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**A guide to the potentially
preventable
hospitalisations indicator
in Australia**

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Level 5, 255 Elizabeth Street, Sydney NSW 2001

Phone: (02) 9126 3600

Fax: (02) 9126 3613

Email: mail@safetyandquality.gov.au

Website: www.safetyandquality.gov.au

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Preface

This preface has been written by the Australian Commission on Safety and Quality in Health Care (the Commission). The guide was written by subject experts from the Centre for Big Data Research in Health, University of New South Wales.

The guide was developed in consultation with the Commission and the Australian Institute of Health and Welfare on behalf of the National Health Information Standards and Statistics Committee (NHISSC).

This guide is intended to help professionals within the health system to understand and interpret one of the indicators in the National Health Performance Framework (NHPF), which focuses on potentially preventable hospitalisations. The NHPF was first developed in 2001 and revised in 2009, with the main purpose of providing a structure for reporting on the performance of the Australian health system at the national level. The framework can also be used as a guiding structure when developing sets of performance indicators for more discrete components of the health system, such as a particular program, or a specific target group.

Within certain sectors of the health system, there is a lack of clarity regarding how to accurately interpret the NHPF indicator^{1,2} 'Potentially Preventable Hospitalisations' and that an interpretive guide could potentially resolve this issue. NHISSC requested the Commission and the Australian Institute of Health Welfare to investigate options on the best way to develop an appropriate user guide. Subject matter epidemiological experts from the Centre for Big Data Research in Health at the University of New South Wales were contracted to write the guide.

The guide provides an overview of the potentially preventable hospitalisations indicator, including common ways that this indicator is reported in Australia, interpretation, and a brief history of how the indicator was developed.

While the guide has been written for a wide audience, it is primarily for professionals in the health system, and should also have utility for service level staff in states and territories, Primary Health Networks (PHNs), and Local Health Network Boards and CEOs.

Data on potentially preventable hospitalisations will be included in the Commission's second *Australian Atlas of Healthcare Variation*. This guide is intended as background, and a resource for understanding and interpreting this indicator.

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A guide to the potentially preventable hospitalisations indicator in Australia

Prepared by:

Centre for Big Data Research in Health, University of New South Wales

for

The National Health Information Standards and Statistics Committee

In consultation with:

Australian Commission on Safety and Quality in Health Care

and Australian Institute of Health and Welfare



Australian Government

Australian Institute of
Health and Welfare



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1. Background

Potentially preventable hospitalisations are currently a health system performance indicator of accessibility and effectiveness in the Australian National Healthcare Agreement (NHA).^{1, 2} This indicator is a part of the Performance and Accountability Framework, and an area of focus for the newly established Primary Health Networks.³

A potentially preventable hospitalisation is an admission to hospital for a condition where the hospitalisation could potentially have been prevented through the provision of appropriate individualised preventative health interventions and early disease management, usually delivered in primary care and community-based care settings (including by general practitioners, medical specialists, dentists, nurses and allied health professionals).

Breakdowns of potentially preventable hospitalisations by condition, population subgroups and geography can help to identify priorities for targeted policy interventions. Trends over time are used to monitor for improvements or identify emerging problem areas.

The indicator is relatively easy to calculate using routinely collected hospital admitted patient data, and importantly provides insights into the interface between primary and secondary health care. However, rates of potentially preventable hospitalisations are also influenced by factors that are not easily influenced by health policymakers, such as socioeconomic status and prevalence of disease.

The guide provides an overview of the potentially preventable hospitalisations indicator, including common ways that this indicator is reported in Australia, interpretation and a brief history of how the indicator was developed.

The Australian Commission on Safety and Quality in Health Care (the Commission) and the Australian Institute of Health and Welfare (AIHW) were jointly commissioned by the National Health Information Standards and Statistics Committee (NHISSC) to develop this user guide on the potentially preventable hospitalisations indicator. The guide has been written by academics from the University of New South Wales who have extensive experience in this area.

The Commission sponsored this project as part of the development and explanation of safety and quality indicators in health care delivery, in both the primary care and hospital sector.

2. Overview of potentially preventable hospitalisations

Potentially preventable hospitalisations are those considered as potentially able to be prevented through timely and accessible, quality primary and community-based care. Also known as preventable hospitalisations, hospitalisations for ambulatory care sensitive conditions, or potentially avoidable hospitalisations, measures of these hospitalisations are used in Australia and internationally as a high-level health system performance indicator.

Potentially preventable hospitalisations are identified from diagnoses recorded in hospital admissions data. The indicator is typically reported using three broad categories which describe the types of conditions in scope: chronic, acute, and vaccine-preventable (see Box 1 below). A list of conditions currently included in the health performance indicator is given in Appendix 1. Past and current specifications of the potentially preventable hospitalisations indicator as used in the Australian NHA, including additional identifying criteria such as relevant procedures and age thresholds, are detailed in the AIHW Metadata Online Registry (METeOR).²

Data for potentially preventable hospitalisations are usually presented as either age-standardised hospitalisation rates (the number of potentially preventable hospitalisations per capita, e.g. per 1 000 or 100 000 population), or as the number of hospital bed days used by patients admitted for a potentially preventable hospitalisation. Ideally, 95% upper and lower confidence intervals should be reported, but this is not always the case. An example of standardised rates of potentially preventable hospitalisations is presented in Table 1 below.

Table 1: Separations for selected potentially preventable hospitalisations per 1 000 people, 2013-14 (age standardised rate). *Source: Steering Committee for the Review of Government Service Provision 2016, Report on Government Services 2016, vol. E, Health, Productivity Commission, Canberra. (Table 10.4, page 10.57)*

	<i>NSW</i>	<i>Vic</i>	<i>Qld</i>	<i>WA</i>	<i>SA</i>	<i>Tas</i>	<i>ACT</i>	<i>NT</i>	<i>Aust</i>
Vaccine preventable conditions	1.1	1.3	1.2	1.2	1.5	0.7	0.9	7.6	1.3
Selected acute conditions	10.9	10.6	14.3	12.9	13.0	10.7	9.5	21.6	12.0
Selected chronic conditions	10.5	11.1	12.6	10.7	11.4	10.8	8.1	21.3	11.2
Total	22.4	22.9	27.9	24.6	25.6	22.0	18.5	48.9	24.4

Box 1: Potentially preventable hospitalisations

In Australia, the indicator is often reported using three broad categories:

- **Chronic conditions.** These conditions may be preventable through lifestyle change, but can also be managed effectively through timely care (usually non-hospital) to prevent deterioration and hospitalisation. This category includes conditions such as congestive cardiac failure, diabetes complications, chronic obstructive pulmonary disease (COPD) and angina.
- **Acute conditions.** These conditions may not be preventable, but theoretically would not result in hospitalisation if timely and adequate care (usually non-hospital) was received. This category includes conditions such as urinary tract infections, cellulitis, dental conditions, ear, nose and throat infections.
- **Vaccine preventable conditions.** These conditions may be preventable through vaccination. This category includes conditions such as influenza, measles, diphtheria and hepatitis B.

