Technical Supplement

Chronic Disease Care:
A piece of the picture

Admissions for Chronic Obstructive Pulmonary Disease (COPD) and Congestive Heart Failure (CHF)

June 2009 to July 2010

The Insights Series

Bureau of Health Information

Chronic Disease Care: A piece of the picture

Introduction

This supplement to the Bureau of Health Information's report on potentially avoidable admissions for chronic obstructive pulmonary disease (COPD) and congestive heart failure (CHF) in NSW public hospitals is intended for audiences interested in the creation of health information. It describes the methods and technical terms used to compute statistics contained in the report and hospital Performance Profiles.

Data sources

The report draws on admitted patient data extracted from the Health Information Exchange (HIE), a centralised data warehouse administered by the NSW Department of Health. These data are stored in multiple databases. Public hospital records of admitted patients are uploaded weekly from each facility's patient administration system to the HIE, via centralised local health area information systems. Most facilites submit admitted patient records to the local health area information systems daily to allow sufficient time to identify and correct errors before submission to HIE.

The NSW Department of Health conducts regular data quality assurance procedures. It requires corrected administrative data to be resubmitted by the end of the month following the initial submission. Corrected diagnostic data must be submitted by the end of the second month following the initial submission. For the 2009-10 financial year, 287 separate facilities submitted admitted patient data to the HIE.

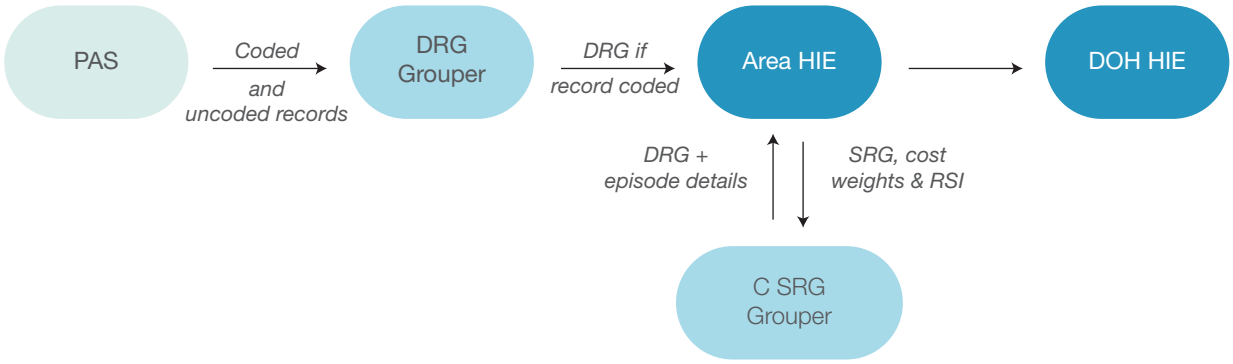
Admissions to NSW public hospitals

Patient admissions to NSW public hospitals are recorded in each hospital's Patient Administration System (PAS). Each record holds patient information, including: age at admission; sex; postcode of usual residence; episode information such as the reason for admission; date and time of admission and discharge; and information about the diagnosis and procedures for which the patient was admitted.

The initial upload of data from the hospital PAS is the admissions, transfers and separations (ATS) upload. This upload includes administrative data such as episode start and end dates, the type of care provided, and demographic information about the patient. This information is available soon after patient discharge. Clinical coding for diagnosis and procedure is most often completed after the patient has been discharged, with the information then being used to assign each record to a Diagnosis Related Group (DRG). DRG and other information is used to classify admissions into Service Related Groups (SRGs) before upload to the state-wide HIE.

Figure 1 illustrates the process through which the admitted patient records are provided to HIE. In *Chronic Disease Care: A piece of the picture*, the Bureau used admitted patient data from 1 July 2005 to 30 June 2010. A time lag between a patient's discharge and reporting is required to ensure records are complete and accurate. Only then can analysis begin.

Figure 1: Clinical coding, diagnosis and procedure grouping, and upload of admitted patient data into the HIE



Analysis

Chronic Disease Care: A piece of the picture publishes statistics about potentially avoidable COPD and CHF admissions. These statistics include counts, proportions and admission rates for each hospital, admitted patient characteristics and episode characteristics.

For each facility, the Bureau publishes:

- Total hospitalisations
- Total potentially preventable hospitalisations
- Total select medical hospitalisations

For each facility and condition (COPD or CHF), the Bureau publishes:

- Total potentially avoidable admissions
- Actual and standardised admission rates
- Percentages by age group, SES quintile, smoking status at admission, rurality and Aboriginal status
- Percentage of admissions that were unplanned
- Percentage of admissions from the emergency department (ED)
- Length of stay averages and histograms
- Total bed days by month and year.

The report analyses information at three levels: state-wide; Local Health Network*; and individual hospital (peer groups A1, BM, BNM, C1 and C2). It also includes Calvary Mater Hospital, which is in the A3 peer group, because it is has a specialist role in respiratory and cardiac care. Albury hospital and its associated facilities are excluded from NSW-level figures and the report as a whole because they are administered by the Victorian Department of Human Services.

* To be renamed Local Health Districts following enactment of legislation.

Total hospitalisations

Total hospitalisations is a count of all episodes of care recorded in the HIE, where episode end dates fall within a given period (including the beginning and end dates of that period). A single patient can have multiple hospitalisations in the period. The Bureau reports total hospitalisations for the periods 1 July 2009 to 30 June 2010, and 1 July 2008 to 30 June 2009.

The Bureau's Advisory Committee concluded that in order to make fair comparisons between hospitals, admission rates should be standardised on the basis of age, sex and socioeconomic status (SES), and expressed as a proportion of select medical hospitalisations.

