



**Australian College of Nursing**

# **A National Minimum Dataset for Nursing Workforce Planning and Decision Making**

A WHITE PAPER BY ACN 2020



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# EXECUTIVE SUMMARY

Nursing workforce planning and decision making in Australia is becoming increasingly difficult as the health care system rapidly evolves. An increasing ageing population with complex care needs, overall changes in patient demographics and variability in models of care, necessitates a skilled nursing workforce to meet health service demands into the future. Variables such as patient acuity, skill mix and staff turnover are some of the factors that play a significant role in workforce planning. While it is recognised that the issues facing nursing workforce planning are multifactorial, at a fundamental level is the lack of a national minimum dataset to permit informed decision making amongst workforce planners.

Until now the value of a nursing workforce dataset to health services has gone largely unnoticed. In Australia, there is currently a lack of timely and accurate access to datasets relating to the nursing workforce across all levels of the health care system. In addition, there is a lack of transparency around workforce datasets employed by workforce planners on a national and international level. Nurse staffing is inherently linked to patient, nurse and health system outcomes. The availability of a national minimum dataset would benefit health services at the local, district, state and national levels; and undisputedly translate into improved patient care, and enhanced outcomes for both patients and nurses.

To address these issues, the Workforce Sustainability Policy Chapter (2019), comprising Australian nurses, with expert knowledge, experience and research around nursing workforce, workforce planning and datasets, was established by the Australian College of Nursing (ACN). The Policy Chapter conducted an informal investigation of nursing datasets utilised within the public and private healthcare sectors across Australia and internationally for the purpose of strategic nursing workforce planning. It was required to highlight the importance of nationally consistent data collection as it relates to and informs workforce requirements, skill mix demands, models of care, service planning and future development of education, curriculum, and research/evaluation methodologies related to nursing practice.

This White Paper intends to introduce key issues around 'Nursing Workforce Planning and Decision Making' in Australia and provide two essential recommendations for consideration by the Australian Government. Specifically, that it is imperative for policy development around a comprehensive national minimum nursing workforce dataset.

# INTRODUCTION

In 2016/17 there were 386,629 nurses and 92,145 nursing students in Australia (AHPRA, 2018). Nursing is the largest single health profession in Australia comprising 56.9% of registered health practitioners (Department of Health, 2019). Developing and sustaining the nursing workforce is of vital importance, and appropriate workforce data is central to understanding the current state of nursing and to meet the growing demand for patient care.

Globally, nursing is challenged with a predicted shortfall in the forthcoming decade (Auerbach & Staiger, 2017; Buchan, Twigg, Dussault, Duffield, & Stone, 2015), emphasising the need to plan effectively. However, nursing workforce planning is challenging because it requires future forecasting of dynamic and complex healthcare system needs and must incorporate models of care that are constantly evolving. As Britnell (2019) highlights, no country manages its healthcare workforce well and few are prepared for the predicted shortfall.

Timely access to relevant nursing workforce information is fundamental to address growing needs, to facilitate sound planning and decision making, and to maximise the effectiveness of the nursing workforce at all levels, whether national, state, district, service, hospital, community centre, or ward. As nurse staffing is linked to outcomes for patients, nurses, and the healthcare system, it is crucial that accurate and consistent data are readily available.

## DEFINITIONS

### Workforce Planning

Workforce planning is a “*continuous business planning process of shaping and structuring the workforce to ensure there is sufficient and sustainable capability and capacity to deliver organisational objectives, now and in the future*” (Australian Public Service Commission, 2019).

### Dataset

A dataset may include one or more databases or sources of information. It is “*a collection of separate sets of information that is treated as a single unit by a computer*” (Cambridge University Press, 2019). In the context of this document, the term dataset indicates systematic, often routine, collection of data.

### Minimum Dataset

In this document, this refers to those data elements that are required to provide a basis for nursing workforce planning. It is often defined as “*a set of data elements agreed for...collection and reporting at a national level...it does not preclude agencies and service providers from collecting additional data to meet their own specific needs*” (AIHW, 2019).

## **Nursing Hours per Patient Day (NHPPD)**

This is a systematic nursing workload monitoring and measuring system that provides a guide to the number of nurses required for service provision within a specific clinical area (DHHS, 2011). This metric is convertible to a Nurse to Patient Ratio (NPR) via a simple equation:

$$(NPR=24\div NHPPD)$$

## **Nurse to Patient Ratio (NPR)**

Often referred to simply as 'ratios', this is a systematic nursing workload monitoring and measuring system that indicates the number of nurses working on a particular ward, unit or department, in relation to the number of patients they care for (Queensland Health, 2019). This metric is convertible to a NHPPD via a simple equation:

$$(NHPPD=24\div NPR)$$

## **Skill Mix**

Skill mix is usually denoted in the literature as the percentage of Registered Nurses (RNs), often as the percentage of RN hours per given time period (Duffield et al., 2011a). It has a broader interpretation that includes qualifications and experience. As noted by Gardner, Duffield, Doubrovsky, Bui, and Adams (2017), nursing workforce planning internationally is often undertaken with a focus on the number of nursing staff needed for a given number of patients. The skill level, qualification, and expertise of nurses is often not well considered. This flies in the face of substantial evidence that emphasises the importance of an appropriate skill mix for quality of care and positive patient outcomes. Multiple studies and reviews have repeatedly identified the negative impact on patients of a reduced proportion of registered nurse staffing (Aiken et al., 2016; Duffield, Roche, Wise, & Debono, 2019a; Duffield, Twigg, Roche, Williams, & Wise, 2019b; Lang, Hodge, Olson, Romano, & Kravitz, 2004; Lankshear, Sheldon, & Maynard, 2005; Twigg et al., 2016). This is therefore an essential factor in a nursing minimum dataset.

