an attempt to demonstrate that these efficiencies in the medium and longer terms are not cost effective and lead to poorer outcomes for the communities they are trying to serve.

Increasingly registered and enrolled nurses are finding their services substituted by unlicensed and unqualified workers, particularly in the aged care sector where unlicensed health care workers now represent the bulk of the workforce providing care. These workers now represent around 64% of staff in residential aged care, while the number of nurses has declined sharply to just 29%.<sup>47</sup>

Altering the skill mix of nursing staff is a practice which is clearly motivated by desire among service providers to drive down one of their major recurrent costs, that of nurse staffing. However, as outlined by the research, this can increase costs to the health service provider and to taxpayers. It also imposes costs on the recipients of care and to nurses themselves. Having the right mix of qualified and experienced nurses available to monitor patients' conditions and intervene to prevent the development of complications, deterioration of illness and to promote recovery is vital.

Altering the skill mix by reducing the proportions of the most highly educated nurses in health care settings can have catastrophic and expensive results.

A recent Australian study found skill mix was a significant predictor of patient outcomes. Reinforcing the findings of other international studies, a skill mix with a higher proportion of registered nurses produced statistically significant decreased rates of negative patient outcomes such as decubitus ulcers, gastrointestinal bleeding, sepsis, shock, physiologic/metabolic derangement, pulmonary failure and failure to rescue. The study found one extra registered nurse per day would reduce the incidence of decubitus ulcers by 20 per 1000 patients; one extra registered nurse per day would reduce the incidence of pneumonia by 16 per 1000 patients; one registered nurse per day would reduce the incidence of sepsis by eight per 1000 patients. Patients are also less likely to fall and suffer injury as registered nursing hours increase.<sup>48</sup>

In an analysis of the records of over five million medical patients and one million surgical patients, Needleman et al found a higher proportion of registered nurse staffing was associated with lower rates of "failure to rescue". Failure to rescue is the failure to prevent a clinical deterioration associated with an underlying illness or complication of health care, which can lead to permanent disability or death. This study demonstrated that a higher proportion of registered nursing hours and a greater number of hours of care per day by registered nurses reduced the incidence of death from one of five life threatening complications: pneumonia, shock or cardiac arrest, upper gastrointestinal bleeding, sepsis or deep vein thrombosis.<sup>49</sup>

Strong evidence of the link between nurse staffing and skill-mix on patient outcomes is provided by the US Agency for Health Research and Quality (AHRQ).<sup>50</sup> Successive reviews of published scientific literature by this agency since 2003 have called for an increase in registered nurse staffing as a key factor in improving patient outcomes. The latest report (March 2007) cites pooled results as showing that every additional registered nurse full time equivalent (FTE) per patient day was associated with a relative risk reduction in hospital-related mortality by 9% in intensive care units and 16% in surgical patients. The AHRQ estimates that an increase by one registered nurse FTE per patient day would save five lives per 1,000 medical patients, and six per 1,000 surgical patients. Reducing the workload from more than six to two or less patients per registered nurse per shift would save 25 lives per 1,000 hospitalised patients and five lives per 1,000 surgical patients.

A further reduction to less than 1.5 patients per registered nurse would save four lives per 1,000 hospitalised patients and nine lives per 1,000 surgical patients.

The AHRQ review notes that every additional patient per registered nurse per shift is associated with a 7% increase in the risk of pneumonia; a 53% increase in pulmonary failure; a 45% increase in unplanned extubations; and a 17% increase in medical complications.

The associations vary by clinical settings and patient population. In intensive care units (ICUs), an increase by one registered nurse FTE per patient day was associated with a consistent decrease in relative risk of these adverse patient outcomes: a 28% decrease of cardiopulmonary resuscitation, a 51% decrease of unplanned extubation, a 60% decrease of pulmonary failure, and a 30% decrease of hospital acquired pneumonia. In surgical patients, an increase of one registered nurse (FTE) per patient day was associated with a consistent reduction in the relative risk of failure to rescue by 16%, and in healthcare acquired (nosocomial) bloodstream infections by 31%.

In research published in 2007, Anne Tourangneau and other researchers from the University of Toronto identified skill-mix, nurse to patient ratios and better resources as key factors associated with lower mortality rates and better nurses' health.<sup>51</sup>

Important predicting factors for lower mortality revealed in this study were: a higher percentage of registered nurses (associated with six fewer deaths for every 1000 patients); a higher percentage of university educated registered nurses; better resources; and lower nurse burnout.

The cost of these adverse events to our health system clearly demonstrates the risks associated with reducing nurse staffing levels and skills-mix.

Cho (2001) found inadequate nurse staffing had implications for miscommunication between nurses and other health care providers, and forced new and inexperienced nurses to undertake tasks they were insufficiently experienced to do safely.<sup>52</sup>

These results further cement the evidence that a greater number of qualified nurses can, and does, prevent complications and save lives as well as ensure savings to our health system and community.

## Residential aged care

Much of the evidence so far has focused on acute health care, however powerful evidence is available about the role of nurses in improving patient outcomes and reducing adverse events in other settings. This is particularly important in healthcare settings such as residential aged care, where people receiving health care are increasingly frail and vulnerable with multiple chronic illnesses and at high risk of injury and side effects, requiring complex medication and health care treatment regimes. In Australian aged care facilities however, registered nurses are increasingly being substituted by unqualified and unlicensed health care workers, who are less expensive to employ, leading to a lower level of safety and quality of care and putting these vulnerable patients at risk.<sup>53</sup> The aged care accreditation data on failed standards reveals that this has led to a decline in quality of care with residents exposed to serious risk from neglect, poor infection control, malnutrition and dehydration, and assault.<sup>54</sup> Many nursing homes fail to ensure adequate staffing, nor adequately prepare new

staff for their roles. With specialised nursing care not available, clinical care is suffering, and so too are elderly people. Failure to treat residents adequately in the residential aged care setting or in their home leads to not only adverse outcomes for residents but also leads to costly admissions for hospital care. While many unlicensed health care workers are valued members of the nursing team, the ANF advocates regulation of all nursing workers to ensure they have appropriate qualifications to underpin the delivery of safe, quality care. This would also enable the articulation of training of these workers with registered nurse and enrolled nurse education.