2.1 Evolution of potentially preventable hospitalisations as health performance indicator

The first specification for potentially preventable hospitalisations was developed in the USA in the late 1980s and early 1990s, where the indicator was used as a tool for identifying socioeconomic and racial disparities in access to primary health care.⁴ Known as admissions for ambulatory care sensitive conditions (ACSC), this indicator included a set of 28 conditions, determined through consensus by a panel of internists and paediatricians who were experts in the provision of care to disadvantaged populations and the problems associated with barriers in access to care.

Subsequent studies supported a relationship between rates of potentially preventable hospitalisations in geographic areas and access to primary health care, as measured by, for example, self-rated access to care or the number of physicians in that area.⁵⁻⁷ This has resulted in widespread international use of potentially preventable hospitalisations to monitor the performance of primary health care systems. More recent research suggests that sociodemographic factors and health behaviours are important determinants of potentially preventable hospitalisations,⁸ and that their relationship with primary health care may differ between health systems,⁹ highlighting the varied and complex means in which preventable hospitalisations may reflect 'access to care'.

Countries that currently use potentially preventable hospitalisations as a tool to monitor the effectiveness of primary and community care include New Zealand,¹⁰ Canada,¹¹ the UK,¹² the USA,¹³ and Australia, where it is used for national, state and local level reporting.¹⁴⁻¹⁶ It is also used in academic research as a measure of health outcomes and to evaluate the effectiveness of policies and primary care interventions. However, this varied use has led to differences in the way potentially preventable hospitalisations are defined, which can cause confusion and difficulties in comparing statistics over time and between jurisdictions.

For example, early versions of the indicator in the US excluded patients aged over 65 years, because it was thought that older patients would not have trouble accessing ambulatory care as they had health coverage through (US) Medicare.¹⁷ Later versions of the indicator were expanded to include older patients, who contribute a large health care burden that is still potentially amenable to improved care, however there is continuing debate about the true 'preventability' of admissions in the older population. As a result, there are inconsistencies between countries in whether older patients are included in the calculation of the indicator or not.¹⁸ Inconsistencies also arise between countries in technical details of the way that the indicator is defined, such as whether planned admissions, hospital transfers, or admissions resulting in death are included.

Notable differences also exist between countries in the types of conditions included. While most indicators include a range of chronic and acute conditions, the exact set of conditions, and the way in which they are defined, can vary. Some of these differences are because of technical issues, such as different disease coding systems which define diseases in different ways (e.g. International Classification of Diseases versions 9 and 10), or technical revisions in response to data quality audits.¹⁹ Other differences relate to varying priorities for policy research and evaluation, such as a focus on specific diseases, or an expanded scope of the indicator to include admissions preventable through broader aspects of community care not usually included in the indicator, such as mental health conditions.²⁰ These differences reflect efforts to design indicators that are the most relevant to the context and health system in which they are being used. However, these differences also result in difficulty comparing

statistics between countries,²¹ and strong considerations should be given to both the indicator definition and the context in which it is being used.

In Australia the indicator was initially developed in the Victorian Ambulatory Care Sensitive Conditions Study, using a selection of conditions based on those used in the international literature.^{18, 22} In recent years as the indicator has been used for national performance monitoring, its specifications have continued to be developed. This includes annual reviews to account for minor revisions, such as any changes in disease coding and classification, and occasional major reviews taking into account larger data quality issues and the current state of clinical care in the Australian health care system. These revisions, undertaken by clinicians, policymakers and data experts, ensure that the measure remains relevant to Australian policy priorities, reliable in its measurement, and comparable between regions and over time. For example, in Australia there have been many changes over time in the way diabetes is recorded in hospitals, such as the standards around whether diabetes was recorded as a 'principal' or 'additional' diagnosis.^{14, 23, 24} These types of changes can strongly influence counts of hospitalisations, and as they reflect differences in hospital coding rather than changes in the prevalence of the condition or the provision of health care, the way in which conditions are defined in the indicator is reviewed and revised accordingly.

The current Australian indicator includes 22 conditions (Appendix 1). Past and current specifications for the potentially preventable hospitalisation indicator as used in the Australian NHA are detailed in METeOR.²

Box 2: Evolution of potentially preventable hospitalisations

- Also referred to as ambulatory care sensitive conditions (ACSC), and potentially avoidable hospitalisations.
- Initially developed in the US, different versions of the indicator are currently used around the world in both research and policy settings, specific to the healthcare system and purpose for which they are being reported.
- International comparisons of potentially preventable hospitalisations are limited by the use of different definitions of the indicator, and the context in which they are being used.
- The conditions included in the Australian indicator are updated annually to ensure current disease classifications are used, and are periodically reviewed and revised by an expert committee to ensure they remain reliable and relevant for monitoring performance of the Australian health care system.

2.2 Strengths and limitations as a health performance indicator

The main strength of the potentially preventable hospitalisations indicator is the ease with which it can be calculated using routinely collected hospital admission data. There are few data sources that capture variation in the provision or quality of primary care, yet hospitalisation data is routinely collected and widely available to both policymakers and researchers. The potentially preventable hospitalisations indicator therefore presents an accessible means for exploring the interface between primary and secondary care.

As potentially preventable hospitalisations are identified using a standard set of diagnosis codes, they can readily be measured at various geographic levels across the healthcare system. Furthermore, it is relatively straightforward for a health jurisdiction or policy organisations to obtain further insight by disaggregating the indicator, to identify specific types of conditions (such as chronic diseases) or population subgroups (such as Indigenous people) which may identify priority areas for a targeted policy response.