A schematic diagram of the Bureau's analyses (Figure 2) depicts the inclusion and exclusion criteria for our cohorts for both COPD and CHF admissions (numerator) and select medical hospitalisations (denominator).

Select medical hospitalisations (denominator)

To calculate admission rates, the denominator comprises a subset of total hospitalisations, termed select *medical hospitalisations*, which exclude admissions for renal dialysis, obstetrics, mental health care and surgery. Rates are directly standardised to the NSW select medical patient population 2009-10.

Surgical admissions are identified by a surgery indicator field derived from the DRG assigned to the admission.[1]

Dialysis admissions are identified by procedure codes starting with '13100', which cover haemodialysis and peritoneal dialysis procedures. Admissions for psychiatric reasons are classified as such if the number of days spent in a psychiatric ward recorded was non-zero. Admissions for obstetric reasons are identified by an SRG code of '72' (for obstetrics) or an enhanced SRG code of '721', '722' or '723' (for antenatal admission, vaginal delivery and caesarean delivery respectively).

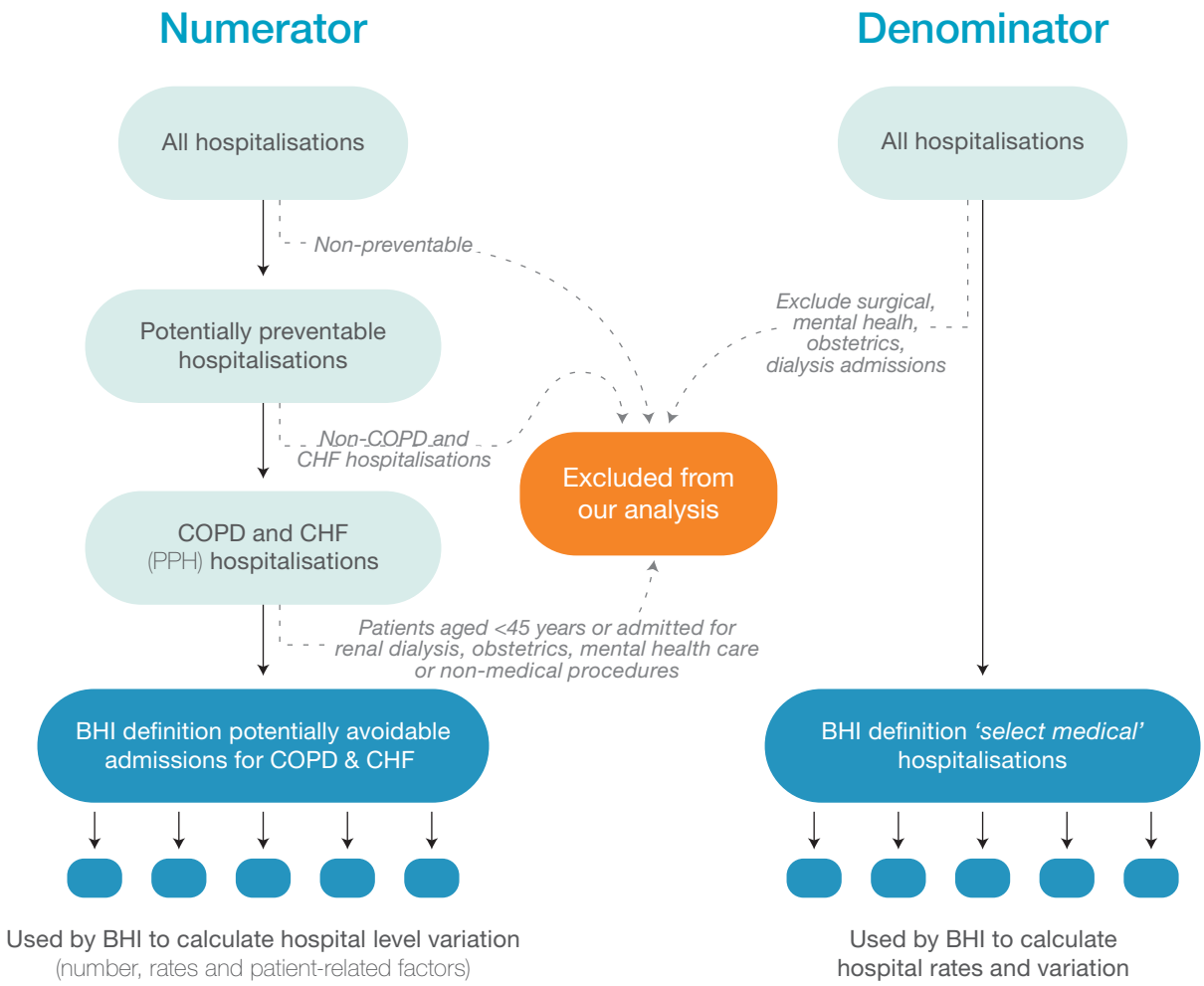
Statistics based on Ambulatory Sensitive Care Condition categories (cascading the numerator)

Potentially preventable hospitalisations (PPHs) are defined on the basis of the NSW Department of Health version of the Ambulatory Sensitive Care Conditions (ACSC) classification scheme and the National Performance Agreement.[2] Additional exclusion criteria have been developed by the Bureau in collaboration with its Advisory Committee.

Potentially preventable hospitalisations

The Bureau reports a count of PPHs, in line with other NSW and Australian research and policy publications. Such hospitalisations are classified as potentially preventable using the ACSC classification adopted by the NSW Department of Health. That classification uses ICD10-AM diagnosis codes and Australian Classification of Health Intervention (ACHI) procedure and procedure block codes (see Table 1). A single admission may be coded for multiple PPH categories. It is important to note that the definition of PPHs for COPD and CHF precludes an admission being assigned to both of these categories.