Of particular concern is the view of nurses employed in the aged care sector that they are unable to complete their work in the time available, they have insufficient staff; their workload is heavy; they see their work stress as high; and they believe morale is poor and deteriorating.<sup>55</sup>

The community's increasing dissatisfaction with this situation can be seen from the following figures. In 2007, in just six months, the federal government's Office of Aged Care Quality and Compliance received nearly 4,000 complaints (more than triple the number of complaints lodged in the previous twelve month period) about the treatment of people that potentially breached the *Aged Care Act 1997*. This included 418 reportable assaults.<sup>56</sup>

Just as with hospitals, nursing research has demonstrated clear links between nurse staffing levels and the quality of nursing home care.<sup>57</sup>

The range of findings are summarised well in the 2005 study by Horn et al which found care delivered by registered nurses in aged care facilities was strongly associated with better resident outcomes, including: fewer pressure ulcers (a major risk factor for the frail aged); fewer hospitalisations; lower incidence of urinary tract infections (thus reducing the requirements for more intensive care, catheterisation, and antibiotic therapy); less weight loss; and a much lower risk of deterioration in the resident's ability to perform activities of daily living, vital to optimising wellbeing and health status.<sup>58</sup>

The evidence creates a compelling case for improving the staffing levels of hospitals and aged care facilities through the urgent implementation of appropriate staffing methodologies, such as nurse to patient ratios and skill-mix ratios to ensure the safety and protection of the most vulnerable members of the community.<sup>59</sup>

As outlined above, there are now many studies that demonstrate the link between registered nurse staffing, skill-mix and increased risks for patients of developing complications, suffering adverse events, and increasing their length of stay.

Every complication, injury or deterioration in health status that could have been avoided with better staffing and skill-mix represents not only human loss and suffering but also a huge financial impost on the health system and the economy. This creates a strong argument for increasing registered nurse staffing and the maintenance of an appropriate balance of highly qualified and experienced registered nurses, enrolled nurses and new graduates to improve health care outcomes, reduce adverse events, and reduce financial costs.

## 4 Nursing workload and patient outcomes

Nurse staffing and nursing workloads are intrinsically linked. When there are not enough nurses, the workload of each nurse is increased. This means less time to attend to routine observations, hygiene, wound care, nutrition, patient education, paperwork, counselling, and taking rest and/or meal breaks.

Inadequate staffing and overwhelming workloads not only reduce nurses' ability to deliver all necessary care, but it also predisposes nurses to increased fatigue and increases the risk of errors. In considering the contribution of workload to patient outcomes, it is important to think not only of the work that nurses **do** that contributes to patient outcomes, but also the care they **do not do**, when rushing between too many patients prevents them from providing optimum nursing interventions.

Being forced to leave tasks undone due to excessive workloads is a common feature of Australian health care settings, with nurses in an Australian study of 286 wards within 27 hospitals reporting tasks undone on every shift, and 39.5% of nurses unable to even comfort or talk to their patients on their most recent shift.<sup>60</sup>

A US study (El-Jardali and Lagace, 2005) found unfinished nursing tasks played "a prominent role in increasing the frequency of adverse events".<sup>61</sup>

An Aiken study (2002) published in the Journal of the American Medical Association (JAMA) demonstrated how increasing a nurse's workload increases the likelihood of patient death with each additional patient per nurse associated with a 7% increase in mortality (likelihood of dying) within 30 days of admission. The effect on the nurse was that each additional patient was associated with a 23% increase in burnout and a 15% increase in job dissatisfaction.

The findings demonstrate that increased staffing of registered nurses substantially decreases patient mortality, and decreases the loss of nurses from the profession due to stress and burnout, two significant factors associated with nurse retention.<sup>62</sup>

Another factor affecting nursing workload is that of "churn", the movement of patients in and out of wards or services, coined by the authors of the 2007 Australian study referred to above.<sup>63</sup>

This important study of nurses' work environment and patient safety found "churn" had a "substantial impact" on nursing workload. Churn is a constant but unpredictable aspect of nursing work that is rarely considered in staffing allocations, for example, when nurses are required to accompany patients to and from other areas of an institution. These patients may be frail, suicidal, bleeding, on oxygen, or otherwise requiring high levels of clinical supervision. Taking nurses away from their other patients for unpredictable periods puts other patients at risk and contributes to nursing workload and stress. As with other studies, patient acuity, or the severity of patients' illness and injuries, also has a significant effect on nursing workload.

Further evidence of the effect of nursing workload on patient safety and adverse events can be found in Rogers et al (2004), a US study which demonstrated work duration, overtime and the number of hours worked had significant effects on the incidence of adverse events. Nurses working shifts of 12.5 hours or more were three times more likely to make an error, working overtime (regardless of length) increased the risk of error and working more than 40 hours a week also increased the risk of error.<sup>64</sup>

Yang (2003) found nurse workload was the most powerful predictor of healthcare acquired (nosocomial) infections, and hours of direct care was the best predictor of the five adverse patient outcome indices used: patient falls, pressure ulcers, respiratory and urinary tract infections, and patient/family complaints.<sup>65</sup>

This is supported by Hugonnet et al (2004) who stated that "understaffing, or a misbalance between workload and resources, are important determinants of nosocomial infections".<sup>66</sup>

Managing nurses' workloads by providing adequate staffing is the key to improving safety and quality. Nurses that have too many patients to care for cannot provide optimal care. This risks patient safety and also increases the likelihood of nurses leaving, either their job or the profession entirely.

## 5 Nurses' work environment: the effect on patient outcomes and nurses

The costs to the community and to taxpayers through adverse events and increased length of stay as a result of excessive workloads and inadequate staffing in health care settings are well demonstrated by the research but the costs do not end there. There are significant personal costs to nurses themselves, which are also well documented in the following pages. The work environment of nurses is inextricably linked to their role in influencing patient outcomes. However many nurses work in an environment where they have responsibility but no real power. They lack access to opportunities to exercise organisational power as they frequently lack enough information, staff, support or resources.<sup>67</sup>

Nurses generally are experiencing high rates of emotional exhaustion, and they have high job dissatisfaction rates, primarily related to inadequate staffing. There are strong links, as indicated above, between higher job burnout and job dissatisfaction and workload, with an increase in the number of patients per nurse increasing the probability of burnout and job dissatisfaction.<sup>68</sup>

In research undertaken with the Queensland Nurses' Union (ANF Qld), nurses indicated they were increasingly unable to provide the care they needed to in the time available. Workload was a major concern with approximately 80% of nurses reporting it to be 'heavy'; over 95% of nurses said work stress was 'high'; and 61% said morale was deteriorating. Fifty-nine percent of nurses believed that their skills and experience were poorly rewarded (remunerated or recognised). This gloomy picture led the authors to state that: "the overwhelming impression ...is of a workforce continually frustrated and unable to provide safe and quality care to their patients/clients/residents within the time allocated".<sup>69</sup>

Other jurisdictions are no different. Victorian nurses say "work is more intense, and nurses are doing more with less resources".<sup>70</sup> Many nurses work for nothing with two-thirds of public sector nurses reporting that they work overtime on a regular basis, and that much of this remains unpaid.<sup>71, 72</sup>

Australian nurses not only find their job emotionally challenging, physically demanding, and stressful, it is also dangerous. Thirty percent of nurses in Duffield's 2007 study reported experiencing a physical or emotional threat or abuse during the last five shifts and one in five had experienced actual physical abuse.<sup>73</sup> Occupational injuries are common. Morale in the profession is low and deteriorating. Nurses lack the autonomy necessary for professional satisfaction, and feel poorly valued by the health system and the community. They consider their pay rates to be poor, and their skills and experience unrewarded. They consider their working hours to be inconvenient, and while they value collegial support and teamwork, not all find it a feature of their workplace. Nurses also consider their career prospects to be limited.<sup>74</sup>

Linda Aiken's work on nurse staffing led her to investigate the links between nurses' workplace environment and patient outcomes. This research utilised the findings of earlier studies which revealed that workplaces with particular characteristics (known as "magnet" hospitals) fared better in the retention of qualified nursing staff in the midst of global shortages.

