

Atlas of Avoidable Hospitalisations in Australia: ambulatory care-sensitive conditions

**Anthea Page
Sarah Ambrose
John Glover
Diana Hetzel**

April 2007

Public Health Information Development Unit



Copyright

© Commonwealth of Australia 2007

This work may be reproduced and used subject to acknowledgement of the source of any material so reproduced.

National Library of Australia Cataloguing in Publication entry

Atlas of avoidable hospitalisations in Australia:
ambulatory care-sensitive conditions

ISBN 0 7308 9588 2 (pbk).

1. Health facilities - Australia. 2. Hospital utilization - Australia. 3. Ambulatory medical care - Australia. I. Page, Anthea, 1970- . II. Public Health Information Development Unit (Australia). III. Australian Institute of Health and Welfare.

362.10994

Public Health Information Development Unit, The University of Adelaide

A Collaborating Unit of the Australian Institute of Health and Welfare

This atlas was produced by PHIDU, the Public Health Information Development Unit at The University of Adelaide, South Australia. The work was funded under a grant from the Australian Government Department of Health and Ageing. The views expressed in this atlas are solely those of the authors and should not be attributed to the Department of Health and Ageing or the Minister for Health and Ageing.

Suggested citation:

Page A, Ambrose S, Glover J, Hetzel D. (2007) *Atlas of Avoidable Hospitalisations in Australia: ambulatory care-sensitive conditions*. Adelaide: PHIDU, University of Adelaide.

Enquiries about or comments on this publication should be addressed to:

PHIDU, The University of Adelaide, South Australia 5005, Australia
Phone: 8303-6236 or e-mail: PHIDU@publichealth.gov.au

Supporting data, together with other publications on population health, are available from the PHIDU website (www.publichealth.gov.au).

Published by Public Health Information Development Unit, The University of Adelaide

Contents

List of tables.....	iv
List of figures	v
List of maps	vi
Acknowledgements.....	vii
Glossary and symbols used.....	ix
Executive summary.....	xi
1 Introduction.....	1
1.1 The concept of avoidable hospitalisations	1
1.2 History of the concept	2
1.3 Strengths and limitations of the concept	2
1.4 Research overview	3
1.5 Approaches to defining ACS conditions.....	4
1.6 Age limits and classification.....	5
1.7 Avoidable hospitalisations: Further research.....	6
1.8 References.....	8
2 Methods	11
2.1 Selection of ACS conditions	11
2.2 Data sources	11
2.3 Data methods and analysis.....	11
3 Avoidable hospitalisations: hospital admissions resulting from ambulatory care-sensitive conditions	13
3.1 Avoidable and unavoidable hospitalisations	13
3.2 Avoidable hospitalisations by age and sex.....	14
3.3 Avoidable hospitalisations by condition.....	15
3.4 Avoidable hospitalisations by State/Territory	21
3.5 Avoidable hospitalisations by socioeconomic status	47
Appendix	55
Appendix 1.1: ICD codes.....	57
Appendix 1.2: Approaches to specification of ambulatory care-sensitive conditions.....	59
Appendix 1.3: Geographic areas mapped	61

