

A review of pressure injury rates in Australian hospitals

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Executive Summary

Background

In 2012, The Australia Commission for Safety and Quality in Health (ASQHC) published a safety and quality improvement guide for Standard 8 – the prevention and management of pressure injuries ^[1]. As a result, robust audit and data collection systems should be developed to evaluate the effectiveness of current strategies and identify areas where improvements can be made. Consequently, health service organisations should ensure that mechanisms are in place to collect data on incidence, prevalence and severity of pressure injuries ^[2].

To ensure the highest quality of care for our patients, and in alignment with National Standards set out by the ASQHC, the Monash Health Skin Integrity Committee is interested in pressure injury rates in Australian hospitals in order to benchmark pressure injury rates and indicators within Monash Health.

Objective

To review the evidence on pressure injury rates in Australian hospitals to determine the target rate used to benchmark the rate of pressure injuries in Monash Health.

Search Strategy

A search was performed in one medical database, four guideline sources and the internet according to the inclusion and exclusion criteria and detailed strategy listed in Table 1.

Results

Three items of peer-reviewed literature were included:

- A Systematic review on the prevalence of pressure injuries in an acute care setting (2017) ^[3]
- A Statewide audit (2012-2014) conducted in Queensland (2017) ^[4]
- A Ten-year audit (2002-2012) in a tertiary hospital in Brisbane (2013) ^[5]

Four items of grey literature were included:

- Best practice suggestions for hospitals published by the Australia Commission on Safety and Quality in Health Care (2018) ^[2]
- Best practice guidelines for intensive care by the New South Wales Agency for Clinical Innovation (2014) ^[6]
- An Australasian Clinical Indicator Report published by the Australia Council on Healthcare Standards (2017) ^[7]
- A Pressure injury point prevalence survey report published by the Clinical Excellence Commission (2018) ^[8]

Conclusions

Number of Pressure Injuries

- In 2015-2016, the rate of hospital-acquired pressure injuries in Australian hospitals was 9.7 injuries per 10,000 hospitalisations ^[2].
- In 2017, the annual rate of inpatients who develop one or more pressure injury was 0.071 per 100 bed days ^[7].
- Statewide prevalence rates from 2012 onwards range from 3.4–9.2% in New South Wales, Western Australia and Queensland ^[4,5,8]; where a hospital-acquired pressure injury prevalence was 4% in the most recent 2018 audit in New South Wales ^[8].
- In Queensland, hospitals are required to conduct annual point prevalence audits with a target of 10% or less hospital acquired pressure injury ^[4].

Number of Pressure Injuries ≥ Stage 3

- This data is not commonly reported in literature. One article reports that pressure injuries of Stage 3 or Stage 4 are less prevalent than Stage 2 in non-intensive care and intensive care patients [4].
- In ICU patients, the prevalence of Stage 3 and Stage 4 pressure injuries was each 2%; in non-ICU patients, the prevalence of Stage 3 and Stage 4 pressure injuries was 2% and 10%, respectively [4].

Number of Pressure Injuries by Stage

- Only two articles report this data [4,8].
- In a recent 2018 audit in New South Wales, Stage 1 and Stage 2 hospital-acquired pressure injuries prevalence was 54% and 31%, respectively [8].
- Excluding Stage 1, Stage 2 hospital-acquired pressure injury prevalence was the most common stage reported (53% for ICU patients vs 63% for non-ICU patients) [4]. More detailed numbers of pressure injuries by stage are found in Table 2. Page 5 Full Report.

Pressure Injuries by Body Location

- The two most common pressure injuries, as reported by four articles, occurs at the sacrum/coccyx (20–41%) and heels (16–27%) [3,4,6,8].
- Other locations reported include and are not limited to the buttocks, lips and nose. To note, mucosal pressure injury proportion was significantly higher in intensive care patients (22%) than in non-intensive care patients (2%) [4].