These hospitals have particular organisational structures that recognise the importance of nurses throughout all levels of the hospitals administration and management from the top down. The first magnet hospitals were found to be places where nurses had autonomy and control over their practice settings; good relationships with their colleagues; adequate support services; enough staff to provide high quality care; time to discuss patient problems with their colleagues; the opportunity to participate in policy decisions; a powerful nursing leader; and an environment that recognised the value of their work.<sup>75, 76</sup>

Aiken's analysis of magnet hospitals, and the effect of these particular work environments on the quality of care and stability of the nursing workforce, found they provide greater autonomy for nurses and gives them greater control over their work. This not only improves nursing morale, but it leads to safer care.<sup>77</sup>

Organisational support also keeps nurses safe. Nurses working in settings where they have strong organisational support are 30% less likely to be injured.<sup>78</sup>

Improving nurses' work environment can reduce errors and preventable adverse outcomes, as well as address the underlying cause of the difficulty in recruiting and retaining sufficient numbers of qualified nurses.

Magnet hospitals are cost effective because they reduce the cost of staff turnover and reduce average patient costs by preventing expensive complications. They have lower mortality rates, fewer requirements for intensive care, lower average length of stay, use fewer pharmaceuticals, and undertake fewer tests, all of which contribute to more cost effective care.

Conversely, poor work environments contribute to errors, which can also lead to adverse events and poorer patient outcomes.

A report from the US Department of Health and Human Services in 2003 summarised the evidence about the impact of working conditions on patient safety and subsequently patient outcomes in an effort to understand how working conditions contribute to the estimated 44,000 to 98,000 deaths that occur in that country each year as result of medical errors.<sup>79</sup>

In a research process that mirrors human factors research approaches from the aviation and nuclear power industries, the Evidence Report/Technology Assessment Number 74 found there was clear evidence that working conditions did affect patient outcomes, in particular the staffing levels of licensed and unlicensed nurses and their level of experience. Information exchange between professionals and between health care settings was also important in contributing to reduced medication errors and hospital readmission.<sup>80</sup>

Long working hours, inadequate staffing and high levels of patient acuity all increase stress and fatigue among health professionals and leave them at risk of making potentially fatal or, at the very least, avoidable errors in their work. Whether the error involves the administration of a medication intended for someone else, the failure to detect a change in someone's vital signs, the incorrect identification of a baby discharged to a family, the failure to detect the loss of a surgical instrument

during an operation, the incorrect identification of a patient awaiting a surgical procedure, or the administration of an incorrect dose of a medication, all these errors are potentially avoidable and must therefore be the focus of efforts to improve the safety and quality of care.

Nurses play an important role in surveillance in health care; one aspect of which is the identification and correction of avoidable errors. An example of this is the study by Leape et al (1995) which found that nurses were responsible for intercepting 86% of all medication errors made by physicians, pharmacists and others.<sup>81</sup> Another study supports this, finding that nurses are "particularly effective at discovering and correcting errors made by other nurses and other members of the health care team."<sup>82</sup>

Some of the factors linked to errors include shift work patterns and shift length - both significant risk factors for nurses in an environment of severe shortages when nurses are frequently under pressure to work longer shifts, stay longer to complete tasks undone, and to forgo rostered breaks between shifts.

Errors in health care obviously have profound consequences and subsequent efforts to improve safety and quality must consider ways to reduce the known risk factors for errors. Improving organisational support for nurses is an important factor, with a strong association between errors and insufficient resources, inadequate support, and inadequate equipment.<sup>83</sup>

As found in the work on magnet hospitals by Aiken and others, work environments (in terms of organisational and managerial approaches) and workplace cultures that offer nursing autonomy not only do better in terms of patient outcomes, but also face lesser personnel costs for recruitment and replacement of skilled and experienced staff. Job satisfaction increases when nurses have adequate administrative support, authority in defining their work and control over the resources they need to provide quality care.<sup>84</sup>

Supporting the magnet hospital research was the finding in Duffield's Australian study that good nursing leadership was a predictor of satisfaction with nursing and nurses' jobs.<sup>85</sup> This serves to highlight the point, made frequently by nursing and midwifery groups, that improving the work environment of nurses and giving them greater autonomy and influence in health care is vital to the attraction and retention of people in this highly significant profession. Greater power to influence resourcing and staffing decisions is also needed, but this requires the culture of health care to adequately value the expertise and capacity of nurses.

These sorts of findings have profound implications for the health and wellbeing of the Australian community and should prompt an emergency response for all sectors of government to address this workforce in crisis. In particular, the federal government should legislate to ensure safe staffing in all settings, including aged care; establish a mechanism to ascertain workforce figures that can usefully predict current and future workforce shortages; and introduce funding mechanisms that reflect and reward nursing care proportional to its value to the health sector and the health of the community. The implementation of nursing workload measures, such as nurse to patient ratios are vital to not only the safety and quality of care in health care settings, but also the wellbeing, ongoing employment, and occupational health and safety of nurses.

## 6 Economic and human costs: the potential for savings

It is clear that failing to support nurses in their work is risking the health and the lives of people for whom they are caring. So, what are the drivers that are creating this situation?

Misplaced efforts to cut costs and achieve financial savings in health care through constraints on nurse staffing are actually driving up economic costs, affecting service delivery and health care practice, and compromising patient safety.<sup>86</sup>

An examination of the effect of cost control policies implemented in the public hospital sector in New Zealand in 1993, coupled with industrial reforms, found significant effects between the reduction in full time nurses and nursing hours and associated patient outcomes.<sup>87</sup>

These reforms saw nurse managers replaced with non-nurse business managers; nursing leadership in hospitals dismantled; nurses losing control of nursing budgets; and many senior nurses replaced with graduates. As a result of the decrease in nurse staffing due to the reforms, patient care quality declined, adverse clinical outcomes increased substantially and, significantly, health costs increased by 40%. A subsequent increase in negative patient outcomes included statistically significant increases in: central nervous system complications, decubitus ulcers, sepsis, urinary tract infections, physiological and metabolic derangement, pulmonary failure and wound infections.<sup>88</sup>

The researchers described the specific causes of these adverse outcomes as: *"Lower staffing levels ... and the associated increased nursing workload can lead to delayed, omitted, fragmented or erroneous care. Inadequate nurse staffing precipitates errors, reduces opportunities to detect errors before they occur, and increases miscommunication between staff. The increased workload forces nurses to prioritise their interactions with patients, potentially causing them to omit important monitoring and clinical interventions that prevent adverse outcomes."*

With adverse events estimated to cost Australia \$4 billion annually, there are clear financial incentives to reduce their occurrence by addressing known causes.