## **Case Mix**

In order to use data effectively to enhance patient outcomes, patient acuity and other characteristics must be incorporated. In inpatient settings this can be derived from Australian Refined Diagnosis Related Groups (AR-DRGs; IHPA, 2018) that provide an estimate of resource intensity, and therefore of patient acuity, most commonly expressed as National Weighted Activity Units (NWAUs). This is incorporated in some existing systems.

## **Nursing Productivity**

This is defined by Health Workforce Australia (2014 p.12) as "...the relationship or ratio between nursing inputs and nursing related outputs in the provision of health services, and focuses on strategies that contribute to service efficiency through the utilisation of nursing skills." Significant interdependencies exist due to the multidisciplinary nature of care provision, with nursing providing a vital but not singular contribution to health service level productivity.

# BACKGROUND

Workforce planning in healthcare is technically difficult with the ever increasing and evolving complexity of health care systems, models of care and patient demographics. Nursing workforce planning is complex due to the many potential variables and measures, such as patient acuity and complexity, diverse nursing activities, and staff turnover that can all compound the development and currency of a workforce dataset. Determining the most appropriate variables for measuring nursing work, to inform decisions from local level workload to national level planning, is challenging but essential.

Australia's current nursing workforce datasets and their associated definitions vary across jurisdictions and services. They are often developed for specific local use and may therefore not be applicable to other services' needs. While national nursing workforce data provide an overview of the workforce (Department of Health, 2019), this is not always timely and does not address service level requirements well. Internationally, there are few examples of nursing workforce datasets although some are reported in the research literature. It is important to understand the value and benefits of these workforce datasets and how they may be best utilised for workforce planning and understanding the quality of patient care.

## International nursing workforce data

Aiken and colleagues (Aiken et al., 2018; Aiken et al., 2014) reported data from the RN4CAST Nurse Survey, a large survey undertaken across medical and surgical wards in the UK and Europe (and recently repeated in Queensland) that collected data on nurse characteristics in addition to information on nursing workload (e.g. patients per nurse). Other studies reported annual or biannual nurse surveys (Hand, Albert, & Sehgal, 2018; Welton, 2011), administrative or other routinely collected data (Fagerström, Kinnunen, & Saarela, 2018; Harrington & Edelman, 2018; Hurst, 2008; Massey, Esain, & Wallis, 2009), unique surveys, collections, or logs (Klaus, Dunton, Gajewski, & Potter, 2013; Nelson et al., 2007), or a review of workload measures (Greaves et al., 2018). Data elements were not consistently provided but often included nurse classification (e.g. registered nurse, licensed practice nurse, nurse assistant), temporary (pool/casual/agency) or permanent, clinical area, level of education, accreditation, age or age group, experience (generally and in specialty area), nurse role (e.g. 'sitter'/'special', 'floater'/'deployed'), shift, day of week, hours of work, and category of hours (e.g. usual hours, training, overtime). These data indicators were used in the studies to calculate total staff numbers, the number and proportion of each nursing classification, hours and proportion of agency or bank/casual nurses. They were also combined with patient data to calculate nurse to patient ratios or nursing hours per patient day. Most primary studies collected data at individual, ward, or hospital level, and usually reported it at the hospital or ward level.

Challenges in using existing administrative datasets were identified in the merging of disparate datasets (Hurst, 2008; Kane, Shamliyan, Mueller, Duval, & Wilt, 2007; Klaus et al., 2013; Massey et al., 2009), classification and qualification of nurses (Massey et al., 2009), and standardisation generally (Klaus et al., 2013; Welton, 2011). Even in well-established systems like the National Database of Nursing Quality Indicators (NDNQI) in the USA, ambiguity in data elements was noted, particularly variation between sites (Klaus et al., 2013). Several studies have combined administrative data or logs with prospective datasets in order to provide a more complete picture (e.g. Duffield et al., 2011a).



## Benefits and value of workforce datasets to health services

Discussion regarding the value of a nursing workforce dataset to health services is sparse. However, the benefits of understanding workforce planning as it pertains to design and cost, and its association with quality of care is apparent. At the national level Rassin and Silner (2007) promoted the benefits of a workforce model for planning services; particularly the capacity to predict likely education needs. Welton (2011) identified significant differences in skill mix between rural and metropolitan hospitals and across states, with non-statistically significant but suggestive differences between hospitals with different funding structures. The value of data in understanding the use of bank/casual or agency nurse utilisation has also been identified (Massey et al., 2009; Nelson et al., 2007). Although the data consistently identify a link between nursing workforce and outcomes, there is variation regarding the details and magnitude of this relationship and is discussed below.