Figure 2: Schematic for NSW patient sub-populations used in *Chronic Disease Care: A piece of the picture*



Potentially avoidable admissions

A subset of PPHs has been defined for this report and is referred to throughout the report as potentially avoidable admissions (PAA). PAAs for COPD include patients aged 45 years or over with a principal diagnosis of COPD (ICD-AM codes J41–J44, J47; and J20 if there is a secondary diagnosis of J41–J44 or J47). PAAs for CHF include patients aged 45 years or over with a principal diagnosis of CHF (ICD-AM codes I11.0, I50, J81) but excluding procedure codes in blocks 600 to 693, 705 to 707 and 717 and procedure codes 38721-00, 38721-01 and 90226-00.

COPD and CHF patients are excluded if they were admitted for renal dialysis, obstetrics, mental health care or non-medical procedures.

For each analysis, all records for PAAs for COPD and CHF with valid and non-missing data are included. For example, if a record containing SES information is missing, it is excluded from analyses using SES, but it is included in all other analyses.

The relationship between total admissions, select medical admissions, potentially preventable hospitalisations and potentially avoidable admissions is shown in Figure 3 (page 6).

Table 1: Diagnostic and procedural codes for potentially preventable hospitalisations*

	Group	ICD-10-AM codes (NSW Health)	Further selection information
Vaccine-preventable	Influenza and pneumonia	J10, J11, J13, J14, J15.3, J15.4, J15.7, J15.9, J16.8, J18.1, J18.8	In any diagnosis field (1–20); exclude people under 2 months; ICD-9-CM: exclude cases with secondary diagnosis of 282.6; ICD-10-AM: exclude cases with secondary diagnosis of D57
	Other vaccine-preventable	A35, A36, A37, A80, B05, B06, B16.1, B16.9, B18.0, B18.1, B26, G00.0, M01.4	In any diagnosis field (1–20)
Chronic	Diabetes complications	E10.0–E10.8, E11.0–E11.8, E12.0–E12.8, E13.0–E13.8, E14.0–E14.8	Principal diagnosis only
	Nutritional deficiencies	E40–E43, E55.0, E64.3	Principal diagnosis only
	Iron deficiency anaemia	D50.1–D50.9	Principal diagnosis only
	Hypertension	I10, I11.9	Principal diagnosis only; ICD-9-CM: exclude cases with procedure code of 35, 36, 37.5, 37.6, 37.7, 37.8; ICD-10-AM: exclude cases with procedures in blocks 600–693, 705–707, 717 and procedure codes 38721-00, 38721-01, 90226-00
	Congestive heart failure	I11.0, I50, J81	Principal diagnosis only; ICD-9-CM: exclude cases with procedure code of 35, 36, 37.5, 37.6, 37.7, 37.8; ICD-10-AM: exclude cases with procedures in blocks 600–693, 705–707, 717 and procedure codes 38721-00, 38721-01, 90226-00
	Angina	I20, I24.0, I24.8, I24.9	Principal diagnosis only; ICD-9-CM: exclude cases with procedure codes 01 to 86.99; ICD-10-AM: exclude cases with procedure codes in blocks 1-1779
	Chronic obstructive pulmonary disease	J41–J44, J47, (J20)	Principal diagnosis only; ICD-9-CM: 466.0 only with secondary diagnosis of 491, 492, 494, 496; ICD-10-AM: J20 only with secondary diagnosis of J41, J42, J43, J44, J47
	Asthma	J45, J46	Principal diagnosis only
Acute	Dehydration and gastroenteritis	E86, K52.2, K52.8, K52.9	Principal diagnosis only
	Convulsions and epilepsy	G40, G41, O15, R56	Principal diagnosis only
	Ear, nose and throat infections	H66, H67, J02, J03, J06, J31.2	Principal diagnosis only
	Dental conditions	K02–K06, K08, K09.8, K09.9, K12, K13	Principal diagnosis only
	Perforated / bleeding ulcer	K25.0–K25.2, K25.4–K25.6, K26.0–K26.2, K26.4–K26.6, K27.0–K27.2, K27.4–K27.6, K28.0–K28.2, K28.4–K28.6	Principal diagnosis only