Number of Pressure Injury Reports by Program

- Vast majority of pressure injuries (61–73%) are reported as intensive care-acquired [6], however only one article compared pressure injury prevalence between programs (i.e., ICU vs non-ICU) [4].
- Overall hospital-acquired pressure injury prevalence was higher (11%) for intensive care patients as compared with non-intensive care patients (3%), where intensive care patients were 3.8 times more likely than non-intensive care patients to develop a pressure injury whilst in hospital [4].

Implications for practice

There is no single 'right' approach to measuring pressure ulcer rates. Every approach has advantages and disadvantages. While considering recommendations from various sources, the most important point is to be consistent. Rates calculated by one approach or methodology cannot be compared to rates calculated another way [2].

Full Report

Background

In 2012, The Australia Commission for Safety and Quality in Health (ASQHC) published a safety and quality improvement guide for Standard 8 – the prevention and management of pressure injuries [1]. As a result, robust audit and data collection systems should be developed to evaluate the effectiveness of current strategies and identify areas where improvements can be made. Consequently, health service organisations should ensure that mechanisms are in place to collect data on incidence, prevalence and severity of pressure injuries [2].

To ensure the highest quality of care for our patients, and in alignment with National Standards set out by the ASHQC, the Skin Integrity Committee is interested in pressure injury rates in Australian hospitals in order to benchmark pressure injury rates and indicators within Monash Health.

Objectives

To review the evidence on pressure injury rates in Australian hospitals to determine the target rate used to benchmark the rate of pressure injuries in Monash Health.

Definitions

The terms pressure injury and pressure ulcer are used interchangeably in literature, and will be referred to as pressure injuries for the purpose of this report.

Prevalence – The total number of a given population with pressure injuries (PI) [6]. It describes the number or percentage of people having a pressure ulcer while on the unit. It may reflect a single point in time or prolonged period of time (i.e. entire hospital stay) [2]. Most recent literature report hospital-acquired pressure injury (HAPI) prevalence.

Incidence – The proportion of at-risk patients who develop a new pressure injury over a specific period [6]. It describes the number or percentage of people developing a new ulcer while in a facility or unit. Therefore, incidence only counts pressure injuries developing after admission [2].

Search strategy

Inclusion/Exclusion Criteria

Table 1. Inclusion/Exclusion criteria decided *a priori* in accordance with PRISMA statement [9]

Population	Include: Hospitals in Australia
Interventions	Include: Pressure Injury rates/prevalence
Outcomes	Primary: Benchmarking/target rates based on following indicators <ul style="list-style-type: none">• Number of Pressure Injuries• Number of Pressure Injuries ≥ Stage 3• Number of Pressure Injuries by stage• Pressure injuries by body location• Number of pressure injury reports by program
Types of evidence	Include: Peer-reviewed and grey literature Exclude: Conference abstracts
Limits	Date: 2013 – Current (22 June 2018) Publications: Systematic reviews (and Australia-wide studies), guidelines, quality standards, white papers Language: Publications in English
Databases	Medical: Cochrane Database of Systematic Reviews; Ovid MEDLINE(R) Epub Ahead of Print, In-Process & Other Non-Indexed Citations, Ovid MEDLINE(R) Daily, Ovid MEDLINE and Versions(R) Guideline Databases: National Institute of Health and Care Excellence, TRIP Database, National Health and Medical Research Council, National Guidelines Clearinghouse Grey Literature Databases: Google

Study Selection

Titles and abstracts identified were exported to EndNote X7 (Thompson, Reuters, Carlsbad, California, USA). Papers identified were screened using inclusion and exclusion criteria established *a priori*. Searches of Medline, the internet (using Google) and guideline websites were screened by one reviewer in consultation with colleagues as necessary. Literature was included based on the above criteria.

Quality Appraisal

No quality appraisal was conducted for grey literature search. The systematic review was of high quality whereas methodological quality of included studies were variable, making it difficult to compare the reported pressure injury outcomes (e.g., prevalence rates) between and across different countries and regions [3]. The other two items of peer-reviewed literature were retrospective audits, and therefore open to a high risk of bias [4,5].