A key limitation is that not all of the hospitalisations captured by the indicator could have been prevented, at least in the short term. While some of these admissions could have been prevented by more effective management in the period leading up to hospitalisation, other admissions may reflect chronically ill or elderly patients who have received optimum management in primary care. While the chronic conditions leading to hospitalisation may have been prevented through primary prevention initiatives (such as quit smoking interventions or physical activity programs), the long time lag between disease onset and complications leading to hospital admission means that such initiatives may take many years to impact on admission rates.

Conversely, the current specification does not include all conditions which could potentially be used to measure the number of potentially preventable hospitalisations. For example, there are likely to be other conditions, such as stroke, for which some hospitalisations could have been prevented if the patient had received timely care and/or management by primary and community health practitioners. Similarly, the indicator does not include non-admitted episodes of care completed entirely in the outpatient or emergency department for conditions in the scope of the indicator. Many factors are considered when designing a health indicator, such as data quality, reliability, and the responsiveness to changes in health policy.^{19, 25, 26} The conditions in the indicator, and the way it is defined, were selected to meet these criteria, but are not exhaustive. This is why they are considered an indicator, rather than a comprehensive set of all potentially preventable hospitalisations.

A further limitation is that potentially preventable hospitalisations may be influenced by many factors beyond those under the control of health policymakers. There is growing evidence that in some health settings, such as Australia, potentially preventable hospitalisations are strongly associated with personal characteristics such as income, education and lifestyle factors.^{8, 9} These factors may operate in several ways to influence rates of potentially preventable hospitalisations, including increasing the incidence of disease, and influencing access to services due to barriers relating to affordability, physical accessibility and cultural appropriateness. This research continues to inform the interpretation of potentially preventable hospitalisations in Australia, and these limitations are further discussed under 'Risk adjustment' in Section 3.1.

Box 3: Strengths and limitations as a health performance indicator

Key strengths:

- Easy to calculate using routinely collected hospital admitted patient data.
- Allows insights into the interface between primary and secondary health care.
- Can be disaggregated at various levels, by geographic regions, population subgroups and conditions to highlight priority areas for further investigation.

Key limitations:

- Different definitions have been used over the years, in different countries, and by different agencies, which can make some comparisons difficult.
- Is a representative, not comprehensive, set of all potentially preventable hospitalisations, and includes some hospitalisations that may not be avoidable.
- Is also influenced by factors that are not readily influenced by health policymakers, such as socioeconomic status, lifestyle factors and prevalence of disease.

3. Using the potentially preventable hospitalisations indicator

Three different types of information are commonly reported for potentially preventable hospitalisations:

1. **Comparisons between geographic regions:** Identifies how rates of potentially preventable hospitalisations differ across geographic regions and allows comparison between regions with similar expected levels of hospitalisation.
2. **Breakdowns by condition and population subgroups:** Provides supplementary information on potentially preventable hospitalisations for a region. This allows identification of potential priorities for action, such as specific conditions or population subgroups with very high rates of admission.
3. **Trends in rates of potentially preventable hospitalisations:** Displays changes in rates of hospitalisation over time, to monitor for improvements or identify emerging problem areas.

This reported information is designed to help identify priority areas for policy and evaluation. It informs policymakers and clinicians so they can respond to the information presented, in conjunction with their experience and local knowledge, to address any issues identified.

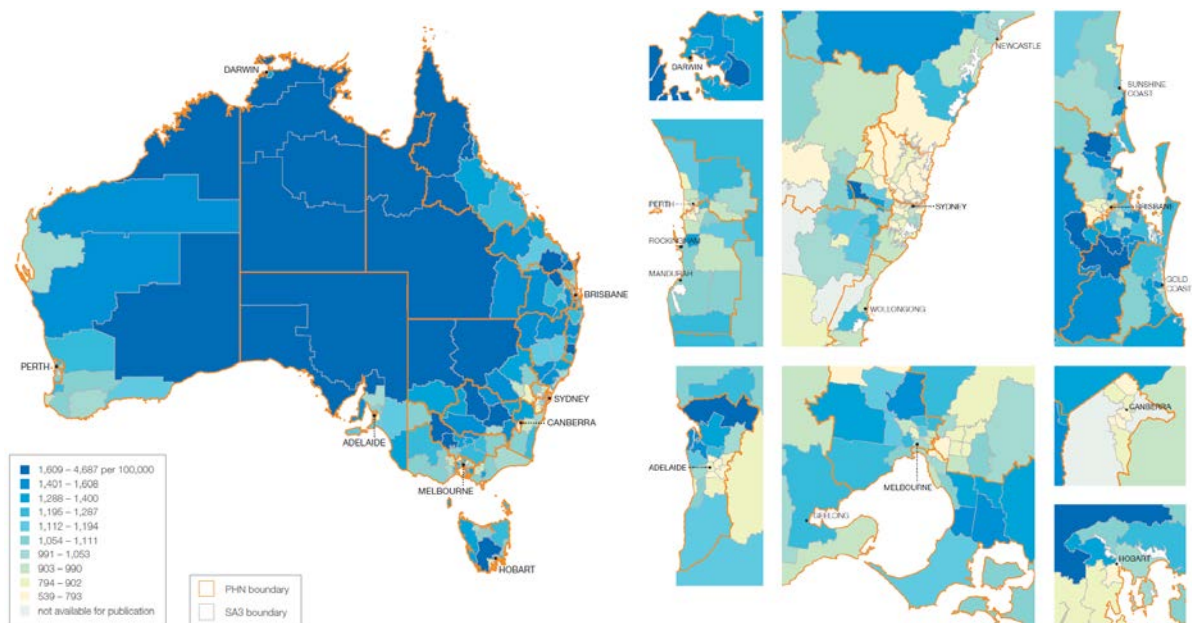
3.1 Comparisons between geographic regions

The most common form of reporting involves comparing potentially preventable hospitalisations between geographic regions, typically as age-standardised population-based rates of the number of hospital admissions which take into account the different age structures of the population of different geographic regions, or as bed days - the total length of time patients spend in hospital. Comparisons of age-standardised rates are used as a screening tool to identify areas with relatively high rates of hospitalisation for more in-depth analysis and potential policy and/or service development. Comparison of crude rates or bed days, which do not account for the different age structure of the population, are used to quantify the burden of preventable hospitalisations in a population.