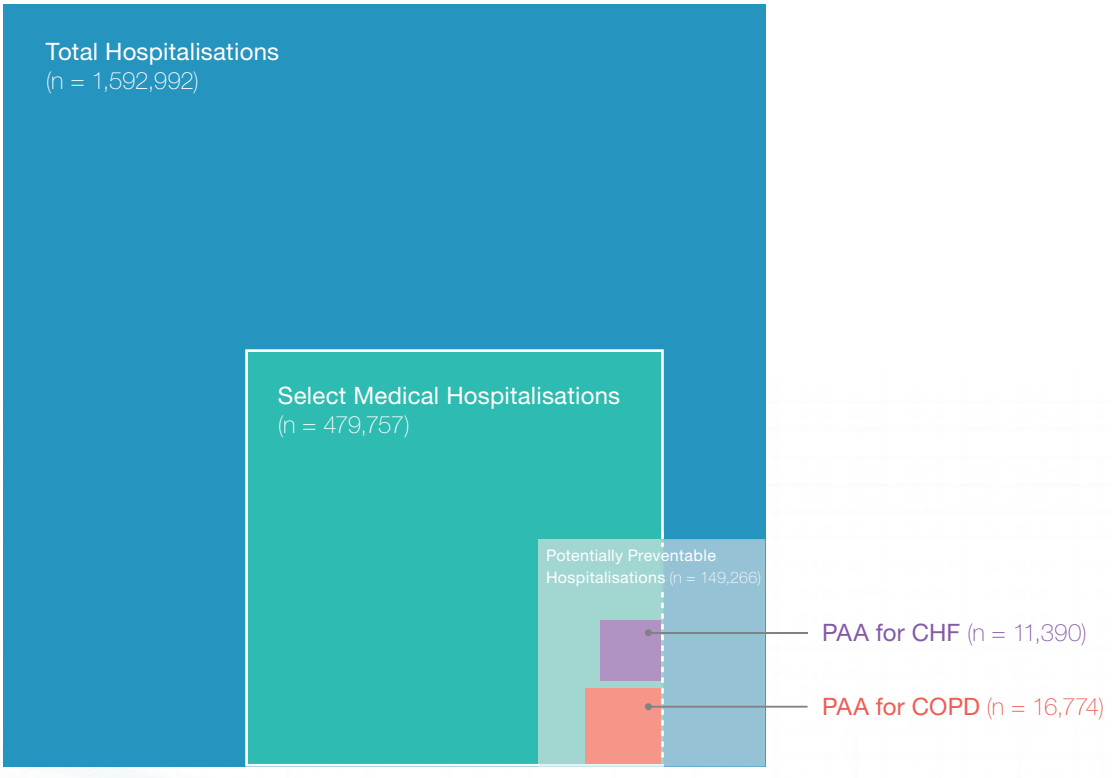
	Group	ICD-10-AM codes (NSW Health)	Further selection information
Acute	Ruptured appendix	K35.0	In any diagnosis field (1–20)
	Urinary tract infections including pyelonephritis	N10, N11, N12, N13.6, N39.0	Principal diagnosis only
	Pelvic inflammatory disease	N70.0, N70.1, N70.9, N73, N74.0–N74.1, N74.2–N74.8	Principal diagnosis only
	Cellulitis	L03, L04, L08.0, L08.8, L08.9, L88, L98.0, L98.3	Principal diagnosis only; ICD-9-CM: exclude cases with procedure codes 01 to 86.99 except 86.0 where it is the only listed procedure; ICD-10-AM: exclude cases when any procedure performed from blocks 1–1779 except when the following procedures done as the only ones: blocks: 1604–1606, 1608 and procedures: 90660-00, 30207-00, 30676-00, 30679-00, 34530-01 and 47912-00.
	Gangrene	R02	In any diagnosis field (1–20)

(*) Centre for Epidemiology and Research. *The health of the people of New South Wales - Report of the Chief Health Officer.* Sydney: NSW Department of Health. Available at www.health.nsw.gov.au/publichealth/chorep/. Accessed 8 April 2011.

Note. Where selection is described as *"in any diagnosis field"* or as *"secondary diagnosis"*, diagnosis fields 1–20 are used.

Note. The procedure codes are based on the Commonwealth Medicare Benefits Scheme (MBS) and are relevant to Australian data only.

Figure 3: Relationships between patient admission cohorts used in *Chronic Disease Care: A piece of the picture*



Directly standardised admission rates

To support fair comparisons, rates are directly standardised on age, sex and SES to the population of patients discharged from NSW hospitals between July 1 2009 and 30 June 2010. Standardisation illustrates what the admission rates would be if hospitals all served the same standard patient population. The process of standardisation is important to support comparisons of admission rates, since hospitals provide services to different types of people. These differences may reflect the characteristics of patients in a hospital's catchment area, which are outside the control of healthcare workers providing hospital care. For standardisation analyses, patients are grouped into four age groups (45–64, 65–74, 75–84 and 85 years or more) and quintiles of SES.

All admissions to NSW public hospitals with complete information for age, sex and SES are used as the standard population. Standardised rates are presented with 95% confidence intervals calculated using the method described by Dobson et al.[3] Actual and standardised admission rates per 1,000 select admissions for 79 hospitals and NSW as a whole are available in the Performance Profiles at www.bhi.nsw.gov.au

The standardisation of the admission rates are sensitive to small and zero counts of admissions. This issue results in unstable and unreliable estimates. One method of addressing this is to collapse some of the cells. The Bureau implemented this method by using SES tertiles and found that although the estimates were more stable, as measured by the relative standard error (RSE), the gains in stability do not justify the loss of discriminatory power. Appendix table 1 on page 11 presents the results of this investigation.

Length of stay and total bed days

The length of stay refers to the number of days between the start date and the end date of an episode of care minus the number of leave days. The term 'total bed days' refers to the number of bed days occupied by patients classified as admitted for an acute episode of care during a defined period. Same-day episodes are defined as having a length of stay of one day.

Length of stay and total bed day statistics are related, but there is an important difference in interpretation. Length of stay is a measure of the burden of the entire episode and thus the unit of analysis is the admission. This report presents the arithmetic average and a histogram to illustrate the length of stay distribution.

Total bed days are a measure of total hospital use over a defined period of time. The Bureau reports total bed days for NSW and for 79 individual hospitals by month (in graph format) and by year (in an accompanying table). This statistic includes all bed days for patients not discharged by the end of the defined period and excludes bed days occupied by patients admitted before the first day of that period. Also:

- Bed days for an episode that begins and ends within the period are calculated by the difference between episode start date and the episode end date.
- Bed days for an episode that begins before the period and ends during the period are calculated as the difference between the beginning of the period and the episode end date.

- The total number of bed days for an episode that begins before the period and ends after the period is calculated as the difference between the beginning and end of the period.
- Episode leave days are not subtracted from the bed days in the calculation of monthly total bed days.