Results

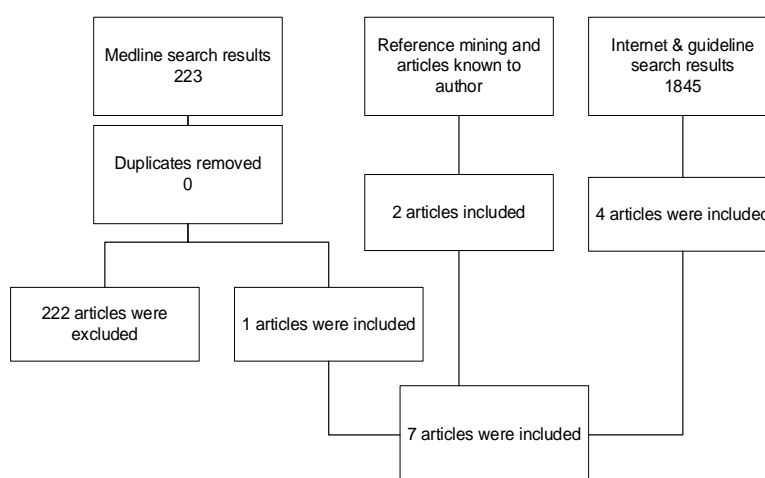
Summary of Findings

Figure 1. Flow diagram to indicate the included articles from the different sources searched.

A total of 223 articles were identified from the medical database search (Ovid Medline). After screening, 1 article was included.

A total of 1845 articles were identified from the grey literature sources. After screening, 4 articles were included.

Reference mining from articles identified in the search, as well as previous articles already known to the author resulted in 2 more references being included. Details and results of search are found in Appendix Table 3.



Three items of peer-reviewed literature were included:

- Systematic review on the prevalence of pressure injuries in acute care setting (2017) [3]
- Statewide audit (2012-2014) conducted in Queensland (2017) [4]
- Ten-year audit (2002-2012) in a tertiary hospital in Brisbane (2013) [5]

Four items of grey literature were included:

- Best practice suggestions for hospitals published by the Australia Commission on Safety and Quality in Health Care (2018) [2]
- Best practice guidelines for intensive care by the New South Wales Agency for Clinical Innovation (2014) [6]
- Australasian Clinical Indicator Report published by the Australia Council on Healthcare Standards (2017) [7]
- Pressure injury point prevalence survey report published by the Clinical Excellence Commission (2018) [8]

The included literature use the approach and methodology from the two resources:

1. Australian Wound Management Association (AWMA). Pan Pacific Clinical Practice Guideline for the Prevention and Management of Pressure Injury. Osborne Park, WA: Cambridge Media; 2012 [10]
2. National Pressure Ulcer Advisory Panel (NPUAP), European Pressure Ulcer Advisory Panel, and Pan Pacific Pressure Injury Alliance. Prevention and Treatment of Pressure Ulcers: Quick Reference Guide. Osborne Park, Australia: Cambridge Media; 2014 [11]

