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Preface

Health financing issues, such as who pays, how much and for what, are hotly debated topics. In particular, the complex funding arrangements for public and private hospitals in Australia have received considerable attention in the media and the political arena.

Because funding in the Australian health care system is complex, it is often unclear what the total costs of hospital care are, and who funds the various components of care whether they be medical services, nursing care, pharmaceuticals or other aspects of care.

This report brings together information from various sources to present a detailed picture of the sources of funding for care for admitted patients in public and private hospitals. It examines the total cost (and funding) of episodes of care received by privately insured and public admitted patients in 2005–06. It includes costs relating to the services provided by the hospital, and costs relating to services provided by private medical practitioners in hospital.

The Australian Government contribution is considered in particular. The report shows that the Australian Government provides about the same amount of funding for privately insured patients in private hospitals as for public patients in public hospitals.

This analysis was prepared to inform work of the National Health and Hospitals Reform Commission in 2008–09 and used 2005–06 data as that was the latest year for which all the relevant hospital documents were available at the time.

I hope you find this analysis useful, and I trust that it will contribute to informed debate about this important sector in our health system.

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Australian Institute Health and Welfare

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Abbreviations

ABS	Australian Bureau of Statistics
AHCAs	Australian Health Care Agreements
AIHW	Australian Institute of Health and Welfare
ALOS	average length of stay
AMI	acute myocardial infarction
AR-DRG	Australian Refined Diagnosis Related Group
CC	complication or comorbidity
DoHA	Australian Government Department of Health and Ageing
DRG	Diagnosis Related Group
FED	front end deductible
HCP	Hospital Casemix Protocol
MBS	Medical Benefits Schedule
NHCDC	National Hospital Cost Data Collection
NHMCM	National Hospital Morbidity Costing Model
NHHRC	National Health and Hospitals Reform Commission
NHMD	National Hospital Morbidity Database
OOP	out-of-pocket
OR	operating room
PBS	Pharmaceutical Benefits Scheme
PHI	private health insurance
PHIAC	Private Health Insurance Administration Council

Symbols

n.a.	not available
n.p.	not published
..	not applicable

Executive summary

This report provides information on sources of funds for admitted patients in Australian hospitals. Using data from 2005–06, the report compares funding for privately insured and public patients in public and private hospitals and, in particular, compares the Australian Government contributions for these patients. For this analysis, ‘privately insured’ patients are those for whom private health insurance was used to fund their episode of care. It does not include patients who had private health insurance but did not use it to fund their care.

Overview of privately insured episodes of admitted patient care

- Expenditure in 2005–06 from all sources for privately insured patients was estimated at \$3,477 per episode on average, for the subset of 596 (out of 666) Australian Refined Diagnosis Related Groups (AR-DRGs) used for this analysis. Of that, \$2,330 (67%) was hospital charges and \$1,101 (32%) was medical charges (Table 2).
- Sources of funds for the hospital and medical charges were private health insurance (PHI) benefits of \$2,646 on average, Medical Benefits Schedule (MBS) rebates of \$512 and out-of-pocket expenditure of \$274 (Table 2).
- Sources of funds for the total cost of the episodes were divided between the Australian Government (41.1%), state/territory governments (0.7%), private health insurance (50.3%) and patient out-of-pocket (7.9%) (Table 3).
- For the 20 highest volume AR-DRGs, the Australian Government contribution ranged between 30% and 50%. Across all the AR-DRGs in the analysis, the range was similar – between 28% and 56%. It varied because the Australian Government funds a greater proportion of medical costs than hospital costs. Thus, AR-DRGs with a higher medical component tended to have greater Australian Government funding.

Comparing Australian Government funding for public patients and privately insured patients

- In 2005–06, the Australian Government’s average contribution per episode for public patients was \$1,367 (Table 4) for the subset of AR-DRGs used for the analysis, compared to the average contribution for privately insured patients in private hospitals of \$1,364 per episode.
- For privately insured patients in public and private hospitals, average funding from the Australian Government per episode was \$1,427.
- For 10 of the top 20 highest volume AR-DRGs, the Australian Government provided higher funding for privately insured patients than for public patients, with expenditure per privately insured episode between 105% and 174% of expenditure per public patient in the same AR-DRG. For the other 10 AR-DRGs, Australian Government funding for privately insured patients ranged from 21% to 97% of funding per public patient (calculated from Table 4).

Age group differences

- The private health insurance rebate varies by age of the fund member, from 30% for those aged 0 to 64 years, to 35% for members aged 65 to 69 years and 40% for those members aged at least 70 years.
- The Australian Government therefore bears a greater proportion of the costs of privately insured admitted patients for each of the 20 highest volume AR-DRGs for the older age groups than for those aged under 65 years (Table 6).

Data quality

The report combines data from a range of sources, such as the Hospital Casemix Protocol (HCP) data set and the Australian Institute of Health and Welfare National Hospital Morbidity Database (AIHW NHMD), to make estimates of the sources of funds for privately insured and public admitted patient care (see methodology details in Chapter 2 and Appendix 3). The HCP data set is an important source of information on funding for privately insured patients. However, because of the limited scope of its data and its incomplete coverage of episodes, the results from this data set should be interpreted with caution. This is particularly the case for public hospital episodes for privately insured patients and for episodes in low volume AR-DRGs, where characteristics of the episodes did not match those in the AIHW NHMD, which is a comparable comprehensive data source.

Most of the analyses in this report use the 20 AR-DRGs from the HCP data set with the largest number of privately insured episodes in the NHMD (together accounting for 34% of all privately insured episodes in the NHMD). Totals are calculated for the 596 AR-DRGs that contain at least 50 episodes in the HCP data set. These high volume AR-DRGs represent 73.3% of all privately insured episodes in the AIHW NHMD.

1 Introduction and scope

Introduction

This report compares funding for privately insured and public patients in public and private hospitals and, in particular, compares the Australian Government contributions for the various categories of patients. The funding is compared using the AR-DRG classification for grouping types of admitted patient care, and for older and younger patients.

While overall levels of funding are widely available, it is more difficult to compare funding for the same type of patient (defined by AR-DRGs) or demographic group without the detailed modelling that has been possible for this report.

Patients admitted to hospitals receive services, not only from the public and private hospitals they are treated in, but in the case of private patients, also from private medical practitioners providing services in hospitals.

This report examines the total costs (and funding) of the episodes of care received by privately insured and public admitted patients in public and private hospitals, regardless of whether the services were provided by the hospital or the private medical practitioner. For this analysis, 'privately insured' patients are those for whom private health insurance was used to fund their episode of care. It does not include patients who had private health insurance but did not use it to fund their care.

Cost of and funding for non-admitted patients of hospitals, such as the cost of their medical care, pharmaceuticals, and pathology and imaging services is not included in this report. Self-funded (uninsured) private patients are also not included in this report but information on their contributions is provided in *Health expenditure Australia* reports (e.g. AIHW 2008).

Scope

Funding of public and privately insured admitted patients

The Australian health care system is very complex, particularly in the way different types of services are funded. Funding arrangements for public and private hospitals are particularly complicated, especially the way private patients are funded in comparison to public patients.

Public admitted patients

Public patients are mainly treated in public hospitals, although relatively small amounts of care are provided to public patients in private hospitals under contract arrangements with public hospitals and health departments.

Funding of public admitted patient care is relatively simple. The Australian Government and state and territory governments jointly fund the whole cost of public admitted patient care – both medical and hospital services and pharmaceuticals. Until the introduction of the intergovernmental financial agreements in 2008, the Australian Government made its contribution through the Australian Health Care Agreements (AHCAs).

Private admitted patients

Private patients are mainly treated in private hospitals, although a small proportion are cared for as private patients in public hospitals. Private patients include patients funded under the following arrangements:

- private health insurance
- self-funded
- workers' compensation
- motor vehicle third party personal claim
- other compensation (e.g. public liability, common law, medical negligence)
- Department of Veterans' Affairs
- Department of Defence
- correctional facilities.

However, this report only covers admitted patient care for patients whose care is paid for by private health insurance, in both public and private hospitals, not for all private patients.

Privately insured admitted patients

Privately insured admitted patients are funded from different sources for the various components of their episodes of hospital care: private health insurance benefits, the Australian Government private health insurance rebate and out-of-pocket payments by individuals.

Under the private health insurance legislation the Australian Government determines minimum benefits for shared ward overnight and day only accommodation which private health insurers must pay while their members are receiving hospital treatment in a hospital. The private health insurance benefit does not usually cover the full cost of care provided, therefore some of the care for privately insured admitted patients in public hospitals is funded by state and territory governments and the Australian Government through the AHCAs. Under the AHCAs (and now the National Healthcare Agreements), state and territory governments are also able to determine higher charges which may need to be met by private patients as out-of-pocket costs.

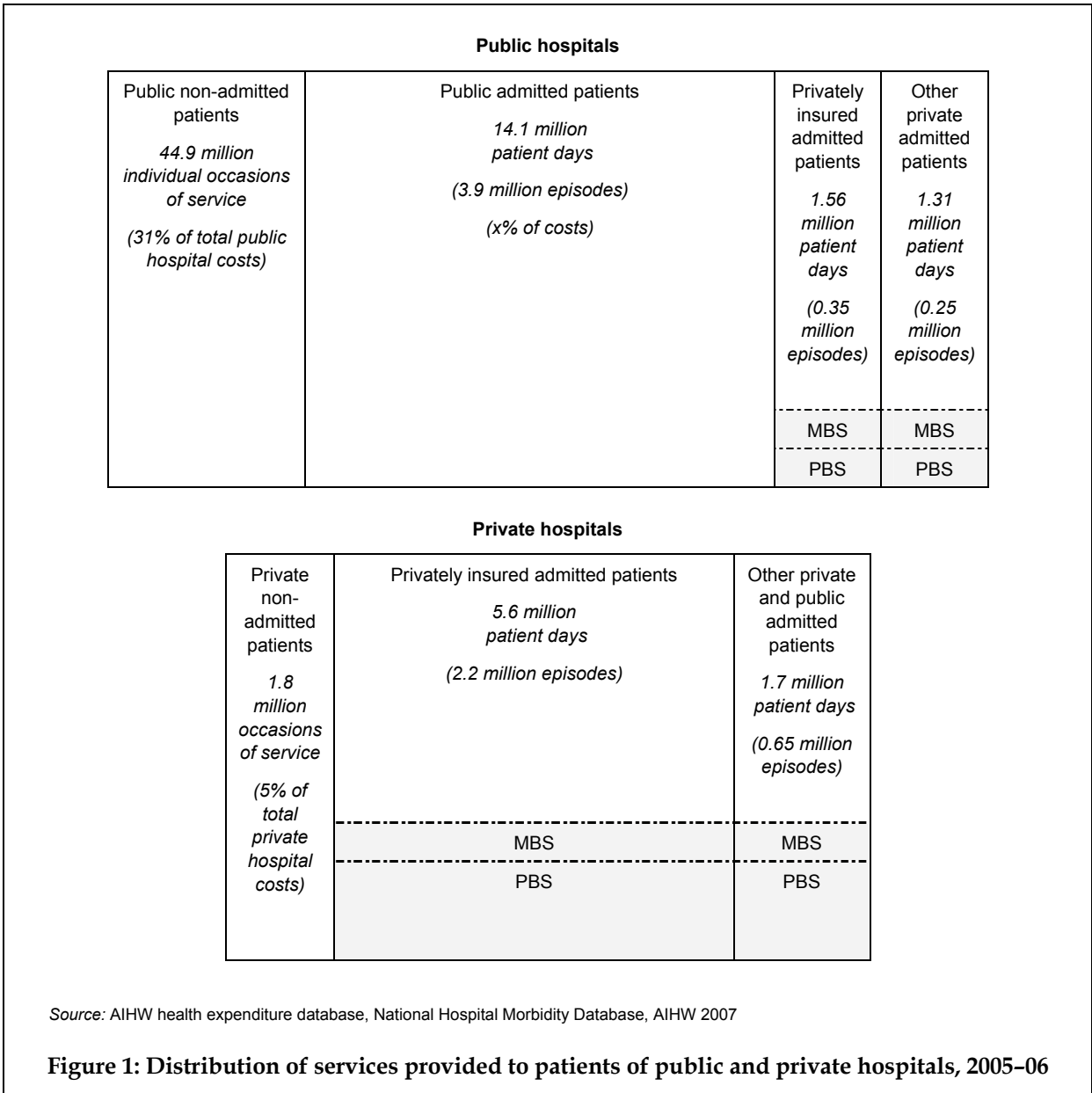
The medical component of the admitted patient episode of care (Figure 1) is funded by the MBS (75% of the scheduled fee plus safety net payments), private health insurance benefits, the Australian Government private health insurance rebate and out-of-pocket payments by individuals. For some types of admitted patient episodes, for example overseas patients and military personnel, there is no MBS payment, and for some episodes of care, such as workers compensation or third party insurance, the MBS payment may be paid but will be reimbursed later by the workers' compensation or third party insurance funds.

