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Assessment of Data Availability for the Analysis of Performance of Public and Private Hospitals

PREPARED BY

Laurie Brown, Linc Thurecht, Andrew Armstrong, Binod Nepal, Cathy Gong and Alicia Payne

PREPARED FOR

Australian Private Hospitals Association

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National Centre for Social and Economic Modelling
University of Canberra ACT 2601 Australia
170 Haydon Drive Bruce ACT 2617

Phone + 61 2 6201 2780
Fax + 61 2 6201 2751
Email natsem@natsem.canberra.edu.au
Website www.natsem.canberra.edu.au

AUTHOR NOTE

Laurie Brown is a Professor, Linc Thurecht is a Senior Research Fellow, Andrew Armstrong is a Senior Research Officer, Binod Nepal is a Research Fellow, Cathy Gong is a Research Fellow and Alicia Payne is a Research Fellow at the National Centre for Social and Economic Modelling, University of Canberra.

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The microdata do not contain any information that enables identification of the individuals or families to which they refer.

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Figures and tables

ABBREVIATIONS

ABS	Australian Bureau of Statistics
ACHS	Australian Council on Health Care Standards
ACSQHC	Australian Commission for Safety and Quality in Health Care
AIHW	Australian Institute of Health and Welfare
ALOS	Average length of stay
APHA	Australian Private Hospitals Association
AR-DRG	Australian Refined Diagnosis Related Groups
ARIA	Accessibility/Remoteness Index of Australia
CIP	Clinical Indicator Program
CURF	Confidentialised unit record file
DoHA	Department of Health and Ageing
DVA	Department of Veterans' Affairs
HCP	Hospital Casemix Protocol data collection
ICD-10-AM	International Statistical Classification of Diseases and Related Health Problems, 10th Revision, Australian Modification
MDC	Major diagnostic category
MINC	Medical Indemnity National Collection
NESWTDC	National Elective Surgery Waiting Times data collection
NHCDC	National Hospital Cost Data Collection
NHMD	National Hospital Morbidity Database
NHPC	National Health Performance Committee
NPHE	National Public Hospital Establishments
OECD	Organisation for the Economic Cooperation and Development
PC	Productivity Commission
PHDB	Private Hospital Data Bureau
PHEC	Private Hospital Establishment Collection

PHIAC	Private Health Insurance Administration Council
RRMA	Rural, Remote and Metropolitan Areas
RSA	Relative stay index
SCRGSP	Steering Committee for the Review of Government Service Provision
SPP	Special Purpose Payments

SUMMARY

This report provides a survey of a range of possible performance indicators for hospitals, and in particular the availability of data to support these metrics, with reference to the Productivity Commission study into the performance of public and private hospitals systems.

A review of the literature reveals a broad range of potential indicators that have been proposed across a number of domains of hospital performance. A range of data collections are surveyed as possible sources for the comparison of relative performance between public and private hospital sectors. Limitations in both the coverage of these collections and the comparability of data items between the sectors are identified.

The National Hospital Cost Data Collection appears to be the best source of data to compare clinically similar services between the two sectors. However, because of different cost structures and the lack of a competitively neutral reporting environment, it is difficult to draw definitive conclusions on the relative efficiency between the two sectors. While quality of care issues are of clear importance to the hospitals sector, existing data collections in the area are incomplete.

1 Purpose and Scope of this Report

In May 2009 the Productivity Commission was requested to undertake a study into the relative performance of public and private hospitals. As part of the Australian Private Hospitals Association (APHA) submission to this enquiry, NATSEM has been engaged to identify possible performance indicators for public and private hospitals and the associated availability of data.

The scope of this report relates to three of the five terms of reference for the Productivity Commission study as follows:

1. Comparative hospital and medical costs for clinically similar procedures performed by public and private hospitals, using baseline data to be provided by states and territories under the new National Healthcare Agreement, and existing data provided to the Government by private hospitals. The analysis is to take into account the costs of capital, FBT exemptions and other relevant factors.

2. The rate of hospital-acquired infections, by type, reported by public and private hospitals, using baseline data to be provided by states and territories under the new National Healthcare Agreement, and existing data provided to the Government by private hospitals.

3. Other relevant performance indicators, including the ability of such indicators to inform comparisons of hospital performance and efficiency.

In this report two issues are initially considered. First, a brief review of possible hospital performance indicators is provided. Part of this examination considers the various domains of hospital performance that have been considered. Second, existing data sources are reviewed to determine the extent to which comparative hospital performance can currently be conducted. Selected performance indicators related to specific issues raised in the Productivity Commission Issues Paper (PC 2009) are then examined. Finally, a number of issues relating to comparability of data between the public and private hospitals sector are considered. The comparative lack of data relating to quality of care is also discussed.

2 HOSPITAL PERFORMANCE: A BRIEF REVIEW

Hospital performance is often considered in terms of the effectiveness and efficiency of operations. The term 'effectiveness' is used to reflect the extent to which a reporting unit achieves a given objective and provides a focus on the outcome that is being achieved. This of course requires the specification of objectives across all relevant domains. The term 'efficiency' is often used in the sense of the quantum of output for a given set of inputs, or alternatively, the minimum inputs required to achieve a given quantum of output. This definition lends itself to economic measures of efficiency, but could equally be applied to clinically related indicators particularly where supply or other capacity constraints are present (eg average number of casemix weighted operations per operating theatre). Other dimensions of efficiency include allocative efficiency (expressed, for example, in performance indicators relating to patient access to hospitals) and dynamic efficiency relating to intertemporal changes in efficiency. This final form while not an explicit part of the formal framework of hospital performance indicators, is implicit in terms of assessing changes in a given indicator over successive reporting periods. Bently et al. (2008) and Hurley (2009) reviewed Australian health care efficiency in three streams: administrative, operational and allocative.

A broader view of the environment in which hospitals operate has led to a wider range of issues being considered in assessing the performance of hospitals. These may reflect specific areas of public policy interests such as quality of care or equality of treatment. An example of the former is the number or rate of adverse events and an example of the latter is the likelihood of breast reconstructive surgery by the ruralness and socioeconomic status of a patient (see Hall and Holman 2003). Workforce sustainability issues have also become more prominent in the context of a structurally ageing population leading to the proposal of performance indicators that seek to identify how adequately the sector is preparing for generational change in the health sector workforce.

As part of the World Health Organization project, the Performance Assessment Tool for quality improvement in Hospitals (PATH), satisfactory hospital performance was defined as "the maintenance of a state of functioning that corresponds to societal, patient, and professional norms" (Veillard et al. 2005, pg 488). As part of this project, six domains for assessing hospital performance were identified: clinical effectiveness, production efficiency, staff orientation, responsive governance, safety, and patient centredness.