Studies that incorporated a prospective observational component (Adomat & Hicks, 2003; Fagerström et al., 2018; Hand et al., 2018; Nelson et al., 2007; Pillay, Nightingale, Owen, Kirby, & Spencer, 2012; Possari, Gaidzinski, Lima, Fugulin, & Herdman, 2015) present different types of value to health services. These studies measured tasks or activities, and in one case incorporated the ward layout (Hurst, 2008). Together they provide estimates of workload that can be linked to nurse and patient type or to the physical structure of the ward, providing evidence on which to base staffing models or redevelopments. There are several key limitations to these types of studies. Firstly, they are often resource intensive and therefore unlikely to be undertaken frequently despite their utility. Also, it is important to note that nursing is not a solely direct care, task-orientated profession, and considering workload without accounting for obtaining assessment information and clinical reasoning is potentially counter-productive (Possari et al., 2015).

## Benefits and value of workforce planning in nursing to patient care/outcomes

Similar to the consideration of the benefit of a dataset to health services, the value of workforce planning to patient care or outcomes is not discussed overtly, although the association between the nursing workforce and quality of care is again apparent. There is a sound evidence base for the impact of nurse staffing and skill mix on patient adverse events (Brand et al., 2012; Kane et al., 2007; Lankshear et al., 2005) and on nurse outcomes such as job satisfaction (Brand et al., 2012; Butler et al., 2011) although the measured strength of the impact varies. Aiken et al. (2014) reinforces the link between nursing workload and patient outcomes, with a one-patient increase in workload increasing the likelihood of mortality by 7% and an increased proportion of bachelor-qualified registered nurses linked to a decrease in adverse patient events. Similarly, Fagerström et al. (2018) noted an increased likelihood of negative patient outcomes including mortality, when nurse workload was not optimum.

Nursing skill mix is also a key factor (Aiken et al., 2016; Duffield et al., 2011a; Roche, Duffield, Aisbett, Diers, & Stasa, 2012; Wilson, Bremner, & Hauck, 2010). Determining what is the 'right' skill mix in nursing is a complex issue (Lavander, Meriläinen, & Turkki, 2016) due to the variation in the division of labour across direct patient care, indirect care, documentation, management roles and other duties. (Dahlke & Baumbusch, 2015; Van Bogaert et al., 2014). This is complicated by staffing systems that may not account well for patient acuity. For example, while the implementation of ratios in California has been linked to better nurse retention, there is ambiguity regarding their impact on patient outcomes (Wynendaele, Willems, & Trybou, 2019). Australian research (Duffield et al., 2019a) has uncovered the potential impact of inflexible systems and reinforced the limitations of relying on administrative systems without contextual understanding. Staffing systems do not take into account the clinical context or facility characteristics which are important predictors of patient outcomes (Duffield et al., 2019a; Hand et al., 2018), nor the time nurses spend in critical thinking (Possari et al., 2015). Greaves et al. (2018) acknowledge the time nurses spend with patient families and carers is rarely included in datasets or workload measurement tools. Nursing is person-centred and in this sense, datasets provide a foundation but local application and context is still essential. (Duffield et al., 2019a; Duffield et al., 2019b). There is therefore a requirement for timely, locally relevant, datasets with data elements to support context-specific decision making. This consideration is vital in the development of a national dataset.

A comprehensive dataset was judged to have significant application at various levels, but there is a dearth of nursing workforce datasets that facilitate both high- and low-level applications. The consequences of this sparsity and the lack of standardisation in developing and maintaining comprehensive nursing datasets are potentially significant. For example, inaccurate data could compromise nursing workload calculations (Klaus et al., 2013; Massey et al., 2009), while not understanding the educational level of clinical staff (Massey et al., 2009) sets a challenge for safe ward staffing. The capacity to understand nursing turnover rates and costs is compromised without the foundation of a solid and consistent dataset (Duffield, Roche, Homer, Buchan, & Dimitrelis, 2014; Hayes et al., 2012; Roche, Duffield, Homer, Buchan, & Dimitrelis, 2015).

The complexity of determining a nursing workforce dataset is evident from the wide variation and limited number of empirical studies available. The diverse nature of the studies reported here, and their use of administrative or bespoke data collections provided little consistency in terms of the key data elements and how they are best structured or obtained. Many studies adopted methods that used multiple sources of data, in many cases to alleviate the limitations of the different sources. This demonstrates both the utility and the limitations of current datasets and highlights the need for greater standardisation and more detailed examination of the data elements currently collected.

# EXISTING DATASETS

A number of nursing datasets are utilised within the public and private healthcare sectors across Australia for workforce planning and staffing decisions. At the national level, data are collected annually from individual practitioners and collated in the National Health Workforce Dataset. This provides information on registration status, hours worked, employment status, workplace, and qualifications. These data are publicly available in summary form and in more detail, on application, for workforce planning purposes (Department of Health, 2019). This dataset was initially developed from multiple sources and remediation has been undertaken to address inconsistencies in dates of registration and qualifications (AHPRA, 2018). Ongoing data collection is largely by self-report at registration renewal, with the concurrent limitations that that imposes. At the state and service levels, data are often used for staffing decisions.