Some privately insured patients may access pharmaceuticals in association with their admitted episode of care that were not provided as part of the care. If that is the case, then their care could be funded through the Pharmaceuticals Benefits Scheme (PBS) and out-of-pocket payments. This funding is additional to government funding identified in the tables and analysis in this report (see details over the page).

In addition, a small amount of funding comes to privately insured admitted patients through the Australian Government medical expenses tax rebate, as that tax rebate subsidises out-of-pocket payments for hospital services. This tax funding is additional to government funding

identified in the tables and analysis in this report, but is not significant as a proportion of total government funding for hospital services (see Appendix 1 for further details).

The majority of privately insured admitted patients receive treatment in private hospitals (86% of total episodes for privately insured patients in 2005–06) (Figure 1) (AIHW 2007). After adjusting for differences in the complexity of procedures undertaken in public and private hospitals, the AR-DRG cost weight-adjusted proportion of privately insured separations in private hospitals was reduced to 83%, so 17% of the cost-weight adjusted proportion of privately insured separations was in public hospitals (AIHW NHMD). This is because less costly procedures are undertaken for privately insured patients in private hospitals than privately insured patients in public hospitals.



Pharmaceuticals

The HCP dataset by itself is not an adequate or reliable source of data on pharmaceuticals. For example, drugs used during operations are included in theatre charges, not under pharmaceutical costs.

However, other data about pharmaceutical costs are available from the National Hospital Cost Data Collection (NHCDC). This collection contains information on the proportion of costs which are borne by the hospital, including those associated with the provision of pharmaceuticals including purchasing, production, distribution, supply and storage of drug products and clinical pharmacy services. These data can be used to estimate the expected private hospital cost proportion for pharmaceuticals, using public hospital pharmaceutical cost data but adjusting it for the impact of private hospital casemix.

Applying the NHCDC public hospital pharmaceutical costs to the number of episodes in private hospitals and day surgeries enables calculation of the expected private hospital cost proportion for pharmaceuticals. On these assumptions, drugs would account for 6.4% of private hospital expenditure if they faced public hospital pharmaceutical costs. Unpublished results from the Australian Bureau of Statistics (ABS) Private Health Establishments Collection 2005–06, excluding freestanding day hospitals, show that the actual proportion was 3.7%. That is, drugs made up a smaller proportion of costs for private hospitals than would be predicted if pharmaceutical costs by DRG for private hospitals was the same as for public hospitals. This suggests that private hospitals have access to lower priced drugs and/or are able to transfer responsibility for up to 40% of their drug expenditure, for example by accessing Pharmaceutical Benefits Scheme (PBS) benefits.

Care provided by public and private hospitals

Public and private hospitals provide a range of services and procedures to privately insured and public admitted patients. For some services and procedures, the sectors provide a complementary service where each sector specialises in particular services and procedures. This occurs, for example, when public or private hospitals provide the majority of a particular procedure. For other procedures where a similar number are provided by each sector, public and private hospitals may be competing against each other to some extent.

In public hospitals, analysis of casemix in the NHMD showed that privately insured patients received a similar mix of episodes of care as defined by AR-DRGs as public patients. That is, the type of public hospital service provided was not substantially affected by whether a patient had private health insurance.

Private hospitals were responsible for 34% of total separations. However, for some DRGs, private hospitals provided from half to almost all separations. While some of this disproportionately high level of private care can be attributed to procedures in which the private sector specialises, some procedures are those that the public sector also provides and for which the private sector competes, such as orthopaedic procedures, ophthalmology and digestive system endoscopies (Duckett 2005).

This analysis of hospital activity was done using a higher level grouping of AR-DRGs called adjacent DRGs, which was used to group similar services provided to patients with differences in comorbidities and complications. The data showed that within any particular adjacent DRG, the public hospital usually does a greater proportion of the complicated cases (the AR-DRGs with complications or comorbidities) vis-à-vis private hospitals, as compared

to the proportion it does of the non-complicated cases (the AR-DRGs without complications or comorbidities). The 666 AR-DRGs in the data set were aggregated up to 399 adjacent DRGs. The analysis showed that public hospitals provided at least 85% of privately insured and public patient episodes for 126 adjacent DRGs, and at least 85% of public patient episodes for 44 adjacent DRGs (Appendix 2, Table 9). Private hospitals provided at least 70% of the episodes for 14 adjacent DRGs (Appendix 2, Table 10), at least 60% for 24 adjacent DRGs and at least 50% for 41 adjacent DRGs.

Thus, there is evidence to support the view that private hospitals provide a mix of both complementary and competing services to what are provided in public hospitals.

2 Methods

This section provides an overview of the data sources used for this report and the methods used to combine and analyse the data. More detail on methodology is available in Appendix 3.

Data sources

The analysis drew on data from the HCP data set, provided to the AIHW for this project by the NHHRC (which sourced it from the Australian Government Department of Health and Ageing (DoHA)). The HCP collates records relating to insured episodes of admitted patient care in Australian hospitals. Information in the records within the HCP is used to derive the AR-DRG for each episode of care. The HCP data cover privately insured patients in both public and private hospitals. However, coverage in private hospitals is more complete than coverage in public hospitals.

The AIHW NHMD collates records relating to essentially all episodes of admitted patient care in Australian hospitals and is therefore the most comprehensive source of data for episodes of admitted patient care.

The Private Health Insurance Administration Council (PHIAC) collates summary data on insured episodes of care, with coverage assumed to be complete.

Cost weights for the AR-DRGs were from published sources based on DoHA's NHCDC. All data sets were for the 2005-06 financial year.

Completeness and representativeness of the HCP data

The completeness of the HCP data set was checked against the PHIAC database and the AIHW NHMD.

Compared to the PHIAC database, the HCP data set is somewhat incomplete, but reasonably representative with respect to hospital sector, age and sex.

In comparison with the AIHW NHMD, the HCP data set contains only 87% of the episodes in the privately insured admitted patient component of the NHMD data, with high variability in completion rates. We used the ratio of the average length of stay (ALOS) between the two databases as an indicator of representativeness. The two values of ALOS are within 5% for 264 AR-DRGs, which together represent 65.7% of the HCP data set, and 78.6% of episodes in the AR-DRGs used for most of the analysis (i.e. the 596 AR-DRGs in the HCP data set that have at least 50 records and are not error AR-DRGs). The AR-DRGs with the largest differences in ALOS are concentrated among the lower volume AR-DRGs.

Further information about the completeness and representativeness of the HCP data is in Appendix 4.

Method

The following information was added to the HCP data set so that the cost of public patients compared to privately insured patients, and the source and amount of funding by the Australian Government and other funding sources, could be analysed.

For public patients, additional information obtained from the AIHW National Hospital Morbidity Costing Model (NHMCM) on the cost of public patients with the same AR-DRG was added to each of the HCP records. The Australian Government contribution was also added to the database, using the Australian Government proportion of public hospital funding for the relevant state or territory.

For privately insured patients, data items concerning the funding sources for the episode of care in the hospital in the HCP data set were added from the AIHW NHMD. Different approaches were taken depending on whether the episode occurred in a private hospital (or private free-standing day hospital/surgery) or a public hospital. For both sectors, the PHI contribution was split into the Australian Government funded rebate and the privately funded remainder.

3 Overview of insured episodes of admitted patient care

Private health insured episodes comprise episodes of admitted patient care in public and private hospitals covered by private health insurance. They do not include other episodes of care for private patients such as funded by workers compensation insurance, compulsory motor vehicle third party insurance or private patient out-of-pocket payments.

All tables in this section use the 20 AR-DRGs from the HCP data set based on the 20 AR-DRGs with the largest number of privately insured episodes in the AIHW NHMD (34% of all privately insured episodes in the NHMD). Excluding Table 1, which contains a total of all 666 AR-DRGs, totals are calculated for the 596 high volume AR-DRGs with 50 or more episodes in the HCP data set, excluding six error AR-DRGs (73.1% of all privately insured hospital episodes).

Table 1 provides basic information about the number of private health insured episodes in the NHMD and in the HCP data set. It illustrates that the coverage of the HCP is about 87.4% of the NHMD overall for all AR-DRGs. For the top 20 AR-DRGs in the analysis, coverage ranges from 48.1% to 85.2%. For private hospitals, coverage was 88% overall (1,933,000 compared with 2,196,000 in the NHMD) and 83.9% in public hospitals (294,000 compared with 351,000 in the NHMD).

Table 1: Top 20 AR-DRGs, description and number of hospital episodes for privately insured admitted patients in public and private hospitals (NHMD and HCP)

AR-DRG	Description	HCP private hospitals	HCP public hospitals	HCP total	NHMD private hospitals	NHMD public hospitals	NHMD total	HCP coverage as % of NHMD
R63Z	Chemotherapy	117,548	2,873	120,421	141,093	13,596	154,689	77.8
L61Z	Admit for renal dialysis	65,813	4,079	69,892	91,697	53,601	145,298	48.1
G44C	Other colonoscopy, sameday	91,594	557	92,151	110,993	4,420	115,413	79.8
C16B	Lens procedures, sameday	51,018	352	51,370	72,073	2,923	74,996	68.5
G45B	Other gastroscopy for non-major digestive disease, sameday	57,056	521	57,577	69,437	4,085	73,522	78.3
D40Z	Dental extractions and restorations	50,244	209	50,453	64,102	2,378	66,480	75.9
U60Z	Mental health treatment, sameday, w/o ECT	53,375	13	53,388	65,678	136	65,814	81.1
G46C	Complex gastroscopy, sameday	36,613	177	36,790	57,007	2,011	59,018	62.3
Z64B	Other factors influencing health status, sameday	37,738	698	38,436	50,502	3,878	54,380	70.7

(continued)

Table 1 (continued): Top 20 AR-DRGs, description and number of hospital episodes for privately insured admitted patients in public and private hospitals (NHMD and HCP)

AR-DRG	Description	HCP private hospitals	HCP public hospitals	HCP total	NHMD private hospitals	NHMD public hospitals	NHMD total	HCP coverage as % of NHMD
Z40Z	Follow up w endoscopy	39,221	276	39,497	48,221	2,115	50,336	78.5
I18Z	Other knee procedures	35,584	105	35,689	43,531	879	44,410	80.4
J11Z	Other skin, subcutaneous tissue and breast procedures	35,055	293	35,348	41,612	2,586	44,198	80.0
Z60C	Rehabilitation, sameday	31,024	4	31,028	42,173	46	42,219	73.5
O60B	Vaginal delivery w/o catastrophic or severe CC	26,779	514	27,293	33,688	5,640	39,328	69.4
N07Z	Other uterine and adnexa procedures for non-malignancy	27,154	203	27,357	36,047	2,346	38,393	71.3
O01C	Caesarean delivery w/o catastrophic or severe CC	20,186	338	20,524	25,167	3,091	28,258	72.6
F42B	Circulatory disorders w/o AMI w invasive cardiac inves proc w/o complex diagnosis/procedure	23,401	299	23,700	25,544	2,287	27,831	85.2
E63Z	Sleep apnoea	21,167	139	21,306	25,085	716	25,801	82.6
G11B	Anal and stomal procedures w/o catastrophic or severe CC	16,583	117	16,700	20,340	1,409	21,749	76.8
IL41Z	Cystourethroscopy, sameday	15,890	118	16,008	19,439	1,251	20,690	77.4
	Top 20 AR-DRGs	853,043	11,885	864,928	1,083,429	109,394	1,192,823	72.5
Sub-total	High volume AR-DRGs ^(a)	1,811,287	50,240	1,861,527	2,189,537	347,619	2,537,156	73.4
Total	All AR-DRGs^(a)	1,932,997	294,199	2,227,196	2,196,147	350,806	2,546,953	87.4

(a) There are 596 high volume AR-DRGs that represent 73% of total privately insured admitted patient episodes. The 70 error and low volume AR-DRGs are listed in Appendix 3.