The Bureau considered excluding day-only admissions from length-of-stay and total-bed-days calculations. Removing day-only admissions from the calculations had a negligible impact on the statistics, as shown in Table 2. Further information on total bed days at **www.meteor.aihw.gov.au/content/index.phtml/itemId/270045**

Smoking status

Smoking status at admission is determined by ICD10-AM diagnosis codes. Records with a diagnosis code of "Tobacco use, current" (Z72.0) or "Tobacco dependence syndrome" (F17.2) in any diagnosis field were classified as current smokers. Records with a diagnosis code of "Personal history of tobacco use disorder" (Z86.43) or "Tobacco use, harmful use" (F17.1) in any diagnosis field were classified as previous smokers. Since smoking status is based on a record of diagnosis, if none of the diagnosis codes listed above appear on the record, the admission is deemed to be of a non-smoking patient. Previous work on the discrimination of this method found sensitivities of 59% and 64% for current smoking and previous smoking respectively, and specificities of 97% and 79% for current smoking status and previous smoking respectively.[4]

Table 2: Total bed days for NSW with and without same-day admissions by year

Financial Year	COPD			CHF		
	Same day and Overnight	Overnight only	% difference	Same day and Overnight	Overnight only	% difference
2005 / 2006	108,358	106,897	1.35%	80,750	79,915	1.03%
2006 / 2007	107,159	105,731	1.33%	88,068	87,287	0.89%
2007 / 2008	112,713	111,459	1.11%	89,424	88,640	0.88%
2008 / 2009	104,478	103,288	1.14%	82,689	81,938	0.91%
2009 / 2010	96,119	94,963	1.20%	72,804	72,109	0.95%

Source: Health Information Exchange, NSW Health. Data extracted 28 February 2011.

What are hospital peer groups?

NSW public hospitals vary in size and the services they provide. To make comparisons between hospitals, people find it useful to compare similar hospitals together. To do this, the Bureau used a NSW classification system called 'peer group'. Peer grouping is based on the number of patients discharged each year (size of hospital), the primary role of the hospital (such as specialist paediatric or principal referral) and, for major non-referral hospitals, whether they are in a metropolitan or rural area. The peer groups mentioned in this report are:

Group	Name	Description
A1	Principal referral	Very large hospitals providing a broad range of services, including specialised units at a state or national level.
A3	Ungrouped acute – tertiary referral	Major specialist hospitals that are not similar enough to any other peer group to be classified with them. Data for this group have been included to ensure completeness but this group is not included for peer group comparison in this report.
BM	Major metropolitan	Large metropolitan hospitals in the greater Sydney area.
BNM	Major non-metropolitan	Large hospitals in rural and smaller urban areas.
C1	District group 1	Medium-sized hospitals treating between 5,000–10,000 patients each year.
C2	District group 2	Smaller hospitals, typically in rural locations.

Admissions from the emergency department

Admissions from EDs are identified using records from the DAYS_EPISODE database. This database contains episode-specific information, particularly the type of unit to which the patient was admitted for the episode of care. A patient is deemed to have been admitted from the ED if the final admission unit type was a hospital ward and the previous admission unit type is the ED.

Aboriginal status

Aboriginal status is derived from an item collected by hospital administration systems and uploaded in the HIE. The Indigenous status field is based on patient-reported status with possible options that include; Aboriginal but not Torres Strait Islander origin; Torres Strait Islander but not Aboriginal origin; Aboriginal and Torres Strait Islander origin; and neither Aboriginal nor Torres Strait Islander origin. In accordance with practices in other NSW Health publications, all admissions identified as being of Aboriginal origin, Torres Strait Islander origin, or both, have been reported as Aboriginal in this report.[5]

Socioeconomic Indexes for Areas (SEIFA)

SES is assigned to each patient in the cohort using their recorded postcode of residence and the Australian Bureau of Statistics Socioeconomic Indices for Areas (SEIFA). SEIFA was developed by the Australian Bureau of Statistics (ABS) to allow ranking of regions / areas, providing a method of determining the level of social and economic wellbeing in that region. The SEIFA indices are created by combining information collected in the five-yearly Census of Population and Housing and show where the affluent (as opposed to just high-income earners) live, where the disadvantaged (as opposed to the unemployed) live, and where the highly skilled and educated (as opposed to tertiary-educated people) live. The index used in this report was the Index of Relative Socioeconomic Disadvantage (IRSD) 2006. More information can be found on the ABS website: **www.abs.gov.au/websitedbs/D3310114.nsf/home/Seifa_entry_page**

Quintile cut points were determined from the IRSD scores of NSW postcodes weighted on the estimated residential postcode populations. Some admission records do not have a valid postcode of residence and therefore were excluded from analyses that required SES information.

Rurality

Rurality is assigned to admission records based on postcode using the Accessibility / Remoteness Index for Australia Plus (ARIA+) as recommended by the Australian Bureau of Statistics.[6] We report rurality in two categories. Rural areas were defined by an ARIA+ score of greater than 2.4 and the remainder were non-rural. Rurality was not assigned to records with an invalid or missing postcode.

Suppression of statistics

The Bureau has a policy of suppressing information in two instances:

1. Any information that may unjustifiably compromise privacy of individuals is not reported. Currently, the application of this rule stipulates that a statistic is not reported when the count of analysis units on which the calculation is based is less than 10.
2. When a statistic becomes unreliable it is not reported. Usually, this occurs when there are insufficient records (analysis units) to calculate the statistic reliably.