The only major study of adverse events in Australian health care settings to date was undertaken in 1995. This found adverse events were associated with 16.6% of hospital admissions, with 51% deemed highly preventable. These adverse events were estimated at a 1992 cost of over \$2.2 billion, with over \$1.1 billion being preventable. The study authors suggest that if the costs estimated for other health care settings, such as mental health institutions, nursing homes, day surgeries, domiciliary care, GP and specialist rooms, and hospital emergency departments were included, the preventable cost of adverse events may be as much as \$5 billion annually, or 5% of the \$100 billion spent each year on health care. Additional costs arising from legal expenses and compensation for medical errors were estimated to consume a further 1% of the health budget.<sup>90</sup>

The poor economic management that leads to cost cutting by limiting nurse staffing below optimum levels has the effect of driving up economic costs. Overworked nurses mean "errors of omission" occur, that is, changes in health status go unnoticed, patients' conditions decline, and costly, avoidable, adverse events occur. This is one of the most significant patient safety indicators known as "failure to rescue".

Many of the studies cited in this paper indicate that significant economies are possible through increasing nurse staffing and so avoiding adverse events and thus reducing length of stay. Cutting costs by reducing nurse staffing is not the answer, as indicated by the example of New Zealand above.

A US review of the literature on the links between nurse staffing and financial performance in 2003 supports this, finding short staffed units had higher costs and patients had a longer length of stay. A higher ratio of registered nurses was not associated with higher personnel or operational costs per admission. In fact, the study found "no statistically significant effect of registered nurse staffing on profit margins".<sup>91</sup>

Another even more recent review supports this, finding significant reductions in cost and length of stay with higher ratios of nursing staff. As demonstrated above, sufficient numbers of registered nurse can help prevent the adverse events that cause patients to stay longer than necessary. Patient costs can also be reduced with a skill-mix containing greater proportions of registered nurses, whose higher level knowledge and skill can not only "provide more effective nursing care" but can also "reduce patient resource consumption". The authors are unequivocal about the health and financial benefits of safe staffing: "Hospital administrators are encouraged to use higher ratios of registered nurses to non-licensed personnel to achieve their objectives of quality patient outcomes and cost containment".<sup>92</sup>

Workload management tools such as ratios can and do contribute to better patient care. Nurses in Victoria say that since the implementation of nurse to patient ratios, patients receive their medication on time more often, nurses have more time for providing personal care, more time for documentation and more time to talk to relatives.<sup>93</sup>

However despite the evidence of the effectiveness of nurse to patient ratios, there is a reluctance here in Australia for governments to mandate workload management tools such as nurse to patient ratios to protect patients and nurses. Even where mandated ratios do exist, such as in the public sector in Victoria, they are being undermined by hospital management. A recent study from Sydney University found nurse to patient ratios were being undermined by a rule known as the '50 per cent rule', which allowed understaffing if patient numbers were not evenly divisible by the mandated ratio.<sup>94</sup> The introduction of nurse to patient ratios have had a significant effect on the recruitment and retention of nurses, with thousands of nurses returning to the health system following their introduction. Without ratios however, they will leave with the study above finding two-thirds of nurses would reduce their hours, leave the public health system, or nursing altogether, if ratios were abolished.

Increasing nursing workloads might save money in terms of the outlay on labour costs, but the effect of this is to drive up other hospital expenditure and increase patient complications and deaths. A comparison of nurse-to-patient ratios of 1:8 with 1:4 found eight patients per nurse was associated with the highest patient mortality. Every additional patient a nurse has to care for beyond a ratio of 1:4 costs the hospital money in treating complications from a lack of nursing care. Decreasing a ratio of 1:5 by one patient might cost \$136,000 per life saved, but compared to other health care interventions, such as routine cervical screening, which costs \$432,000 per life saved, increasing nurse-to-patient ratios is extremely cost effective.<sup>95</sup>

This analysis of the implementation of nurse-to-patient ratios in the US found if nurse-to-patient ratios of 1:4 were implemented nationally, 72,000 lives could potentially be saved annually.<sup>96</sup> The researchers found that when nurses saved patients from pneumonia, they saved US\$4,000-US\$5,000 a day. When nurses prevented an adverse drug event, they saved US\$1,520 a day.

Another study has demonstrated that while increasing nurse staffing may increase costs, it does not necessarily result in a decrease in profits. This study also found that increasing the proportion of registered nurses in organisations with a high proportion of licensed practical nurses (LPNs, known as enrolled nurses in Australia) was more cost effective than simply increasing the number of LPNs, suggesting the roles are "complements, not substitutes".<sup>97</sup>

The costs of additional nurse staffing is more than justified when the costs of adverse events are calculated. An important study published earlier this year revealed that while increasing nurse staffing by one registered nurse hour per patient day (HPPD) added US\$659 to the "cost per case", each additional adverse event increased the cost per case by US\$1,029 for medical patients, and US\$903 for surgical patients. Costs varied according to the type of adverse event, with urinary tract infections associated with a US\$1,005 increase per case, and pressure ulcers even more expensive at US\$2,384 per case.<sup>98</sup>

There are other implications for profit margins associated with inadequate nurse staffing. It leads to higher turnover, and nursing turnover is expensive. Every nurse that leaves the profession represents a loss of public funds with each exit from the profession worth (conservatively) AUD\$150,000.<sup>99</sup>

Common causes of nurse turnover have been identified as: a lack of professional respect and recognition from health care administrators, doctors and the community,<sup>100</sup> burnout as a result of workplace stress,<sup>101</sup> job dissatisfaction,<sup>102</sup> organisational climate,<sup>103</sup> poor relationships with medical colleagues,<sup>104</sup> bullying and inflexible schedules.<sup>105</sup>

Addressing turnover and ensuring adequate staffing are just one part of the picture. As demonstrated in the research presented earlier, it is the effectiveness of nursing interventions, as well as having enough nurses that is critical to positive patient outcomes and health care savings. Nursing care, when it is delivered by qualified, experienced staff, who are supported with enough staff and have an appropriate skill-mix, can contribute enormously to reduced morbidity and mortality. This obviously leads to less use of expensive health care resources and it means more quality adjusted life years (QALYS) for those members of the community who have avoided illness and adverse outcomes. This goes beyond the individual, as poor health affects families, and so this too applies to carers of those who would otherwise be incapacitated.