This comparison is typically presented on a map, with coloured shading representing areas with a lower or higher than average relative rates of hospitalisation. This comparison can also be presented as a table or figure, listing or visually representing each geographic region and their corresponding values. The regions used for comparison reflect those relevant to health policymakers, such as Primary Health Networks (PHNs) which have recently been established in Australia with the objective of improving the efficiency and effectiveness of medical services for patients, particularly those at risk of poor health outcomes, and improving coordination of care to ensure patients receive the right care in the right place at the right time.³

An example map published by the National Health Performance Authority is provided below, showing variation in rates of potentially preventable hospitalisations across PHNs and Statistical Area 3 (SA3) geographic areas, noting that this is determined by the place of residence of the patient.¹⁵ In this map, areas coloured in light yellow have the lowest age-standardised rates of hospitalisation (between 539-793 admissions per 100 000 population), and the areas coloured in dark blue have the highest rates of hospitalisation (between 1 609-4 687 admissions per 100 000 population). The colour gradient in between represents the gradient from areas with the lowest to the highest rates of admission. This map shows large variation in patterns of hospitalisation, with areas near major cities on the east and west coast tending to have the lowest rates of potentially preventable hospitalisations, and areas in central Australia tending to have the highest rates of hospitalisation.

Figure 1: Example figure, rates of potentially preventable hospitalisations across Primary Health Networks and Statistical Area 3 geographic regions in Australia, 2013-2014. (Source: National Health Performance Authority).



3.2 Risk adjustment

There are many factors that can influence peoples' risk of hospitalisation, such as age, lifestyle risk factors, chronic diseases, ability to afford care and remoteness from services.²⁷ Some of the geographic variation in potentially preventable hospitalisation may reflect these differences in the population, which is problematic as they are not features of the primary care system and may be outside the influence of health policymakers.⁸

Almost all reporting of potentially preventable hospitalisations presents age-standardised rates or bed days, which takes into account the fact that some areas have an older population who are at greater risk of hospitalisation. However, the impact of other population characteristics, such as variations in the prevalence of chronic diseases, is not usually accounted for. Many reports recommend 'adjusting' for these population characteristics to allow fairer comparisons between geographic areas, however this is rarely performed as there are few quality methods and data sources available to do so. This limitation is evident in most geographic comparisons. Furthermore, such adjustment may possibly mask important sources of variation.

Some reports partially account for this issue by presenting stratified rates of potentially preventable hospitalisations, such as by categories of remoteness or socioeconomic status. An overall statistic, such as an average rate of admission in an urban or regional area, can set a benchmark value against which similar areas can compare their expected rate or burden of hospitalisation. Some reports also present geographic areas grouped by similar characteristics, for example equivalent socioeconomic status or remoteness from services centres, to allow fairer comparisons between similar areas. Examples of such reporting are provided in Appendix 2.

A review is warranted if the relative rate or burden of potentially preventable hospitalisations in an area is found to be high. This may be in comparison to all other areas being reported, a benchmark or expected value, or other comparable areas with similar characteristics.

Box 4: Comparison between geographic regions

- Comparisons of population-based admission rates or total bed days between geographic regions are used to identify areas with a relatively high rate or burden of potentially preventable hospitalisations.
- Some of the geographic variation in hospitalisations is likely to reflect differences in population composition, for example variations in socioeconomic status or the incidence/prevalence of disease.
- Where available, comparison between regions with similar socioeconomic and remoteness characteristics can help to identify if rates of potentially preventable hospitalisations are higher than expected.
- Areas with high rates of potentially preventable hospitalisations warrant further review.

3.3 Breakdowns by condition and population subgroups

To help inform interventions to reduce potentially preventable hospitalisations, more detailed information by condition and/or population subgroups is often provided. This may be for the state or country as a whole, or separately for each geographic region.

It is very common for potentially preventable hospitalisations to be presented by groups of conditions (e.g. chronic, acute, vaccine-preventable) or by specific types of conditions (e.g. diabetes, COPD, cellulitis). Examples of such reporting are presented in Appendix 3.

Admissions are also often broken down according to age groups and Indigenous status. Indigenous people in Australia have historically poorer health and health outcomes than other Australians, including higher rates of potentially preventable hospitalisations. The NHA recommends that rates of potentially preventable hospitalisations in Australia should be reported by Indigenous status, and disparities between Indigenous and non-Indigenous Australians are reported as part of the Aboriginal and Torres Strait Islander Health Performance Framework.²⁹ However, variation in the quality of data on Indigenous identification, and the small number of hospitalisations for geographic areas, can at times restrict the reporting of Indigenous data for small geographic regions. An example of reporting by Indigenous status is presented in Appendix 3.

Breakdowns of potentially preventable hospitalisations can convey different types of information. Looking at how the admissions are distributed can help identify where the greatest burden of potentially preventable hospitalisations lies in a population, and what targeted priority areas should be.

However, hospitalisations for some conditions will be more common than others, as will hospitalisations in some population groups, such as older people. Comparing the profile of potentially preventable hospitalisations in one region to other similar regions, or to a state or national average, can help identify if the profile is different to what might be expected. For example, if a region has a particularly high rate of one type of condition when compared to the Australian total, this may indicate a potential problem area which needs to be addressed even if it comprises a relatively small proportion of the total burden of hospitalisations. Conversely, if a region has a particularly low relative rate of one type of condition, this might indicate the region has successfully implemented a policy managing this condition.

Other factors that might need to be investigated to explore such differences include differences in hospital admission policies and data coding practices. For example, some jurisdictions may admit patients with certain conditions while others may treat them as an outpatient or in the emergency department. The influence of outlier individuals who have a large number of hospitalisations can also be investigated, as these patients may heavily influence rates of hospitalisation, particularly at the small area level.

Conditions or population subgroups that have the largest burden of potentially preventable hospitalisations should be the focus for targeted investigation and policies. A review may be warranted if a condition or population subgroup has a much higher rate than what would be expected.

Box 5: Breakdowns by condition and population subgroups

- Breakdowns of potentially preventable hospitalisations by conditions or population subgroups can help to identify priorities for targeted policy interventions.
- Potentially preventable hospitalisations are often presented by condition, age and Indigenous status of patients.
- Conditions or population groups with the largest burden may indicate priority areas to target improvement.
- Conditions or population groups with a higher than expected rate may indicate potential areas for review.

3.4 Trends in potentially preventable hospitalisations

Trends in potentially preventable hospitalisations, usually presented as age-standardised population-based rates by year, can be used to monitor changes in the rate or burden of hospitalisation, to evaluate the impact of policies or identify emerging problems. Trends can be presented as an overall figure over time, or broken down by area, type of condition or Indigenous status of the population. An example of reporting of time trends is presented in Appendix 4.