Sources: DoHA HCP database and AIHW NHMD.

The broad financial structure for insured episodes is in Table 2. This includes average expenditure for each insured episode, divided into hospital charges, medical charges and public hospital funding. Funding sources are shown for the hospital and medical charges as average PHI benefits and required out-of-pocket (OOP) payments for each insured episode.

Table 2: Top 20 AR-DRGs, expenditure and type of funding per hospital episode for privately insured admitted patients in public and private hospitals (\$)

		Expenditure per episode ^(a)	Hospital and medical charges for Insured episodes ^(a)			Funding sources for hospital and medical charges			
			Hospital	Medical	Total	PHI benefits ^(b)	MBS	Out-of-pocket	Total funding
R63Z	Chemotherapy	567	404	147	551	446	93	12	551
L61Z	Admit for renal dialysis	354	314	36	350	326	23	1	350
G44C	Other colonoscopy, sameday	1,300	547	749	1,296	757	396	143	1,296
C16B	Lens procedures, sameday	3,273	1,765	1,500	3,265	2,319	679	267	3,265
G45B	Other gastroscopy for non-major digestive disease, sameday	1,014	404	605	1,009	573	315	120	1,008
D40Z	Dental extractions and restorations	1,284	942	339	1,281	858	121	302	1,281
U60Z	Mental health treatment, same day, w/o ECT	260	245	15	260	240	9	11	260
G46C	Complex gastroscopy, sameday	1,506	593	910	1,503	870	463	169	1,502
Z64B	Other factors influencing health status, sameday	928	484	439	923	602	226	96	924
Z40Z	Follow up w endoscopy	1,163	538	622	1,160	717	316	127	1,160
I18Z	Other knee procedures	3,015	1,578	1,432	3,010	2,005	581	423	3,009
J11Z	Other skin, subcutaneous tissue and breast procedures	1,575	873	692	1,565	1,057	322	186	1,565
Z60C	Rehabilitation, sameday	240	233	6	239	230	4	6	240
O60B	Vaginal delivery w/o catastrophic or severe CC	5,231	3,751	1,450	5,201	4,297	502	402	5,201
N07Z	Other uterine and adnexa procedures for non-malignancy	2,219	1,231	976	2,207	1,459	427	321	2,207
O01C	Caesarean delivery w/o catastrophic or severe CC	7,245	4,953	2,233	7,186	5,822	880	484	7,186
F42B	Circulatory disorders w/o AMI w invasive cardiac inves proc w/o complex diagnosis/procedure	5,010	3,373	1,608	4,981	6,088	887	150	7,125
E63Z	Sleep apnoea	1,084	512	569	1,081	607	340	133	1,080
G11B	Anal and stomal procedures w/o catastrophic or severe CC	2,077	1,283	784	2,067	1,466	369	232	2,067
L41Z	Cystourethroscopy, sameday	1,293	723	566	1,289	857	249	182	1,288
	<i>Average per episode for top 20 AR-DRGs</i>	<i>1,590</i>	<i>940</i>	<i>641</i>	<i>1,581</i>	<i>1,128</i>	<i>302</i>	<i>151</i>	<i>1,581</i>
	Average per episode for high volume AR-DRGs	3,477	2,330	1,101	3,431	2,646	512	274	3,432

(a) Differences between expenditure and hospital and medical charges are due to the subsidisation by government of private patients in public hospitals. This subsidy is not uniform across the DRGs due to cross-subsidisation.

(b) PHI benefits are all benefits paid by PHI whether funding comes from the Australian Government PHI rebate or from PHI own-source funding.

Source: DoHA HCP database.

The Australian Government provides funding under the AHCA for public hospitals. While most of this funding is directed to public patients, funding is not quarantined within public hospitals, and bed day charges for privately insured patients are on average lower than actual costs, so there is subsidisation of privately insured patients in public hospitals. Hence, the Australian Government provides funding for privately insured patients through three streams: the PHI rebate, MBS benefits and, for public hospital patients only, AHCA funding.

Table 3 summarises the contribution from each funding source for privately insured patients for the 20 highest volume AR-DRGs. For these AR-DRGs, the Australian Government contribution ranges between 30% and 50%. Across AR-DRGs with at least 50 episodes the range is similar, between 28% and 56%.

A key source of the variation in the Australian Government share is the relatively higher responsibility it has for medical costs than hospital costs, through its MBS funding of medical costs. Thus, AR-DRGs with a higher medical component tend to have greater funding from the Australian Government (see Table 2). For example, the AR-DRG with the highest Australian Government share is *Other colonoscopy, sameday* (G44C), which has an MBS benefit of over half the total PHI benefits – unlike episodes with higher hospital care components which have lower MBS benefits.

Table 3: Top 20 AR-DRGs, contribution from each source of funding for hospital episodes for privately insured admitted patients in public and private hospitals

AR-DRG	Description	Australian Government (%)	State/territory governments (%)	PHI ^(a) (%)	Out-of-pocket (%)	\$ Per episode	Total expenditure (\$m)
R63Z	Chemotherapy	43.8	1.6	52.5	2.1	567	88
L61Z	Admit for renal dialysis	39.4	0.7	59.6	0.3	354	51
G44C	Other colonoscopy, sameday	49.7	0.2	39.2	11.0	1,300	150
C16B	Lens procedures, sameday	47.3	0.1	44.4	8.1	3,273	245
G45B	Other gastroscopy for non-major digestive disease, sameday	49.6	0.3	38.2	11.9	1,014	75
D40Z	Dental extractions and restorations	29.8	0.1	46.6	23.5	1,284	85
U60Z	Mental health treatment, sameday, w/o ECT	32.0	0.0	64.0	4.1	260	17
G46C	Complex gastroscopy, sameday	49.5	0.2	39.1	11.2	1,506	89
Z64B	Other factors influencing health status, sameday	45.2	0.3	44.2	10.3	928	50
Z40Z	Follow up w endoscopy	48.1	0.2	40.8	10.9	1,163	59
I18Z	Other knee procedures	40.3	0.1	45.6	14.0	3,015	134
J11Z	Other skin, subcutaneous tissue and breast procedures	43.2	0.4	44.7	11.8	1,575	70
Z60C	Rehabilitation, sameday	34.7	0.0	63.0	2.3	240	10
O60B	Vaginal delivery w/o catastrophic or severe CC	34.5	0.3	57.5	7.7	5,231	206
N07Z	Other uterine and adnexa procedures for non-malignancy	39.3	0.3	45.9	14.4	2,219	85
O01C	Caesarean delivery w/o catastrophic or severe CC	36.6	0.5	56.3	6.7	7,245	205

(continued)

Table 3 (continued): Top 20 AR-DRGs, contribution from each source of funding for hospital episodes for privately insured admitted patients in public and private hospitals

AR-DRG	Description	Australian Government (%)	State/territory governments (%)	PHI ^(a) (%)	Out-of-pocket (%)	\$ Per episode	Total expenditure (\$m)
F42B	Circulatory disorders w/o AMI w invasive cardiac inves proc w/o complex diagnosis/ procedure	45.0	0.3	51.7	3.0	5,010	139
E63Z	Sleep apnoea	49.2	0.2	38.3	12.3	1,084	28
G11B	Anal and stomal procedures w/o catastrophic or severe CC	40.4	0.3	48.1	11.2	2,077	45
L41Z	Cystourethroscopy, sameday	41.4	0.2	44.4	14.1	1,293	27
	<i>Average contribution for top 20 AR-DRGs</i>	42.3	0.3	47.9	9.5	1,590	1,375
	Average contribution for high volume AR-DRGs	41.1	0.7	50.3	7.9	3,477	6,472

(a) The PHI column includes only that portion of PHI benefits which is funded by private health insurance funds. It does not include that portion of benefits funded by the Australian Government PHI rebate.

Sources: DoHA HCP database; AIHW NHMD and NHMCM.

4 Comparing Australian Government funding for public patients and privately insured patients

As for the previous section, all tables in this section use the 20 AR-DRGs in the HCP data set based on the 20 AR-DRGs with the largest number of insured episodes in the AIHW NHMD. Totals are calculated for the 596 AR-DRGs that contain at least 50 episodes in the HCP data set.

The average amount provided by the Australian Government for public patients and, by hospital sector, for privately insured patients is shown in Table 4. Funding patterns vary substantially across AR-DRGs, even among the highest volume types of care. For 10 of the top 20 AR-DRGs, the Australian Government provided higher funding for privately insured patients than for public patients, with funding per insured episode between 105% and 174% of funding per public patient in the same AR-DRG. For the other 10 AR-DRGs, Australian Government funding for privately insured patients ranged from 21% to 97% of funding per public patient.

Overall, the Australian Government contribution to privately insured patients was \$1,427 per episode, which was higher than the contribution to public patients (\$1,367). The contribution for insured episodes varied by hospital sector. For privately insured patients in public hospitals, the average Australian Government contribution was higher than for privately insured patients in private hospitals. This difference arises because there is an extra source of Australian Government funding for insured care in public hospitals (i.e. general funding via the AHCA, which is in addition to the PHI rebate). If the hospital charges are insufficient to cover the hospital costs, the Australian Government (and state and territory governments) subsidise the care through their general public hospital funding.

Generally, for AR-DRGs where Australian Government expenditure was similar for privately insured patients in public and private hospitals, the elements of the Australian Government funding varied, with higher PHI rebate shares for private hospitals balancing contributions through AHCA funding in public hospitals.

Table 4: Top 20 AR-DRGs, Australian Government contribution (\$) per episode, by type of patient and hospital sector

AR-DRG	Description	Public patients	Privately insured episodes			
			All insured	Public hospital ^(a)	Private hospital	Day surgery
R63Z	Chemotherapy	372	248	429	233	276
L61Z	Admit for renal dialysis	197	140	165	157	113
G44C	Other colonoscopy, sameday	438	646	660	650	636
C16B	Lens procedures, sameday	889	1,548	1,399	1,605	1,491
G45B	Other gastroscopy for non-major digestive disease, sameday	402	503	577	509	490
D40Z	Dental extractions and restorations	731	383	545	390	350
U60Z	Mental health treatment, sameday, w/o ECT	340	83	n.p.	83	290

(continued)

Table 4 (continued): AR-DRGs, Australian Government contribution (\$) per episode by type of patient and hospital sector

AR-DRG	Description	Privately insured episodes				
		Public patients	All insured	Public hospital ^(a)	Private hospital	Day surgery
G46C	Complex gastroscopy, sameday	505	746	368	752	731
Z64B	Other factors influencing health status, sameday	321	420	346	407	473
Z40Z	Follow up w endoscopy	415	559	563	559	560
I18Z	Other knee procedures	1,155	1,215	1,420	1,224	1,081
J11Z	Other skin, subcutaneous tissue and breast procedures	702	680	834	753	496
Z60C	Rehabilitation, sameday	388	83	n.p.	83	74
O60B	Vaginal delivery w/o catastrophic or severe CC	1,611	1,804	1,633	1,807	no episodes
N07Z	Other uterine and adnexa procedures for non-malignancy	1,247	873	1,109	939	554
O01C	Caesarean delivery w/o catastrophic or severe CC	2,798	2,652	2,981	2,646	no episodes
F42B	Circulatory disorders w/o AMI w invasive cardiac inves proc w/o complex diagnosis/procedure	1,424	2,254	2,110	2,260	2,097
E63Z	Sleep apnoea	791	534	n.p.	533	387
G11B	Anal and stomal procedures w/o catastrophic or severe CC	940	840	n.p.	857	661
L41Z	Cystourethroscopy, sameday	482	535	n.p.	547	376
<i>Average Australian Government contribution per episode for top 20 AR-DRGs</i>		726	673			
Average Australian Government contribution per episode for high-volume AR-DRGs^(b)		1,367^(c)	1,427^(d)	1,490	1,364	

(a) Interpret with care; very low volumes for most privately insured public hospital AR-DRGs.

(b) These estimates of contribution per episode are not adjusted for casemix complexity.

(c) State and territory governments contribute \$1,929 of funding per episode in addition to the Australian Government funding.

(d) State and territory governments contribute on average \$26 of funding per episode in addition to the Australian Government funding.

Sources: DoHA HCP database; AIHW NHMD and NHMCM.