## Jurisdictional Challenges

One of the challenges in developing and maintaining an Australian nursing dataset is the variation in nomenclature across jurisdictions. This was noted in 2011 (Duffield, Gardner, Chang, Fry, & Stasa, 2011b) and further explored more recently (Gardner et al., 2017), where 66 nursing position titles across Australia were mapped into seven equivalent titles and practice profiles. Simplification along these lines would provide substantial support for a national nursing dataset. Jurisdictional differences therefore mandate distinct approaches, which are primarily focused on acute hospital inpatient services.

## Staffing Applications

### Nurse Patient Ratios

Nurse patient ratios (NPR) are used to establish clinical staffing requirements. They are applied in Victoria (Parliament of Victoria, 2015, 2018) and Queensland (Parliament of Queensland, 2015). Details vary but typical staffing in public hospitals on morning and afternoon shifts is based on a minimum 1:4 ratio, with 1:7 (Queensland) and 1:8 (Victoria) for night shift, plus an in-charge nurse on all shifts. The Victorian implementation incorporates flexibility to address patient acuity, whereby a nurse may be allocated a smaller number of patients to facilitate safe care, while other nurses may take on additional patients who require less nursing interventions.

### Nursing Hours per Patient Day

Nursing Hours Per Patient Day (NHPPD) also delineate clinical staffing requirements. This approach has been adopted in Western Australia (Australian Industrial Relations Commission, 2002), New South Wales (NSW Health, 2019), Tasmania (Tasmanian Industrial Commission, 2007), the Australian Capital Territory (ACT Government, 2017), and the Northern Territory (Duffield, 2009). Details and specificity vary widely. Excluding areas with mandated 12 NHPPD (1:2 ratio) or 24 NHPPD (1:1 ratio), provisions and details range, for example in Western Australia from 3 NHPPD in ambulatory care to 7.5 in high dependency units, and New South Wales 5, 5.5 or 6 depending on unit and hospital type. In order to assist in local planning, instruments such as the NHPPD Health Support Services Tool have been developed, with future models likely to adopt a whole of service approach to merge multiple existing datasets and facilitate local and state-wide planning.

It is important to note the equivalence of the NHPPD and NPR metrics (Table 1), even though the systems of implementation and reporting vary widely. Many services use Nursing Hours per Bed Day (NHPBD) instead of or interchangeably with NHPPD, further complicating the issue.

*Table 1 NPR / NHPPD Equivalents*

<b>PATIENTS: NURSE</b>	<b>NHPPD</b>
1:1	24.0
2:1	12.0
3:1	8.0
4:1	6.0
5:1	4.8
6:1	4.0
7:1	3.4
8:1	3.0
12:1	2.0
24:1	1.0

## Other

South Australia combines the NHPPD and NPR approaches in a detailed hospital- and unit-specific model that incorporates setting, acuity, and patient stability (Government of South Australia, 2016). A hospital-level skill mix ratio is included for non-metropolitan hospitals, and provision is made for disability support patients. Application of datasets in primary health care settings and in rural or remote Australia is limited. The most available indicator appears to be workforce density for the nursing profession as a whole across all work settings, as applied in Queensland (Queensland Health, 2016). The private hospital sector maintains independent datasets and generally uses NHPPD or an equivalent approach, although as systems are often proprietary, specific information is difficult to obtain. Anecdotally, local acuity tools and dashboards have been developed in some organisations, and some report considerable investment in data systems to understand minimum workforce requirements.

Ongoing review of requirements is embedded in most of these industrial agreements, and there is considerable variability between the systems in how they are implemented, particularly which factors are considered, and how they are applied. For example, the workload inherent in patient turnover may or may not be incorporated, a specific skill mix may or may not be mandated, and the inclusion of only direct care, or of direct and indirect care, differs. As might be expected across such diverse systems, a clear and consistent set of data elements is not available.

# KEY POINTS REGARDING EXISTING DATASETS

With the exception of the aggregated data available in the National Health Workforce Dataset, existing datasets are applied at the state level (e.g. Queensland Health, 2016, 2019) or to acute inpatient staffing. Key points are noted as follows:

- The AIHW (2019) delineates several high-level categorisations related to the nursing workforce. However, generally, there are no agreed national nursing workforce definitions and there is no defined minimum dataset. Variations occur at an intrastate and interstate level, between public and private and between rural and metro services.
- Workforce composition, skill mix, roles and training in rural and remote locations is not well-reported.
- There are apparent differences between nursing workforce determination within public and private sectors. The private sector has negotiated collective agreements with unions that are considered commercial-in-confidence. The nature and application of these data therefore remains unclear.
- Health services collect detailed human resources and payroll data for all employees. This data is used for budgeting and cost centre configurations but is not linked to other nursing, or patient, systems, limiting its utility.
- The National Health Workforce Dataset can inform services about workforce characteristics and potentially about important projections such as expected retirements (Department of Health, 2019). However, with an 18-month delay from collection to publication, timelines is an issue.
- International experts agree that nursing hours per patient day (NHPPD) is a useful operational staffing measure (Van den Heede, Clarke, Sermeus, Vleugels, & Aiken, 2007), particularly with the incorporation of acuity measurements (Mark & Harless, 2011; Van den Heede, Diya, Lesaffre, Vleugels, & Sermeus, 2008).
- A fundamental requirement for effective planning is that all the key drivers of supply and demand are identified and that there is ongoing, systematic collection of quality data to monitor trends over time (Joyce, McNeil, & Stoelwinder, 2004). The National Health Workforce Dataset is an important step in addressing that requirement.