Synthesis of results

Table 2. Indicators of interest for pressure injuries rates in hospitals

1. Number of pressure injuries																							
<p>Australia-wide: There were 4,313 pressure injuries occurring in Australian public hospitals in 2015-2016. The rate of hospital-acquired pressure injuries (HAPI) which includes the diagnoses Stage III ulcer, Stage IV ulcer and Unspecified decubitus ulcer and pressure area, in Australian hospitals was 9.7 injuries per 10,000 hospitalisations in 2015–16 [2].</p> <p>The Australasian Clinical Indicator Report 2017 presents data from 825 healthcare organisations (HCO), which has been validated by statisticians. In 2016, there were 724 records from 414 HCOs. The annual rate of inpatients who develop one or more pressure injury was 0.071 per 100 bed days. In 2016, the potential gains totalled 6,733 fewer patients who develop one or more pressure injuries, corresponding to a reduction by approximately three-quarters. In 2016, there were 49 outlier records from 36 HCOs whose combined excess was 2,289 more patients who develop one or more pressure injuries. The outlier HCO rate was 0.16 per 100 bed days [7].</p> <p>State-wide: In 2017, 17 New South Wales (NSW) Health local health districts and specialty health networks (consisting of 172 inpatient facilities) undertook a comprehensive pressure injury prevalence survey. Overall prevalence of pressure injuries for inpatients consenting to a skin inspection in hospitals in NSW was 7.7%; where prevalence of HAPI was 4.0% [8]. The prevalence rate in 18 rural hospitals in NSW, was 6% in 2000, as reported in a 2017 systematic review [3].</p> <p>A HAPI prevalence was 3.4% in intensive care (ICU) and non-ICU patients, published in a national three-year audit (2012–2014) in 18 hospitals in Queensland [4].</p> <p>Miles et al (2013) reported a district recorded prevalence rate of HAPI in 2011 to be 7.6%, which was comparable to state-wide prevalence rates in Queensland, Western Australia and NSW (8.8%; 7.7%; and 9.2% respectively) [5]. The statewide prevalence for HAPI in Victoria, as reported by a 2006 survey, was 11.9% [5].</p>																							
2. Number of pressure injuries ≥ stage 3																							
<p>This was not commonly reported in literature, and only one article reported data on pressure injury ≥ Stage 3 [4].</p> <p>In ICU patients, the prevalence of Stage 3 and Stage 4 pressure injuries was each 2%. In non-ICU patients, the prevalence of Stage 3 and Stage 4 pressure injuries was 2% and 10%, respectively [4]. Stage 1 pressure injuries were excluded in the analysis. Detailed tables of results are found in Appendix Tables 5 and 6.</p>																							
3. Number of pressure Injuries by stage																							
<p>Hospital-acquired pressure injury rates reported in hospitals in NSW in a 2017 point prevalence survey was [8]:</p> <p>Stage 1: 54%</p> <p>Stage 2: 31%</p> <p>In another article, Stage 1 PI was excluded from analysis on the basis that these injuries are reversible; therefore Stage 2 HAPI prevalence was the most common stage reported [4].</p> <table border="1"> <thead> <tr> <th>Stages</th> <th>ICU</th> <th>Non-ICU</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Not analysed</td> <td>No analysed</td> </tr> <tr> <td>2</td> <td>n=26 (53%)</td> <td>n=179 (63%)</td> </tr> <tr> <td>3</td> <td>n=1 (2%)</td> <td>n=28 (10%)</td> </tr> <tr> <td>4</td> <td>n=1 (2%)</td> <td>n=4 (3%)</td> </tr> <tr> <td>*Unstageable</td> <td>n=6 (22%)</td> <td>n=31 (11%)</td> </tr> <tr> <td>^Suspected deep tissue injury (SDTI)</td> <td>n=3 (5%)</td> <td>n=43 (15%)</td> </tr> </tbody> </table> <p>Hospital-acquired pressure injury rates reported in non-ICU and ICU patients (2012-2014) are listed in the Appendix Tables 5 and 6.</p>			Stages	ICU	Non-ICU	1	Not analysed	No analysed	2	n=26 (53%)	n=179 (63%)	3	n=1 (2%)	n=28 (10%)	4	n=1 (2%)	n=4 (3%)	*Unstageable	n=6 (22%)	n=31 (11%)	^Suspected deep tissue injury (SDTI)	n=3 (5%)	n=43 (15%)
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^Suspected deep tissue injury (SDTI)	n=3 (5%)	n=43 (15%)																					
<p>*Unstageable – Full thickness tissue loss in which the base of the wound is covered by slough and/or eschar in the wound bed. Depth unknown.</p> <p>^SDTI – A localised area of purple or maroon discoloured, intact skin or blood-filled blister. The area may be preceded by tissue that is painful, firm, mushy, boggy, warmer or cooler as compared to surrounding tissue. Depth unknown.</p>																							

4. Pressure injuries by body location

Data on pressure injuries by body location was reported by four articles [3,4,6,8].