Nursing interventions can prevent injury and illness, and where models of care support these being implemented and evaluated effectively, the evidence for effective care and cost savings is very strong.

Preventing patient falls is an area where there is strong evidence that nursing intervention can prevent deaths, reduce injuries, and save considerable sums of money. A 2006 Canadian study found that the costs of implementing a nursing driven falls prevention program could easily be covered by the money saved in preventing falls. With falls the sixth largest cause of death in Canada, and annual direct costs of \$2.4 billion there are clear imperatives for taking action. Fall rates in hospitals internationally range from 2.2 to seven per 1000 bed days in acute hospitals; 11 to 24.9 per 1000 bed days in long term care; and eight to 19.8 per 1000 bed days in rehabilitation hospitals.

The Quality of Australian Health Care Study<sup>106</sup> estimated as many as 62% of falls in hospital are preventable, a staggering human and financial cost, and one which has cost one health centre, the McGill University Health Centre (MUHC) in Canada, \$4.6 million in settling falls related claims between 2001-2004. Falls at MUHC were causing an additional 4,554 patient bed days of which (if the conservative estimate of 50% being preventable were applied) would mean 2,277 beds available for other admissions.<sup>107</sup>

A 2003 study of the role of a specialist nurse in managing chronic heart failure found enormous clinical and economic benefits associated with their care. Not only did the program reduce recurrent hospital stay by 30-50% relative to usual care, hospital costs were also reduced by one-third. The estimated economic benefits of a similar specialist nurse program in the UK indicate every specialist heart failure nurse could save that health system £49,000 per annum, with a potential saving of £18 million in one year alone.<sup>108</sup>

The UK is recognising the value and capacity of nursing led teams, with nurses being put in charge of multidisciplinary night teams in National Health Service (NHS) hospitals as clinical coordinators. The evidence from this intervention suggests there are benefits to patients as well as organisations, with a reduction in mortality and a 20% drop in average length of stay since the move took effect.<sup>109</sup>

International evidence on the role of nursing in primary health care demonstrates powerfully the contribution nurses make in delivering care in community settings: as community nurses, occupational health nurses, sexual health nurses, mental health nurses, maternal and child health nurses, and in many other roles, providing services in a diverse range of settings including homes, schools, community centres, general practices, outreach services and in rural and remote areas. However while a significant number of services are delivered by nurses in Australia in these sorts of settings, there is currently a dearth of evidence on the quality, safety, and cost effectiveness of care provided by primary health care nurses in this country.

The evidence we do have however is compelling: a review of 25 articles, involving 16 studies (Laurant et al 2004) found appropriately trained nurses can produce a quality of primary care that is equivalent to that of doctors and achieve health outcomes for patients that are just as effective. Not only that, patients receive more health advice and report higher levels of satisfaction with the services of nurses. This evidence alone should be sufficient to encourage governments to place a greater

emphasis on ensuring that nurses are widely utilised in the delivery of primary health care services, and for extensive evaluations to occur across all settings to establish the health care outcomes and the economic benefits of using nurses in primary health care more widely.

Expenditure on nursing by federal and state governments through the Australian Health Care Agreements (AHCAs) on public hospitals and by the federal government on residential aged care are the two principal areas in which Australian governments fund nursing services. Collectively the federal, state and territory governments spent \$100 billion in the 2003-2008 AHCAs.<sup>111</sup> Expenditure by the federal government on residential aged care in 2004-05 was \$5.5 billion.<sup>112</sup>

Part of the accountability for that expenditure should be to demonstrate that the public funds provided for these health services is being used effectively. If governments are failing to staff hospitals and aged care facilities with sufficient numbers of adequately trained nurses and this results in additional costs associated with preventable injury, illness or death for people accessing those services then there is not only a moral obligation to address this but there is also one of accountability for expenditure of public funds. The community has a right to demand that the taxpayer dollars being spent in this sector are put to the best possible use in delivering safe, high quality care that optimises the quality of life and wellbeing of the community.

Nursing not only offers the opportunity to reduce costs by minimising adverse events, avoiding otherwise preventable admissions and reducing length of stay but there are also savings associated with the availability of specialist nursing care by reducing demand for hospital beds and keeping people well.

## 7 Legal liabilities: unsafe staffing and excessive workloads

Other factors to be considered by governments and health care institutions in relation to the economic costs of nursing care are the costs associated with negligence and vicarious liability claims arising from inadequate staffing, particularly in residential aged care settings, but as a significant threat in any health care setting.

Class actions being launched by groups of patients whose health has been endangered by health care institutions in the United States should give Australian governments and health care providers pause for thought in relation to risk. One pending lawsuit is a breach-of-contract class action on behalf of residents in an aged care facility who were not provided adequate care in accordance with current state and federal regulations and another is for "abuse and neglect of nursing home residents". Most cases cite understaffing as the main problem. The other problem cited is inadequate skill-mix, with the bulk of care being delivered by nursing assistants who are the "least trained, lowest paid, and most over-worked employees in nursing homes".<sup>113</sup>

In 2006, a woman from Kansas, USA, filed a class action lawsuit against hospital giant HCA accusing the chain of causing her husband's death through their inadequate supply of qualified nurses. Mildred Spires said her husband died at HCA's Wesley Medical Center in 2004 as a result of inadequate care. Her action seeks to force the hospital chain to pay damages of \$12.5 billion to patients who have been treated at its facilities over the past decade. Mrs Spires's lawyer is using research linking understaffing with poor health outcomes to argue HCA put revenues ahead of patient safety and employee wellbeing.<sup>114</sup>

Harvard lawyer George Annas is an expert in the field of law and medicine, and director of the Boston University School of Law's Center for Law and Health Sciences. In a recent article in the *New England Journal of Medicine*, Annas argues that hospitals have a legal duty to implement patient safety measures, and failure to do so could be "viewed as negligent, leaving them open to malpractice lawsuits when a violation of the [patient's] right to safety results in injury".

He goes on to say that "the major safety reasons for which hospitals have been successfully sued are inadequate nursing staff and inadequate facilities. Since providing a safe environment for patient care is a corporate responsibility, understaffing is corporate negligence."<sup>115</sup>

This is supported by the finding against a US health care facility found to be liable for a patient's death by "deliberately allowing the facility to go understaffed".<sup>116</sup>

The potential liability for Australian governments and health care providers of failing to staff health care settings with sufficient numbers of appropriately educated and experienced nurses should provide them with a strong incentive to act.