Within the empirical literature, there is conflicting evidence on hospital performance in relation to the size and ownership of hospitals. For example, Coyne et al. (2009) in a study of hospitals in the USA state of Washington found that cost and efficiency were influenced by size and ownership of the hospital.

The study found that small and large not-for-profit hospitals appeared to have achieved higher efficiency levels than government-owned hospitals. Larger hospitals also reported greater efficiency than smaller hospitals irrespective of ownership type. In contrast, small, not-for-profit hospitals reported comparable costs to those of the largest hospitals. In contrast, Helmig and Lapsley (2001) found that over the 1991 to 1996 period German hospitals in the public and welfare sector were more efficient than private hospitals. They noted that public, welfare and private hospital sectors had different best-practice frontiers and that public and welfare hospital sectors appeared to use less resources than private hospitals.

To investigate the factors explaining the conflicting empirical evidence regarding quality of hospital care by hospital ownership, Eggleston et al. (2008) conducted a systematic review of 31 studies since 1990 and used multivariate analysis to examine the quality of care at non-federal general acute, short-stay US hospitals. They noted that findings that compare for-profit and government-controlled hospitals in relation to mortality rates and rates of adverse events were dependent on data sources, region and the time period covered. They concluded that the "true" effect of ownership was dependent on the institutional context, including differences across regions, markets and over time.

This underlies the importance of context in assessing not only the performance of individual hospitals, but also when considering relative performance between heterogeneous groups of hospitals, such as differences between the public and private hospitals sector. The context arises from the regulatory, competitive and funding environment, but also in the interface between government policy and local demand for and supply of hospital services. This environment is also dynamically changing over time.

2.1 Domains of Hospital Performance

As part of the process of specifying specific performance indicators for hospitals, the relevant domains of performance first need to be identified. These domains are broad areas of performance for which a range of specific indicators can then be developed. The domains should reflect the desired objectives and outcomes to be achieved within the hospital sector.

A review of hospital performance indicator typologies reveals a diverse range of approaches to this question. Appendix A provides a selection of various typologies and suites of related performance indicators.

The previous section discussed a range of ways in which the relative performance of hospitals might be assessed. Perhaps the most comprehensive frameworks for the assessment of hospital performance in the Australia context are provided by AIHW (2008), SCRGSP (2009) and PC (2009). These frameworks have broadly common elements but also provide their own particular emphases. They also

represent a more general consensus of a broader range of indicators of hospital performance reflecting economic and quality of care considerations in addition to various issues of public policy relevance. Details of the specific domains and performance indicators suggested by each are provided in Attachment B.

Within the scope of matters this project is considering, the following common domains emerge from a synthesis of performance frameworks suggested in AIHW (2008), SCRGSP (2009) and PC (2009):

- Efficiency in the provision of hospital services
- Quality of care in the treatment of patients
- Accessibility of hospitals services
- Sustainability of the sector

Because the scope of this project does not include matters relating to patient satisfaction, we do not consider possible performance indicator metrics in that domain.

2.2 Levels of Performance Comparison

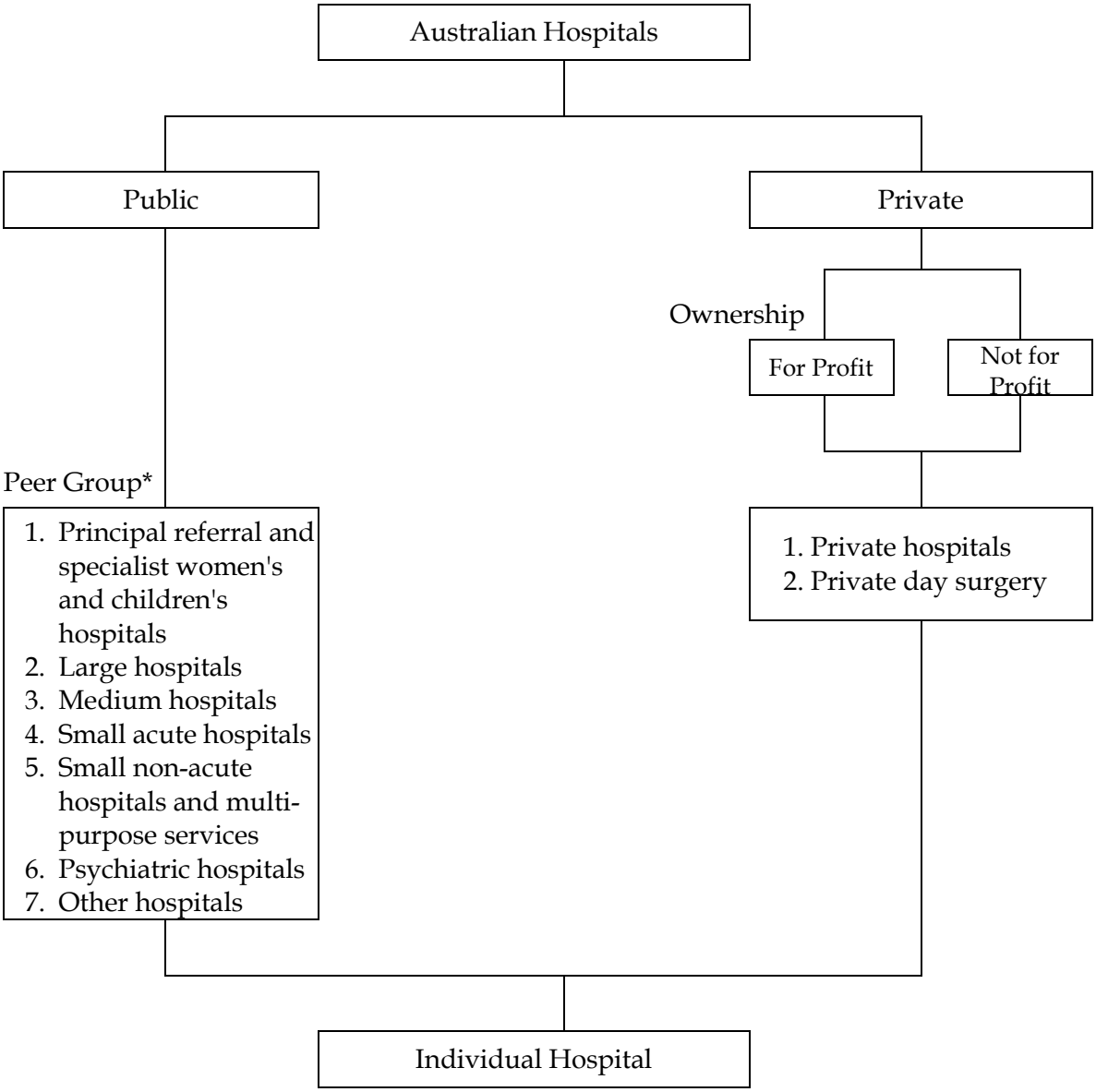
There are a number of conceptual levels at which the relative performance of hospitals could be assessed. The appropriate comparison should ideally be determined by the most relevant level for the metric being considered. This in turn would be influenced by the type of actions that are feasible in response to any perceived shortcomings. In practise, however, data availability will often determine the level at which comparative performance can be assessed. For example, when considering workforce sustainability issues, it is not clear what the age distribution of the workforce within a specific establishment or group of hospitals says about the performance of the reporting hospital(s) on the issue. With a matter such as this, it is perhaps the collective performance of the sector rather than individual establishments which is most relevant to consider.