Table 3.1: Avoidable and unavoidable hospitalisations, by sex, Australia, 2001/02	13
Table 3.2: Avoidable hospitalisations by age and sex, Australia, 2001/02.....	14
Table 3.3: Avoidable hospitalisations by sub-category and condition, Australia, 2001/02	15
Table 3.4: Avoidable hospitalisations by condition rank, Australia, 2001/02.....	16
Table 3.5: Avoidable hospitalisations by selected condition and age, Australia, 2001/02	18
Table 3.6: Avoidable hospitalisations by selected condition, age and sex, Australia, 2001/02	20
Table 3.7: Total and avoidable hospitalisations by State/ Territory, Australia, 2001/02	21
Table 3.8: Avoidable hospitalisations by State/ Territory and condition, 2001/02.....	22
Table 3.9: Avoidable hospitalisations by State/ Territory, Australia, 2001/02.....	24
Table 3.10: Avoidable hospitalisations: diabetes complications, by State/ Territory, Australia, 2001/02	26
Table 3.11: Avoidable hospitalisations: chronic obstructive pulmonary disease, by State/ Territory, Australia, 2001/02.....	28
Table 3.12: Avoidable hospitalisations: angina, by State/ Territory, Australia, 2001/02	30
Table 3.13: Avoidable hospitalisations: dental conditions, by State/ Territory, Australia, 2001/02	32
Table 3.14: Avoidable hospitalisations: congestive heart failure, by State/ Territory, Australia, 2001/02....	34
Table 3.15: Avoidable hospitalisations: asthma, by State/ Territory, Australia, 2001/02	36
Table 3.16: Avoidable hospitalisations: dehydration and gastroenteritis, by State/ Territory, Australia, 2001/02	38
Table 3.17: Avoidable hospitalisations: ear, nose and throat infections, by State/ Territory, Australia, 2001/02	40
Table 3.18: Avoidable hospitalisations: convulsions and epilepsy, by State/ Territory, Australia, 2001/02	42
Table 3.19: Avoidable hospitalisations: cellulitis, by State/ Territory, Australia, 2001/02	44
Table A1: ICD codes and additional selection information for avoidable hospitalisations: hospital admissions resulting from ambulatory care-sensitive conditons	57
Table A2: Differences in ambulatory care-sensitive condition lists under ICD-10-AM: Vic DHS, NSW Health and AIHW, September 2006	59

Figure 3.1: Avoidable and unavoidable hospitalisations, by sex, Australia, 2001/02	13
Figure 3.2: Avoidable hospitalisations by age and sex, Australia, 2001/02	14
Figure 3.3: Avoidable hospitalisations by condition, Australia, 2001/02	16
Figure 3.4: Avoidable hospitalisations by State/ Territory, Australia, 2001/02.....	21
Figure 3.5: Avoidable hospitalisations by remoteness, Australia, 2001/02.....	24
Figure 3.6: Avoidable hospitalisations: diabetes complications, by remoteness, Australia, 2001/02.....	26
Figure 3.7: Avoidable hospitalisations: chronic obstructive pulmonary disease, by remoteness, Australia, 2001/02	28
Figure 3.8: Avoidable hospitalisations: angina, by remoteness, Australia, 2001/02	30
Figure 3.9: Avoidable hospitalisations: dental conditions, by remoteness, Australia, 2001/02.....	32
Figure 3.10: Avoidable hospitalisations: congestive heart failure, by remoteness, Australia, 2001-01	34
Figure 3.11: Avoidable hospitalisations: asthma, by remoteness, Australia, 2001/02	36
Figure 3.12: Avoidable hospitalisations: dehydration and gastroenteritis, by remoteness, Australia, 2001/02	38
Figure 3.13: Avoidable hospitalisations: ear, nose and throat infections, by remoteness, Australia, 2001/02	40
Figure 3.14: Avoidable hospitalisations: convulsions and epilepsy, by remoteness, Australia, 2001/02	42
Figure 3.15: Avoidable hospitalisations: cellulitis, by remoteness, Australia, 2001/02	44
Figure 3.16: Avoidable hospitalisations by socioeconomic status, Australia, 2001/02.....	47
Figure 3.17: Avoidable hospitalisations: vaccine-preventable conditions by socioeconomic status, Australia, 2001/02	48
Figure 3.18: Avoidable hospitalisations: chronic conditions by socioeconomic status, Australia, 2001/02	49
Figure 3.19: Avoidable hospitalisations: acute conditions by socioeconomic status, Australia, 2001/02	50
Figure 3.20: Avoidable hospitalisations: socioeconomic status by State/ Territory, Australia, 2001/02.....	53

Map 3.1: Avoidable hospitalisations: admissions resulting from ACS conditions, Australia, 2001/02	25
Map 3.2: Avoidable hospitalisations: Diabetes complications, Australia 2001/02	27
Map 3.3: Avoidable hospitalisations: Chronic obstructive pulmonary disease, Australia, 2001/02	29
Map 3.4: Avoidable hospitalisations: Angina, Australia, 2001/02	31
Map 3.5: Avoidable hospitalisations: Dental conditions, Australia, 2001/02	33
Map 3.6: Avoidable hospitalisations: Congestive heart failure, Australia, 2001/02	35
Map 3.7: Avoidable hospitalisations: Asthma, Australia, 2001/02	37
Map 3.8: Avoidable hospitalisations: Dehydration and gastroenteritis, Australia, 2001/02	39
Map 3.9: Avoidable hospitalisations: Ear, nose and throat infections, Australia, 2001/02	41
Map 3.10: Avoidable hospitalisations: Convulsions and epilepsy, Australia, 2001/02	43
Map 3.11: Avoidable hospitalisations: Cellulitis, Australia, 2001/02	45
Map A1: Health regions mapped for Australia	61

