Queensland Government

Hospital utilisation and funding for patients with selected chronic conditions - 1. Asthma/COPD

Taku Endo, Miles Utz, Trisha Johnston

For further information contact:

Health Statistics Centre
Queensland Health
GPO Box 48
Brisbane Queensland 4001 Australia
tel (+61) (07) 3234 1875
hlthstat@health.qld.gov.au
www.health.qld.gov.au

Published by the State of Queensland (Queensland Health), July, 2012

Hospital utilisation and funding for patients with selected chronic conditions - 1. Asthma/COPD

Taku Endo, Miles Utz, Trisha Johnston
Health Statistics Centre, Queensland Health

Respiratory system diseases are the third largest cause of death, the seventh largest cause of hospitalisations and the second largest cause of national health and aged care expenditure in Queensland[1]. Although the prevalence of these conditions in Australia has been stable in the last decade[1,2], the admitted patient services expenditure for respiratory conditions in Australia is expected to increase by 157% between 2012/13 and 2032/33[3]. Asthma and chronic obstructive pulmonary disease (COPD) are the two chronic respiratory conditions that contribute the greatest burden[1]. It is estimated that these two conditions together account for over 5% of the total burden of disease in Queensland, and approximately 1% of total episodes of care in Queensland hospitals in 2007/08 were primarily due to these conditions[1]. Although severe forms of these conditions do require care in hospital, effective community healthcare management may prevent hospital admissions. In order to determine the potentially reducible burden to the hospital system, the pattern of hospital utilisations by these patients needs to be understood.

The aim of this report is to assess the characteristics of hospitalisations for patients with asthma or COPD, and the funding by the Queensland Government for admissions for these patients in Queensland public hospitals. Data were extracted from the Queensland Hospital Admitted Patient Data Collection (QHAPDC) from 1 July 2003 to 30 June 2010. Deterministic and probabilistic linkage techniques were used to allow the linkage of episodes for an individual patient across public hospitals in Queensland. Episodes from private hospitals were excluded as the quality of linkage for these facilities was lower in the earlier years included in the analysis. Episodes of care with diagnoses of asthma or COPD (J41-J46.x) were used to determine if a patient had been 'ever' coded with these chronic conditions. The first episode with a diagnosis (index episode) and any subsequent episodes for the same patient were included in the analysis, with an assumption that after the onset of the disease, the patient has the disease for life[*]. Episodes for boarders, organ procurement and unqualified neonates were excluded. Episodes involving child birth, defined as having Z37.x (Outcome of delivery) as a diagnosis within the episode of care were also excluded from reporting. However, if the childbirth episode included a diagnosis of asthma/COPD, that patient's subsequent episodes were included. Hospital admissions that were primarily due to community injuries[4] were excluded from the analyses, as these episodes were not likely to be related to a patient's chronic conditions, except for self-inflicted intentional injuries where a potential association between chronic respiratory conditions and suicidal behaviours has been noted in an earlier study[5]. The funding information was obtained from the pAWS_archive database, where values for Model Phase 14 were utilised.

[*] Although this may not be the case for childhood asthma, due to the relatively short time frame for this study all episodes have been included.

Characteristics of asthma and COPD admissions

During the study period, there were 77,445 unique patients 'ever coded' with asthma/COPD, contributing to 388,878 episodes of care. In 2009/10, nearly 63,000 episodes (excluding the index episode[†]) were from these patients, which equates to approximately 7% of total admitted patient care in Queensland public hospitals[6]. Of these, 9,937 (15.9%) episodes had a principal diagnosis of asthma/COPD. This implies that only 16% of hospitalisations of these patients are primarily due to asthma/COPD.