Comparing Hospital Performance

Figure 2.1 provides one typology of the defining characteristics of hospitals in Australia that may be relevant in determining the appropriate level of comparison of hospital performance.

At the highest level, hospital performance can be assessed for the sector as a whole. This may be appropriate in areas where differences between sector or individual hospitals are less important than how the overall sector is performing. This may be relevant, for example as previously discussed, with certain workforce sustainability issues.

Figure 2.1 Typology of Australian Hospitals



* A more detailed peer group classification structure is shown in Appendix C

The next level down is to compare hospital performance between the public and private sectors. This would be appropriate when considering overall differences between the two sectors. An example in this respect may be the range of treatments provided or the relative complexity of treatments provided within the two sectors. This is the level of comparison that is the focus of the Productivity Commission study into the performance of public and private hospitals.

The next level is between groups of hospitals that are homogenous in some manner relevant to comparing performance. For the public sector, there is a recognised typology of hospitals according to the number of admissions per year that results in the classification of public hospitals into one of seven types of peer groups. Within these seven categories, public hospitals can be further

distinguished. A full list of the peer group structure for public hospital establishments is provided in Appendix C.

For private hospitals, one broad classification is to distinguish on the basis of whether the establishment provides day only surgery. However, another important distinction can relate to the ownership of the hospital. This is generally distinguished on the basis of whether the hospital is operated by a for-profit entity or a not-for-profit organisation (denominational/charitable organisations or other not-for-profit entity). Controlling for homogeneous groups can prevent invalid comparisons from being made where there are differences in the operational environment they face.

The final level at which hospital performance might be compared is at the individual establishment level. Differences at this level may highlight how varying clinical or administrative practices manifest in performance metrics. However, care must be taken to only make valid comparisons given the diverse range of characteristics for individual hospital establishments as discussed above. There may also be patient confidentiality or commercial sensitivities associated with assessing relative performance at this level.

While a given performance metric might have an ideal level at which it would be assessed, practical limitations such as the feasibility of collecting the necessary data, patient confidentiality issues or commercial sensitivity concerns may also be a determining factor that leads to relative performance being assessed at higher levels of aggregation. Furthermore, the scope for policy intervention to address any perceived shortcomings in a particular area may also influence the level at which relative performance is most meaningfully assessed.

For example, as noted in PC (2009), around a quarter of public hospitals had less than 50 beds, and because of more limited flexibility in the utilisation of resources within smaller hospitals, they are more likely to be relatively less efficient than larger hospitals. Balanced against this, PC (2009) note that larger hospitals may also be required to maintain sufficient stand-by capacity to handle major events that may not be optimally used (eg emergency departments).

Patient Level Data versus Establishment Level Comparisons

The preceding discussion focuses on comparisons between appropriate groupings of hospitals. However, the distinction should also be made between performance indicators that relate to specific patients and those that relate to individual hospitals (or homogenous groups of hospitals). While many potential indicators will naturally relate to the performance of the establishment or group of establishments as a whole (eg average cost per casemix weighted separation), other performance indicators will perhaps be most appropriate at a patient level. An example of the latter may relate to adverse events where manifestation and resolution are not necessarily attributable to one establishment.

The crucial issue that this raises is the extent to which an individual patient can be traced through the hospital system and the health system more broadly. Absent the ability to follow the course and continuity of care for a given individual, it may not be possible to capture certain metrics, or any attempt may produce potentially biased results.

Differences Between State and Territory Jurisdictions

An additional factor that could be relevant for assessing the relative performance of hospitals are differences related to the jurisdiction in which the hospital operates. While differences at this level are reported for public hospitals by the AIHW (eg refer to the AIHW series *Hospital Statistics*), less is publicly known about the extent to which differences in the regulatory and operating environment of different states and territories affect the relative performance of private hospitals. While the ABS conducts an annual collection of data from private hospitals, only a limited range of details are released (refer to Section 4 and Appendix F for further details).

3 PERFORMANCE INDICATORS IN THE HOSPITAL SECTOR

Freeman (2002) suggests that there are two principal uses of performance indicators. First, as a mechanism to provide external accountability and verification of performance by the reporting unit. Second, as a mechanism for internal quality improvement. From a broader perspective, performance indicators can then be used to direct attention towards outcomes which are considered sub-optimal against a specified criteria or to highlight areas of varying performance so that broader conclusions might be reached on how to better operate hospitals as a sector.

AIHW (2008) also note that performance indicators can be dichotomised into those that relate to the outcomes that are achieved for patients, and process and structural issues. While the former focuses on the objectives of patient care, AIHW (2008) notes that the latter may be more appropriate for specific accountabilities and may be more sensitive to changing service delivery practices. It can also be the case that processes metrics are more easily captured than metrics related to outcomes.

This Section provides a brief overview of some of the performance indicators that have been proposed for the hospitals sector. The international experience is considered and then some of the more recent performance indicator frameworks that have been developed in Australia.

3.1 INTERNATIONAL HOSPITAL PERFORMANCE INDICATORS

Indicators are developed to synthesise complex systems so that they can be objectively measured and compared across time and across systems. According to the definition adopted in the PATH project framework for assessment of hospital performance, an indicator represents a measurable element that provides information about complex phenomenon such as quality of care which is not in itself easily captured (Veillard et al. 2005).[1]

A set of indicators are often used to assess the performance of complex organisations such as hospitals which tend to have several dimensions of functioning. The PATH project reviewed 100 possible performance indicators which were then refined to a set of 24 core performance indicators and 27 tailored indicators. The core indicators were considered to be relevant, responsive, valid in most contexts, relying on sound scientific evidence and for which data was available or easy to collect. The tailored indicators were viewed as supplementary measures applicable in specific contexts. Core indicators from the PATH project are shown in Table A1 of Appendix A.

[1] Refer to Section 2 for further details on the PATH project.

There has been a widespread practice of developing and using indicators for assessment of hospital systems. International reviews suggest that there are commonalities as well as wide differences in the scope or domains of the selected indicators (Copnell et al. 2009; Groene et al. 2008). While clinical aspects of performance are typically the focus, some have emphasised economic aspects of performance.

Groene et al. (2008) reviewed eleven projects on hospital performance. These included ten national projects that contained one or more domains of the six-dimensional framework of the PATH project. Across these projects, the number of indicators ranged from 36 in the Joint Commission Accreditation of Health Care Organisation, USA, to over 300 in the Australian Council on Health Care Standards (ACHS).