Table 5: AR-DRGs where Australian Government funding for privately insured admitted patient episodes^(a) is higher than total expenditure on public admitted patient episodes^(b) (\$)

AR-DRG	Description	Expenditure per episode		Australian Government funding for each privately insured patient episode		
		Public patient	Privately insured patient	PHI rebate	MBS benefit	Total
F02Z	AICD component implantation/replacement	19,885	57,328	18,733	2,084	20,817
F17Z	Cardiac pacemaker replacement	6,650	17,364	6,175	891	7,066
F18Z	Cardiac pacemaker revision except device replacement	5,867	15,080	5,224	1,023	6,247
F66B	Coronary atherosclerosis w/o CC	1,459	4,478	1,319	597	1,916
I69B	Bone diseases & spec arthropathies age >74 or w (catastrophic or severe CC)	3,191	8,991	3,061	616	3,677
I69C	Bone diseases & spec arthropathies age <75 w/o catastrophic or severe CC	1,785	9,240	2,711	490	3,202
I78B	Fractures of neck of femur w/o catastrophic or severe CC	2,232	8,266	2,739	744	3,482
X60B	Injuries age >64 w/o CC	1,651	4,179	1,426	407	1,833

(a) Comprises privately insured admitted patient episodes in private hospitals and day surgery hospitals.

(b) Comprises public admitted patient episodes in public or private hospitals.

Sources: DoHA HCP database; AIHW NHMD and NHMCM.

There are 8 AR-DRGs (with 0.5% of episodes) for which the Australian Government funding per episode of insured care in private hospitals and day surgeries is higher than the entire cost per episode for a public patient (see Table 5). For these DRGs the total expenditure per episode for privately insured patients was about three times the public patient expenditure. However, this difference is explainable.

For the three cardiac surgery AR-DRGs (*AICD component implantation/replacement* (F02Z), *Cardiac pacemaker replacement* (F17Z), *Cardiac pacemaker revision except device replacement* (F18Z)), the underlying cause of the higher cost is the cost of the prostheses, which accounts for almost all of the privately insured patient charges. In addition, the ALOS for *Cardiac pacemaker replacement* (F17Z) is 33% higher in the HCP data set (2.8 days) than in the NHMD (2.1 days).

AR-DRG *Coronary atherosclerosis w/o CC* (F66B) is one of the AR-DRGs for which coverage comparisons suggest data quality is poor. The ALOS recorded in the HCP episodes (2.5 days) is 12% higher than in the NHMD (2.2 days), and the number of days accounted for in the HCP (4,564 days) is 9.8% higher than in the NHMD (4,155 days).

Like cardiac surgery, the three orthopaedic AR-DRGs – *Bone diseases & spec arthropathies age >74 or w (catastrophic or severe CC)* (I69B), *Bone diseases & spec arthropathies age <75 w/o catastrophic or severe CC* (I69C), *Fractures of neck of femur w/o catastrophic or severe CC* (I78B) – have very high prostheses costs. The average prostheses benefits are \$2,507, \$3,521 and \$933 respectively for the insured care in private hospitals, but the NHMCM has public hospital average prosthesis costs at \$6, \$9 and \$12. Differences in prostheses costs are likely to reflect differences in casemix classification in private hospitals compared with public hospitals, rather than actual differences in prostheses cost as these AR-DRGs are medical rather than surgical (so it is expected that prostheses would be needed infrequently). *Bone diseases & spec*

arthropathies age >74 or w (catastrophic or severe CC) (I69B) and Bone diseases & spec arthropathies age <75 w/o catastrophic or severe CC (I69C) also have data quality issues, with more episodes and longer ALOS in the HCP data set than the NHMD suggests. Thus, some of these episodes may have been misclassified into a medical AR-DRG instead of the correct surgical AR-DRG.

AR-DRG *Injuries age >64 w/o CC (X60B)* is less straightforward to explain. However, the ALOS of the HCP episodes is 28% higher than the NHMD average, so data quality is poor.

By hospital sector, there are 20 AR-DRGs in public hospitals (representing 6.5% of insured public hospital episodes) and 44 AR-DRGs in private hospitals and day surgeries (7.7% of insured private hospital episodes) where the Australian Government contribution is at least 1.5 times that for a public patient.

Age groups

The private health insurance rebate funded by the Australian Government varies by age of the fund member, from 30% for those aged 0 to 64 years, to 35% for ages 65 to 69 years and 40% for those members aged at least 70 years. As well, the balance between hospital and medical care is affected by age. Thus, the Australian Government funded a greater proportion of privately insured patients' costs for each of the highest volume AR-DRGs for the older age groups (Table 6).

In addition, absolute Australian Government funding increased as age increased for the majority of the top 20 AR-DRGs. However, there were three AR-DRGs for which Australian Government funding per episode decreased for the older age groups. These were *Other factors influencing health status, sameday (Z64B)* comprising mainly adjustment and management of implanted devices, and screening examinations for cancers, *Rehabilitation, sameday (Z60C)* and *Cystourethroscopy, sameday (L41Z)*.

Table 6: Top 20 AR-DRGs, all source expenditure per episode for privately insured patients and Australian Government share by age group (\$)

AR-DRG	Description	Age 0–64 years		Age 65–69 years		Age 70+ years	
		Expenditure \$	Australian government proportion (%)	Expenditure \$	Australian government proportion (%)	Expenditure \$	Australian government proportion (%)
R63Z	Chemotherapy	564	41.3	566	45.5	574	48.7
L61Z	Admit for renal dialysis	349	34.3	360	39.4	358	44.0
G44C	Other colonoscopy, sameday	1,284	47.5	1,326	51.7	1,340	55.6
C16B	Lens procedures, sameday	3,280	40.7	3,269	45.4	3,272	49.8
G45B	Other gastroscopy for non-major digestive disease, sameday	1,003	47.8	1,026	51.6	1,052	55.8
D40Z	Dental extractions and restorations	1,283	29.5	1,267	34.3	1,341	39.9
U60Z	Mental health treatment, sameday, w/o ECT	257	31.1	270	36.6	298	42.0
G46C	Complex gastroscopy, sameday	1,496	48.0	1,521	51.2	1,542	54.7
Z64B	Other factors influencing health status, sameday	989	44.1	806	46.7	728	50.9
Z40Z	Follow up w endoscopy	1,161	45.6	1,163	48.9	1,168	52.6
I18Z	Other knee procedures	3,007	39.0	2,918	44.0	3,166	48.1
J11Z	Other skin, subcutaneous tissue and breast procedures	1,478	40.1	1,619	44.8	1,834	49.7
Z60C	Rehabilitation, sameday	251	30.4	238	35.2	226	40.1
O60B	Vaginal delivery w/o catastrophic or severe CC	5,231	34.5
N07Z	Other uterine and adnexa procedures for non-malignancy	2,222	39.2	2,091	43.2	2,127	47.3
O01C	Caesarean delivery w/o catastrophic or severe CC	7,245	36.6
F42B	Circulatory disorders w/o AMI w invasive cardiac inves proc w/o complex diagnosis/procedure	4,904	41.6	4,949	45.4	5,195	49.5
E63Z	Sleep apnoea	1,082	48.1	1,081	51.8	1,103	55.5
G11B	Anal and stomal procedures w/o catastrophic or severe CC	2,000	39.0	2,198	43.4	2,578	47.1
L41Z	Cystourethroscopy, sameday	1,353	38.9	1,246	42.8	1,172	47.4

Sources: DoHA HCP database; AIHW NHMD and NHMCM.

Appendix 1: Supplementary analysis of net medical expenses tax offset

This appendix focuses on the net medical expenses tax offset, which provides a tax offset for 20% of personal medical and related costs above the threshold level of \$1,500. The offset is also available for expenses such as dental work and prescription glasses. Further information about the tax offset is available from the Australian Taxation Office website at www.ato.gov.au/individuals/content.asp?doc=/content/19181.htm.

In 2005–06, there were 601,255 claims for a total offset of \$366.5 million.

To examine the tax offset, the (cleaned) individual records from the HCP were used to identify episodes for which the copayment (difference between charges and combined insurance and MBS benefits) was greater than \$1,500. The estimated offset is calculated as 20% of the copayment minus \$1,500. Note that this calculation underestimates the potential offset associated with insured hospital care in several ways:

- individuals and families are not identified in the HCP, so multiple episodes within a family are not recognised
- episodes in the HCP data set are only part of a person's medical services for the whole year, so even where the HCP indicates the offset would be available it would underestimate the size of the offset
- the HCP collection is incomplete (approximately 90% coverage depending on whether comparing episodes or benefits).

There are also factors that would result in the HCP data overestimating the tax offset:

- not all eligible people apply for the tax offset
- some of the care included in the HCP data set would be cosmetic and not eligible for the offset.

The total gap (out-of-pocket expense) for the 2.2 million episodes in the HCP was \$568 million; with medical care gaps almost twice those for the hospital care gaps (Table 7). This converts to an average \$255 per episode.

The total potential tax offset identified from the HCP data set was \$22.9 million. This represented 0.32% of the total charges accounted for in the HCP and was equivalent to \$10.27 per episode.

Health insurance benefits for hospital care (including associated medical services) totalled \$6,132 million, of which the Australian Government funded more than 30% through the private health insurance rebate (i.e. it provided a 30% subsidy for premiums for people aged less than 65 years, 35% for those aged 65 to 74 years, and 40% for those aged 75 years and over). An additional \$1,393 million was provided by the Australian Government in MBS benefits for medical services for insured hospital care.¹ Thus the tax offset of potentially \$23 million was a small part of overall Australian Government funding.

¹ Private Health Insurance Administration Council, Quarterly Reports A.

However, it is significant where it applies. There were 74,871 episodes which were potentially eligible for the tax offset. Averaging over just these records, the average gap was \$3,028 and the average tax offset attracted was \$306 (Table 7).

Table 7: PHI and tax offset overview (\$), 2005–06

Data item	Day surgery	Private hospital	Public hospital	Total
<i>All (clean) HCP records</i>	310,248	1,622,749	294,199	2,227,196
Hospital benefits (\$m)	180.5	4,122.2	400.9	4,703.6
Medical PHI benefits (\$m)	81.3	717.7	67.5	866.6
MBS benefits (\$m)	97.3	887.7	113.7	1,098.7
Total medical gap (\$m)	27.8	317.6	22.6	368.0
Total hospital gap (\$m)	21.0	161.3	17.8	200.0
Potential tax offset (\$m)	0.7	20.8	1.4	22.9
Gap per episode (\$)	157.10	295.10	137.20	255.00
FED (included in gap) (\$)	71.88	73.39	49.01	69.96
Offset per episode (\$)	2.17	12.83	4.70	10.27
<i>Records eligible for offset</i>	<i>4,017</i>	<i>66,954</i>	<i>3,900</i>	<i>74,871</i>
Gap per episode (\$)	2,336.00	3,055.00	3,272.00	3,028.00
FED per episode (\$)	133.00	136.50	98.00	134.30
Offset per episode (\$)	167.30	311.10	354.40	305.60

Note: FED refers to front end deductible.

The tax offset also varied substantially by AR-DRG. Table 8 shows the total and average tax offset for those in the top AR-DRGs based on either total (10 AR-DRGs) or average (10 AR-DRGs) tax offset, for private hospitals and day surgeries. Public hospitals and error AR-DRGs are excluded for data quality reasons. AR-DRGs represented by only one episode are also not included.

Some of the AR-DRGs may include episodes considered to be cosmetic and therefore would not attract the tax offset (e.g. Some of *Major procedures for non-malignant breast conditions* (J06B)). In this respect, the analysis here may overestimate the cost to the Australian Government of the tax offset.

Table 8: Top AR-DRGs by total or average tax offset, private hospitals and day surgeries

AR-DRG	Description	Episodes	Offset total (\$)	Offset average (\$)
D04B	Maxillo surgery w/o CC	730	318,468	436
D10Z	Nasal procedures	1,131	439,433	389
F63A	Venous thrombosis w catastrophic or severe CC	8	18,413	2,302
I03C	Hip replacement w/o catastrophic or severe CC	1,584	468,668	296
I04Z	Knee replacement and reattachment	2,397	655,703	274
I09B	Spinal fusion w/o catastrophic or severe CC	848	525,751	620
I10B	Other back and neck procedures w/o catastrophic or severe CC	1,464	542,337	370
J06B	Major procedures for non-malignant breast conditions	2,178	1,084,437	498
J10Z	Skin, subcutaneous tissue and breast plastic OR procedures	1,009	408,167	405
K04Z	Major procedures for obesity	1,326	464,855	351
M01Z	Major male pelvic procedures	1,208	696,600	577
P63Z	Neonate, admwt 1000–1249 g w/o significant or procedure	8	12,402	1,550
P65D	Neonate, admwt 1500–1999 g w/o significant or procedure w/o problem	14	27,675	1,977
V63A	Opioid use disorder and dependence	9	12,604	1,400
X60A	Injuries age >64 w CC	4	4,991	1,248
Z40Z	Follow up w endoscopy	13	23,587	1,814
All with tax offset >0		70,971	21,499,715	303

Note: AR-DRGs represented by one episode are not included in this table.