We use the relative standard error (RSE) to determine whether a statistic is reliable to report. RSE is used by other national and international agencies, but the threshold above which reliability is not guaranteed varies. RSE is calculated by dividing the standard error of the statistic by the value of the statistic. The standard errors for the directly standardised rates are calculated as described in Rothman et al.[7] For this report, a statistic with an RSE of greater than 40% is considered not reliable enough to report and is suppressed. A statistic with a RSE of between 30% and 40% is considered moderately unreliable and is reported with a warning to the reader that the statistic must be interpreted with caution. These thresholds of reliability are similar to those used by other agencies. Some agencies consider an estimate to be unreliable when the RSE is greater than 30%, while other agencies deem a 50% threshold is appropriate.[8,9,10]

Appendix 1: Hospital level comparisons (urban and rural LHNs)

Appendix table 1: Relative standard errors for PAAs for COPD by facility, 2008-09 and 2009-10

	2009 / 2010		2008 / 2009	
	IRSD in 5 groups	IRSD in 3 groups	IRSD in 5 groups	IRSD in 3 groups
Central Coast Local Health Network (CCLHN)				
Gosford Hospital	7.5%	4.7%	6.8%	4.8%
Wyong Hospital	6.6%	5.9%	10.1%	8.4%
Far West Local Health Network (FWLHN)				
Broken Hill Base Hospital	40.6%	51.4%	36.5%	38.6%
Hunter New England Local Health Network (HNELHN)				
Armidale and New England Hospital	20.9%	19.6%	16.4%	17.1%
Belmont Hospital	16.4%	9.5%	14.3%	7.6%
Calvary Mater Newcastle	6.5%	6.9%	31.6%	7.3%
Cessnock District Hospital	34.2%	27.0%	30.9%	26.3%
Gunnedah District Hospital	30.6%	31.4%	17.6%	17.8%
Inverell District Hospital	45.3%	49.2%	15.1%	15.1%
John Hunter Hospital	5.8%	5.5%	5.9%	5.6%
Kurri Kurri District Hospital	20.7%	20.5%	43.5%	19.8%
Maitland Hospital	9.6%	7.9%	12.2%	8.8%
Manning Base Hospital	25.9%	23.5%	28.7%	25.4%
Moree District Hospital	51.1%	36.9%	29.3%	31.7%
Muswellbrook District Hospital	21.8%	19.4%	40.9%	33.4%
Narrabri District Hospital	32.2%	15.8%	29.2%	16.0%
Singleton District Hospital	45.6%	42.6%	32.0%	33.9%
Tamworth Base Hospital	14.3%	13.8%	13.9%	9.1%
Illawarra Shoalhaven Local Health Network (ISLHN)				
Bulli District Hospital	27.1%	26.3%	21.1%	22.0%
Milton and Ulladulla Hospital	24.4%	20.9%	23.1%	18.0%
Shellharbour Hospital	12.0%	4.9%	17.6%	5.4%
Shoalhaven and District Memorial Hospital	12.9%	14.2%	13.0%	16.0%
Wollongong Hospital	9.8%	5.4%	8.6%	5.3%
Murrumbidgee Local Health Network (MLHN)				
Deniliquin Health Service	41.9%	49.1%	12.2%	12.3%
Griffith Base Hospital	17.8%	18.5%	16.8%	16.9%
Tumut Health Service	20.8%	13.9%	25.5%	16.1%
Wagga Wagga Base Hospital	16.6%	12.6%	11.3%	8.4%
Young Health Service	40.4%	21.8%	41.2%	31.2%

	2009 / 2010		2008 / 2009	
	IRSD in 5 groups	IRSD in 3 groups	IRSD in 5 groups	IRSD in 3 groups
Mid North Coast Local Health Network (MNCLHN)				
Bellinger River District Hospital	16.2%	14.2%	15.0%	14.2%
Coffs Harbour Base Hospital	21.0%	14.1%	28.0%	17.6%
Kempsey Hospital	32.5%	15.0%	22.5%	17.3%
Macksville District Hospital	37.8%	29.9%	40.9%	45.8%
Port Macquarie Base Hospital	13.8%	6.8%	17.2%	6.7%
Nepean Blue Mountains Local Health Network (NBMLHN)				
Blue Mountains District Anzac Memorial Hospital	17.5%	23.4%	17.3%	24.6%
Lithgow Health Service	40.7%	21.1%	34.9%	33.7%
Nepean Hospital	8.1%	6.3%	8.8%	6.2%
Northern NSW Local Health Network (NNSWLHN)				
Ballina District Hospital	25.3%	26.8%	22.1%	18.9%
Casino and District Memorial Hospital	44.0%	41.4%	18.3%	18.3%
Grafton Base Hospital	49.1%	30.2%	17.5%	22.0%
Lismore Base Hospital	15.5%	16.5%	20.9%	24.2%
Maclean District Hospital	36.0%	30.1%	10.2%	35.9%
Murwillumbah District Hospital	24.9%	17.2%	26.9%	12.4%
The Tweed Hospital	14.5%	8.5%	6.3%	6.0%
Northern Sydney Local Health Network (NSLHN)				
Hornsby and Ku-Ring-Gai Hospital	38.2%	37.1%	25.6%	27.9%
Manly District Hospital	45.5%	47.3%	66.5%	45.2%
Mona Vale and District Hospital	40.1%	55.7%	59.2%	53.6%
Royal North Shore Hospital	23.8%	20.8%	22.2%	19.6%
Ryde Hospital	13.4%	11.0%	24.0%	12.4%
South Eastern Sydney Local Health Network (SESLHN)				
Prince of Wales Hospital	9.5%	7.1%	7.8%	7.6%
St George Hospital	9.4%	8.0%	8.1%	8.0%
Sutherland Hospital	22.8%	39.8%	16.5%	18.4%
Southern NSW Local Health Network (SNSWLHN)				
Bateman's Bay District Hospital	29.9%	22.3%	44.8%	52.1%
Bega District Hospital	21.9%	13.8%	25.0%	14.3%
Cooma Health Service	28.5%	24.6%	23.1%	22.5%
Goulburn Base Hospital	26.1%	16.3%	70.6%	13.7%
Moruya District Hospital	31.3%	31.7%	24.7%	11.8%
Pambula District Hospital	13.1%	13.1%	16.8%	14.8%
Queanbeyan Health Service	48.8%	22.3%	32.3%	24.5%
St Vincent's Health Network (SVHN)				
St Vincent's Hospital, Darlinghurst	11.7%	12.8%	10.8%	10.6%