In a wider review of quality of hospital care indicators, Copnell et al. (2009) identified 383 discrete indicators from 22 source organisations or projects. They classified the indicators according to: aspects of care provision - structure, process or outcome; dimensions of quality - safety, effectiveness, efficiency, timeliness, patient-centredness and equity; and domain of application - hospital-wide, surgical and non-surgical clinical specialities. Of the 383 indicators, 27.2 per cent were hospital-wide, 26.1 per cent related to surgical patients and 46.7 per cent related to non-surgical specialities, departments or diseases. The majority of these indicators (55.5 per cent) measured processes of care and 37.3 per cent measured outcomes. The reviewers noted that safety and effectiveness were the most frequently represented domains and few indicators measured the remaining dimensions.

Efficiency indicators tend to focus on economic (financial) issues, with a range of specific indicators. However, some non-financial economic efficiency performance indicators were also considered in Helmig and Lapsley (2001) in a study of the relative efficiency of public, welfare (not-for-profit) and private (for-profit) hospital sectors in Germany. Both financial and non-financial efficiency indicators used included: beds per 10 000 inhabitants; average length of stay; occupancy rates; doctors per bed; nursing personnel per bed; cost per inpatient case; cost per inpatient day; and costs per inpatient bed.

In a study that considered the measurement of quality of hospital care, de Pouvourville and Minvielle (2002) classified hospital performance indicators into three broad groups: mortality rates; intermediate outcome; and process indicators. Mortality rates were considered to be the ultimate outcome indicator but it was noted that there are difficulties in comparing the performance of hospitals that receive patients from various demographics and are equipped with different resources. A list of the most frequently studied mortality rates following specific procedures documented in de Pouvourville and Minvielle (2002) is shown in Table A2 of Appendix A. Intermediate outcomes considered included measures such as rates of hospital-acquired infections, rates of nosocomial

infections which were not specific to a given pathology and the number of therapeutic accidents resulting from medication prescription errors. Process indicators examined were grouped into clinical and non-clinical indicators. Clinical process indicators reflected the quality of clinical procedures (eg the rate of caesarean sections and rate of vaginal births after first caesarean sections), while non-clinical indicators included length of hospitalisation, rates of unplanned admissions and volumes of activity by type of interventions.

Finally, in a study that examined the comparative performance of Canadian hospitals, Witt (2007) summarised a suite of 36 indicators used to assess hospital performance. These indicators were almost entirely clinically focussed. A full list of these indicators is provided in Table A3 of Appendix A.

3.2 Australian Hospital Performance Indicators

A review of Australian literature on hospital performance suggests that a unified framework that covers clinical, economic, access and equity, quality of care and other aspects of hospital performance is yet to emerge.

In the "National Report on Health Sector Performance Indicators 2001" by the National Health Performance Committee (NHPC), eight domains to health performance indicators were identified (see Table A4 in Appendix A for further details). The domains of hospital performance were effectiveness, appropriateness, efficiency, responsiveness, accessibility, safety, continuity and sustainability. In this report, three indicators are proposed under the 'efficiency' domain: Cost per casemix adjusted separation for selected public hospitals; average length of stay for hospital admissions; and per capita fee-for-service expenditure on primary and secondary health services generated by non-specialist attendances. Other non-economic performance indicators were proposed that related to aspects of quality of care.

In a Productivity Commission investigation of private hospitals (PC 1999), three domains of performance were considered. These were hospital efficiency, service quality or quality of care and appropriateness of services provided. Hospital efficiency was assessed with the following measures: cost efficiency measured by cost per casemix-adjusted separation; labour productivity measured by revenue per employee; and average length of stay. Quality of care was assessed with the following measures: quality accreditation; hospital misadventures or service failure; and patient satisfaction. Appropriateness of services centred on whether the treatment was appropriate to the particular condition of the patient. The report also noted that appropriateness of care is mainly related to the treatment provided by doctors and reflects individual level process rather than systemic issues relating to the operation of private hospitals.

The Australian Council on Health Care Standard (ACHS 2009) publishes the "Australasian Clinical Indicators Report" that contains more than 300 indicators

covering the three domains of safety, effectiveness and efficiency. The efficiency indicators of ACHS are not designed to directly measure economic efficiency but the report suggests that activities related to these indicators indirectly reflect economic considerations.

The states and territories have also developed their own frameworks, but they are not readily comparable. Performance indicators developed by NSW that only relate to clinical outputs are shown in Appendix A Table A5. Performance indicators developed by Queensland relating to safety and quality and efficiency are shown in Appendix A Table A6. Notably, the efficiency indicators included "eco" efficiency which relates to the use of electricity, gas and water. Performance indicators developed by Victoria are categorised into financial performance, service performance and access performance and are shown in Table A7 in Appendix A. As previously discussed, the performance frameworks proposed in AIHW (2008), SCRGSP (2009) and PC (2009) represent the broadest synthesis of those suggested in the Australian context (refer to Appendix B for further details).

This brief examination of hospital performance indicators shows that there are diverse ways of assessing hospital performance that have been documented across various countries and jurisdictions. Patient outcomes are often viewed as the ideal object of effective hospital performance since the underlying reason for providing hospital services is to improve the health of patients. But this data is often either not available or not easily collected. For some outcome orientated performance indicators there may also be considerable resourcing implications for them to be collected. Hospital outputs that can be reported from existing data systems therefore tend to determine which indicators are reported on. The broader issue raised is that an appropriate set of performance indicators needs to not only provide insight to the aspect of performance that is being measured, but also be based on data that can feasibly be collected.

4 Possible Data Sources to Assess Hospital Performance

A lack of comprehensive data suitable for measuring the performance of hospitals is a recognised problem in Australia. A review of literature prepared for the National Health and Hospitals Reform Commission acknowledges that 'there is no nationally consistent system for reporting performance across health services' in Australia (Hurley 2009, p. 29). This review added that while there were some measures of hospital and physician performance published, data were inconsistent at the state level. Furthermore, PC (2006) also notes that measuring productivity in the health sector is complex with the necessary data often poorly measured or unobservable.