Appendix 2: Adjacent DRGs with high proportions of care provided by public or private hospitals

Public hospitals

In 2005-06, public hospitals provided at least 85% of privately insured and public patient episodes for 126 adjacent DRGs and at least 85% of public patient episodes for 44 adjacent DRGs.

Table 9: Adjacent DRGs where the proportion of total hospital separations provided by public hospitals is greater than 85%, 2005-06, per cent

ADRG	Description	Proportion of total hospital episodes provided by public hospitals		
		Public patient episodes	Private patient episodes	Public and private patient episodes
A01	Liver transplant	88.0	12.0	100.0
A03	Lung or heart/lung transplant	94.1	5.9	100.0
A05	Heart transplant	82.9	17.1	100.0
Y01	Severe full thickness burns	95.7	4.3	100.0
Y60	Burns, transferred to another acute care facility < 5 days	96.5	3.0	99.5
W01	Ventilation or craniotomy procs for multiple significant trauma	92.1	6.9	99.1
R64	Radiotherapy	71.4	27.6	99.0
W60	Multiple trauma, died or transf to another acute care facility, LOS<5 days	95.5	3.3	98.8
X62	Poisoning/toxic effects of drugs & other substances	95.1	3.2	98.3
A41	Intubation age<16	90.3	7.9	98.1
P03	Neonate, admwt 1000-1499 g w significant or procedure	74.9	23.2	98.1
S65	HIV-related diseases	91.2	6.9	98.1
Y61	Severe burns	91.1	6.9	98.1
Y62	Other burns	93.4	4.1	97.5
P62	Neonate, admwt 750-999 g	81.0	16.5	97.5
B80	Other head injury	93.5	3.8	97.4
S60	HIV, sameday	92.6	4.7	97.3
A09	Renal transplant	79.6	17.5	97.1
W03	Abdominal procedures for multiple significant trauma	93.3	3.7	97.0
C62	Hyphema and medically managed trauma to the eye	93.9	3.1	97.0
B79	Skull fractures	90.3	6.5	96.8

(continued)

Table 9 (continued): Adjacent DRGs where the proportion of total hospital separations provided by public hospitals is greater than 85%, 2005–06, per cent

ADRG	Description	Proportion of total hospital episodes provided by public hospitals		
		Public patient episodes	Public patient episodes	Public patient episodes
E60	Cystic fibrosis	87.3	9.4	96.7
P61	Neonate, admwt < 750 g	81.7	15.0	96.7
D64	Laryngotracheitis and epiglottitis	90.0	6.7	96.7
A40	ECMO w/o cardiac surgery	84.3	12.4	96.6
V61	Drug intoxication and withdrawal	96.1	0.5	96.6
B41	Telemetric EEG monitoring	79.0	17.4	96.4
B75	Febrile convulsions	89.1	7.2	96.3
P04	Neonate, admwt 1500-1999 g w significant or procedure	73.1	23.1	96.3
I60	Femoral shaft fractures	86.3	9.9	96.3
U62	Paranoia & acute psychotic disorders	94.5	1.4	95.9
E70	Whooping cough and acute bronchiolitis	88.2	7.7	95.9
A07	Allogeneic bone marrow transplant	76.6	19.1	95.7
G63	Uncomplicated peptic ulcer	90.5	5.0	95.5
X60	Injuries	91.3	4.0	95.4
H40	Endoscopic procedures for bleeding oesophageal varices	88.0	7.2	95.2
Y02	Other burns w skin graft	86.2	8.9	95.1
P05	Neonate, admwt 2000-2499 g w significant or procedure	76.4	18.5	94.9
X61	Allergic reactions	88.6	6.3	94.9
B76	Seizure	89.0	5.8	94.8
W04	Other OR procedures for multiple significant trauma	84.5	10.4	94.8
G68	Gastroenteritis age <10	87.0	7.5	94.6
B78	Intracranial injury	85.9	8.4	94.3
V60	Alcohol intoxication and withdrawal	93.1	1.1	94.2
E41	Respiratory system diagnosis w non-invasive ventilation	82.9	10.6	93.5
U61	Schizophrenia disorders	93.0	0.4	93.4
P02	Cardiothoracic/vascular procedures for neonates	71.4	21.9	93.4
E40	Respiratory system diagnosis w ventilator support	85.5	7.5	92.9
F60	Circulatory disorders w AMI w/o invasive cardiac investigative proc	82.3	10.5	92.9
E68	Pneumothorax	85.5	7.3	92.8
U68	Childhood mental disorders	89.2	3.5	92.7
O63	Abortion w/o or procedure	89.4	3.2	92.7
P63	Neonate, admwt 1000-1249 g w/o significant or procedure	77.2	15.4	92.6
G06	Pyloromyotomy procedure	78.6	13.6	92.1
W61	Multiple trauma without significant procedures	81.2	10.8	92.0

(continued)

Table 9 (continued): Adjacent DRGs where the proportion of total hospital separations provided by public hospitals is greater than 85%, 2005–06, per cent

ADRG	Description	Proportion of total hospital episodes provided by public hospitals		
		Public patient episodes	Public patient episodes	Public patient episodes
X64	Other injury, poisoning and toxic effect diagnosis	86.6	5.4	92.0
W02	Hip, femur and limb procs for multiple significant trauma, incl implantation	79.5	12.5	91.9
I74	Injury to forearm, wrist, hand or foot	85.0	6.9	91.9
N61	Infections, female reproductive system	87.5	4.2	91.8
I78	Fractures of neck of femur	80.5	11.3	91.7
F40	Circulatory system diagnosis w ventilator support	82.0	9.7	91.6
I61	Distal femoral fractures	82.9	8.8	91.6
E69	Bronchitis and asthma	84.7	6.9	91.6
J65	Trauma to the skin, subcutaneous tissue and breast	86.9	4.6	91.6
F72	Unstable angina	82.2	9.2	91.4
B40	Plasmapheresis w neurological disease	81.7	9.7	91.4
K61	Severe nutritional disturbance	84.7	6.1	90.8
K63	Inborn errors of metabolism	80.7	10.0	90.7
H60	Cirrhosis and alcoholic hepatitis	84.9	5.8	90.7
T63	Viral illness	83.0	7.6	90.6
I75	Injury to shoulder, arm, elbow, knee, leg or ankle	83.1	7.5	90.6
H62	Disorders of pancreas except for malignancy	83.0	7.6	90.5
G69	Oesophagitis and misc digestive system disorders age<10	81.9	8.5	90.4
D63	Otitis media and URI	83.5	6.6	90.0
F70	Major arrhythmia and cardiac arrest	80.5	9.5	89.9
P64	Neonate, admwt 1250-1499 g w/o significant or procedure	77.4	12.5	89.9
B73	Viral meningitis	76.1	13.7	89.8
L60	Renal failure	79.9	9.7	89.6
B74	Nontraumatic stupor and coma	83.7	5.8	89.6
O66	Antenatal & other obstetric admission	85.7	3.8	89.5
E72	Respiratory problems arising from neonatal period	85.2	4.3	89.5
Y03	Other OR procedures for other burns	85.8	3.6	89.3
U67	Personality disorders and acute reactions	88.5	0.8	89.3
H64	Disorders of the biliary tract	81.2	8.1	89.3
P60	Neonate, died or trans <5 days of adm, w/o significant or procedure	79.6	9.5	89.1
Z65	Multiple, other and unspecified congenital anomalies	80.6	8.4	89.0
C60	Acute and major eye infections	75.7	13.2	88.9
G66	Abdominal pain or mesenteric adenitis	83.4	5.5	88.9

(continued)

Table 9 (continued): Adjacent DRGs where the proportion of total hospital separations provided by public hospitals is greater than 85%, 2005–06, per cent

ADRG	Description	Proportion of total hospital episodes provided by public hospitals		
		Public patient episodes	Public patient episodes	Public patient episodes
J68	Major skin disorders	82.2	6.6	88.9
C61	Neurological and vascular disorders of the eye	80.6	8.2	88.8
B77	Headache	83.1	5.6	88.7
G61	GI haemorrhage	80.4	8.0	88.4
A06	Tracheostomy or ventilation >95 hours	77.4	10.9	88.4
L61	Admit for renal dialysis	81.6	6.8	88.4
F74	Chest pain	82.4	5.9	88.4
B70	Stroke	76.6	11.7	88.3
E65	Chronic obstructive airways disease	81.9	6.4	88.3
P01	Neonate, died or transf <5 days of admission w significant or procedure	76.7	11.4	88.1
F66	Coronary atherosclerosis	80.8	7.2	88.0
L63	Kidney and urinary tract infections	80.2	7.6	87.8
L02	Operative insertion of peritoneal catheter for dialysis	79.1	8.5	87.6
B63	Dementia and other chronic disturbances of cerebral function	80.0	7.5	87.5
A08	Autologous bone marrow transplant	61.7	25.7	87.4
J64	Cellulitis	81.1	6.2	87.4
K60	Diabetes	77.4	9.8	87.2
F73	Syncope and collapse	79.4	7.7	87.1
B64	Delirium	77.9	9.2	87.1
G67	Oesophagitis, gastroenteritis & misc digestive system disorders age>9	80.2	6.7	87.0
K64	Endocrine disorders	75.3	11.5	86.8
E64	Pulmonary oedema and respiratory failure	77.8	8.9	86.7
H63	Disorders of liver except malig, cirrhosis, alcoholic hepatitis	79.9	6.7	86.6
D60	Ear, nose, mouth and throat malignancy	79.0	7.7	86.6
I64	Osteomyelitis	75.6	11.0	86.6
E75	Other respiratory system diagnosis	78.6	8.0	86.5
T62	Fever of unknown origin	77.1	9.4	86.5
D62	Epistaxis	79.0	7.5	86.5
I76	Other musculoskeletal disorders	79.4	6.7	86.1
E62	Respiratory infections/inflamations	76.6	9.3	85.9
B72	Nervous system infection except viral meningitis	74.7	11.2	85.8
I67	Septic arthritis	76.3	9.5	85.8
U64	Other affective and somatoform disorders	82.6	3.2	85.8

(continued)

Table 9 (continued): Adjacent DRGs where the proportion of total hospital separations provided by public hospitals is greater than 85%, 2005–06, per cent

ADRG	Description	Proportion of total hospital episodes provided by public hospitals		
		Public patient episodes	Public patient episodes	Public patient episodes
O64	False labour	82.5	3.2	85.7
D61	Dysequilibrium	77.2	8.3	85.5
Q62	Coagulation disorders	75.2	10.2	85.4
T60	Septicaemia	74.6	10.5	85.2
B60	Established paraplegia/quadruplegia w or w/o OR procedures	76.8	8.3	85.0

Source: AIHW NHMD.

Private hospitals

Private hospitals provided at least 70% of the episodes for 14 adjacent DRGs, at least 60% for 24 adjacent DRGs and at least 50% for 41 adjacent DRGs.