It follows that all employers, including governments, must be held accountable for their actions when, through unsafe systems of work or unrealistic work expectations of nurses, they put at risk not only patients/residents but also the licence (as regulated health professionals) and livelihood of nurses.<sup>117</sup>

This was made plain in a recent inquest into a death in the Northern Territory, which found the NT government's policy for staffing its hospitals had contributed to the death of a woman in 2006 who fell whilst in hospital. In the findings reported on 4 September 2008, Coroner Greg Cavanagh stated that "Nursing staff deficiencies ...contributed to both the fall and failure to do observations; the total number of nurses was too low; the proportion of agency (casual) and overtime nurses and nurses from a different part of the hospital was too high, and the nursing skills-mix was problematic".<sup>118</sup>

As a result of the inadequate staffing of nurses and poor skill-mix, the fall, which ultimately led to the patient's death, failed to be prevented and resulted in the inability of nursing staff to attend to the patient's neurological observations in the appropriate time frame.

The lack of nursing staff was attributed to the policy and actions of the NT Department of Health which, Mr Cavanagh reported, made "three policy decisions in 2006" which had "significant detrimental effects on nursing staffing arrangements". These policies, instituted in order to contain staffing levels for "budgetary reasons" meant that the Department had taken responsibility for recruitment away from the management of the Royal Darwin Hospital, and failed to respond to applications in a timely manner. The Department did not ascertain the required nurse staffing levels appropriately, nor did it use "any evidence-based methodology about the numbers required for safe care", with staffing instead "set in response to budgetary considerations". Another policy that led to inadequate staffing was the requirement for nursing requests for extra staff to be approved by the Assistant Secretary of the Department. This could hardly be considered a mechanism by which inadequate staffing could be addressed in an appropriate time frame to respond to the sudden deteriorations in a patient's condition, emergency admissions, or other fluctuations in staffing requirements that could be expected in the 24/7 environment of a busy public hospital.

This extremely tragic death is, unfortunately, a clear example of the risks of failing to staff health care settings appropriately. It also demonstrates the problems that arise when nurses are not sufficiently empowered to influence nurse staffing decisions, over which surely they are the experts.

## 8 Discussion

The nursing profession has evolved and changed dramatically over the last 50 years, however the management and design of health systems in which they work have not recognised or acknowledged this evolution. These issues are central to the global nursing shortage and the problems with the safety and quality of contemporary health care.<sup>119</sup>

As many nursing organisations argue, there is not only a shortage of nurses, there is also a shortage of nurses willing to work in the current health care environment. This is one in which nurses are disempowered, their workloads are too high, their contribution is not recognised by managers or their medical colleagues, and they are forced to work in an environment that prevents them from delivering safe, quality care.

However multiple studies have demonstrated that retention can be dramatically improved if nurses' work environment is improved.

The magnet research refutes the often quoted tale of woe from hospital administrators and governments that their ability to attract and retain qualified nurses in the health system is linked to the national and global shortages of nurses. The fact that magnet hospitals are able to maintain healthy work environments with safe staffing, professionally satisfied nurses and positive patient outcomes demonstrates that there is not only a shortage of nurses, but there is also a shortage of nurses willing to work in dysfunctional, under resourced, unsafe, unsupported health systems. As the research shows, and as the response of Victorian nurses to mandatory nurse to patient ratios shows, if nurses are provided with a work environment in which they are adequately staffed and supported, they will come and they will stay.

Better support for nurses to undertake education is required. The financial costs of undertaking nurse education compared to the economic returns of working in the profession are insufficient. This can have the effect of either deterring nurses from undertaking additional education to upgrade their skills during their career or even discourage others from considering the profession at all. There is therefore an urgent need to continue to expand the enrollment of nursing students by increasing the numbers of undergraduate and postgraduate nursing places in universities for registered nurses and in the technical and further education (TAFE) sector for enrolled nurses. Additional funding for clinical placements is also vital, as there are currently too few clinical places available to accommodate the existing number of students and care must be taken to ensure that any increases in the number of students do not place an additional burden on a system already stretched in this regard.

Supporting nurses through the provision of child care services, access to paid continuing professional development, and improving their workplace environments through incorporation of principles seen to be effective in magnet institutions will also assist in improving nurse recruitment and retention.

There is evidence that increasing nurses' salaries increases nurse labour participation, making income a strong factor in the choices nurses make about workforce participation and working hours. Recent research indicates reimbursement is a significant issue, and nurses regard it as a key factor in the nursing shortage.<sup>120</sup>

However it is in the area of quantifying the economic contribution that nurses make to health system performance that much work needs to be done. With such strong evidence of the impact of nursing care in avoiding adverse outcomes, increased length of stay, and avoidable death, it is also essential to establish national data systems with indicators that can demonstrate those patient outcomes that are sensitive to the input of nurses.<sup>121</sup>

There are now well established frameworks internationally to provide a mechanism against which to evaluate the effectiveness of nursing interventions. The American Nurses Association established the National Database of Nursing Quality Indicators in 1998 (see Appendix C), which collects data on a range of nurse sensitive indicators, such as patient falls, pressure ulcers, staff mix, nursing hours per patient day, job satisfaction, education, psychiatric patient assault rate, restraints prevalence, nurse turnover, and healthcare acquired (nosocomial) infections.

Ensuring an appropriate allocation of nursing resources to provide safe, quality care requires the utilisation of nurse sensitive indicators to assist nurses in demonstrating what it is that nurses do, what outcomes they achieve, and at what cost.<sup>122</sup>

The effect of the composition and adequacy of the nursing and midwifery workforce and nurses' and midwives' work environment on the safety and quality of care has received far too little attention to date in hospital and health care performance evaluation. It is time a set of nurse sensitive quality indicators was developed for Australian health care settings to demonstrate the capacity of nursing care to contribute to positive patient outcomes.

The framework for a workforce reporting database which includes nurse sensitive indicators should be included in the hospital and health care funding agreements and performance frameworks. It is proposed that in addition to nurse sensitive indicators such as those referred to above, that indicators be developed for the following:

- staffing (including numbers of nurses and midwives per service provider);
- workload (including patient "churn");
- skill-mix (proportion of assistants in nursing, enrolled nurses and registered nurses);
- education (proportion of nursing staff with undergraduate and post graduate qualifications);
- staff satisfaction;
- staff turnover (to demonstrate the level to which staffing concerns are being addressed); and
- occupational health and safety benchmarks, such as workplace injuries (risks to staff) and compliance with occupational health and safety legislation.

Furthermore, consideration should be given to altering the current system of reimbursement for nursing services that sees nurses "bundled" into hospital operating costs. Efforts to identify the actual costs of nursing care and have them reflected in the patient classification system known as diagnostic related groups (DRGs) are underway in the US, where nurse intensity billing systems are being developed to quantify the actual costs of nursing care.<sup>123</sup>

Such a system has the potential to address the current situation in which nursing is seen as a cost, and which leads to a "significant distortion of the economic value of nursing care and therefore a significant under representation of the amount and quality of nursing care needed"<sup>124</sup>

## 9 Conclusion

In a climate of global nursing shortages, improvements in nurse staffing and nursing workload can only be achieved by investing in the nursing workforce through the development of incentives that reward nurse retention, and by educating the workforce in sufficient numbers to meet community demand. Acting to ensure the existence of those workplace characteristics that are proven to attract and retain nurses is also vital to ensure the community has access to safe, quality nursing care.