# POTENTIAL DATA ELEMENTS

The potential data elements described below were estimated from enterprise agreements developed mainly for staffing calculations in acute inpatient hospital settings. Other elements may be required for primary care settings. This table was developed using the following principles:

- A restricted set of key data elements, collected reliably, is likely to provide more consistent and useful information than a large set of data elements collected less reliably.
- Data should be calculated rather than pre-calculated measures, to avoid errors in interpretation and calculation. That is, in order to calculate NHPPD or NPR, nurse hours and patient hours for a given period should be obtained.
- Data should be collected at the finest level available, thereby providing opportunity for higher-level aggregation. If data are collected at a higher level, disaggregation is not reliable and could lead to error. For example, data collected at the hospital level may be subject to aggregation or averaging (Kane et al., 2007) and has been noted to contain an unknown amount of measurement error (Klaus et al., 2013).

*Table 2 Preliminary List of Minimum Dataset Data Elements*

DATA ELEMENT	SOURCE/COMMENT
Nurse hours	Rostering or payroll system
Type of nurse hours	Rostering or payroll system e.g. standard, overtime, leave
Nurse classification	Rostering or payroll system e.g. registered nurse Requires national consistency
Nurse experience	Rostering or payroll system Requires national consistency, particularly experience in specialty
Nurse employment status	Rostering or payroll system e.g. part time, casual, agency Requires national consistency
Nurse qualifications	Usually not recorded in rostering or payroll systems Requires recording in rostering and payroll systems, national consistency, and mapping of international qualifications
Nurse accreditation	Rostering or payroll system and/or human resources system e.g. nurse practitioner, credentialed mental health nurse
“Specialling”	Potentially, rostering or payroll system Requires national consistency
Clinical area	Patient administration system or other hospital system Derive from National Health Workforce Dataset

Patient hours	Patient administration system
Patient turnover	Patient administration system Admission/discharge dates and times; patient movements
Occupied beds	Patient administration system
Patient complexity/acuity	Patient administration system AR-DRGs (National Weighted Activity Unit) provide an estimate but other tools may be needed for a more complete picture or in some specialist areas
Case mix	Patient administration system Span of AR-DRGs (or Major Diagnostic Categories [MDCs]) indicate the variety of cases
Admission type	Patient administration system Emergency or elective an additional indicator of acuity
Patient outcomes	ICD-10AM codes (Duffield et al., 2011a; Twigg, Duffield, Bremner, Rapley, & Finn, 2011), adverse event systems

Nursing hours per patient day and nurse patient ratios are applied in Australia to determine and distribute nursing workload. Few organisations report having a data-centric comprehensive nursing workforce plan that is linked to organisational strategy which informs key decision making. Nursing workforce information is currently stored at different information levels (aggregated or disaggregated), in disparate systems, with inconsistent coding schema that do not integrate well.

The identification of all useful elements for informing nursing workforce planning is challenging but necessary. Nationally consistent workforce data will support ongoing development of the nursing workforce and will inform future nursing related productivity debate, policy development, models of care, and service planning. It will enhance the future development of education, curriculum development, and research to the work of nurses. It is anticipated the World Health Organisation's State of the World's Nursing report 2020 will offer additional insights and recommendations to inform Australia's work in this vital area.

# CONCLUSION

There is limited consistency or commonality between current nursing workforce datasets, whether nationally or internationally. The emphasis is often on local utility over state or national standardisation. This inconsistency has a detrimental impact on such central matters as quantifying nursing work, evaluating the impact of current nursing staffing on patient outcomes, and on effective planning for future nursing needs. Many of the existing datasets do not incorporate factors that have been associated with patient outcomes or incorporate them in a limited way that restricts their utility.

The development of tools such as dashboards that can improve service delivery and clinical management are often undertaken at the state or local level, and may not incorporate all relevant data elements, leading to a disparity in how services understand and address their nursing needs. In order to facilitate strong context-relevant decision making, data and support should be made available to dataset users at all levels, who can apply their understanding to ensure the most effective utilisation of these data for positive patient outcomes.

As the pre-eminent professional nursing body, ACN is committed to working with the Australian Government and industry to facilitate a strong and sustainable nursing workforce to meet future health care needs of all Australians. An expanded, evidence-based minimum dataset is a fundamental component.



# RECOMMENDATIONS

General requirements for a comprehensive national nursing workforce dataset include:

- Consistency with existing national data dictionaries wherever common data elements exist;
- Adoption of standardised classifications for nursing positions, however named across jurisdictions;
- Incorporation of evidence-based outcomes into planning and decision-making processes;
- Assumption of existing outcome definitions (e.g. the Nursing Turnover Cost Calculation Methodology (Jones, 2005)).