An increasing trend in potentially preventable hospitalisations indicates that these admissions are increasing and is an issue requiring further investigation. A decreasing trend indicates that these admissions are decreasing, which may be the result of successful intervention strategies, such as changes in the health of the population, effective management of health conditions and changes in the way services are provided, such as substitution of hospital care by community-based services.

When looking at trends, care should be taken not to over-interpret small changes. Fluctuations can emerge as a result of even a small number of events, particularly in small populations where a single person with multiple admissions can heavily influence the population-based rate. These fluctuations mean that changes in rates will not always move in a direct manner, such as in a straight line, and more attention should be paid to longer term trends over several years than small differences between two years. New methods for identifying persistently high regions of hospitalisation have been proposed to help reduce the impact of these fluctuations.³⁰

A review is warranted if there is an increasing trend in the rate or burden of potentially preventable hospitalisations over time. Examination of decreasing trends may help inform where successful intervention strategies have been introduced.

Limitations

Changes in potentially preventable hospitalisations over time may reflect factors other than changes in the provision of health care. Updates to coding standards, such as the International Classification of Diseases and Related Health Problems, changes in hospital admission policies, such as through financial incentives, and the way hospitals record admissions and certain conditions can all influence rates of potentially preventable hospitalisations, and could be misleading if a region is trying to track performance over time.

For example, there have been changes over time both to Commonwealth funding to public hospitals, as well as to the way diabetes is recorded by hospitals.¹⁴ These changes could influence time trends by altering whether a patient's care is being counted as a hospitalisation, and whether their admission is classified as being related to diabetes or not.

These types of technical changes are monitored by health policymakers, and the indicator is reviewed and revised to help minimise their impact. However, some changes may not be able to be fully accounted for. Care should always be taken when viewing trends to look for any reported limitations, interpret the data with caution, and utilise local knowledge of what is happening within a particular local area to inform interpretation of the trends. In some cases the changes in data quality may be too great to allow for meaningful comparisons over time, and time trends may not be reported.

Box 6: Trends over time

- Trends can be used to monitor changes in the rate or burden of potentially preventable hospitalisations over time.
- Trends may not be reported if there are concerns about poor data quality limiting comparability over time.
- Action should be taken if trends reveal an increase in the rate or burden of potentially preventable hospitalisations over time.
- Care should be taken in interpreting changes over time due to changes in coding and admission practices.

4. Further resources

4.1 Further information on potentially preventable hospitalisations in Australia

Further information on potentially preventable hospitalisations in Australia is available in the following reports.

- Ambulatory Care Sensitive Conditions. Victorian Health Information Surveillance System. <https://hns.dhs.vic.gov.au/3netapps/vhisspublicsite/ViewContent.aspx?TopicID=1&SubTopicID=10>
- Australian Institute of Health and Welfare 2016. Admitted patient care 2014–15: Australian hospital statistics. Health services series no. 68. Cat. no. HSE 172. Canberra: AIHW.
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4.2 Additional data sources informing the provision of primary care

Potentially preventable hospitalisations were developed at a time when there were few sources of available information on the primary care system. While there are still no comprehensive, population-level data sources available in Australia, a number of additional data sources have been used more recently to further inform the delivery and performance of primary and preventive care in a region.

For example, data from Medicare Australia on Medicare Benefit Schedule (MBS) and Pharmaceutical Benefit Scheme (PBS) claims are increasingly being used to monitor and inform the performance of the Australian health care system. This includes monitoring trends in specific types of service use,^{31, 32} evaluating adherence to best practice guidelines such as the use of chronic disease management plans³³ or disease specific processes of care,³⁴ and identifying hospitalisations which may have been prevented through medication-related issues.³⁵ Clinical information at the medical practice level are being used internationally to measure the impact of specific case management strategies,³⁶ and while there are emerging sources of such electronic medical records in Australia,³⁷ further work is needed to develop these comprehensively at the national level.

Information is also available on the Australian health workforce. Practitioner registration and survey data are being used to identify patterns in the provision of health care,³⁸⁻⁴⁰ while patient experience surveys are being used to provide information about barriers in access to care.⁴¹ Together these data sources are all being used to help build a picture of patient and practitioner perspectives on access to, and the delivery of, health services.⁴²

These additional sources of data will increasingly be of value for providing further insights into the provision of care in Australia.

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Appendices

Appendix 1: Conditions included in the potentially preventable hospitalisations indicator

Conditions included in the potentially preventable hospitalisations health performance indicator, as per the specifications for the National Healthcare Agreement in 2016, are listed below.²

Vaccine-preventable conditions	
<ul style="list-style-type: none">• Pneumonia and influenza	<ul style="list-style-type: none">• Other vaccine-preventable conditions
Chronic conditions	
<ul style="list-style-type: none">• Asthma• Congestive cardiac failure• Diabetes complications• COPD• Bronchiectasis	<ul style="list-style-type: none">• Angina• Iron deficiency anaemia• Hypertension• Nutritional deficiencies• Rheumatic heart diseases
Acute conditions	
<ul style="list-style-type: none">• Pneumonia (not vaccine-preventable)• Urinary tract infections, including pyelonephritis• Perforated/bleeding ulcer• Cellulitis• Pelvic inflammatory disease	<ul style="list-style-type: none">• Ear, nose and throat infections• Dental conditions• Convulsions and epilepsy• Eclampsia• Gangrene

Appendix 2: Examples of comparisons between geographic regions using peer grouping to make fairer comparisons

Figure A2.1: Age-standardised rates of potentially preventable hospitalisations and bed days by local area (SA3s), remoteness and socioeconomic status, 2013-14. *Source: National Health Performance Authority 2015, Healthy Communities: Potentially preventable hospitalisations in 2013-14, page 11*