Given that quality of care is affected by higher staffing, but profit is not, and lower staffing increases turnover, there are compelling economic arguments for higher skill-mix and staffing levels in Australian health care settings. The implementation of staffing and workload measures such as minimum nurse to patient ratios offer a predictable and consistent method of planning nurse staffing, which can safeguard nurses from burnout and reduce the risk of adverse patient outcomes.<sup>125</sup>

The evidence presented here clearly demonstrates the links between nurse staffing and patient mortality, nurse staffing and patient outcomes, nurse education and patient outcomes, nursing skill-mix and patient outcomes, nurse workload and nurse retention, nurse workload and job satisfaction and the effect on financial performance of health care institutions and organisations of failing to ensure adequately staffed health care settings with enough appropriately educated and experienced nurses.

Some of the world's leading nursing workforce researchers have summarised the situation: "The stakes are high, not only because of the potential for poor patient outcomes, but also for the potential result of disgruntled, disillusioned, and un-empowered health care providers that may lead to even further erosion of hospital quality".<sup>126</sup>

The costs to the community, as outlined above, of failing to invest in nurses, of not acting to address the poor working environment of nurses and the problems associated with the nursing workforce are grave.

Traditionally, nursing care has been regarded by hospital administrators as an intrinsic cost as part of hospital infrastructure. But with strong evidence about effects of inadequate nurse staffing on mortality, complications, and length of stay, it is time to consider nurse staffing as the clinically significant and economically valuable intervention that it is.

Hospital expenditure is by far the largest component of health expenditure. With total government health expenditure projected to increase substantially in the next three decades, there are compelling reasons to reduce unnecessary hospitalisation to reduce not only individual burden, but also to reduce costs. Funds that are unused in hospital care will always be welcome in other areas of the health sector, perhaps in health promotion and illness prevention programs, which can further reduce health care costs.

Current funding mechanisms for hospitals and health care do not identify or quantify the specific costs associated with the largest portion of their financial outlays - nursing costs.

Rewarding nursing and resourcing it appropriately requires that payment formulations for hospitals and health care institutions be developed to reflect the quality and types of nursing services being provided. Only when the true costs of nursing are established, can the full economic benefit of nursing care be known and provision made to ensure funding goes where it is needed, to provide safe, quality care.<sup>127</sup>

As Rothberg says, "if a hospital decided, for economic reasons, not to provide thrombolytic therapy for acute myocardial infarction, physicians would refuse to admit their patients to that hospital, and people would fear to go there. Physicians, hospital administrators and the public must now begin to see safe staffing levels in the same light as other patient safety measures".<sup>128</sup>

Hospital administrators and other health professionals should also apply the same thinking to nursing care. If safe staffing is not available, patients and admitting physicians should stay away.

Only in making nursing work and its associated outcomes more visible will it be possible to demonstrate, and appreciate, the value and capacity of nursing care.

There are few health issues in Australia today that require as high a priority as the recruitment and retention of an appropriately educated nursing workforce that is sufficient in quantity to enable nurses to provide safe, quality care.

Governments have a particular responsibility to the community, not only to ensure the delivery of safe, quality care and provide safe workplaces, but for sound economic management. That requires investing in nursing.

# 10 Recommendations

Based on strong evidence the ANF recommends that:

1. The federal government commissions a cost-benefit analysis to determine the cost-effectiveness of nursing and midwifery care as a matter of priority.
2. The federal government funds a national research project to develop a set of agreed national nursing indicators against which health care services can be evaluated.
3. A national system of indicators to evaluate the performance of all health care services (both public and private) include nurse sensitive outcome indicators as well as indicators for nursing workload, staffing and skill-mix.
4. These indicators require the utilisation of an appropriate staffing methodology that considers patient acuity and "churn", as well as workload measures to ensure safe nurse to patient ratios.
5. The contribution of nursing interventions to positive patient outcomes be recognised in organisational budgetary allocations and risk management plans, and reflected in nursing salaries.
6. The federal government fund a national project to develop evidence-based skill-mix ratios of registered nurses (RN), enrolled nurses (EN), assistants in nursing (AIN), and others who assist with the provision of nursing services in a range of settings, and these be included in national health care services performance indicators.
7. Residential aged care providers should ensure a registered nurse is available on duty and accessible 24 hours a day, seven days a week, and a registered nurse employed as the director of nursing.
8. Health care providers must ensure a safe skill-mix which includes experienced nurses working each shift to ensure that graduate and beginner nurses are adequately mentored and supervised.
9. Health care organisations should implement strategies which ensure that:
  - nurses occupy significant positions of authority in every organisation;
  - nurses are supported to exercise professional autonomy and control over their practice;
  - strategies are implemented to ensure effective, collaborative and egalitarian interdisciplinary and intra-organisational communication;
  - nurses are supported and encouraged to participate in policy decisions at all levels of the organisation;
  - the organisation demonstrates and promotes its recognition of the value of nursing work;
  - nurses have access to and are supported to participate in regular, high quality professional development activities;
  - nurses are provided with supportive work environments, which include adequate remuneration, manageable workloads, and access to child care.

10. The federal government must:

- establish a mechanism to ascertain workforce figures that can usefully predict current and future workforce shortages;
- invest further in nursing education by increasing undergraduate nursing places (including funding for clinical placements and clinical supervision);
- provide significant additional postgraduate scholarships; and
- increase the funding for nursing education to reflect the true cost of course delivery.

# 11 Glossary

## Adverse event

An incident where harm resulted to a person while in the care of the health system.

## Adverse outcome

The harm caused to the person resulting from the adverse event.

## Churn

The movement of patients in and out of wards, which affects nursing workload.

## Failure to rescue

Failure to prevent a clinical deterioration associated with an underlying illness or complication.

## Magnet hospital

A health care facility which meets defined standards. Magnet characteristics embody a professional environment guided by a strong and visionary nursing leader who advocates and supports excellence in nursing practice.

## Skill-mix

Relative proportions of registered nurses to enrolled nurses and nursing assistants.

## Unlicensed health care worker

Assistants in nursing or midwifery and other unlicensed workers (however titled) who assist nurses and midwives in the provision of nursing and midwifery care.

## Unplanned extubation

An accidental or purposeful removal of the endotracheal tube by a patient.

## Workload measures

Mechanisms which assist in determining and allocating nursing resources to manage their workloads e.g. nurse: patient ratios; nursing hours per patient day (NHPPD).