For the purposes of this project, the analysis of potential data sources for assessing hospital performance was confined to select data collections retained by the following custodians:

- Department of Health and Ageing (DoHA):
  - National Hospital Cost Data Collection (NHCDC)
  - National Admitted Patient Care Dataset
  - Elective Surgery Waiting Times Additions and Removals
  - Elective Surgery Waiting Times Census
  - Non-admitted Patient Emergency Care
  - Outpatient Care Dataset
  - Public Hospital Establishment Collection
  - The Hospital Casemix Protocol (HCP) data collection
  - Private Hospital Data Bureau (PHDB)
- Australian Institute of Health and Welfare (AIHW):
  - National Hospital Morbidity Database
  - National Public Hospital Establishments data collection
  - Health Expenditure data cubes
  - Mental Health Admitted Patients data cubes
  - National Elective Surgery Waiting Times data collection
- Australian Bureau of Statistics (ABS):
  - Private Health Establishments: Acute and Psychiatric Hospitals Data Report
  - Private Health Establishments: Free Standing Day Hospital Facilities Data Report
- Australian Council of Healthcare Standards
  - Clinical Indicator Program
- Private Health Insurance Administration Council:
  - Industry Statistics

- Other data relating to quality of care (custodian):
  - Australian Commission for Safety and Quality in Health Care reports
  - National Medical Indemnity Collection (AIHW)

While this is not an exhaustive stock-take of all potential data sources to assess hospital performance, this does capture the major comprehensive collections that are available in the public domain. In this respect, with the exception of those maintained by ABS, all of the above data sources are not primary collections, but rather the aggregation of data transfers provided by state and territory health departments under protocols established with the Commonwealth government (although the PHIAC Industry Statistics is based on data provided by all private health insurers in Australia under statutory reporting requirements). This contrasts with data collected by the ABS which conducts a primary data capture when conducting surveys.[2]

It is not possible within the scope of this project to conduct an exhaustive assessment of all data items contained within the selected data sets. Furthermore, the suitability of individual data sets for assessing hospital performance will depend on the specific performance indicator in question and the level of disaggregation at which hospital performance is to be assessed. Nevertheless, it is possible to scope the types of information contained within each dataset and to identify any known limitations.

For each data set the characteristics that were considered were the period of time the data has been collected and how frequently it is updated, the accessibility of the data and the possibility of conducting more detailed analysis than possible with publicly available reports or data cubes, the scope of the collection and any relevant limitations, and the types of data that are collected such as clinical items, financial details, administrative items or data relating to the quality of care.

4.1 DATASETS MAINTAINED BY DOHA

The Commonwealth Department of Health and Ageing (DoHA) gathers and manages at least nine sizeable hospital administrative data collections (listed above). These provide a comprehensive range of hospital cost and activity data and potential comparative performance indicators from both public and private sector institutions, with data ranging across hospital separation information, surgery waiting times, emergency care details, outpatient care services and various levels of establishment expenditure.

[2] Note that the term "survey" in connection with ABS private hospitals data collection is a misnomer. These data collections are more correctly be referred to as a census as all private hospitals in Australia are included.

Summaries of each of these data sets are provided in Appendix D. The discussion that follows raises various issues of relevance across the DoHA holdings of hospitals data.

Linkable Sets

Six DoHA data collections form a potentially linkable set via establishment identifier numbers, and with the exception of the fifth and sixth via person identifier numbers (1 The National Admitted Patient Care Dataset; 2 Elective Surgery Waiting Times Additions and Removals; 3 Elective Surgery Waiting Times Census; 4 Non-admitted Patient Emergency Care; 5 Outpatient Care Dataset, and 6 Public Hospital Establishment Collection). A seventh set, the National Hospital Cost Data Collection collates individual public and private hospital cost and activity data and relays de-identified aggregated group-level data. Two further datasets are dedicated solely to privately insured patients and private hospital activity, and form a potentially linkable set via provider number, insurer number and patient demographic identifiers. The first is the Hospital Casemix Protocol Data Collection and the second is the Private Hospital Data Bureau (refer to the respective dataset summaries in Appendix D for further details).

Datasets Most Relevant to Hospital and Medical Costing Comparisons: NHCDC and HCP

The two key hospital and medical costing datasets amongst the DoHA datasets are the National Hospital Cost Data Collection (NHCDC) and Hospital Casemix Protocol (HCP). A voluntary survey, the NHCDC contains cost and activity data from both public and private acute care hospitals across Australia (DoHA 2008a). The most recent round of published results (2006-07) were based on responses from 47% of all public hospitals and 36% of all private hospitals, spanning 86% and 59% of public and private acute separations respectively.

A range of hospital groupings are provided for the purposes of comparison across cost components, number of separations, length of patient stay and so forth. AR-DRG cost weights (the average cost of respective AR-DRGs relative to the average cost of all separations) are produced using the NHCDC, for public and private hospitals, peer groups, teaching and non-teaching hospitals, major urban and non-major urban hospitals, and the five biggest States (NSW, Victoria, Queensland, South Australia and Western Australia). Public hospital funding is commonly allocated using these weights, such that establishment funding is relative to the frequency of separations for each AR-DRG multiplied by associated cost weights. This funding allocation process motivates public hospitals to maintain costs at levels similar to their peers, after accounting for differences in casemix. Peer groups are also derived from the NHCDC for the purposes of cost per casemix-adjusted separation analysis (comparing the costs and activities) across hospitals with similar levels of activity.

The HCP contains data collected as part of private health insurance regulation. It contains information on privately insured admitted patients' hospital separations, including information on patient demographics, clinical information (ICD-10-AM), hospital charges, medical information, medical charges, prosthetic items, prosthetic charges, health fund benefits and consumer out of pocket expenses. Data is collated at the patient, provider and insurer level. Ninety-two percent of separations were accounted for in the most recent dataset (2003-2004) made available.

A third database of potential interest to a cost comparison exercise is the Public Hospital Establishment Collection. Public hospital data are reported at the establishment and system level. Establishment data include numbers of staff type, salaries and wages, non-salary expenditure, revenue, quality accreditations, and occasions of service provided to non-admitted patients by service type. System level data include major gross and net capital expenditure items and recurrent expenditure items. Summarized data from this collection have been most recently presented in the June 2009, "State of Our Public Hospitals" report (DoHA 2009). However, no equivalent publically-available private hospital data are identified. Such a collection needs to be identified or established to make cross-sector comparisons at this level.

Issues With Private-Public Hospital Expenditure Comparisons Using the DoHA Datasets

Time Series Analysis

The NHCDC is identifiable as the most reliable source for comparing public-private cost estimates across time, providing data on diagnosis-related groups across sectors by cost components. However its limitations must be recognised. The NHCDC contains no private hospital data for the period 2003-04 to 2006-07. Moreover, less than fifty percent of private hospital separations data are covered between 1996-97 and 2002-03. Importantly, the HCP does contain some substitutable private hospital cost data covering these periods, data which covers more than three quarters of private hospital separations. But, no information is collected for episodes of care where payment is made directly by the patient, or by the Department of Veterans Affairs (DVA; DVA patients accounted for 6.4 per cent of separations in private hospitals, AIHW 2009a). A further issue hampering incorporation of NHCDC and HCP data is that the NHCDC contains data on hospital expenditure/costs, whereas the HCP contains amounts charged to patients and benefits paid by insurers.