Acknowledgements

The following people were consulted as to code sets and the methods used in their jurisdiction:

- Dr Zahid Ansari, Victorian Department of Human Services
- Dr Helen Moore, New South Wales Department of Health
- Jenny Hargreaves and Stephen Halpin, Australian Institute of Health & Welfare

The final conditions and codes used in this atlas were agreed in collaboration with Dr Helen Moore and Dr Hanna Noworytko of the New South Wales Department of Health.

The data were supplied from the National Hospital Morbidity Database at the Australian Institute of Health & Welfare, by Ian Titulaer, with approval from the State and Territory data custodians.

This page intentionally left blank

Glossary and symbols used

Glossary

ACS conditions

Ambulatory care-sensitive conditions

Admissions

The technical term describing a completed hospital episode (i.e. the discharge, death or transfer of a patient) is a 'separation'.

Separation is an episode of care for an admitted patient which can be a total hospital stay (from admission to discharge, transfer or death), or a portion of a hospital stay beginning or ending in a change of type of care (for example, from acute to rehabilitation). Separation also means the process by which an admitted patient completes an episode of care either by being discharged, dying, transferring to another hospital or changing type of care. Separations of unqualified newborns, boarders or organ procurement patients are excluded.

In this atlas, the more commonly used term of 'admission' has been used. In an analysis such as this, which excludes most long stay patients, there is little difference between the number of admissions and the number of separations in a year. Also, 'admission' is a much more familiar term to many people who will use this atlas.

Health regions

Health regions (variously called regions, areas, districts etc. – see below) are areas used by the States and Territories to present data. These are mostly based on groupings of Statistical Local Areas: note that boundaries will not match regions that are not defined on 2001 SLAs, such as the Northern Territory regions, but reflect the closest alignment with the 2001 SLAs. As the ACT has no health regions as such, district groupings from ACT Health population projections have been used. Additional comments of relevance to regions in Queensland and the Northern Territory are on page 62.

Health regions in the jurisdictions are defined as follows:

- Area Health Service (New South Wales)
- District Health Service (Queensland)
- Health Region (Western Australia; South Australia country (Health Service in SA metropolitan area))
- Health Service Area (Northern Territory)
- Primary Care Partnership (Victoria)
- Region (Tasmania)

Hospitalisations

Refer to 'Admissions' above

ICD-9

International Classification of Diseases, Ninth Revision [WHO]

ICD-10-AM

International Statistical Classification of Diseases and Related Health Problems, Tenth Revision, Australian Modification

IRSD

The IRSD is an area-based, summary measure of socioeconomic disadvantage and is calculated from variables relating to education, labour force status, occupation, Indigenous status, etc. of individuals and families. It is expressed as a number with a base for Australia of 1000: numbers above 1000 show relatively low disadvantage, and numbers below 1000 relatively high disadvantage.

RR

Rate ratio – for further information, refer to Chapter 2, *Methods*

Separations

Refer to 'Admissions' above

Symbols used

- * Statistically significant, at the 5% confidence level
- ** Statistically significant, at the 1% confidence level
- nil, or less than half the final digit shown
- .. not applicable

Executive summary

Introduction

Avoidable hospitalisations represent a range of conditions for which hospitalisation should be able to be avoided because the disease or condition has been prevented from occurring, or because individuals have had access to timely and effective primary care. This report addresses the level and extent of regional variation in Australia in a sub-set of avoidable hospitalisations, namely those arising from ambulatory care-sensitive (ACS) conditions.

ACS conditions are certain conditions for which hospitalisation is considered potentially avoidable through preventive care and early disease management, usually delivered in a primary care setting, for example by a general medical practitioner, or at a community health centre. They can be used as an indicator to assess the adequacy, efficiency and quality of primary health care within the broader health system. Analyses at the area level may assist as a tool to monitor need; as a performance indicator of variations in access to, or the quality of, primary care; or in allocating limited resources among communities.