	2009 / 2010		2008 / 2009	
	IRSD in 5 groups	IRSD in 3 groups	IRSD in 5 groups	IRSD in 3 groups
South Western Sydney Local Health Network (SWSLHN)				
Bankstown / Lidcombe Hospital	7.4%	6.0%	7.0%	6.2%
Bowral and District Hospital	57.5%	25.9%	26.6%	20.3%
Camden Hospital	37.2%	25.3%	35.4%	23.4%
Campbelltown Hospital	7.9%	6.1%	8.5%	5.7%
Fairfield Hospital	13.1%	12.1%	14.2%	12.5%
Liverpool Hospital	7.3%	6.2%	14.0%	6.3%
Sydney Local Health Network (SYDLHN)				
Canterbury Hospital	11.0%	8.3%	7.7%	6.2%
Concord Hospital	7.9%	8.0%	8.0%	7.8%
Royal Prince Alfred Hospital	5.6%	5.2%	4.8%	4.6%
Western NSW Local Health Network (WNSWLHN)				
Bathurst Base Hospital	19.9%	15.6%	17.5%	14.6%
Cowra District Hospital	13.2%	10.4%	30.7%	11.8%
Dubbo Base Hospital	23.0%	29.9%	10.3%	8.2%
Forbes District Hospital	56.1%	54.3%	57.1%	46.8%
Mudgee District Hospital	32.2%	23.2%	41.5%	18.6%
Orange Base Hospital	14.0%	14.1%	28.7%	11.7%
Parkes District Hospital	40.0%	26.7%	40.1%	43.6%
Western Sydney Local Health Network (WSLHN)				
Auburn Hospital	15.8%	12.5%	15.6%	13.1%
Blacktown Hospital	4.8%	4.9%	4.8%	4.9%
Mount Druitt Hospital	8.8%	8.0%	8.4%	8.1%
Westmead Hospital (all units)	5.3%	5.1%	5.1%	5.0%

1. Chronic obstructive pulmonary disease (COPD). For inclusion criteria, see *Chronic Disease Care: A piece of the picture, June 2009 to July 2010*, Appendix 2.
2. Congestive heart failure (CHF). For inclusion criteria, see *Chronic Disease Care: A piece of the picture, June 2009 to July 2010*, Appendix 2.
3. For further information about relative standard error calculation, see page 11.
4. Local Health Networks to be renamed ***Local Health Districts*** following enactment of legislation.

Appendix table 2: Relative standard errors for PAAs for CHF, 2008-09 and 2009-10

	2009 / 2010		2008 / 2009	
	IRSD in 5 groups	IRSD in 3 groups	IRSD in 5 groups	IRSD in 3 groups
Central Coast Local Health Network (CCLHN)				
Gosford Hospital	9.2%	6.1%	9.9%	6.0%
Wyong Hospital	7.5%	8.3%	7.3%	9.0%
Far West Local Health Network (FWLHN)				
Broken Hill Base Hospital	42.6%	48.8%	12.8%	12.8%
Hunter New England Local Health Network (HNELHN)				
Armidale and New England Hospital	16.9%	16.8%	18.1%	18.0%
Belmont Hospital	14.2%	8.8%	10.3%	8.6%
Calvary Mater Newcastle	7.5%	7.6%	8.0%	9.3%
Cessnock District Hospital	28.2%	28.2%	31.5%	28.9%
Gunnedah District Hospital	33.1%	25.3%	69.4%	57.3%
Inverell District Hospital	74.2%	72.2%	75.4%	50.9%
John Hunter Hospital	6.2%	5.9%	6.3%	6.0%
Kurri Kurri District Hospital	34.0%	34.2%	34.0%	31.5%
Maitland Hospital	12.6%	10.0%	14.9%	10.6%
Manning Base Hospital	34.8%	31.5%	31.9%	35.2%
Moree District Hospital	65.8%	63.4%	60.7%	77.9%
Muswellbrook District Hospital	43.9%	35.7%	31.6%	25.0%
Narrabri District Hospital	27.9%	27.9%	41.8%	42.8%
Singleton District Hospital	25.7%	25.2%	26.1%	25.3%
Tamworth Base Hospital	14.2%	13.6%	13.0%	10.0%
Illawarra Shoalhaven Local Health Network (ISLHN)				
Bulli District Hospital	55.6%	26.0%	20.8%	22.8%
Milton and Ulladulla Hospital	23.7%	23.3%	39.5%	29.0%
Shellharbour Hospital	18.2%	7.7%	27.5%	7.2%
Shoalhaven and District Memorial Hospital	18.0%	17.8%	7.6%	12.9%
Wollongong Hospital	16.4%	6.5%	5.8%	6.0%
Murrumbidgee Local Health Network (MLHN)				
Deniliquin Health Service	46.5%	43.2%	46.9%	48.1%
Griffith Base Hospital	18.9%	16.3%	32.9%	15.1%
Tumut Health Service	19.2%	19.3%	20.4%	20.5%
Wagga Wagga Base Hospital	11.3%	9.9%	15.0%	14.3%
Young Health Service	68.5%	53.6%	42.4%	15.3%
Mid North Coast Local Health Network (MNCLHN)				
Bellinger River District Hospital	43.8%	29.4%	27.6%	25.3%
Coffs Harbour Base Hospital	9.2%	22.4%	11.3%	31.3%
Kempsey Hospital	72.1%	77.6%	13.5%	9.5%
Macksville District Hospital	17.7%	17.7%	61.9%	72.7%
Port Macquarie Base Hospital	37.5%	21.8%	23.0%	17.7%