In a NSW evaluation conducted in 2012, the distribution of pressure injury in ICU according to location are [6]:

1. Sacrum (29% in 2009; 30.1% in 2010; 29% in 2011)
2. Heels (19.7% in 2009; 16.3% in 2010; 19.7% in 2011)
3. Buttock (11.1% in 2009; 14.8% in 2010; 11.1% in 2011)
4. Lips/mouth (9.2% in 2009; 8.8% in 2010; 6.6% in 2011)
5. Nose/nares (6.9 % in 2009; 7.5% in 2010; 6.3% in 2011)

Hospital-acquired pressure injury rates reported in NSW hospitals in a 2017 point prevalence survey was [8]:

1. Buttocks and sacrum (41%)
2. Heels (27%)

In rural hospitals in NSW, the prevalence rate reported by one study (n=18 rural hospitals) in 2000 [3]:

1. Sacrum (20%)
2. Heels (26%)

In a three-year audit conducted in Queensland between 2012-2014, the three most common PI by site were [4]:

1. Sacrum/coccyx (34%)
2. Heels (21%)
3. Nose (5%)

A list of pressure injuries listed by site are included in Appendix Table 7 [4].

5. Number of pressure injury reports by program

The NSW Agency for Clinical Innovation report 2427 pressure injuries (790 in 2009, 863 in 2010 and 774 in 2011) with the vast majority reported as ICU-acquired (72% in 2009, 61% in 2010 and 73% in 2011) [6].

The Queensland Bedside Audit (QBA), is a significant collaborative annual clinical benchmarking process within Queensland Health Hospital Health Service (HHS). The QBA audit measures clinical practice within health care facilities against elements of the National Safety Quality Health Service Standards which can be compared between and within facilities of the HHS and benchmarked. Tools developed for the HHS in response to the National Safety and Quality Health Service Standards, were used in collect QBA audit data to compare state-wide pressure injury prevalence of ICU versus non-ICU patients [4].

In Queensland, prevalence was significantly higher in ICU patients (11.5%, n = 296) than non-ICU patients (3.0%) ($p < 0.001$), where HAPI prevalence in non-ICU patients was skewed towards those in older age groups, especially those aged ≥ 76 years (4.0%, n = 2114). Mucosal pressure injury proportion was significantly higher in intensive care patients (22%) [4].

Discussion

In acute care, prevalence rate varies between studies depending on the methodology of data collection [3]. The two main approaches and methodology that are referenced are the Australian Wound Management Association [10] and the National Pressure Ulcer Advisory Panel [11]. With the advent of the classification in 2009 (EUPAP) of the suspected deep tissue injury and unstageable pressure injury, more recent studies report a higher and increasing incidence of these classifications of pressure injuries [6]. Also worthy of note is the inclusion of incontinence associated dermatitis (IAD) questions in most recent point prevalence survey (2018) in NSW [8].

It is critical to distinguish between incidence and prevalence. Incidence rates capture new pressure injuries developing during an admission, and provide the most direct evidence of the quality of care [2]. Prevalence rates include all pressure injuries present in a group of patients – those that developed during a hospital stay as well as those that developed elsewhere [2]. Prevalence rates can provide a useful snapshot of the pressure injury burden but they say less about your quality of preventive care than do incidence rates [2]. However, it is noted that prevalence measurements may be useful by providing an estimate of the frequency of pressure injuries and therefore the scope of the problem in a given setting [3]. Recently, much included literature report on the prevalence of hospital-acquired pressure injury (HAPI) [2,4,5,8]. Inpatients who develop one or more pressure injuries is also listed as a clinical indicator in the Australasian Clinical Indicator Report [7]. Having said this, HAPI is commonly viewed as a nurse-sensitive indicator. Nevertheless it is important to note that the impact of nursing care on prevention may be complicated by patient factors, for example, patients who decline repositioning or nutritional guidance [7].