In light of the discussion and research presented in this White Paper, ACN has two key recommendations that are essential for the effective planning and implementation of a sustainable nursing workforce:

1. Development of consistent national definitions and terminology for the nursing workforce.
  - a. This may entail data categorisation mapping across jurisdictions ('crosswalks') and the implementation of a national nomenclature (Gardner et al., 2017) to avoid the need to change current roles or terms.
2. An expanded, nationally consistent, minimum nursing workforce dataset should be developed and implemented. This dataset must:
  - a. Include a limited set of key measures for planning and utilisation at all levels.
    - i. These should incorporate measures identified from the research evidence (e.g. NHPPD/NPR, skill mix, education) known to be related to nurse, patient and system outcomes (adverse outcomes, patient satisfaction, job satisfaction, turnover)
  - b. Be based on a limited set of data elements that are routinely collectable and provide the basis for the key measures in (a) through aggregation or calculation.

Consideration should also be given to:

- A tiered approach to categorisation similar to that of other systems (for example the International Classification of Diseases), whereby additional digits or characters can be added to provide more precise information where needed in a given jurisdiction, while not compromising higher-level consistency.
- Development of definitions of key outcomes where they do not presently exist.
- The timeliness of dataset availability, and the requirements for associated skill development, in order to facilitate best use at all levels.
- An alternative to self-reporting for nationally important data such as this.

# REFERENCES

- ACT Government. (2017). *Act public sector nursing and midwifery enterprise agreement 2017- 2019*. Canberra: Australian Capital Territory
- Adomat, R., & Hicks, C. (2003). Measuring nursing workload in intensive care: An observational study using closed circuit video cameras. *Journal of Advanced Nursing*, 42(4), 402-412.
- AHPRA. (2018). Nursing and midwifery board of Australia annual report summary 2016/17. In. Canberra: Australian Health Practitioner Regulation Agency.
- AIHW. (2019). National minimum data sets and data set specifications. Retrieved from <https://meteor.aihw.gov.au/content/index.phtml/itemId/344846>
- Aiken, L. H., Sloane, D. M., Ball, J. E., Bruyneel, L., Rafferty, A. M., & Griffiths, P. (2018). Patient satisfaction with hospital care and nurses in england: An observational study. *BMJ Open*, 8(1), e019189.
- Aiken, L. H., Sloane, D. M., Bruyneel, L., Van den Heede, K., Griffiths, P., Busse, R., . . . Lesaffre, E. (2014). Nurse staffing and education and hospital mortality in nine european countries: A retrospective observational study. *The Lancet*, 383(9931), 1824-1830.
- Aiken, L. H., Sloane, D. M., Griffiths, P., Rafferty, A. M., Bruyneel, L., McHugh, M., . . . Sermeus, W. (2016). Nursing skill mix in european hospitals: Cross-sectional study of the association with mortality, patient ratings, and quality of care. *BMJ Quality & Safety*, 26(7), 559-568. doi:10.1136/bmjqs-2016-005567
- Auerbach, D. I., & Staiger, D. O. (2017). How fast will the registered nurse workforce grow through 2030? Projections in nine regions of the country. *Nursing Outlook*, 65(1), 116-122.
- Australian Industrial Relations Commission. (2002). *Exceptional matters order. Australian nursing federation and others and the honourable minister for health and others*. Perth: Australian Government Printer
- Australian Public Service Commission. (2019). Workforce planning guide. Retrieved from <https://www.apsc.gov.au/workforce-planning-resources>
- Brand, C. A., Barker, A. L., Morello, R. T., Vitale, M. R., Evans, S. M., Scott, I. A., . . . Cameron, P. A. (2012). A review of hospital characteristics associated with improved performance. *International Journal for Quality in Health Care*, 24(5), 483-494.
- Britnell, M. (2019). *Human: Solving the global workforce crisis in healthcare*. Oxford: Oxford University Press.
- Buchan, J., Twigg, D., Dussault, G., Duffield, C., & Stone, P. W. (2015). Policies to sustain the nursing workforce: An international perspective. *International Nursing Review*, 62(2), 162-170.
- Butler, M., Collins, R., Drennan, J., Halligan, P., O’Mathúna, D. P., Schultz, T. J., . . . Vilis, E. (2011). Hospital nurse staffing models and patient and staff-related outcomes. *Cochrane Database of Systematic Reviews*(7).
- Cambridge University Press. (2019). Cambridge dictionary. Retrieved from <https://dictionary.cambridge.org/>

Dahlke, S., & Baumbusch, J. (2015). Nursing teams caring for hospitalised older adults. *Journal of Clinical Nursing*, 24(21-22), 3177-3185. doi:10.1111/jocn.12961

Department of Health. (2019). National health workforce dataset. Retrieved from <https://hwd.health.gov.au/datasets.html>

DHHS. (2011). Safe staffing user manual – nursing hours per patient day model. In. Hobart, Tasmania: Department of Health and Human Services.