Table 1 displays the frequency of admission for the cohort of patients in 2009/10, who had 'ever' been admitted for asthma/COPD prior to 2009/10 and who did not link to death records or to a hospital record where discharge status was 'died in hospital' prior to the start of 2009/10. Although most of the patients were not hospitalised during the period, approximately 30% of these patients had at least one hospital admission, with 5% of them being admitted more than 3 times in a year. Roughly 14% of these admissions had a diagnosis of asthma/COPD, with 1.1% admitted with asthma/COPD recorded more than 3 times a year.

Co-existing conditions

1. Principal diagnosis and other diagnoses, where asthma/COPD was recorded

Between 2003/04-2009/10, for those episodes where asthma/COPD was coded within an episode of care, for nearly 60% of cases the principal diagnosis was either asthma or COPD (Figure 1). When asthma/COPD was recorded as the principal diagnosis, common 3-character ICD-10AM other diagnoses were:

- personal history of certain other diseases (Z86.x), driven by Z86.43 (personal history of tobacco use disorder)
- problems related to lifestyle (Z72.x), most commonly Z72.0 (Tobacco use, current)
- acute upper respiratory infections of multiple and unspecified sites (J06.x)
- primary hypertension (I10.x) and
- type II diabetes (E11.x).

Table 1. Frequency of admission for ever-asthma/COPD patients, 2009/10

No. of admissions	All admissions[#]	Asthma/COPD related admissions[#] ^
0	34,753 (68.3%)	43,823 (86.1%)
1	8,322 (16.4%)	4,642 (9.1%)
2	3,496 (6.9%)	1,360 (2.7%)
3	1,670 (3.3%)	517 (1.0%)
4+	2,657 (5.2%)	556 (1.1%)
Total	**50,898 (100.0%)**	**50,898 (100.0%)**

Source: Queensland Hospital Admitted Patient Data Collection

#If a patient had an episode change or was transferred to another hospital, these series of episodes were grouped as an "admission". The admission was included if they were ever admitted with asthma/COPD prior to and were alive at the start of 2009/10.

^Asthma/COPD related admission is defined as an admission where asthma/COPD was coded at least once within the episodes of care included.

When asthma/COPD were recorded as other diagnoses (i.e. asthma/COPD recorded, but not as principal diagnosis),

[†] Index admissions, by default, include a diagnosis of asthma/COPD. As a result, index admissions were excluded so as to not over-estimate the proportion of admissions with asthma/COPD recorded.

- at the ICD-10AM chapter level, Diseases of Respiratory System (ICD-10AM Chapter J, excluding asthma/COPD) was the most commonly recorded principal diagnosis, followed by Diseases of Circulatory System (ICD-10AM Chapter I) (Figure 1)

The most common 3-character ICD-10AM principal diagnoses were:

- pneumonia, organism unspecified (J18.x)
- heart failure (I50.x)
- care involving rehabilitation procedures (Z50.x) and
- problems related to medical facilities and other health care (Z75.x), most commonly Z75.11 (awaiting admission to residential aged care service).