Table 10: Adjacent DRGs where the proportion of total hospital separations provided by private hospitals is greater than 50%, 2005–06, per cent

ADRG	Description	Proportion of total hospital episodes in private hospitals
N11	Other female reproductive system OR procedures	92.2
K04	Major procedures for obesity	90.9
K07	Obesity procedures	82.3
E63	Sleep apnoea	81.8
I16	Other shoulder procedures	77.5
M01	Major male pelvic procedures	76.8
U60	Mental health treatment, sameday, w/o ECT	76.3
C04	Major corneal, scleral and conjunctival procedures	76.2
D40	Dental extractions and restorations	75.7
I29	Knee reconstruction or revision	75.3
I18	Other knee procedures	72.8
J10	Skin, subcutaneous tissue and breast plastic OR procedures	71.9
I09	Spinal fusion	71.1
M40	Cystourethroscopy w/o CC	70.3
I01	Bilateral or multiple major joint procedures of lower extremity	69.5
G46	Complex gastroscopy	68.7
K40	Endoscopic or investigative procedure for metabolic disorders w/o CC	68.5
M06	Other male reproductive system OR procedures	68.3
N07	Other uterine & adnexa procedures for non-malignancy	68.2

(continued)

Table 10 (continued): Adjacent DRGs where the proportion of total hospital separations provided by private hospitals is greater than 50%, 2005–06, per cent

ADRG	Description	Proportion of total hospital episodes in private hospitals
D06	Sinus, mastoid and complex middle ear procedures	68.1
I10	Other back and neck procedures	67.9
V62	Alcohol use disorder and dependence	67.9
C11	Eyelid procedures	67.7
G44	Other colonoscopy	67.6
J08	Other skin graft and/or debridement procedures	67.2
J06	Major procedures for breast conditions	65.7
C12	Other corneal, scleral and conjunctival procedures	64.4
D14	Mouth and salivary gland procedures	64.1
Z40	Follow up w endoscopy	63.4
C16	Lens procedures	63.3
L40	Ureteroscopy	62.3
B03	Spinal procedures	62.1
D10	Nasal procedures	62.1
I20	Other foot procedures	61.6
J14	Major breast reconstructions	61.4
G45	Other gastroscopy for non-major digestive disease	60.9
B06	Procedures for cerebral palsy, muscular dystrophy, neuropathy	60.7
I05	Other major joint replacement and limb reattachment procedures	60.2
M60	Malignancy, male reproductive system	59.9
C05	Dacryocystorhinostomy	59.4
I04	Knee replacement and reattachment	59.2
N06	Female reproductive system reconstruction procedures	58.8
J13	Lower limb procedures w/o ulcer/cellulitis	58.3
C14	Other eye procedures	58.1
M02	Transurethral prostatectomy	58.1
F20	Vein ligation and stripping	57.8
M63	Sterilisation, male	57.5
L42	ESW lithotripsy for urinary stones	57.3
D13	Myringotomy w tube insertion	56.9
C03	Retinal procedures	56.7
F03	Cardiac valve proc w CPB pump w invasive cardiac investigation	55.9
F42	Circulatory disorders w/o AMI w invasive cardiac investigative proc	55.0
F15	Percutaneous coronary intervention w/o AMI w stent implantation	54.6
L07	Transurethral procedures except prostatectomy	54.3

(continued)

Table 10 (continued): Adjacent DRGs where the proportion of total hospital separations provided by private hospitals is greater than 50%, 2005–06, per cent

ADRG	Description	Proportion of total hospital episodes in private hospitals
J11	Other skin, subcutaneous tissue and breast procedures	54.0
L08	Urethral procedures	53.8
I24	Arthroscopy	53.6
N04	Hysterectomy for non-malignancy	53.4
D11	Tonsillectomy and/or adenoidectomy	53.0
J01	Microvascular tissue transfer for skin, subcutaneous tissue & breast disorder	52.8
L06	Minor bladder procedures	52.8
R63	Chemotherapy	52.6
I03	Hip revision or replacement	52.5
G11	Anal and stomal procedures	52.5
D09	Miscellaneous ear, nose, mouth & throat procedures	52.4
G09	Inguinal and femoral hernia procedures age>0	52.4
J62	Malignant breast disorders	52.2
C13	Lacrimal procedures	52.2
L41	Cystourethroscopy, sameday	51.8
K06	Thyroid procedures	51.7
K05	Parathyroid procedures	51.6
Z60	Rehabilitation	51.6
D05	Parotid gland procedures	51.5
N01	Pelvic evisceration and radical vulvectomy	51.4
M61	Benign prostatic hypertrophy	51.1
J07	Minor procedures for breast conditions	51.1
B05	Carpal tunnel release	51.0
L05	Transurethral prostatectomy	50.8
N05	Oophorectomies & complex fallopian tube procedures for non-malignancy	50.8

Source: AIHW NHMD

Appendix 3: Methodological details

Data sources

All data sets were for the 2005–06 financial year. Cost weights and estimated average costs for the AR-DRGs were from published sources, based on DoHA's NHCDC.

Hospital Casemix Protocol data set

The analysis drew on data from the HCP data set, provided to the AIHW for this project by the NHHRC and sourced from DoHA. The HCP collates records relating to insured episodes of admitted patient care in Australian hospitals. This includes demographic information on the patient, information on their diagnoses and the procedures that they underwent, and information on the charges made by the hospitals and medical practitioners for the episode of care. Information in the records is used to derive the AR-DRG for each episode of care. The HCP data cover privately insured patients in both public and private hospitals. However, coverage in private hospitals is more complete than in public hospitals. Details of the coverage of the HCP data are in Appendix 4.

There are two HCP data sets that containing episodic and medical information that are linked with an episode identifier.

The data comprise 2,227,196 episodes of valid data. Items used in this analysis comprise:

- each general data item includes AR-DRG version 5.1, hospital sector and same-day status
- demographic items include age, sex and postcode (mapped to a remoteness classification)
- PHI benefits and charges information for hospital care, including accommodation, theatre intensive care, prostheses, pharmacy and ancillary care associated with the hospital episode
- MBS benefits, PHI benefits and charges information by MBS item.

Further details are in Appendix 4.

AIHW National Hospital Morbidity Database

The AIHW NHMD collates records relating to essentially all episodes of admitted patient care in Australian hospitals. Like the HCP, it includes demographic information on the patient, information on their diagnoses and the procedures that they underwent, and the AR-DRG derived for each episode of care. Coverage of the data set is essentially complete for both public and private hospitals.

Summary data from this database are published in the AIHW's annual *Australian hospital statistics* reports and in data cubes at <www.aihw.gov.au>.

AIHW National Hospital Morbidity Costing Model

The AIHW NHMCM uses episodes from the NHMD and adds cost weights from the NHCDC. Further scaling accounts for differences by AR-DRG and hospitals in one-off and daily costs, length of stay, and the actual admitted patient expenditure for each hospital. Further detail about the model is available in Appendix 5 of AIHW 2001.

This model:

- starts with the episodes from the NHMD
- adds cost weights from the NHCDC
- separates the cost weights into 'one-off' costs such as operating rooms, and 'daily' costs such as ward nursing
- rescales the separated cost weights to reflect length of stay of the particular episode
- rescales the cost weights so that the total cost of all episodes in each particular hospital in the dataset reflects the admitted patient expenditure of that hospital.

Private Health Insurance Administration Council data set

The PHIAC collates summary data on insured episodes of admitted patient care, with coverage assumed to be complete. The data were used to assess the completeness of the HCP data.

Methods

To each of the HCP combined records (see above) we add information obtained from the AIHW NHMCM on the cost of public patients with the same AR-DRG.

The mean cost weight is then calculated by the variables of interest. For this project, the cost weight is calculated by state and age group. These are added to the HCP records, with state (or national) cost weight used for those cases where an appropriate state/age weight is not available from the model.

The cost of a public patient is calculated by multiplying the cost weight by \$3,452 (the national average cost for 2005–06). This cost is allocated to two sources of funding – Australian Government and state and territory government – using the Australian Government proportion of public hospital funding for the relevant state or territory.

The next step adds data items concerning the funding sources for the privately insured episode described by the HCP data set.

For all episodes:

- Australian Government contribution via PHI rebate = rebate proportion (30%, 35% or 40%, depending on age) multiplied by the PHI hospital, medical and ancillary benefits.
- personal contribution via out-of-pocket copayment = total charges, net of total benefits.

For episodes in private hospitals or free-standing day surgeries:

- Australian Government contribution via AHCA = 0.
- State contribution via public hospital funding = 0.

For privately insured episodes in public hospitals:

- Net cost to the hospital of the episode is public patient cost multiplied by the nonmedical proportion of the national AR-DRG, net of hospital charges.
- Australian Government contribution via AHCA = AHCA proportion of public hospital funding multiplied by net cost.
- State contribution via public hospital funding = state proportion of public hospital funding multiplied by net cost.

Note that total Australian Government funding also includes MBS benefits, which are included in the original HCP data set and do not need to be calculated.

Totals are calculated for the 596 AR-DRGs with at least 50 episodes each in the HCP data set (excluding error AR-DRGs). Information on error and low volume AR-DRGs is available in Appendix 6.

A small number of NHMD episodes were omitted from the modelling due to AR-DRG version data issues (0.005%).

Appendix 4: HCP data set

The HCP is a collection that provides demographic, casemix and financial information for each hospital episode attracting private health insurance benefits. The key data sets used for this study comprise the hospital episodes and associated medical services in the 2005–06 HCP collection:

- episode data set: 2,229,196 records with 177 variables
- medical data set: 15,693,498 records with 12 variables.

After processing, the combined episode and medical data set used to produce the summary tables has 2,227,196 episodes (99.9% retained) with medical information attached that covers 15,548,752 services (99.1% retained).

Processing of the data

For 2005–06, HCP data were accepted with up to 10% of records failing the edit checks. That is, data were submitted with invalid codes, data items that represent totals but do not equal sums describing the individual contributors, text characters where numeric codes are expected and other errors. Guidelines were updated to reduce the tolerance limit of record errors in later years' collections.

Prior to the HCP data set being used for analysis, it was processed to clean some of the more important errors by deleting records for which key classification variables are missing. The medical information was summarised and added to the episodes database and some demographic information was added. These steps are described in Table 11. Note that episode records with missing or invalid fields overlapped so that only 2,000 records were deleted, although there were 3,345 instances of relevant missing values.

Table 11: Processing of supplied HCP extract

Data set	Step	Comment
Medical	Add field for broad type of service, mapped from MBS item number	New field: 16 codes
Medical	Map from 16 broad type of service groups to 4 broad categories—GP, imaging, pathology, other specialist. Delete allied health and optometry.	4 records deleted. See Table 8 for mapping.
Medical	Summarise: one record for each episode with variables for services, MBS benefits, PHI benefits, charges for each of the 4 broad categories.	Summary file with 1,910,612 records and 17 variables
Episodes	Delete variables not required	Mostly grouper and clinical fields
Episodes	Merge summary medical data set onto episodes data set. Delete medical records for which no valid episode link.	21,984 summary medical records deleted
Episodes	Delete records without AR-DRG v5.1 code	No change
Episodes	Delete records without valid state	1,556 records invalid
Episodes	Map provider number to hospital type (day surgery, private, public). Delete if not able to assign.	New field: Sector 8 records deleted

(continued)

Table 11 (continued): Processing of supplied HCP extract

Data set	Step	Comment
Episodes	Map postcode to ASGC broad regional type (0 for capital, 3 for combined remote and very remote). Delete if unable to assign code. Note: ASGC codes were not used in the modelling or analysis for this report.	New field: Remote 0–3 1,598 records invalid
Episodes	Delete records with unknown or invalid sex	191 records invalid
Episodes	Add fields for broad age groupings from age in years: <ul style="list-style-type: none"> • 5 year bands: 0–4, 5–9, ..., 90–94, 95+ • broad age groups: 0–64, 65–69, 70+ Delete if age missing	New fields: 2 age groupings 0 records deleted
Episodes	Add fields to simplify hospital benefits and charges: Hospital benefit (charge) = total benefit (charge) excluding ancillary, pharmacy and prostheses	New fields: Hospital benefit and hospital charge (amounts)

An official mapping from MBS item to broad type of service could not be obtained in time to conduct the analysis. Hence, a map was constructed from previous AIHW analysis of medical services and new item numbers (primarily resulting from changes to anaesthetic items) were mapped manually using a section of the schedule or description of the item (Table 12).

Table 12: Mapping of medical service types

Code	Broad type of service (DoHA)	Group
A	GP/VRGP attendance	GP
B	Other non-referred attendance	GP
C	Specialist attendance	Other specialist
D	Obstetrics	Other specialist
E	Anaesthetics	Other specialist
F	Pathology tests	Pathology
G	Diagnostic imaging	Imaging
H	Operations	Other specialist
I	Assistance at operations	Other specialist
J	Optometry	Delete
K	Radiation therapy / Radiotherapy	Other specialist
L	Other	Other specialist
M	EPC attendance	GP
N	Pathology patient episode initiation	Pathology
O	Practice nursing	GP
P	Allied health	Delete

Once the official mapping was provided, the HCP medical records were checked for consistency in allocation to service groups. Of the 15.7 million medical records, only 9,896 (0.06%) would have been classified differently if the mapping had been provided in time to be used.

Completeness and representativeness

In order to assess whether the HCP data set is suitable for analyses of privately insured patients, its completeness was checked against the PHIAC's summary data on insured episodes of admitted patient care and against the AIHW's NHMD. Coverage of those two comparison data collections is assumed to be complete.