Cost Components

A logical step in performing cost comparisons is to model between-hospital differences in average cost per separation. This approach is broadly valid for between-public hospital comparisons (after accounting for peer group, casemix and so forth). But, such comparisons between public and private hospitals are much less valid, since the range of costs incurred across the two sectors are

inherently different. For instance, "Ward Medical" cost component differences between public and private hospitals are large primarily due to the low number of salaried medical officers employed in the private sector in contrast to the public. Imaging and Pathology differences are considerable since they are generally outsourced by the private sector, yet performed within the public hospital sector. Likewise, a large share of medical and pharmaceutical expenditure in private hospitals is billed directly to patients, which are subsequently not included in the NHCDC.

Summary data in Table 4.1 quantifies the extent of these differences by comparing the percentage of total costs allocated to each cost component (also referred to as cost buckets), and the ratio of these costs, across the public and private sectors. As shown in the three final columns, cost ratios for thirteen of the sixteen components differ by more than 1.5 times or 150% between the public and private sector, whether in terms of direct costs, overhead costs or both. Considerable caution thus needs to be exercised when comparing average costs between the public and private sectors.

Table 4.1 Percentage of total costs by component, and cost ratio by component, Public & Private Sector, Round 11

	Public (AR-DRG 5.1)			Private (AR-DRG 4.2)					
	Direct Costs (%)	Over-head Costs (%)	Total (%)	Direct Costs (%)	Over-head Costs (%)	Total (%)	Direct Costs	Over-head Costs	Total
							Cost ratio		
Ward Medical	14.31	10.91	12.61	1.31	0.41	1.04	10.92	26.61	12.13
Ward Nursing	25.67	22.65	24.16	24.72	3.67	18.48	1.04	6.17	1.31
Non-Clinical Salaries	2.54	6.84	4.69	1.99	8.14	3.81	1.28	1.19	1.23
Pathology	3.79	3.17	3.48	0.15	0.19	0.17	25.27	16.68	20.47
Imaging	3.32	2.9	3.11	0.39	0.34	0.37	8.51	8.53	8.41
Allied Health	2.35	2.43	2.39	1.36	0.79	1.19	1.73	3.08	2.01
Pharmacy	5.54	3.82	4.68	2.66	0.47	2.01	2.08	8.13	2.33
Critical Care	8.21	7.37	7.79	6.75	5.18	6.28	1.22	1.42	1.24
Operating Room	13.34	12.48	12.91	22.31	21.5	22.07	1.67	1.72	1.71
Emergency Department	5.07	4.73	4.9	0.88	0.62	0.8	5.76	7.63	6.13
Ward Supplies	3.16	6.06	4.61	2.79	16.41	6.83	1.13	2.71	1.48
Specialised Procedure Suits	1.19	1.15	1.17	3.28	2.75	3.12	2.76	2.39	2.67
Prosthetics	3.79	2.37	3.08	24.11	2.54	17.71	6.36	1.07	5.75
Staff On-costs	4.51	5.45	4.98	3.85	3.82	3.84	1.17	1.43	1.30
Hotel Overheads	1.96	4.3	3.13	2.12	23.95	8.59	1.08	5.57	2.74
Depreciation	1.25	3.33	2.29	1.34	9.22	3.68	1.07	2.77	1.61
Total	100	100	100	100	100	100	1	1	1

Cost Ratio – Public hospital costs higher

 Cost Ratio – Private hospital costs higher

Source: National Hospital Cost Data Collection (2008a).

Accessibility

Although data are retained by DoHA at the establishment level and in many cases the patient level, all publically available data are de-identified and presented in aggregate format. Written permission from the organisation from which the data originated is necessary to procure disaggregated data at the establishment or other level. This level of data is required in order to make valid cost component comparisons between private and public hospitals with similar functionality or departments.

Data Collection and Processing

The NHCDC Cost Report (DoHA 2008a) summarises seven salient data collection issues common to the current and preceding DoHA rounds. These issues warrant attention in any potential comparative performance-by-cost or performance-by-output analyses. The issues are:

- Insufficient detail in breakdown of costs in General Ledgers;
- Inconsistency in General Ledger reporting;
- Inaccurate ward transfer data;
- Inability to link ward transfer data with patient records;
- Tracking of patients who visit operating theatres or specialist areas;
- The Private Hospital Data Bureau (PHDB) contains many incomplete patient records;
- The PHDB data does not contain the most up to date information in some cases and necessitated resubmission of PHDB files.

These points reflect differences in accounting treatment of items, internal management practices and the non-mandatory provision of standardised data to a coordinating agency. Commercial sensitivities are also sometimes cited as an impediment to the release of data. Regard must also be had for the implicit diversion of resources that would be required by hospital establishments and relevant authorities to improve and standardise existing data collections. Reporting issues are in part addressed through the National Health Care Agreements between the states, territories and Commonwealth governments. However, private hospitals are outside the scope of these agreements beyond limited statutory reporting requirements.

4.2 Datasets Maintained by the AIHW

Appendix E provides a summary of selected data sets maintained by the AIHW in relation to hospitals.

National Hospital Morbidity Database

The National Hospital Morbidity Database (NHMD) is a comprehensive census of hospital separations across both the public and private sectors. With the collection extending back to 1997-98, the NHMD lends itself to time series analysis. With information collected at the DRG and ICD level, the complexity of treatment is directly controlled for. Cost data is not available restricting analysis to epidemiological and administrative metrics. Cross-tabs are publicly reported for a range of variables, including comparisons between the public and private sector for some variables and metrics. However, the data cubes do not permit any more detailed comparisons to be made between the two sectors. While requests can be made for either custom data extracts or access to the unit records upon which the collection has been built, this can involve the need to obtain clearance from individual state and territory authorities which may impose there own restrictions on the use of their data.

Limitations of the data within the collection need to be determined with reference to the specific performance indicators that are sought to be collected. Beyond the cross-tabs that can be performed with the public domain data cubes, it is not known where specific concerns about confidentiality may lie. However, previous experience suggests that obtaining disaggregated data on private hospitals can be problematic due to perceived commercial sensitivities. Access to spatial data can also be problematic as the perception can be that it raises the likelihood of identifying particular establishments or patients.[3]

The absence of a unique patient identifier within the separations data provided to the AIHW also means that there are limits to what can be inferred about the performance of hospitals on a patient basis. Because each separation is effectively viewed as independent of all others, patterns of treatment for individual patients cannot be assessed. This could be relevant when comparing hospital performance either individually or between homogenous groups, or for certain quality of care performance indicators where the patient experience is not defined in terms of a single episode of care.