	2009 / 2010		2008 / 2009	
	IRSD in 5 groups	IRSD in 3 groups	IRSD in 5 groups	IRSD in 3 groups
Nepean Blue Mountains Local Health Network (NBMLHN)				
Blue Mountains District Anzac Memorial Hospital	20.0%	25.6%	23.1%	28.3%
Lithgow Health Service	15.2%	15.2%	44.2%	32.5%
Nepean Hospital	10.0%	7.1%	8.2%	6.5%
Northern NSW Local Health Network (NNSWLHN)				
Ballina District Hospital	21.7%	13.4%	23.2%	23.1%
Casino and District Memorial Hospital	26.3%	16.8%	19.6%	19.6%
Grafton Base Hospital	42.3%	12.4%	32.3%	58.3%
Lismore Base Hospital	15.1%	15.7%	15.7%	19.0%
Maclean District Hospital	17.8%	17.1%	18.3%	18.3%
Murwillumbah District Hospital	31.8%	16.8%	36.5%	31.0%
The Tweed Hospital	22.4%	18.3%	18.1%	10.9%
Northern Sydney Local Health Network (NSLHN)				
Hornsby and Ku-Ring-Gai Hospital	33.7%	36.0%	28.3%	30.7%
Manly District Hospital	64.5%	77.8%	27.2%	37.8%
Mona Vale and District Hospital	12.9%	57.4%	12.9%	8.7%
Royal North Shore Hospital	29.6%	29.6%	26.5%	23.2%
Ryde Hospital	11.5%	14.2%	31.4%	17.3%
South Eastern Sydney Local Health Network (SESLHN)				
Prince of Wales Hospital	11.2%	9.3%	15.7%	10.2%
St George Hospital	10.0%	7.9%	8.9%	7.7%
Sutherland Hospital	28.4%	27.9%	30.5%	22.6%
Southern NSW Local Health Network (SNSWLHN)				
Bateman's Bay District Hospital	53.2%	27.6%	42.8%	36.5%
Bega District Hospital	27.1%	22.1%	26.4%	16.9%
Cooma Health Service	25.1%	16.6%	25.9%	21.1%
Goulburn Base Hospital	48.7%	15.3%	67.3%	17.9%
Moruya District Hospital	57.6%	46.9%	45.1%	42.3%
Pambula District Hospital	21.2%	20.1%	33.2%	42.7%
Queanbeyan Health Service	36.0%	31.5%	21.5%	20.3%
St Vincent's Health Network (SVHN)				
St Vincent's Hospital, Darlinghurst	11.2%	11.4%	11.2%	11.5%
South Western Sydney Local Health Network (SWSLHN)				
Bankstown / Lidcombe Hospital	11.4%	7.3%	7.1%	6.3%
Bowral and District Hospital	35.2%	12.7%	41.6%	46.6%
Camden Hospital	52.9%	30.3%	26.0%	28.3%
Campbelltown Hospital	12.5%	8.1%	13.7%	8.0%
Fairfield Hospital	12.9%	17.0%	13.7%	15.5%
Liverpool Hospital	10.4%	7.8%	11.7%	8.6%

	2009 / 2010		2008 / 2009	
	IRSD in 5 groups	IRSD in 3 groups	IRSD in 5 groups	IRSD in 3 groups
Sydney Local Health Network (SYDLHN)				
Canterbury Hospital	9.5%	8.4%	8.6%	7.5%
Concord Hospital	7.8%	8.2%	6.9%	7.4%
Royal Prince Alfred Hospital	6.5%	6.1%	6.3%	6.0%
Western NSW Local Health Network (WNSWLHN)				
Bathurst Base Hospital	28.1%	22.9%	32.8%	23.0%
Cowra District Hospital	23.0%	17.3%	64.6%	80.6%
Dubbo Base Hospital	16.4%	15.4%	17.9%	10.3%
Forbes District Hospital	47.8%	53.3%	34.4%	15.9%
Mudgee District Hospital	66.1%	27.6%	29.8%	30.7%
Orange Base Hospital	14.8%	13.4%	14.8%	12.9%
Parkes District Hospital	67.6%	24.3%	20.9%	20.9%
Western Sydney Local Health Network (WSLHN)				
Auburn Hospital	17.3%	13.6%	16.4%	10.6%
Blacktown Hospital	6.9%	7.0%	7.3%	7.4%
Mount Druitt Hospital	11.6%	10.1%	11.0%	10.9%
Westmead Hospital (all units)	5.1%	5.0%	4.9%	4.7%

1. Chronic obstructive pulmonary disease (COPD). For inclusion criteria, see *Chronic Disease Care: A piece of the picture, June 2009 to July 2010*, Appendix 2.
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- *Performance Profiles* (reports for 79 hospitals and NSW as a whole)
- *Technical Supplement*

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The Bureau of Health Information provides the community, healthcare professionals and the NSW Parliament with timely, accurate and comparable information on the performance of the NSW public health system in ways that enhance the system's accountability and inform efforts to increase its beneficial impact on the health and wellbeing of the people of NSW.

The Bureau is an independent, board-governed statutory health corporation. The conclusions in this report are those of the Bureau and no official endorsement by the NSW Minister for Health, the NSW Department of Health or any other NSW statutory health corporation is intended or should be inferred.

To contact the Bureau

Telephone: +61 2 8644 2100
Fax: +61 2 8644 2119
Email: enquiries@bhi.nsw.gov.au
Postal address:
PO Box 1770
Chatswood
New South Wales 2057
Australia
Web: www.bhi.nsw.gov.au

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