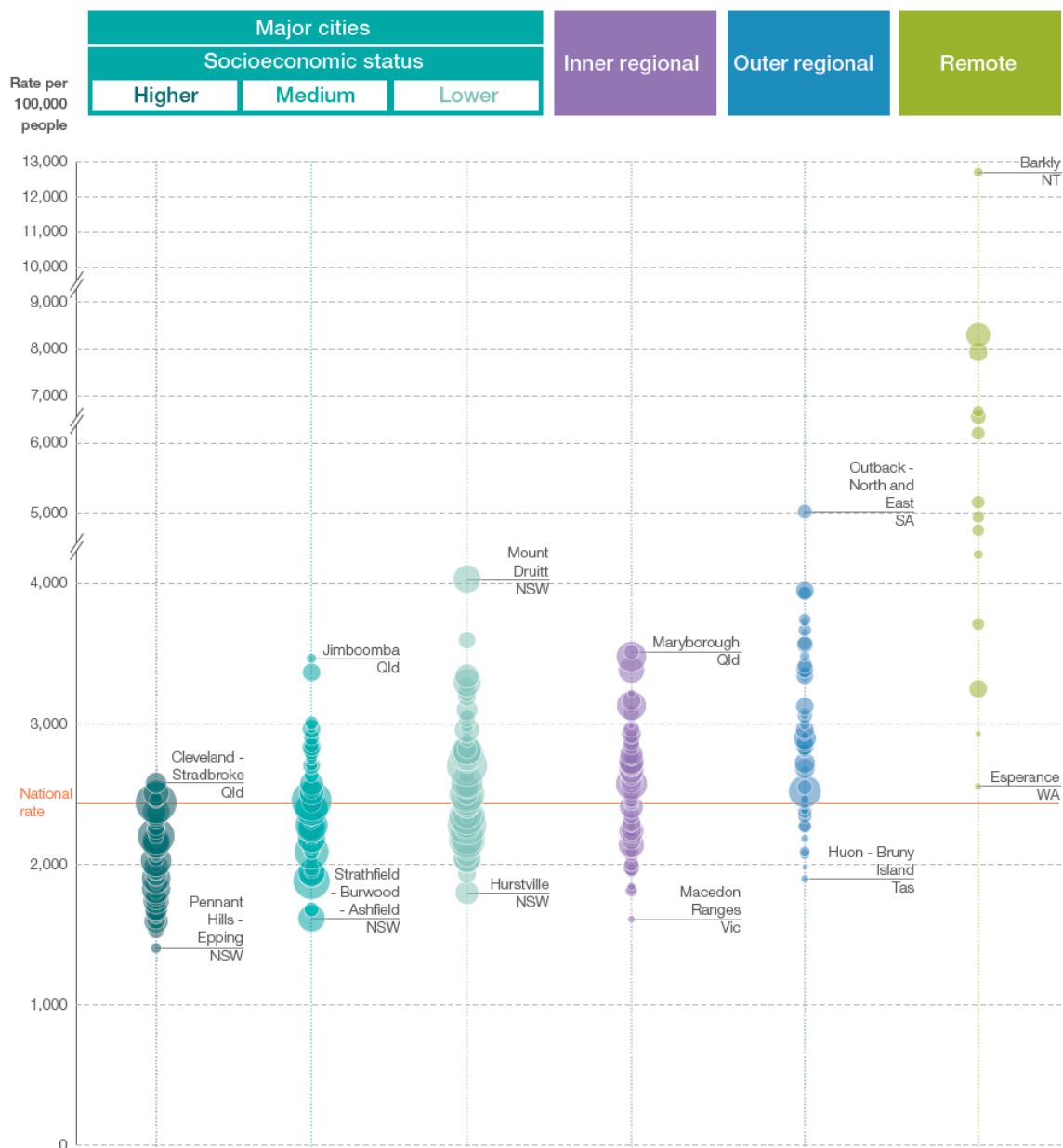
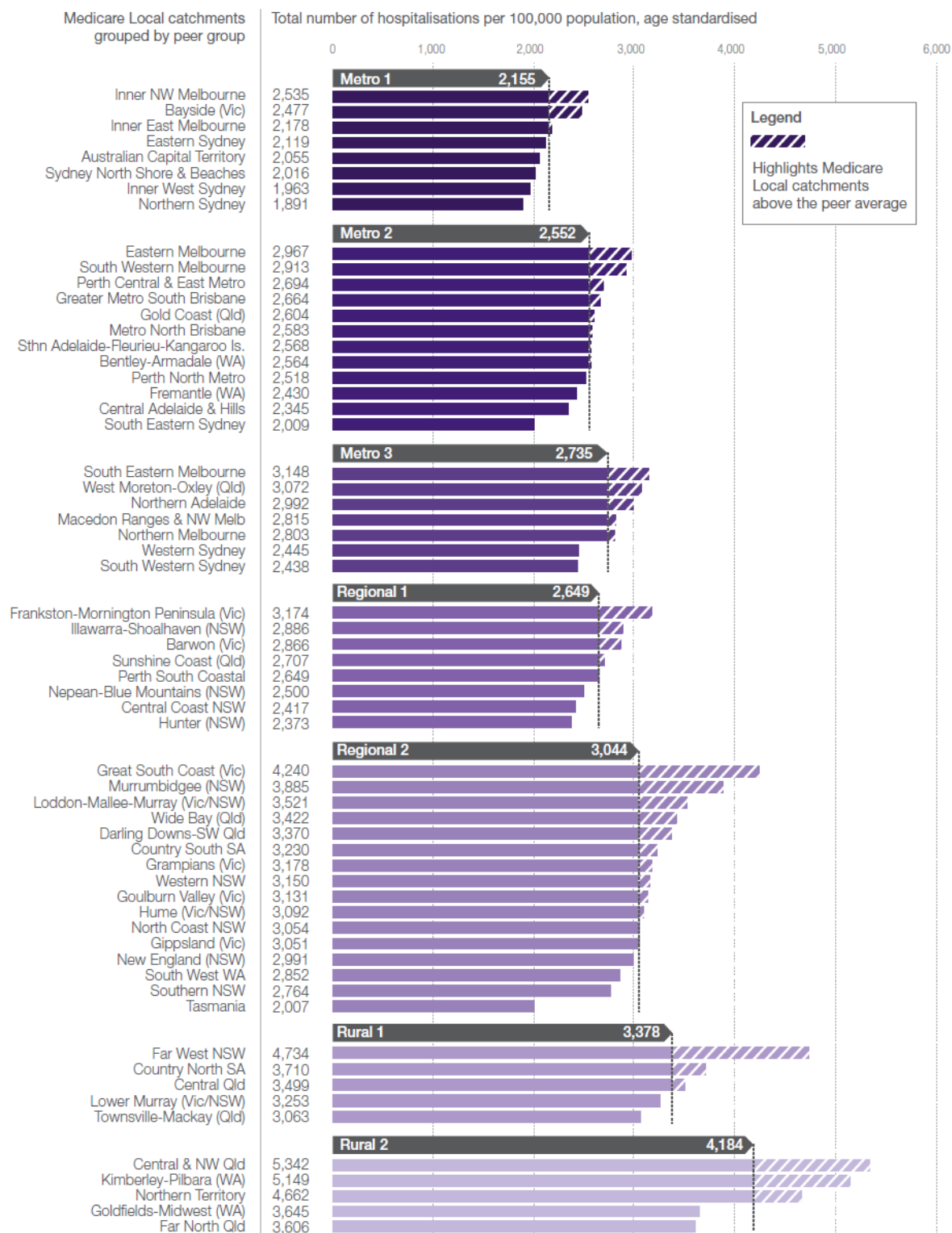