National Public Hospital Establishments Data Collection

The National Public Hospital Establishments (NPHE) data collection is a census of public hospitals collecting details on capacity, staffing and limited financial information. With the collection extending back to 1993-94, the NPHE lends itself to time series analysis (although the public data cubes only contain data from 2003-04). Analysis by peer group is possible meaning that it is feasible to compare

[3] Spatial data can be useful in a number of ways. For example, regional differences can be assessed in, say, waiting lists at public hospitals or the geographic accessibility to private hospitals. Alternatively, hospitals data can be enhanced by imputing spatially matched variables such as the socioeconomic status of a geographic area (eg using an ABS Socioeconomic Index for Areas) or of a specific patient (eg see Thurecht et al 2005).

operationally similar establishments. Data on recurrent expenditure is available for categories such as salaried medical officers, visiting medical officers, drug supplies and repairs and maintenance. However, with both the public data cubes and AIHW standard reports, expenditure data is only available by state and territory (not type of hospital).

The AIHW *Hospital Statistics* series reports some additional details that are not available in the publicly available data cubes. One example is revenue by source for each state and territory. Total expenditure figures are also reported for each state and territory, both inclusive and exclusive of depreciation thus enabling the total depreciation for public hospitals in the state or territory to be determined. However, it is not immediately obvious how the comparison of depreciation at the aggregate state level could be meaningfully interpreted in terms of comparative public hospital performance.

It is not currently known the extent to which more disaggregated financial data is provided by states and territories to the AIHW to compile this collection. However, even if more detailed financial information were provided, it would be necessary to control for the confounding effects of *inter alia* differences in services provided by different hospitals and differences in the complexity of treatment for the episode of care. This latter point is why comparisons at the DRG level are most commonly performed.

Given that the terms of reference for the Productivity Commission study are to compare performance between the public and private sectors, the National Public Hospital Establishments (NPHE) is only relevant if comparable data on private hospitals can be obtained. This is the subject of the ABS Private Hospitals data collection discussed below. However, to validly perform such a comparison any financial data would need to be standardised with respect to the accounting treatment of all items, neutrality of tax burdens faced and to reflect suitably appropriate returns on capital invested in operations. Hurley (2009) recently recommended a move towards activity-based funding of both public and private hospitals. Were this to be implemented this could provide a more controlled means of comparing the performance of public and private hospitals with respect to financial metrics.

National Elective Surgery Waiting Times Data Collection

The National Elective Surgery Waiting Times Data Collection (NESWTDC) reports flow statistics on the number of people awaiting treatment for various elective procedures. The collection is constrained to public sector as the funding base for these hospitals is premised on free and universal access compared to private hospitals where access is largely determined by the capacity to pay. With the NESWTDC extending back to 1995-96, the collection lends itself to time series analysis.

Within the domains of hospital service discussed in Section 2, waiting lists as a performance indicator relates to area of access. While an important public policy issue for the public hospitals sector, because of the relative lack of relevance to private sector hospitals, this dataset is not considered any further.

4.3 Datasets Maintained by ABS

Appendix F provides a summary of selected data sets maintained by the ABS in relation to hospitals. Because of the availability of data on public hospitals in data collections maintained by DoHA and the AIHW, the selected ABS data collection is constrained to the annual Private Hospitals collection.

The Private Hospitals collection contains details about the facilities, activities, staffing and finances of all private hospitals, including both private acute and/or psychiatric hospitals and free-standing day hospital facilities. With the collection extending back to 1992-93, it lends itself to time series analysis. Data is reported at either the national or state level.

Across the ABS publication and data cube, the information reported on private hospitals through this collection is very broad. There is limited information on financial aspects of the performance of private hospitals. Data is not available at lower than state level. There is no information that would enable separations or costs to be weighted by complexity.

The main use of the Private Hospitals collection would appear to be for broad sector statements of capacity and scope of operations. The data collections maintained by DoHA on private hospital separations by DRG and component costs of DRG cost weights would appear to be the most viable source currently available to meaningfully compare public and private hospital performance.

4.4 Datasets Relating to Patient Safety and Quality of Health Care

As identified in Section 3 on hospital performance indicators, there are a wide range of patient safety and quality of care issues that have been considered in various settings. Within Australia, there is a relative lack of comprehensive datasets in the area of patient safety and quality of care. Four selected collections are examined below.

ACHS Clinical Indicator Program

The Australian Council on Healthcare Standards (ACHS) is an independent private sector not-for-profit organization which aims to improve the quality of health care in Australia through the ongoing review of performance, assessment and accreditation. The ACHS publishes a clinical indicator report based on its Clinical Indicator Program (CIP) (ACHS, 2008). The CIP is a service offered to health care organisations in Australia and New Zealand. It has a large number of clinical indicators, ranging across 23 different areas, and includes 47 which

measure health care-associated infections linked to specific procedures. This data collection appears to be the most detailed published data on hospital-acquired infections that are nationally consistent and cover both public and private hospitals (PC 2009). However, there are known weaknesses with this data source:

- participation in the CIP is voluntary, and so the sample may not be representative;
- the number of reporting hospitals is often small, and so sample sizes may not be sufficient to reach robust conclusions about the relative performance of the public and private hospital systems; and
- the ACSQHC review raised concerns about data collection and validation methods used for the CIP (PC 2009).

The ACHS is not prescriptive about how participating organisations collect their data and there is no requirement that an organisation monitors a specific number of indicators. However, they must ensure that the data they do collect are in strict accordance with the specified definitions in order to provide consistency in the data submitted to ACHS.

As the Productivity Commission (2009) also points out, government monitoring of hospital-acquired infections occurs largely at the state and territory level but each jurisdiction often uses a different approach and typically only collects data for public hospitals. Exceptions to this appear to be Queensland, South Australia and Western Australia which monitor infections in both private and public hospitals.

The ACHS also collects data and reports on unplanned re-admissions after 28 days, unplanned return to an operating theatre and unplanned return to an intensive care unit. However, the data collection is of a voluntary nature and again the information could be affected by sampling issues. In its 2008 report, the ACHS also notes that its readmission and return rate data are not adjusted for differences in casemix and patient risk. The CIP also contains information on selected adverse events including patient falls, the development of pressure ulcers and adverse drug reactions.

AIHW's National Hospital Morbidity Database (NHMD)

This database has been discussed previously. Using specific ICD-10-AM codes, it is possible to extract both hospital-acquired infections and adverse event data for both public and private hospitals.

Adverse events are measured in terms of separations with an adverse event such as infections, haemorrhages, misadventures during surgery, falls resulting in injuries, medication errors and medical device problems. The NHMD separations data include ICD-10-AM diagnoses, places of occurrence, and external causes of injury and poisoning which indicate that an adverse event was treated and may have occurred during the hospital admission (AIHW 2009a). However, other

ICD-10-AM codes may also indicate that an adverse event occurred or was treated, and some adverse events are not identifiable using these codes. The data contained in the NHMD collection can therefore be interpreted as representing selected adverse events in health care that have resulted in, or have affected, hospital admissions, rather than all adverse events that occurred in hospitals. Appendix G shows the adverse events reported in AIHW (2009a).