In Queensland, hospitals are required to conduct annual point prevalence audits with a target of 10% or less hospital-acquired PI set in the Patient Safety and Quality Plan 2008–2012 [4]. In NSW, the CEC supports a standard approach to pressure injury point prevalence survey data collection [8,12]. To facilitate this, a Monitoring and Auditing Framework was released in March 2014 [13], and an electronic data collection tool was released in the QARS in July 2016 [14].

Having said this, the most important thing is to be consistent. Therefore, rates calculated by one approach or methodology cannot be compared to rates calculated another way [2].

Conclusions

Number of Pressure Injuries

In 2015-2016, the rate of hospital-acquired pressure injuries in Australian hospitals was 9.7 injuries per 10,000 hospitalisations [2]; the annual rate of inpatients who develop one or more pressure injury was 0.071 per 100 bed days [7]. Statewide prevalence rates from 2012 onwards range from 3.4–9.2% in New South Wales, Western Australia and Queensland [4,5,8]. In the most recent audit in New South Wales, HAPI prevalence was 4% [8]. In Queensland, hospitals are required to conduct annual point prevalence audits with a target of 10% or less hospital acquired pressure injury [4].

Number of Pressure Injuries ≥ Stage 3

This data is not commonly reported in literature. One article reports that pressure injuries of Stage 3 or Stage 4 are less prevalent than that of Stage 2 in non-intensive care and intensive care patients [4]. In ICU patients, the prevalence of Stage 3 and Stage 4 pressure injuries was each 2%. In non-ICU patients, the prevalence of Stage 3 and Stage 4 pressure injuries was 2% and 10%, respectively [4].

Number of Pressure Injuries by stage

Only two articles report this data [4,8]. In the most recent audit in New South Wales, Stage 1 and Stage 2 HAPI prevalence was 54% and 31%, respectively [8]. Excluding Stage 1, Stage 2 hospital-acquired pressure injury prevalence was the most common stage reported (53% for ICU patients vs 63% for non-ICU patients) [4].

Pressure injuries by body location

The two most common pressure injuries, as reported by four articles, occurs at the sacrum/coccyx (20–41%) and heels (16–27%) [3,4,6,8]. Other locations reported include and are not limited to the buttocks, lips and nose. To note, mucosal pressure injury proportion was significantly higher in intensive care patients (22%) than in non-intensive care patients (2%) [4].

Number of pressure injury reports by program

Vast majority of pressure injuries (61–73%) are reported as intensive care-acquired [6], however only one article compared pressure injury prevalence between programs (i.e., ICU vs non-ICU) [4].

Overall hospital-acquired pressure injury prevalence was higher (11%) for intensive care patients as compared with non-intensive care patients (3%), where intensive care patients were 3.8 times more likely (RR 2.7–5.4, 95% CI) than non-intensive care patients to develop a pressure injury whilst in hospital [4].

Implications for practice

There is no single 'right' approach to measuring pressure ulcer rates. Every approach has advantages and disadvantages. While considering recommendations from various sources, the most important thing is to be consistent. Rates calculated by one approach or methodology cannot be compared to rates calculated another way [2].