Admissions for these conditions can be avoided in three ways. Firstly, for conditions that are usually preventable through immunisation, disease can be prevented almost entirely. Secondly, diseases or conditions that can lead to rapid onset of problems, such as dehydration and gastroenteritis, can be treated. Thirdly, chronic conditions, such as congestive heart failure, can be managed to prevent or reduce the severity of acute flare-ups to avoid hospitalisation.

The analysis is presented for the individual ambulatory care-sensitive conditions, and for these conditions grouped into three sub-categories: conditions that can be prevented through vaccination; acute conditions for which hospitalisations are commonly avoidable with antibiotics or other medical interventions available in primary care; and selected chronic conditions that can be managed by pharmaceuticals, patient education, and lifestyle.

This report does not cover other aspects of avoidable hospitalisations, namely preventable hospitalisations, a sub-category of avoidable hospitalisations, comprising hospitalisations of people from diseases preventable through population-based health promotion strategies (e.g. alcohol-related conditions and most cases of lung cancer); or hospitalisations potentially avoidable through injury prevention strategies (e.g. road traffic accidents). Currently, there is no agreed approach to the categorisation of these aspects of avoidable hospitalisations in Australia, or internationally.

Key points

In 2001/02, admissions resulting from ambulatory care-sensitive (ACS) conditions accounted for 8.7% of all hospital admissions in Australia. This equates to over 552,000 admissions, all of which are potentially avoidable.

Admissions for these conditions accounted for a markedly higher proportion of all admissions of males (9.5% of all admissions of males) than was the case for females (7.9% of all admissions of females).

Over one quarter (27.1%) of avoidable hospitalisations occurred in the 75 years and over age group, with more than one fifth (22.1%) in the 45 to 64 years age group. These two age groups alone contributed to 271,837 avoidable hospitalisations, almost half (49.2%) of all avoidable hospitalisations in this period.

The overall hospitalisation rate from ACS conditions for males was slightly higher than for females, with male rates 5.9% above those for females; however there was marked variation between the age groups. Males in the 0 to 14 year age group had 26% more admissions than the same aged females; with 38% more admissions of males at ages 65 to 74 years, 16% at ages 45 to 64 years and 34% at ages 75 years and over. Rates for males were lower than for females in the 15 to 24 (32% lower) and 25 to 44 (15%) year age groups.

Almost two-thirds of hospital admissions for ACS conditions are attributable to chronic conditions, just over one-third to acute conditions and a small proportion (3.0%) to vaccine-preventable conditions.

The high proportion of admissions for chronic conditions in this period can be primarily attributed to the large number of hospitalisations for diabetes complications (accounting for 25.6% of all avoidable hospitalisations), with a number of circulatory and respiratory conditions contributing to a further 34.0%: these are chronic obstructive pulmonary disease (9.9%), angina (9.0%), congestive heart failure (7.7%) and asthma (7.4%).

Dental conditions (7.9%); dehydration and gastroenteritis (6.8%); ear, nose and throat infections (5.8%); convulsions and epilepsy (5.6%); and cellulitis (5.1%) make the greatest contribution to hospitalisations for acute conditions.

Influenza and pneumonia (2.4%) is the main admission cause for vaccine-preventable conditions.

The Northern Territory, with 10.7%, and Tasmania, 9.5%, both had higher proportions of avoidable hospital admissions compared to the national average of 8.7%. Besides the Australian Capital Territory, where the proportion of total avoidable hospitalisations was below the national average, the five remaining States all had proportions consistent with the national average, ranging from 8.5% in Queensland and South Australia, to 8.8% in Victoria and Western Australia.

In all States and Territories, the highest rates of hospital admissions for ambulatory care-sensitive conditions were attributable to chronic conditions, with diabetes complications consistently the highest ranked condition.

There is a distinct, step-wise socioeconomic gradient evident in total avoidable hospitalisation rates in Australia, with each increase in disadvantage accompanied by an increase in admissions from these conditions. Overall, people in the most disadvantaged areas of Australia had 61.0% more hospitalisations for an ambulatory care-sensitive condition than those in the least disadvantaged areas.

While there is not a clear socioeconomic gradient for all States and Territories, the highest rates for avoidable hospitalisations in each case occur in the most disadvantaged areas.