Comparison with PHIAC data

PHIAC publishes the *Quarterly report A* containing information about episodes and benefits paid by funds including information by hospital sector and by age and sex distribution. The HCP data set contains records that account for approximately 90% of the reported episodes and benefits. The exception is for MBS benefits, for which the HCP coverage is lower (Table 13).

Table 13: Completeness of HCP data set compared to PHIAC 2005-06

Data item	Public	Private	Day surgery	Total
Episodes—PHIAC	331,606	1,810,919	2,137,691	2,469,297
Episodes—HCP	294,199	1,622,749	310,248	2,227,196
Episodes completeness	88.7%	89.6%	94.9%	90.2%
Hospital benefits—PHIAC	\$ 406.29 m	\$ 3,751.71 m	\$ 178.55 m	\$ 4,336.55 m
Hospital benefits—HCP	\$ 358.67 m	\$ 3,438.28 m	\$ 163.65 m	\$ 3,960.59 m
Hospital benefits \$ completeness	88.3%	91.6%	91.7%	91.3%
Prostheses benefits—PHIAC				\$ 837.96 m
Prostheses benefits—HCP				\$ 737.02 m
Prostheses \$ completeness				88.0%
Medical benefits paid by PHI fund—PHIAC				\$ 957.26 m
Medical benefits paid by PHI fund—HCP				\$ 866.57 m
Medical \$ paid by PHI fund completeness				90.5%
Medical benefits paid by MBS—PHIAC				\$ 1,393.40 m
Medical benefits paid by MBS—HCP				\$ 1,098.73 m
Medical \$ paid by MBS completeness				78.9%

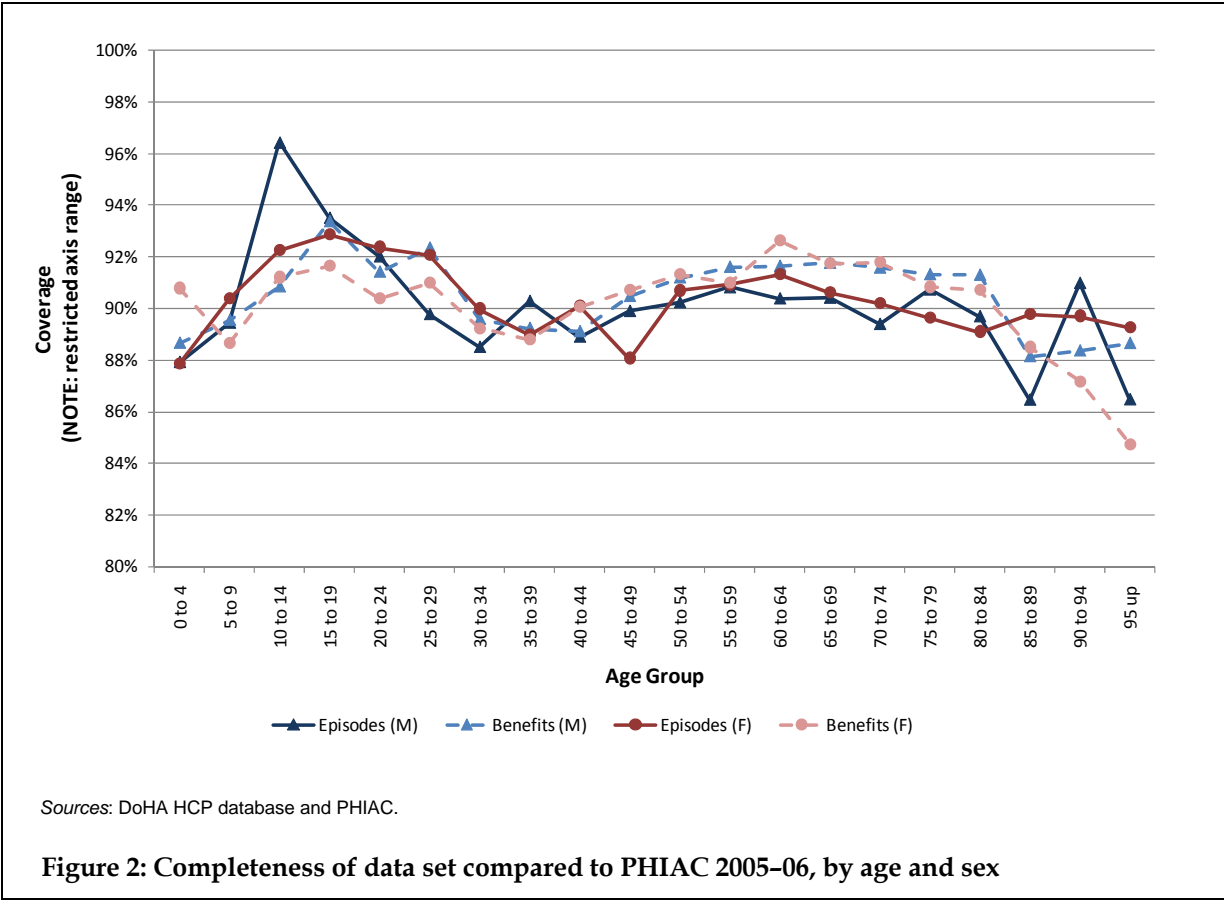
Sources: DoHA HCP database and PHIAC.

This information is also available at state level and for the Northern Territory. The data for the Australian Capital Territory are not published separately and are included with data for New South Wales. However, until the recent PHI legislation changes, the state or territory reported to PHIAC was not necessarily the state or territory of residence. Where a fund had fewer than 500 single equivalent units (roughly, adult members), the episode and associated

benefits were reported against the major state or territory for the fund. Thus, a similar analysis cannot investigate completeness by state or territory.

PHIAC also publishes information by sex and five year age groups, with all PHI benefits paid under hospital tables combined (that is, hospital, prostheses and medical benefits). This enables an assessment of whether the approximately 90% of episodes and benefits accounted for in the HCP data set are representative by age and sex.

The HCP data set accounts for between 88% and 90% of episodes and benefits for most age and sex subpopulations (Figure 2). There is some relative under-reporting in the oldest age groups and higher completeness for males aged 15 to 19. However, these groups make up only a small proportion of the populations being reported in this study (0 to 64 years, 65 to 69 years, 70 years and over) so have only minimal impact on the results.



Comparison with the National Hospital Morbidity Database

The AIHW NHMD contains details on essentially all hospital episodes in Australian hospitals. From the 2005-06 data set, those records with a funding source of private health insurance were extracted for comparison with the HCP data set.

Overall, the HCP data set looks relatively complete with 87.4% of episodes and 85.7% of days from the NHMD included. However, the AR-DRG profile shows that the coverage is inconsistent. In particular, 364,469 (16.4%) of the HCP episodes are in one of the six error AR-DRGs, almost all in 'Ungroupable' (960Z), and almost entirely among the public hospital sector. In the NHMD data, only 5,633 episodes are in the error AR-DRGs. Without the error

AR-DRGs, the HCP data set contains only 73.3% of the episodes and 66.5% of the days in the NHMD data. This suggests there is some bias in the HCP data set under-reporting days of care. In addition, removing the episodes with error AR-DRGs substantially reduces the number of public hospital records and raises questions about the representativeness of the remaining records.

The relatively high classification of episodes as ‘Ungroupable’ and consequent low completeness in other AR-DRGs could make comparisons within AR-DRGs problematic. However, this would only be problematic if the episodes classified into these AR-DRGs in the HCP data set are unrepresentative of the episodes classified into the same AR-DRGs in the NHMD.

Of the 666 AR-DRGs, six are excluded from the analysis as they are error AR-DRGs and 64 are excluded as they have fewer than 50 episodes in the HCP data set (see Appendix 5, Table 15). The remaining 596 AR-DRGs are assessed for completeness in episodes compared to the NHMD (Table 14).

Table 14: Number of AR-DRGs in completeness and ALOS representativeness ranges, excluding error and low volume AR-DRGs

Completeness (%)	AR-DRGs	Episodes (%)	ALOS difference (%)	AR-DRGs	Episodes (%)
<65	385	13.4	< 2	129	51.7
65–85	229	60.7	2–5	135	14.1
85–95	29	4.0	5–15	225	11.8
95–115	19	2.1	15–25	64	3.9
At least 115	24	3.4	At least 25	43	2.1

Sources: DoHA HCP database and AIHW NHMD.

The ratio of the ALOS in the HCP data set compared to the ALOS in the NHMD is used as the indicator of representativeness. The two values of ALOS are within 5% for 264 AR-DRGs, which together represent 65.7% of the HCP data set, and 78.6% of episodes in the AR-DRGs that are high volume AR-DRGs. A further 225, representing 11.8% of the HCP records have ALOS differences of between 5% and 15%.

Of most concern are those AR-DRGs where the ALOS of the episodes in the HCP data set is very different from the ALOS for the private health insurance funded episodes in the NHMD (64 with an ALOS difference of between 15 and 25%, and 43 with an ALOS difference of more than 25%, see Appendix 4). Fortunately, the AR-DRGs with the largest differences in ALOS are concentrated among the lower volume AR-DRGs. The highest volume 30 AR-DRGs represent 44.6% of privately insured episodes in the NHMD and, of these, 29 have ALOS differences of less than 5%. Of these 30 AR-DRGs, 15 have same-day proportions of greater than 90%, including all of the top 10.

This analysis suggests that the HCP database can provide a representative set of episodes for higher volume AR-DRGs. Although not shown here, this is particularly true for private hospitals and day surgeries. However, care must be taken where ALOS differences exceed 5% (Appendix 6).

Furthermore, there are 43 AR-DRGs where the HCP data set accounts for over 95% of the episodes in the NHMD. As the HCP accounts for 73% of the privately insured NHMD episodes, excluding error AR-DRGs, these very high levels of completeness are likely to indicate some misclassification.

Appendix 5: Error and low volume AR-DRGS

Table 15 lists the AR-DRGs where inconsistent or inadequate data were provided (six error AR-DRG codes between 901Z and 963Z) or where the number of records was less than 50 in the HCP data.

Table 15: Error and low volume AR-DRGs

AR-DRG code	Description
901Z	Extensive OR procedure unrelated to principal diagnosis
902Z	Non-extensive or procedure unrelated to principal diagnosis
903Z	Prostatic or procedure unrelated to principal diagnosis
960Z	Ungroupable
961Z	Unacceptable principal diagnosis
963Z	Neonatal diagnosis not consistent with age/weight
A01Z	Liver transplant
A03Z	Lung or heart/lung transplant
A05Z	Heart transplant
A08B	Autologous bone marrow transplant without catastrophic CC
A09A	Renal transplant with pancreas transplant or catastrophic CC
A09B	Renal transplant w/o pancreas transplant without catastrophic CC
A40Z	ECMO w/o cardiac surgery
A41A	Intubation age<16 with CC
A41B	Intubation age<16 without CC
B07A	Peripheral and cranial nerve & other nervous system procedures with CC
B40Z	Plasmapheresis with neurological disease
B41Z	Telemetric EEG monitoring
B61A	Spinal cord conditions with or without OR procedures with catastrophic or severe CC
B78A	Intracranial injury with catastrophic or severe CC
C60B	Acute and major eye infections age <55 without catastrophic or severe CC
E60A	Cystic fibrosis with catastrophic or severe CC
E72Z	Respiratory problems arising from neonatal period
F11A	Amputation for circulatory system except upper limb and toe with catastrophic CC
F40Z	Circulatory system diagnosis with ventilator support

(continued)