# Appendix A

## World Health Assembly Resolution WHA59.27 and the Islamabad Declaration

In May 2006 the World Health Assembly reaffirmed the crucial role of nursing and midwifery to "health systems, to the health of the people they serve, and to efforts to achieve the internationally agreed health-related development goals".

This resolution calls for:

- the establishment of comprehensive programmes for the development of human resources which support recruitment and retention, while ensuring equitable geographical distribution, in sufficient numbers of a balanced skill-mix, and a skilled and motivated nursing and midwifery workforce within their health services;
- the need to actively involve nurses and midwives in the development of their health systems and in the framing, planning and implementation of health policy at all levels, including ensuring that nursing and midwifery is represented at all appropriate governmental levels, and have real influence;
- continued progress toward implementation at country level of the World Health Organisations' (WHO) strategic directions for nursing and midwifery;
- regularly reviewing legislation and regulatory processes relating to nursing and midwifery in order to ensure that they enable nurses and midwives to make their optimum contribution in the light of changing conditions and requirements;
- to provide support for the collection and use of nursing and midwifery core data as part of national health-information systems; and
- to support the development and implementation of ethical recruitment of national and international nursing and midwifery staff.

In support of resolution WHA59.27, the WHO, the International Council of Nurses (ICN) and the International Confederation of Midwives (ICM) issued a declaration, the Islamabad Declaration, declaring that increasing nursing workforce capacity, improving skill-mix and creating positive workplace environments were vital to supporting efficient, effective nursing and midwifery services that are "critical... to the general health of all nations".

# Appendix B

Islamabad Declaration on Strengthening Nursing and Midwifery | 4-6 March 2007

## Preamble

In May 2006, the World Health Assembly endorsed Resolution WHA59.27, reaffirming the crucial contribution of the nursing and midwifery professions to health systems and the health of the people they serve. In response, the Federal Minister of Health for Pakistan, Mr Mohammad Nasir Khan, former chair of the World Health Organisation Executive Board, hosted a high level global consultation on nursing and midwifery in March 2007, organised in collaboration with the WHO, the International Council of Nurses and the International Confederation of Midwives.

This Declaration is founded on our belief that efficient, effective nursing and midwifery services are critical to achieving the Millennium Development Goals, country priority programmes including primary health care, health systems strengthening, and the general health of all nations.

Therefore, we believe:

1. All people should have access to competent nurses and midwives who provide care, supervision and support in all settings.
2. A coordinated, integrated, collaborative, sustainable approach to planning, policy and health care delivery is necessary to strengthen nursing and midwifery services and acknowledge that countries in crisis or conflict have unique needs.
3. Urgent attention is needed in three key areas:
  - scaling up nursing and midwifery capacity
  - skill-mix of existing and new cadres of workers
  - positive workplace environments.

We affirm that equitable, efficient and effective nursing and midwifery service delivery requires a range of personnel and that, prior to creating new cadres, investments should be made in mobilizing nurses and midwives currently under-utilized, unemployed, working in other sectors, or who have left active practice.

We declare the following principles fundamental to decision making, effective policy development, planning, implementation, evaluation and quality assurance of education and health services, and of value to a wide range of stakeholders.

## Principles for scaling up nursing and midwifery capacity

Scaling up nursing and midwifery capacity encompasses a range of strategies that address workforce planning, education, skill-mix, maximum utilization of roles, career frameworks, work environments and regulatory frameworks to ensure efficient, effective, and safe health systems.

High level political leadership and commitment, a multi-sectoral approach, significant financial investment in education and employment expansion, and active participation of nursing and midwifery leaders are required to enhance scaling up of the nursing and midwifery workforce.

Each country must establish policies and practices to ensure self-sufficiency in workforce production within the limits of its own resources.

Nursing and midwifery capacity development requires ongoing data collection and its integration into health information systems, as well as regular and rigorous monitoring and evaluation to enhance evidence-based decision making.

Rapid scaling-up measures may be appropriate in country specific crisis situations; such measures should contribute to longer term sustainable development of the nursing and midwifery workforce.

#### Principles for scaling up nursing and midwifery capacity

Employment practices that address workload, scheduling, necessary infrastructure and support systems, and provide safe, secure working conditions are necessary to assure occupational health and patient and health care provider safety.

Workplace policies that assure gender equity, adequate employee compensation, recognition, professional development opportunities and continuing education are essential contributors to recruitment and retention of a committed, productive and efficient workforce.

Policy frameworks that support participatory decision making, autonomy, authority and accountability along with positive interdisciplinary relationships and effective nursing and midwifery management are essential to creating and sustaining positive practice environments.

Positive practice environments are facilitated when nursing and midwifery leadership is part of, and actively involved in, all governance structures.

#### In conclusion

We reaffirm the importance of WHO and Member States, the International Council of Nurses, the International Confederation of Midwives, national nursing and midwifery organisations and other partner organisations committing to active measures to strengthen nursing and midwifery, in line with the Millennium Development Goals, Resolution WHA59.27, priority programmes and other initiatives.

We urge policy makers, planners, politicians, employers, health professions and their associations, donors, educators, regulators, and patient representative organisations to utilise these principles as they strive to ensure better health and health care for the people of all nations.

We pledge to work at the sub-national, national, regional, and international level, in partnership with all relevant ministries and bodies, statutory and non-governmental organisations, and the private sector, to realize the aspiration of this Declaration.

# Appendix C

## National Database of Nursing Quality Indicators

The National Database of Nursing Quality Indicators (NDNQI) is a nursing quality measurement program that was established by the American Nurses Association and is administered by the University of Kansas School of Nursing.

The database provides over 1,200 US hospitals with unit-level performance reports with comparisons to national averages, percentile rankings and other important data. All indicator data are collected and reported at the nursing unit level.

It provides research-based national comparative data on nursing care and its' relationship to patient outcomes.

NDNQI nursing-sensitive indicators reflect the structure, process, and outcomes of nursing care. It provides data on the following nurse-sensitive indicators:

- Patient falls
- Patient falls with injury
- Pressure ulcers: community acquired / hospital acquired / unit acquired
- Staff mix
- Nursing hours per patient day
- Registered nurse surveys: job satisfaction / practice environment scale
- Registered nurse education and certification
- Paediatric pain assessment cycle
- Paediatric intravenous infiltration rate
- Psychiatric patient assault rate
- Restraints prevalence
- Nurse turnover
- Nosocomial infections: Ventilator-assisted pneumonia (VAP) / Central line associated blood stream infection (CLABSI) / Catheter associated urinary tract infections (CAUTI).

Many of the NDNQI indicators are endorsed by the National Quality Forum (NQF), the body responsible for health care quality measurement and reporting, as part of the NQF's Nursing-Sensitive Measure Set.

Source: [www.nursingquality.org](http://www.nursingquality.org)

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