



Paying for Value

# Estimating private hospital episode of care costs: The case of the missing DRGs

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# Estimating private hospital episode of care costs: The case of the missing DRGs

**Background:** Data on the cost of hospital care are complex. Costs related to public hospital admissions are estimated by the Independent Hospital Pricing Authority and released annually via their National Hospital Cost Data Collection (NHCDC) Report. Costs related to privately insured admissions are collected by the Department of Health and released via its Hospital Casemix Protocol annual reports. These cost estimates are released at a number of levels, including episode-level Australian Refined Diagnosis Related Groups (AR-DRGs), a classification system which relates different types of patients with the resources required by the hospital to treat them. Researchers studying hospital costs of care in Australia commonly assign these estimated costs to admissions data according to AR-DRGs recorded for each episode of care.

**The problem:** Since 2014/15, private hospitals in NSW are no longer required to provide AR-DRG classifications with each episode of care. As a result, the cost information for these private patient episodes is missing from 2014/15 onwards. In our case, we had access to admissions data from the NSW Admitted Patients Data Collection from 2005 to 2018. To examine costs of hospital care, we needed to assign AR-DRGs to episodes where they were missing.

**The proposed solution:** We purchased grouper software, a software which uses an algorithm based on commonly collected data to assign values to the missing AR-DRGs. This routine data includes disease (ICD-10) and intervention (ACHI) codes, gender, age, mode of separation, length of stay, newborn weight, and hours of mechanical ventilation. Various grouper software



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options can be found on the Independent Hospital Pricing Authority website. See [here](#) for details.

**The challenges:** There were numerous challenges with the chosen software, including:

- No user manual. This meant that we were left to guess the formats and naming conventions, and the combination of input variables and files themselves to upload to the software.
- Software bugs. This meant that even when the input file matched the software requirements, output files were not created or saved, and DRGs still missing.

**The solution:** The following rows contain mock data comprising the required variables and formats for the grouper software. Row headers should be removed before uploading the admission records. Data on newborn birthweight (in grams) is needed for birth records.

Admissions relating to the Department of Veteran Affairs were removed due to a lack of cost data (within the APDC data, denoted by `payment_status_on_sep= 50` or `51`).

Patient ID	Patient name	Adm_date	Sep_date	LOS	Gender	Hours on mechanical ventilation	Mode of separation	diag_p	proc_p
101	A	10/05/2019	15/05/2019	5	1	0	1	O140	9555001
102	B	01/01/2013	10/01/2013	10	2	0	4	U739	9251499

In addition to the above variables, full diagnosis codes (in our case diagnosis codes 1-50 drawn from the ICD-10AM classification scheme) and procedure codes (from 1-49 drawn from the ACHI codes) are also included behind their primary counterparts (i.e. `diag_p diag_1 ...diag_50` `proc_p proc_1....proc_49`). Note that the mode of separation variable needs to be



mapped from the admissions data to the Grouper classifications (see appendix). Within the Grouper software, this order of variables then needs to be input into the main interface.

Finally, a judgement must be made on the version of AR-DRG codes to be used. Our chosen software product generates versions 8.0 and 9.0. The choice will likely depend on the classification of cost data, which is available annually from the NHCDC and HCP collections. The admissions data will already have AR-DRGs attached to public hospital admissions and private admissions prior to 2014. The final DRGs - whether you use the original DRGs or generated ones - are then mapped to the publicly available data on costs by DRG.

**Recommendation:** Choose your grouper software vendor wisely. Ensure there is a manual, and that good technical support is available before purchasing.

## Appendix: Mapping mode of separation

Mode of Separation (APDC Admissions data)

Code	Description
0	Discharge on leave
1	Discharged by hospital
2	Discharged at own risk
3	Transferred to nursing home
4	Transferred to psychiatric hospital
5	Transferred to other hospital
6	Died (autopsy)
7	Died (no autopsy)
8	Transferred other accommodation
9	Type change separation
10	Discharge on leave
11	Transferred to palliative care unit/hospice

Mode of Separation (Grouper)

Code	Description
1	Transferred to other hospital
2	Transferred to nursing home
3	Transferred to psychiatric hospital
4	Transferred to palliative care unit/hospice
5	Type change separation
6	Discharged at own risk
7	Discharge on leave
8	Died (autopsy) Died (no autopsy)
9	Discharged by hospital Transferred other accommodation