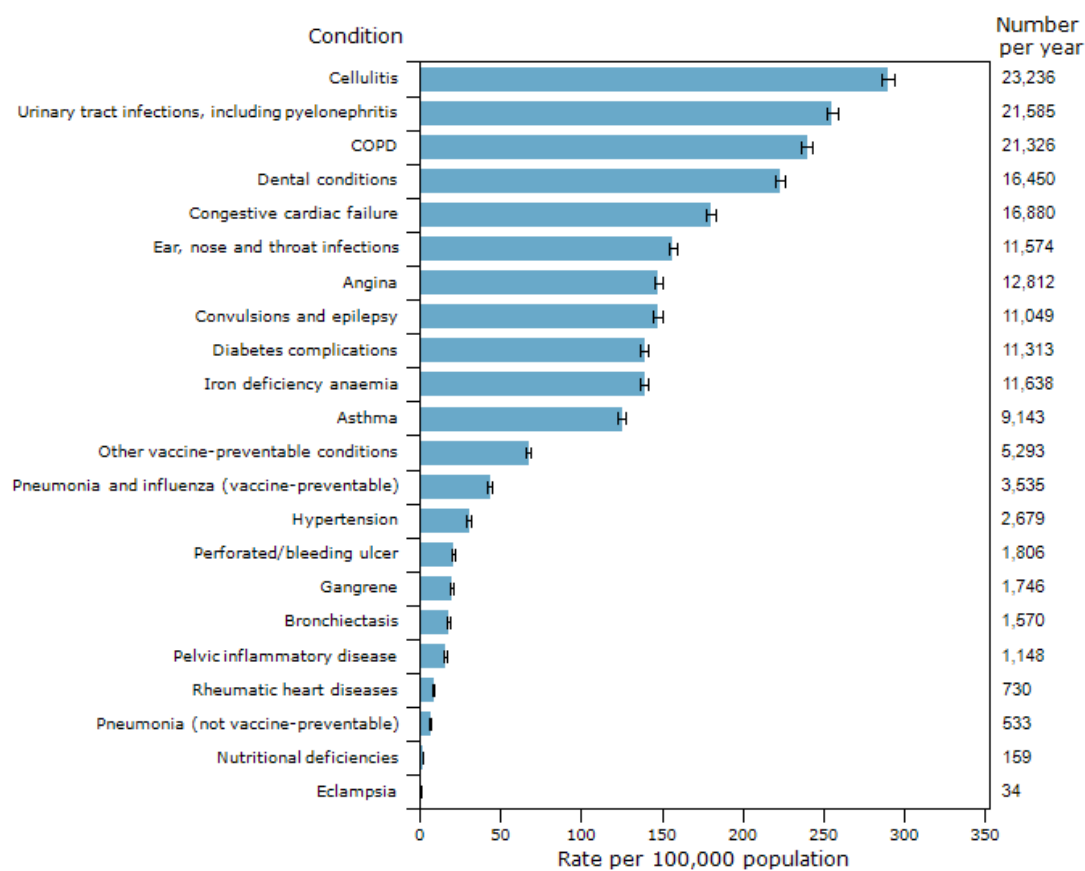