Duffield, C. (2009). Initial report on the implementation of the nhppd management tool for nursing staffing levels. In *Report prepared for the Northern Territory Minister for Health*. Darwin: Northern Territory Department of Health and Families.

Duffield, C., Diers, D., O'Brien-Pallas, L. L., Aisbett, C., Roche, M. A., King, M., & Aisbett, K. (2011a). Nursing staffing, nursing workload, the work environment and patient outcomes. *Applied Nursing Research*, 24(4), 244-255. doi:10.1016/j.apnr.2009.12.004

Duffield, C., Gardner, G., Chang, A. M., Fry, M., & Stasa, H. (2011b). National regulation in Australia: A time for standardisation in roles and titles. *Collegian*, 18(2), 45-49.

Duffield, C., Roche, M. A., Homer, C., Buchan, J., & Dimitrelis, S. (2014). A comparative review of nurse turnover rates and costs across countries. *Journal of Advanced Nursing*, 70(12), 2703-2712. doi:10.1111/jan.12483

Duffield, C., Roche, M. A., Wise, S., & Debono, D. (2019a). Harnessing ward level administrative data and expert knowledge to improve staffing decisions: A multi-method case study. *Journal of Advanced Nursing*. doi:10.1111/jan.14207

Duffield, C., Twigg, D., Roche, M. A., Williams, A., & Wise, S. (2019b). Uncovering the disconnect between nursing workforce policy intentions, implementation, and outcomes: Lessons learned from the addition of a nursing assistant role. *Policy, Politics, & Nursing Practice*. doi:10.1177/1527154419877571

Fagerström, L., Kinnunen, M., & Saarela, J. (2018). Nursing workload, patient safety incidents and mortality: An observational study from Finland. *BMJ Open*, 8(4), e016367.

Gardner, G., Duffield, C., Doubrovsky, A., Bui, U. T., & Adams, M. (2017). The structure of nursing: A national examination of titles and practice profiles. *International Nursing Review*, 64(2), 233-241.

Government of South Australia. (2016). *Nursing/midwifery (South Australia public sector) enterprise agreement 2016*. Adelaide: Government of South Australia

Greaves, J., Goodall, D., Berry, A., Shrestha, S., Richardson, A., & Pearson, P. (2018). Nursing workloads and activity in critical care: A review of the evidence. *Intensive and Critical Care Nursing*, 48, 10-20.

Hand, R. K., Albert, J. M., & Sehgal, A. R. (2018). Structural equation modeling to explore patient to staff ratios as an explanatory factor for variation in dialysis facility outcomes. *Journal of Renal Nutrition*, 28(5), 309-316.

Harrington, C., & Edelman, T. S. (2018). Failure to meet nurse staffing standards: A litigation case study of a large us nursing home chain. *INQUIRY: The Journal of Health Care Organization, Provision, and Financing*, 55, 0046958018788686.

Hayes, L. J., O'Brien-Pallas, L. L., Duffield, C., Shamian, J., Buchan, J., Hughes, F., . . . North, N. (2012). Nurse turnover: A literature review—an update. *International Journal of Nursing Studies*, 49(7), 887-905.

Health Workforce Australia. (2014). Nursing workforce sustainability: Improving nurse retention and productivity. In. Canberra: Department of Health.

Hurst, K. (2008). UK ward design: Patient dependency, nursing workload, staffing and quality—an observational study. *International Journal of Nursing Studies*, 45(3), 370-381.

IHPA. (2018). Australian refined diagnosis related groups (ar-drg) v7.0 (short and long description). Retrieved from <https://www.ihsa.gov.au/publications/australian-refined-diagnosis-related-groups-ar-drg-v70-short-and-long-description>

Jones, C. B. (2005). The costs of nurse turnover, part 2: Application of the nursing turnover cost calculation methodology. *Journal of Nursing Administration*, 35(1), 41-49.

Joyce, C. M., McNeil, J. J., & Stoelwinder, J. U. (2004). Time for a new approach to medical workforce planning. *The Medical Journal of Australia*, 180(7), 343-346.

Kane, R. L., Shamliyan, T. A., Mueller, C., Duval, S., & Wilt, T. J. (2007). The association of registered nurse staffing levels and patient outcomes: Systematic review and meta-analysis. *Medical Care*, 45(12), 1195-1204.

Klaus, S. F., Dunton, N., Gajewski, B., & Potter, C. (2013). Reliability of the nursing care hour measure: A descriptive study. *International Journal of Nursing Studies*, 50(7), 924-932.

Lang, T. A., Hodge, M., Olson, V., Romano, P. S., & Kravitz, R. L. (2004). Nurse–patient ratios: A systematic review on the effects of nurse staffing on patient, nurse employee, and hospital outcomes. *Journal of Nursing Administration*, 34(7), 326-337.

Lankshear, A. J., Sheldon, T. A., & Maynard, A. (2005). Nurse staffing and healthcare outcomes: A systematic review of the international research evidence. *Advances in Nursing Science*, 28(2), 163-174.

Lavander, P., Meriläinen, M., & Turkki, L. (2016). Working time use and division of labour among nurses and health-care workers in hospitals—a systematic review. *Journal of Nursing Management*, 24(8), 1027-1040.