References

1. Australian Commission on Safety and Quality in Health Care. Safety and Quality Improvement Guide Standard 8: Preventing and Managing Pressure Injuries (October 2012). Sydney: ACSHQC; 2012.
2. Australian Commission on Safety and Quality in Health Care. Selected best practices and suggestions for improvement for clinicians and health system managers; (March 2018). Sydney: ACSHQC; 2018.
3. Tubaishat A., Papanikolaou P., Anthony D. and Habiballah, L. Pressure Ulcers Prevalence in the Acute Care Setting: A Systematic Review, 2000-2015. *Clinical Nursing Research*. 2017; 1-28.
4. Coyer F., Miles S., Gosley S., Fullbrook P. *et al.* 2017 Pressure injury prevalence in intensive care versus non-intensive care patients: A state-wide comparison. *Australian Critical Care*. 2017; 30:244-250.
5. Miles SJ., Fullbrook P. and Franks C. Decreasing pressure injury prevalence in an Australian general hospital: a 10-year review. *Wound practice research*. 2013; 21 (4): 148-156.
6. Rolls K, Jones S, Power D, Cook S, Flood K, Hennessy C, Mackenzie K, Robertson Y, Rodgers J, Blanchfield D, Kuzmiuk L and Fullbrook P. Pressure Injury Prevention for Critically Ill Adults: a clinical practice guideline. Agency for Clinical Innovation NSW Government Version 1, Chatswood NSW; 2014
7. Australian Council on Healthcare Standards (ACHS). Australasian Clinical Indicator Report: 2009–2016: 18th Edition. Sydney, Australia; ACHS; 2017.
8. Clinical Excellence Commission. 2017 NSW Pressure Injury Point Prevalence Survey Report (2018), Sydney: Clinical Excellence Commission; 2018
9. Moher, D., Liberati, A., Tetzlaff J., and Altman D.G. Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. *BMJ*. 2009;339:b2535
10. Australian Wound Management Association (AWMA). Pan Pacific Clinical Practice Guideline for the Prevention and Management of Pressure Injury. Osborne Park, WA: Cambridge Media; 2012.
11. National Pressure Ulcer Advisory Panel, European Pressure Ulcer Advisory Panel, and Pan Pacific Pressure Injury Alliance. Prevention and Treatment of Pressure Ulcers: Quick Reference Guide. Osborne Park, Australia: Cambridge Media; 2014.

Additional Resources

12. http://www.cec.health.nsw.gov.au/_data/assets/pdf_file/0005/259250/pipmp-monitoring-and-auditing-framework-march-2014.pdf
13. A Monitoring and Auditing Framework promoting a standard approach to pressure injury point prevalence survey data collection. <http://www.cec.health.nsw.gov.au/patient-safetyprograms/adult-patient-safety/pressure-injury-preventionproject/evaluation>
14. Electronic data collection tool to support the 2018 Point Prevalence survey; Quality Audit Reporting System (QARS) available at <http://qars.cec.health.nsw.gov.au/>

Excluded

Nicholas Graves & Henry Zheng. The prevalence and incidence of chronic wounds: a literature review. *Wound practice and research*, Vol 22 (1): March 2014 pp 4-19.

Victorian Quality Council VQC State-wide PUPPS Report 2006. [Internet]. Victoria; Department of Human Services; 2007 Available from: <http://www.health.vic.gov.au/pressureulcers/downloads/pupps3.pdf>

Nguyen K-H, Chaboyer W, Whitty JA. Pressure injury in Australian public hospitals: a cost-of-illness study. *Australian Health Review*, 2015.

Hahnel E., Lichterfeld A., Blume-Peytavi U., and Kottner, J. The epidemiology of skin conditions in the aged: A systematic review. *Journal of tissue viability*, 2017; 26: 20-28

Australian Institute of Health and Welfare 2009. Towards national indicators of safety and quality in health care. Cat. no. HSE 75. Canberra: AIHW. Summary and Appendix 1.

Appendix 1

Table 3. Information sources and search terms

Search Terms		
Terms related to “pressure (injuries OR ulcers)” AND “rate OR prevalence”		
Search Results		
Guideline Databases	Search Results	Included
TRIP Database	857	0
National Health and Medical Research Council	1	1
National Guidelines Clearinghouse (Website available only until 16 July 2018)	162	0
Agency for Healthcare Research and Quality	600	0
Google	225	3

Table 4. Database Search Terms

Search terms in Medline (25 June 2018)	
1	exp Pressure Ulcer/cl, di, ep, nu [Classification, Diagnosis, Epidemiology, Nursing]
2	exp Skin Ulcer/cl, di, ep, nu [Classification, Diagnosis, Epidemiology, Nursing]
3	decubit*.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]
4	(skin adj3 breakdown).mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]
5	bedsore.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]
6	(bed adj1 sore).mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]
7	(decubitus adj (ulcer or sore)).mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]
8	(pressure adj (wound or sore or ulcer or injur* or damag*)).mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]
9	1 or 2 or 3 or 4 or 5 or 6 or 7 or 8
10	(incidence or prevalence or rate or survey or statistic*).mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]
11	9 and 10
12	limit 11 to (english language and humans and yr="2013 -Current")
13	Limit 12 to “review articles”
	Results = 223

Table 5. Hospital-acquired pressure injury rates reported in ICU patients (2012-2014) listed according to ICU level [4]

Table 3
Hospital-acquired PI by stage and ICU level.