Table 15 (continued): Error and low volume AR-DRGs

AR-DRG code	Description
G06Z	Pyloromyotomy procedure
H40Z	Endoscopic procedures for bleeding oesophageal varices
I07Z	Amputation
I11Z	Limb lengthening procedures
I14Z	Stump revision
I67A	Septic arthritis w catastrophic or severe CC
K61Z	Severe nutritional disturbance
L02A	Operative insertion of peritoneal catheter for dialysis with catastrophic or severe CC
L02B	Operative insertion of peritoneal catheter for dialysis without catastrophic or severe CC
L09A	Other procedures for kidney and urinary tract disorders with catastrophic CC
L09B	Other procedures for kidney and urinary tract disorders with severe CC
O40Z	Postpartum and post abortion with OR procedure
P01Z	Neonate, died or transf <5 days of admission with significant OR procedure
P02Z	Cardiothoracic/vascular procedures for neonates
P03Z	Neonate, admwt 1000-1499 g with significant OR procedure
P04Z	Neonate, admwt 1500-1999 g with significant OR procedure
P05Z	Neonate, admwt 2000-2499 g with significant OR procedure
P06A	Neonate, admwt > 2499 g with significant OR procedures with multiple major problems
P06B	Neonate, admwt > 2499 g with significant OR procedures without multiple major problems
P61Z	Neonate, admwt < 750 g
P62Z	Neonate, admwt 750-999 g
P65A	Neonate, admwt 1500-1999 g without significant OR procedures with multiple major problems
P66A	Neonate, admwt 2000-2499 g without significant OR procedures with multiple major problems
R64Z	Radiotherapy
S60Z	HIV, sameday
S65A	HIV-related diseases with catastrophic CC
S65B	HIV-related diseases with severe CC
S65C	HIV-related diseases without catastrophic or severe CC
U61A	Schizophrenia disorders with mental health legal status

(continued)

Table 15 (continued): Error and low volume AR-DRGs

AR-DRG code	Description
U62A	Paranoia & acute psych disorder with catastrophic or severe CC or with mental health legal status
V63B	Opioid use disorder and dependence, left against medical advice
W01Z	Ventilation or craniotomy procs for multiple significant trauma
W02Z	Hip, femur and limb procs for multiple significant trauma, including implantation
W03Z	Abdominal procedures for multiple significant trauma
W04Z	Other OR procedures for multiple significant trauma
W60Z	Multiple trauma, died or transf to another acute care facility, los<5 days
W61Z	Multiple trauma without significant procedures
Y01Z	Severe full thickness burns
Y02A	Other burns w skin graft age >64 or with (catastrophic or severe CC) or with complicating procedure
Y02B	Other burns w skin graft age <65 without (catastrophic or severe CC) without complicating procedure
Y03Z	Other OR procedures for other burns
Y60Z	Burns, transferred to another acute care facility < 5 days
Y61Z	Severe burns
Y62A	Other burns age >64 or with (catastrophic or severe CC) or with complicating procedure
Z65Z	Multiple, other and unspecified congenital anomalies

Appendix 6: Average length of stay (ALOS) differences between HCP and the NHMD

Table 16: HCP and NHMD ALOS difference is between 15% and 25%, by AR-DRGs, 2005-06

AR-DRG	Description	HCP ALOS	NHMD ALOS	% Difference
B66B	Nervous system neoplasm w/o catastrophic or severe CC	7.11	6.18	15
F75C	Other circulatory system diagnoses w/o catastrophic or severe CC	3.39	2.94	15
N11A	Other female reproductive sys OR procs age >64 or w malignancy or w CC	7.81	9.20	15
I02B	Skin graft w/o catastrophic or severe CC, excluding hand	4.27	5.05	15
M60A	Malignancy, male reproductive system w catastrophic or severe CC	7.86	9.29	15
T62B	Fever of unknown origin w/o CC	3.49	3.02	15
H42C	ERCP other therapeutic procedure w/o CC	2.34	2.02	16
I15Z	Cranio-facial surgery	5.70	4.93	16
R04B	Other neoplastic disorders w other OR procedures w/o cat or sev CC	2.54	2.19	16
F73B	Syncope and collapse w/o catastrophic or severe CC	3.34	2.88	16
R62A	Other neoplastic disorders w CC	5.87	6.97	16
B72B	Nervous system infection except viral meningitis w/o cat or sev CC	7.50	6.46	16
B72A	Nervous system infection except viral meningitis w cat or sev CC	14.51	17.29	16
M62B	Inflammation of the male reproductive system w/o CC	2.06	2.46	16
F04B	Cardiac valve proc w cpb pump w/o invasive cardiac inves w/o cat CC	10.63	9.15	16
G03B	Stomach, oesophageal and duodenal procedures w/o malignancy w cat/ sev CC	8.80	10.51	16
G05B	Minor small and large bowel procedures w/o CC	5.72	4.92	16
E73C	Pleural effusion w/o catastrophic or severe CC	4.41	3.78	17
D67A	Oral and dental disorders except extractions and restorations	3.37	4.06	17
B60A	Established paraplegia/quadruplegia w or w/o OR procs w catastrophic CC	24.52	29.59	17
C15A	Glaucoma and complex cataract procedures	1.36	1.64	17
D63B	Otitis media and URI w/o CC	1.79	2.17	17
I76A	Other musculoskeletal disorders age >69 w CC	9.62	8.18	18
X64A	Other injury, poisoning and toxic effect diagnosis age >59 or w CC	3.42	2.90	18
E69C	Bronchitis and asthma age <50 w/o CC	2.35	1.99	18
B03A	Spinal procedures w catastrophic or severe CC	12.20	14.83	18
C04Z	Major corneal, scleral and conjunctival procedures	1.03	1.25	18
A06Z	Tracheostomy or ventilation >95 hours	27.78	33.81	18
H02C	Major biliary tract procedures w/o malignancy w/o CC	4.13	3.50	18
B70C	Stroke w/o catastrophic or severe CC	7.73	6.56	18
I27A	Soft tissue procedures w catastrophic or severe CC	8.41	10.28	18
X63A	Sequelae of treatment w catastrophic or severe CC	7.05	5.96	18

(continued)

Table 16 (continued): HCP and NHMD ALOS difference is between 15% and 25%, by AR-DRGs, 2005-06

AR-DRG	Description	HCP ALOS	NHMD ALOS	% Difference
U64Z	Other affective and somatoform disorders	11.83	14.50	18
B80Z	Other head injury	2.72	2.28	19
F01A	Implantation or replacement of AICD, total system w cat or sev CC	5.46	6.78	19
B79Z	Skull fractures	4.57	3.82	19
O66A	Antenatal & other obstetric admission	3.27	2.74	19
F72B	Unstable angina w/o catastrophic or severe CC	3.16	2.64	20
E02C	Other respiratory system OR procedures w/o catastrophic or severe CC	1.99	1.66	20
I64B	Osteomyelitis w/o CC	6.47	5.39	20
I75C	Injury to shoulder, arm, elbow, knee, leg or ankle age <65 w/o CC	1.61	2.02	20
N60A	Malignancy, female reproductive system w catastrophic or severe CC	6.07	7.60	20
I17Z	Maxillo-facial surgery	1.97	2.47	20
I72A	Specific musculotendinous disorders age >79 or w (cat or sev CC)	5.93	7.45	20
F06B	Coronary bypass w/o invasive cardiac inves w/o catastrophic or severe CC	9.94	8.23	21
J62A	Malignant breast disorders (age >69 w CC) or w (cat or sev CC)	5.12	6.47	21
I72B	Specific musculotendinous disorders age <80 w/o cat or sev CC	1.90	2.42	22
D60B	Ear, nose, mouth and throat malignancy w/o catastrophic or severe CC	3.29	4.20	22
E75B	Other respiratory system diagnosis age >64 or w CC	6.48	5.33	22
B67C	Degenerative nervous system disorders age <60 w/o cat or sev CC	3.27	2.69	22
B71A	Cranial and peripheral nerve disorders w CC	6.65	8.50	22
I71B	Other musculotendinous disorders age >69 or w CC	4.25	3.48	22
N62B	Menstrual and other female reproductive system disorders w/o CC	1.57	1.28	22
T01C	OR procedures for infectious and parasitic diseases w/o CC	7.68	6.28	22
F70B	Major arrhythmia and cardiac arrest w/o catastrophic or severe CC	3.43	2.80	22
V60B	Alcohol intoxication and withdrawal w/o CC	3.24	4.20	23
G67B	Oesophagitis, gastroent & misc digestive system disorders age>9 w/o cat/sev CC	2.30	2.98	23
G61A	GI haemorrhage age >64 or w (catastrophic or severe CC)	3.39	4.42	23
C61Z	Neurological and vascular disorders of the eye	2.24	2.93	24
I76B	Other musculoskeletal disorders age >69 or w CC	3.58	4.72	24
E75C	Other respiratory system diagnosis age <65 w/o CC	2.96	2.38	24
E62C	Respiratory infections/inflammations w/o CC	5.53	4.44	25
B74Z	Nontraumatic stupor and coma	4.02	5.33	25
T60B	Septicaemia w/o catastrophic or severe CC	7.22	5.78	25

(continued)

Table 17: AR-DRGs where the difference in ALOS is >25%, 2005-06

AR-DRG	Description	HCP ALOS	NHMD ALOS	% Difference
H06Z	Other hepatobiliary and pancreas OR procedures	5.83	7.78	25
F65A	Peripheral vascular disorders w catastrophic or severe CC	11.58	9.25	25
Y62B	Other burns age <65 w/o (cat or sev CC) w/o complicating proc	3.01	2.41	25
P60B	Neonate, died/transf <5 days of adm, w/o significant OR proc, not newborn	1.68	2.25	25
L06A	Minor bladder procedures w catastrophic or severe CC	6.17	8.29	26
U68Z	Childhood mental disorders	5.40	7.33	26
B78B	Intracranial injury w/o catastrophic or severe CC	8.21	6.50	26
F69B	Valvular disorders w/o catastrophic or severe CC	2.57	2.03	26
I02A	Microvascular tissue transfer or (skin graft w cat or sev CC), excluding hand	16.96	23.15	27
E40Z	Respiratory system diagnosis w ventilator support	13.81	10.85	27
P67D	Neonate, admwt > 2499 g w/o significant OR procedure w/o problem	3.87	3.02	28
J07A	Minor procedures for malignant breast conditions	1.65	1.28	28
X60B	Injuries age >64 w/o CC	6.41	4.99	28
Q02A	Other or procedure of blood & blood forming organs w cat or sev CC	7.54	10.59	29
L09C	Other procedures for kidney and urinary tract disorders w/o cat or sev CC	3.02	2.34	29
X62B	Poisoning/toxic effects of drugs & other substances age <60 w/o CC	2.36	1.82	30
M61B	Benign prostatic hypertrophy w/o catastrophic or severe CC	1.48	1.14	30
G12B	Other digestive system OR procedures w/o catastrophic or severe CC	3.85	2.95	31
Z01B	OR procedures w diagnoses other contacts w health services w/o cat/sev CC	1.75	1.34	31
B60B	Established paraplegia/quadruplegia w or w/o OR procs w/o catastrophic CC	11.02	8.39	31
H60C	Cirrhosis and alcoholic hepatitis w/o catastrophic or severe CC	3.28	2.49	31
C62Z	Hyphema and medically managed trauma to the eye	2.33	3.40	31
E61B	Pulmonary embolism w/o catastrophic or severe CC	7.77	5.91	32
G61B	GI haemorrhage age <65 w/o catastrophic or severe CC	1.39	2.04	32
B63Z	Dementia and other chronic disturbances of cerebral function	11.23	16.48	32
F60B	Circulatory disorders w AMI w/o invasive cardiac inves proc w/o cat or sev CC	4.29	3.24	33
B04A	Extracranial vascular procedures w catastrophic or severe CC	7.39	11.03	33
F17Z	Cardiac pacemaker replacement	2.75	2.06	33
E66B	Major chest trauma age >69 or w CC	8.71	6.48	34
C63B	Other disorders of the eye w/o CC	1.06	1.64	35
K60B	Diabetes w/o catastrophic or severe CC	4.64	3.40	36
E71C	Respiratory neoplasms w/o CC	4.26	3.09	38
G62Z	Complicated peptic ulcer	2.54	4.62	45
B65Z	Cerebral palsy	6.48	4.44	46
T64B	Other infectious and parasitic diseases w/o catastrophic or severe CC	4.75	3.25	46
C01Z	Procedures for penetrating eye injury	1.13	2.13	47

(continued)

Table 17 (continued): AR-DRGs where the difference in ALOS is >25%, 2005-06

AR-DRG	Description	HCP ALOS	NHMD ALOS	% Difference
F09B	Other cardiothoracic procedures w/o CPB pump w/o catastrophic CC	6.44	4.37	47
I78B	Fractures of neck of femur w/o catastrophic or severe CC	8.70	5.74	52
G63Z	Uncomplicated peptic ulcer	1.72	3.59	52
I69C	Bone diseases & spec arthropathies age <75 w/o catastrophic or severe CC	3.82	2.40	59
C63A	Other disorders of the eye w CC	1.91	5.44	65
Z64A	Other factors influencing health status	6.08	28.62	79
A07Z	Allogeneic bone marrow transplant	2.14	35.75	94

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