Figure A2.2: Number of potentially avoidable hospitalisations per 100,000 people, age-standardised, in Medicare Local catchments by peer group, 2011-12. Source: National Health Performance Authority 2013, Healthy Communities: Selected potentially avoidable hospitalisations in 2011-12, page 8



Appendix 3: Examples of breakdown of potentially preventable hospitalisations by conditions, age, and Indigenous status

Figure A3.1: Potentially preventable hospitalisations by condition, NSW 2013-14. *Source: Centre for Epidemiology and Evidence. HealthStats NSW. Sydney: NSW Ministry of Health. Available at: www.healthstats.nsw.gov.au. Accessed 17/05/2016*



LL/UL 95%CI = lower and upper limits of the 95% confidence interval for the point estimates are displayed

Figure A3.2: Potentially preventable hospitalisation rates (age-specific) and percentage of the population in each age group, Australia, 2013-14. *Source: National Health Performance Authority 2015, Healthy Communities: Potentially preventable hospitalisations in 2013-14, page 79*

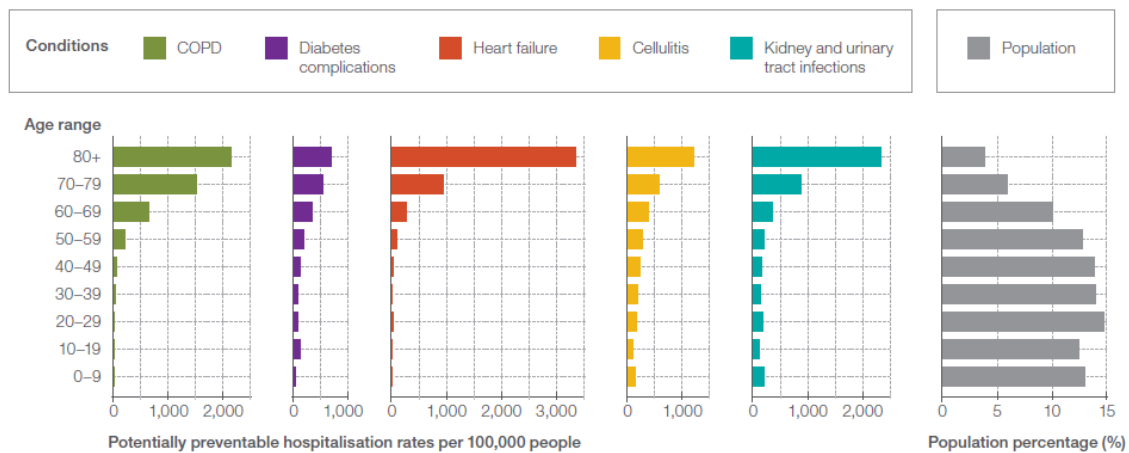
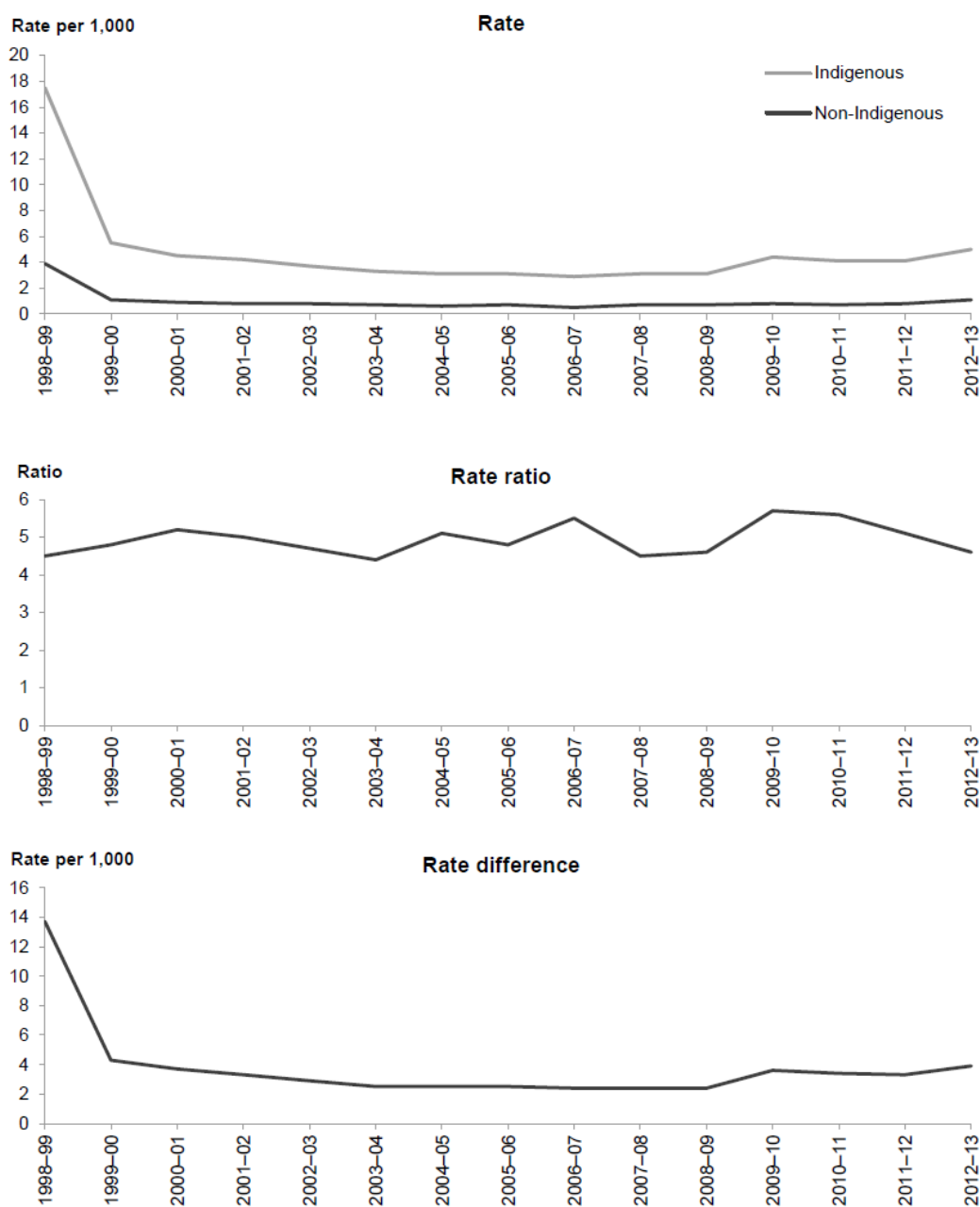


Figure A3.3: Age-standardised hospitalisation rates, rate ratios and rate differences between Indigenous and non-Indigenous Australians for vaccine-preventable conditions, QLD, WA, SA and NT combined, 1998-99 to 2012-13. *Source: Australian Institute of Health and Welfare 2015. Aboriginal and Torres Strait Islander Health Performance Framework 2014 report: detailed analyses. Cat. No. IHW 167. Page 2073*



Appendix 4: Example of reporting trends in potentially preventable hospitalisations

Table A4.1: Selected potentially preventable hospitalisations (PPH) per 1,000 population, by PPH category, all hospitals, 2009-10 to 2013-14. *Source: Australian Institute of Health and Welfare 201. Admitted patient care 2013-14: Australian hospital statistics. Health Services Series no. 60. Cat no. 156. Canberra: AIHW. Page 90*

	2009-10	2010-11	2011-12	2012-13	2013-14	Change (%)	
						Average since 2009-10	Since 2012-13
Vaccine preventable conditions ^(a)	0.7	0.7	0.7	0.9	1.3	16.0	41.1
Acute conditions	11.3	11.9	12.2	11.9	12.0	1.6	0.9
Chronic conditions ^(b)	13.4	11.4	11.4	11.2	11.2	-4.3	-0.2
Diabetes complications ^(c)	3.8	1.6	1.6	1.7	1.7	-18.6	-2.2
Chronic conditions (excluding diabetes)	9.6	9.8	9.8	9.6	9.6	0.0	0.1
Total	25.3	23.9	24.2	23.9	24.4	-0.9	1.7

(a) Changes in coding standards between 2012-13 and 2013-14 for the recording of hepatitis took effect from 1 July 2012. See Appendix A for more information.

(b) As more than one chronic condition may be reported for a separation, the sum of *Diabetes complications* and *Chronic conditions (excluding diabetes)* does not necessarily equal the total number of separations for *Chronic conditions*.

(c) Changes in coding standards for the recording of diabetes-related conditions took effect from 1 July 2010 and 1 July 2012. See Appendix A for more information.

Australian Commission on Safety and Quality in Health Care

Level 5, 255 Elizabeth Street, Sydney NSW 2001
GPO Box 5480, Sydney NSW 2001

Phone: (02) 9126 3600
Fax: (02) 9126 3613

Email: mail@safetyandquality.gov.au
Website: www.safetyandquality.gov.au

AUSTRALIAN COMMISSION
ON SAFETY AND QUALITY IN HEALTH CARE