Figure 1. Principal diagnosis where asthma/COPD was recorded

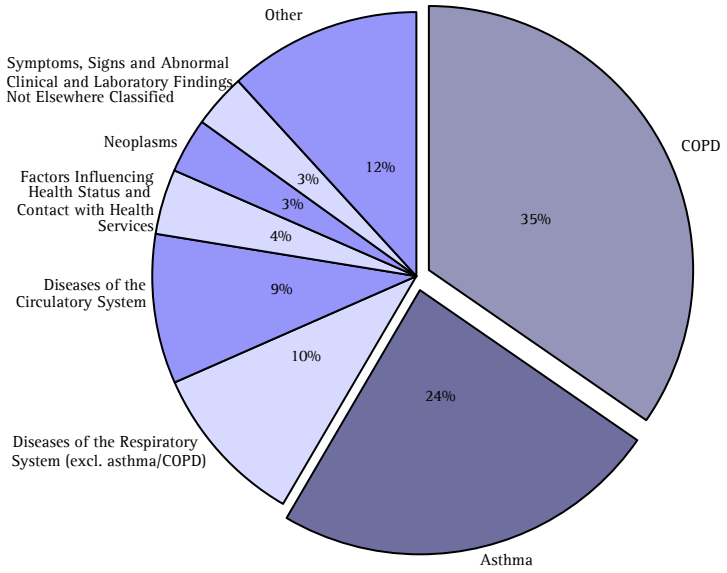
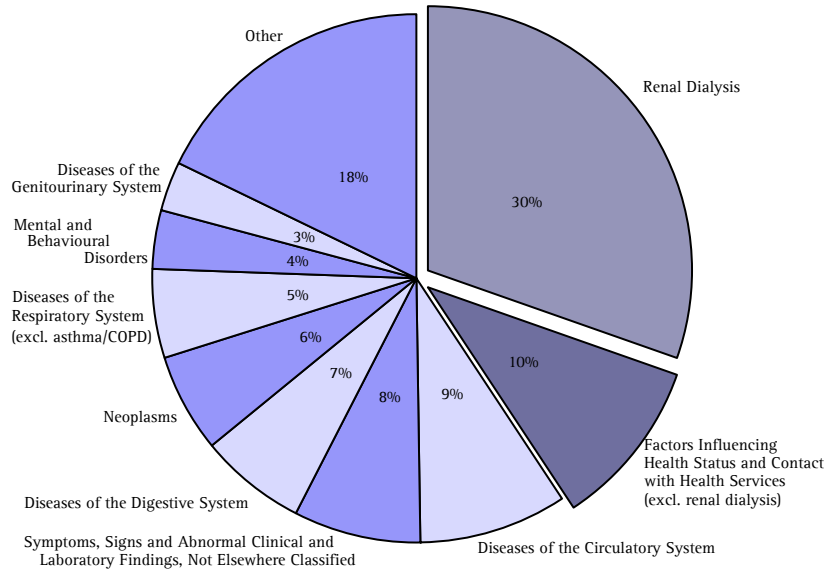


Figure 2. Principal diagnosis where asthma/COPD was not recorded



Source: Queensland Hospital Admitted Patient Data Collection

2. Principal diagnosis where asthma/COPD was not recorded

Between 2003/04-2009/10, 222,316 'ever-coded' episodes did not have a record of asthma/COPD within the episode of care at all. For these episodes:

- more than 40% (90,449) had a principal diagnosis starting with '*Z*' (ICD-10AM Chapter 21: *Factors influencing health status and contact with health services*), with 67,543 of these being for renal dialysis (Z49.1, Z49.2) (Figure 2)
- the number of individual patients who ever-had a diagnosis of asthma/COPD and had renal dialysis as principal diagnosis during the study period was 403, which illustrates the frequency of admission for this cohort of patients
- circulatory conditions (ICD-10AM Chapter I) were also commonly recorded, accounting for approximately 9% of episodes
- pharmacotherapy session for neoplasm (Z51.1) and care involving use of rehabilitation procedure, unspecified (Z50.9) accounted for 5.2% of total episodes.

3. Common co-morbidities among the cohort for selected age groups

For patients with asthma ever recorded who were younger than 15 at the time of admission:

- more than 37% of patients had J06.9 (acute upper respiratory infection, unspecified) recorded at least once
- more than 50% had acute-respiratory infection (J00-J22.x) recorded at least once.

For patients with COPD ever recorded who were 55 years or over at the time of admission:

- more than 52% of patients had Z86.43 (Personal history of tobacco disorder) recorded at least once in the ever-COPD QHAPDC data
- 75% had at least one tobacco-related diagnosis *(Z86.43* – personal history of tobacco disorder, *Z72.0* – Tobacco use, current or *F17.x* – Mental and behavioural disorders due to tobacco), which may illustrate the strong relationship between COPD and tobacco smoking
- after tobacco related diagnoses, circulatory conditions were most commonly recorded among these patients, with more than 70% having at least one episode recorded
- coronary heart disease (I20-I25.x) was recorded among 32% of these patients
- hypertension and heart failure were also commonly recorded
- respiratory conditions are also common co-morbid conditions, where 39% of the cohort had an episode where an acute-respiratory infection was recorded
- approximately 20% also had diabetes (E10-E14.x) recorded
- overall, 9.1% of the patients had COPD, coronary heart disease and diabetes ever-recorded within the cohort of patients.