Mark, B. A., & Harless, D. W. (2011). Adjusting for patient acuity in measurement of nurse staffing: Two approaches. *Nursing Research*, 60(2), 107-114.

Massey, L., Esain, A., & Wallis, M. (2009). Managing the complexity of nurse shortages: A case study of bank and agency staffing in an acute care trust in Wales, UK. *International Journal of Nursing Studies*, 46(7), 912-919.

Nelson, A., Powell-Cope, G., Palacios, P., Luther, S. L., Black, T., Hillman, T., . . . Gross, J. C. (2007). Nurse staffing and patient outcomes in inpatient rehabilitation settings. *Rehabilitation Nursing*, 32(5), 179-202.

NSW Health. (2019). *Public health system nurses' and midwives'(state) award 2019*. North Sydney: New South Wales Ministry of Health

Hospital and health boards (safe nurse-to-patient and midwife-to-patient ratios) amendment bill, No. 29, Parliament of Queensland, (2015).

Safe patient care (nurse to patient and midwife to patient ratios) act, No. 51 of 2015, Parliament of Victoria, (2015).

Safe patient care (nurse to patient and midwife to patient ratios) amendment bill, No. 1 of 2018, Parliament of Victoria, (2018).

Pillay, T., Nightingale, P., Owen, S., Kirby, D., & Spencer, A. (2012). Neonatal nurse staffing and delivery of clinical care in the ssbc newborn network. *Archives of Disease in Childhood-Fetal and Neonatal Edition*, 97(3), F174-F178.

Possari, J. F., Gaidzinski, R. R., Lima, A. F. C., Fugulin, F. M. T., & Herdman, T. H. (2015). Use of the nursing intervention classification for identifying the workload of a nursing team in a surgical center. *Revista Latino-Americana de Enfermagem*, 23(5), 781-788.

Queensland Health. (2016). *Business planning framework: A tool for nursing and midwifery workload management*. Brisbane: Queensland Health Retrieved from [http://qheps.health.qld.gov.au/nmoq/workforce/bpf\\_about.htm](http://qheps.health.qld.gov.au/nmoq/workforce/bpf_about.htm)

Queensland Health. (2019). Office of the chief nursing and midwifery officer: Nurse to patient ratios. Retrieved from <https://www.health.qld.gov.au/ocnmo/nursing/nurse-to-patient-ratios>

Rassin, M., & Silner, D. (2007). Trends in nursing staff allocation: The nurse-to-patient ratio and skill mix issues in israel. *International Nursing Review*, 54(1), 63-69.

Roche, M. A., Duffield, C., Aisbett, C., Diers, D., & Stasa, H. (2012). Nursing work directions in Australia: Does evidence drive the policy? *Collegian*, 19(4), 231-238. doi:10.1016/j.colegn.2012.03.006

Roche, M. A., Duffield, C., Homer, C., Buchan, J., & Dimitrelis, S. (2015). The rate and cost of nurse turnover in Australia. *Collegian*, 22(4), 353-358. doi:10.1016/j.colegn.2014.05.002

Tasmanian Industrial Commission. (2007). *Variation of registered industrial agreement t13071 of 2007 - nhppd model*. Hobart: Tasmanian Industrial Commission

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

Twigg, D., Myers, H., Duffield, C., Pugh, J., Gelder, L., & Roche, M. A. (2016). The impact of adding assistants in nursing to acute care hospital ward nurse staffing on adverse patient outcomes: An analysis of administrative health data. *International Journal of Nursing Studies*, 63, 189-200. doi:10.1016/j.ijnurstu.2016.09.008

Van Bogaert, P., Timmermans, O., Weeks, S. M., van Heusden, D., Wouters, K., & Franck, E. (2014). Nursing unit teams matter: Impact of unit-level nurse practice environment, nurse work characteristics, and burnout on nurse reported job outcomes, and quality of care, and patient adverse events—a cross-sectional survey. *International Journal of Nursing Studies*, 51(8), 1123-1134.

Van den Heede, K., Clarke, S. P., Sermeus, W., Vleugels, A., & Aiken, L. H. (2007). International experts' perspectives on the state of the nurse staffing and patient outcomes literature. *Journal of Nursing Scholarship*, 39(4), 290-297.

Van den Heede, K., Diya, L., Lesaffre, E., Vleugels, A., & Sermeus, W. (2008). Benchmarking nurse staffing levels: The development of a nationwide feedback tool. *Journal of Advanced Nursing*, 63(6), 607-618.

Welton, J. M. (2011). Hospital nursing workforce costs, wages, occupational mix, and resource utilization. *JONA: The Journal of Nursing Administration*, 41(7/8), 309-314.

Wilson, S., Bremner, A., & Hauck, Y. (2010). Association between nurse staffing and hospitalised children's health outcomes: A systematic review. *JBI Database of Systematic Reviews and Implementation Reports*, 8(8), 1-15.

Wynendaele, H., Willems, R., & Trybou, J. (2019). Systematic review: Association between the patient–nurse ratio and nurse outcomes in acute care hospitals. *Journal of Nursing Management*, 27(5), 896-917. doi:10.1111/jonm.12764