Hospital ICU level	Stage II n (%)		Stage III n (%)		Stage IV n (%)		Unstageable n (%)		SDTI n (%)		Mucosal injury n (%)		Totals n (%)	
	ICU	Non-ICU	ICU	Non-ICU	ICU	Non-ICU	ICU	Non-ICU	ICU	Non-ICU	ICU	Non-ICU	ICU	Non-ICU
I	-	23 (62)	-	1 (3)	-	0 (0)	-	6 (16)	-	5 (14)	-	2 (5)	-	37 (100)
II	10 (67)	67 (74)	1 (7)	6 (7)	0 (0)	1 (1)	0 (0)	8 (9)	0 (0)	8 (9)	4 (27)	0 (0)	15 (100)	90 (100)
III	10 (37)	89 (57)	0 (0)	13 (8)	1 (4)	3 (2)	6 (22)	17 (11)	3 (11)	30 (19)	7 (26)	3 (2)	27 (100)	155
Total n (%)	26 (53)	179 (63)	1 (2)	28 (10)	1 (2)	4 (3)	6 (22)	31 (11)	3 (6)	43 (15)	11 (22)	5 (2)	49 (100)	282 (100)

Results are not reported where there were fewer than 10 patients in the sample.

Table 6. Hospital-acquired pressure injury rates reported in non-ICU patients (2012-2014) [4]

Table 4
Hospital-acquired PI by site per stage for non-ICU patients.

PI site	Hospital-acquired PI stage- Non-ICU									
	Stage 2		Stages 3 and 4		UPI and SDTI		Mucosal		Total per site	
	n	%	n	%	n	%	n	%	n	%
Occiput	2	1%	2	8%						4
Ear	6	3%								6
Nose	6	3%	1	4%			2	40%		9
Lips/mouth										0
Scapula	3	2%								3
Humeral head										0
Upper arm										0
Lower arm/hand	3	2%			4	5%				7
Elbow	7	4%	1	4%	2	3%				10
Finger			1	4%						1
Spine	5	3%	1	4%	1	1%				7
Ischium	2	1%	3	13%	3	4%				8
Sacrum/coccyx	78	44%	14	58%	8	11%				100
Trochanter/hip	3	2%								3
Knee	2	1%								2
Lower leg	2	1%			1	1%				3
Ankle	6	3%			7	9%				13
Heel	30	17%			36	49%				66
Foot	5	3%			3	4%				8
Toe	8	4%	1	4%	5	7%				14
Other	11	6%			4	5%	3	60%		18
Total per stage	179	100%	24	100%	74	100%	5	100%		282

n: number of hospital-acquired pressure injuries for non-ICU patients.

% Represents number of HAPI per site and stage divided by total number of HAPI per stage for all CSCF level 4,5 and 6 non- ICU patients.

Note: site of upper arm was not collected in 2012 QBA; it was added for 2013 and 2014 QBA.

UPI: unstageable pressure injury.

SDTI: suspected deep tissue injury.

Table 7. Pressure injury by site [4]

Table 5
Hospital-acquired PI by site.

	ICU patients n (%)	Non-ICU patients n (%)	Total n (%)
Sacrum/coccyx	11 (22)	100 (35)	111 (34)
Heels	5 (10)	66 (23)	71 (21)
Nose	6 (12)	9 (3)	15 (5)
Ears	7 (14)	6 (2)	13 (4)
Lips/mouth	8 (16)	0 (0)	8 (2)
Other sites	12 (25)	101 (36)	113 (34)
Total	49 (100)	282 (100)	331 (100)