Funding

In 2009/10, funding provided by the Queensland Government for treatment of patients who had been admitted for asthma or COPD at least once since 2003/04 totalled approximately $401M in admitted care settings (Table 2). Roughly 52% of this was for episodes with asthma/COPD recorded, even though these episodes accounted for only 35% of the total number of episodes. When asthma/COPD was recorded as the principal diagnosis, the total amount funded was approximately $84M, with approximately 84.5% funded through DRG funding, and 10.5% funded for treatments in the Intensive Care Unit (ICU). The average funding per episode for these episodes was roughly $5,100. For those episodes with no asthma/COPD recorded, the average funding per episode was approximately $4,000. This increased to $5,400 when episodes involving renal dialysis, which has relatively low funding, were removed. For episodes where asthma/COPD was recorded as an other diagnosis the average funding was $13,400 per episode,

Table 2. Average and total funding for episodes of care by type of diagnoses recorded for patients with asthma/COPD, 2009/10

Type	Asthma/COPD as PD	Asthma/COPD as OD	No asthma/COPD recorded
# of episodes (n)	16,342	9,363	47,158
Psychiatric (av. $)	$0.65	$1,104.32	$348.57
Sub/Non-Acute (av.	$257.63	$2,394.91	$511.46
ICU (av. $)	$539.50	$2,447.89	$238.53
DRG (av. $)	$4,347.18	$7,474.90	$2,951.15
Total (av. $)	$5,144.97	$13,422.02	$4,049.71
Total ($)	**$84,079,019.54**	**$125,670,413.5**	**$190,976,047.93**

Source: Queensland Hospital Admitted Patient Data Collection, pAWS_archive database

which accounted for the funding of $126M. For these episodes the average funding for ICU was $2,400 per episode, which is nearly a 10-fold increase compared to those with no asthma/COPD recorded. These results may suggest that for certain diagnoses the presence of asthma or COPD increases the clinical care required and substantially increases the average funding per episode. Overall, 65% of episodes for the cohort did not include a diagnosis of asthma or COPD. In 2009/10 this was associated with the funding of $191M which could potentially be attributed to these conditions.

Acknowledgements

The authors would like to thank Paul Jilek and Rada Robey from the Activity Based Funding Models Team for providing us with the funding information, and their expert advice on the use of the data.

References

1. Queensland Health. *The Health of Queenslanders 2010*: *Third Report of the Chief Health Officer Queensland*. Queensland Health: Brisbane; 2010.

2. Australian Centre for Asthma Monitoring, Woolcok Institute of Medical Research. *Asthma in Australia 2011*. Cat. No. ACM 22. Australian Institute of Health and Welfare: Canberra; 2008

3. Australian Institute of Health and Welfare: Goss J. *Projection of Australian health care expenditure by disease, 2003 to 2033*. Cat. No. HWE 43. AIHW: Canberra; 2008

4. Australian Institute of Health and Welfare: Kreisfeld R & Harrison JE *Hospital separations due to injury and poisoning 2005-06*. Injury research and statistics series no. 55. Cat. No. INJCAT 131. AIHW: Canberra; 2010.

5. Scott KM, Hwang I, Chiu WT, Kessler RC, Sampson NA, Angermeyer M et al. *Chronic physical conditions and their association with first onset of suicidal behaviour in the World Mental Health surveys*. Psychosomatic Medicine 2010; 72: 712-719.

6. Queensland Health: Health Statistics Centre. *Public Acute Hospital Summary Data, 2009/2010*. Revised Oct 11, 2011.