Of key importance in interpreting this data, AIHW (2009, p. 53) states that, "the data [on adverse events] for public hospitals are not comparable with the data for private hospitals because their casemixes differ and recording practices may be different". Furthermore, Curtis et al (2004) recommend against the use of ICD codes based on a retrospective review of surgical-site infections for the procedures they considered.

ACSQHC Reports

The Australian Commission for Safety and Quality in Health Care (ACSQHC) was established 1 January 2006 to provide national leadership in health care safety and quality. The ACSQHC publishes a number of reports including 'Reducing Harm to Patients from Health Care Associated Infection: The Role of Surveillance'. However, its 2008 review of Australia's monitoring and reporting arrangements for health care-associated infections showed that there were issues with data quality and that there were reporting deficiencies in the existing arrangements. As a result, the ACSQHC recommended strengthening surveillance (PC 2009).

The Medical Indemnity National Collection (MINC) (AIHW)

This statistical collection managed by the AIHW was developed to monitor the costs of health-care litigation which could be used as a surrogate indicator of quality and safety. The MINC provides data on the number, nature, incidence and costs of public sector medical indemnity claims (AIHW 2009b). Claims are for compensation for harm or other loss resulting from health care as a result of an allegation of harm or other loss and fall into one of two categories: actual claims on which legal activity has commenced via a letter of demand, the issue of a writ or a court proceeding; or potential claims which are those that are likely to eventuate in an actual claim and have had a reserve amount (estimate of the cost of resolving the claim) placed against them (AIHW 2009a).

Annual data has been collected since 2003. In 2006, the MINC was extended to include claims data from private sector medical indemnity insurers. The public and private sector data were combined in the national reporting of claims for 2004-05 and 2005-06. However, private hospital insurance claims – claims against hospitals as opposed to claims against individual practitioners – were not in the scope of the MINC (AIHW 2008). The AIHW is currently reviewing the combined collection to determine whether the data underlying the joint reporting can be

improved sufficiently to replace the current (2006-07) public sector only report (AIHW 2009a).

Information is collected on 21 data items. Of relevance, is data item 12 'Health service setting' which is defined as the health service provider setting in which the incident giving rise to the claim occurred. Public hospital/day surgery centre (including public psychiatric hospital) and private hospital/day surgery centre (including public psychiatric hospital) are two of the 11 classification codes. Thus, if the private sector claims data became available then it would be possible to use the MINC to investigate differences in performance between public and private hospitals. AIHW (2005, p. 47) indicates that information is collected on setting as a means for looking at where risk lies in terms of the health service provider in order to minimise the occurrence of adverse events that give rise to claims.

Summary

Quality of care is a broad area of hospital performance focussing on adverse events, appropriateness of care and safety issues. While clearly of great importance in the treatment of patients, there is little in the way of comprehensive data on the majority of performance metrics that have been suggested in the literature. The data that is available has either known deficiencies or is limited in scope (eg refer to AIHW 2009 and PC 2009). In terms of the capacity to report against national performance indicators in this domain, the necessary data capture and reporting processes are presently inadequate.

4.5 Datasets Maintained by the Private Health Insurance Administration Council

The Private Health Insurance Administration Council (PHIAC) collects and maintains a number of nation-wide databases, summaries of which are published quarterly or annually. Publically available data are aggregated to the state or national level. Broadly speaking, the data concern the number of policies and insured persons covered by private health insurance for hospital treatment and general treatment and the proportion of the population these insured persons represent. The PHIAC data collection is used to measure and report on its performance in terms of its core functions, these being to monitor and regulate the private health insurance industry, and to provide information to government and other stakeholders on private health insurance membership and utilisation, risk equalisation and gap cover. The following data collections area available:

- *Quarterly statistics hospital and general treatment statistics*. These statistics detail the number of persons covered by private health insurance for hospital treatment and general treatment cover and the proportion of the population these persons represent. Summary statistics are presented by age cohort and by state in report format.

- *Quarterly gap payment and medical benefit statistics*. A database concerning in-hospital medical services, including the proportion of services for which there was no gap or known gap and the average gap payment are shown by state.
- *PHIAC A*. This database contains levels of membership, policy categories, episodes of treatment, length of stay and benefits paid by health benefits funds for quarterly periods, aggregated by state.
- *PHIAC B*. This data is distributed to private health insurers only, providing information contained in the PHIAC A by individual fund. PHIs are further provided statistical reports comparing their fund against the industry.
- *PHIAC 3*. A database detailing prosthetic benefits paid by private health insurers for patients treated in private and day hospitals, and public hospitals, by major prosthetic category for quarterly periods.
- *PHIAC 4*. A database detailing benefits paid and gap payments for medical services by major medical groups for quarterly periods, by state.
- *Hospital and general treatment insurance: statistical trends in policies and insured persons.* A database containing trends data compiled from PHIAC A, concerning private health insurance membership for hospital and general treatment, by quarter since 1997, by state.
- *Hospital and general treatment insurance: statistical trends in benefits paid.* Compiled from PHIAC A, this database details state trends in private health insurance benefits paid for hospital and general treatment by quarter since 1997.
- *Annual private health insurance membership survey*. This database presents aggregated numbers of persons with private health insurance by age, gender and state, on an annual basis.

Hospital Performance Indicators

Outcome and output data from the PHIAC collection bear little to no direct relevance to the measurement of hospital performance as envisaged within the terms of reference provided by the Productivity Commission (2009). More specifically, the data are not representative of SCRGSP (2009) conceptualisations of equity of access, effectiveness and efficiency.

4.6 Some Observations on the Available Data

An initial perusal of the data available to assess relative hospital performance between the public and private sectors suggests that the necessary collections are in place to report upon many of the potential performance indicators commonly considered. In particular for the Productivity Commission study, the NHCDC contains the cost of complexity weighted separations (ie separations by AR-DRG). However, a closer inspection reveals that in many ways this data is not directly

comparable between the public and private sectors (or even necessarily with groups of homogenous hospitals within each sector).

Cost Structures and Relative Performance

Perhaps the most obvious area where the issue of non-comparability arises is with the differences in cost structures that hospitals face. Within the public sector, the peer group structure attempts to control for this, premised on the basis that the more separations a hospital has the more complex will be the mix of services provided by the establishment with a concomitant cost structure to reflect these operations. Within the private sector, a similar structure to distinguish hospitals does not exist. Moreover, as shown in Table 4.1 there are significant differences in the cost structures of the two sectors.

The difficulty highlighted by Table 4.1 is distinguishing between differences in the underlying cost structure of the two sectors and differences in relative performance by the two sectors. For example, the significant differences in pathology costs can be attributed to private hospitals outsourcing these services and the patient being charged directly. Pathology services are still being performed for private hospital patients, but charging practices are the cause of this superficial difference in costs, not differences in performance. Similar issues arise for "ward medical" costs where it is well known that the public sector hospitals have a higher proportion of salaried medical staff whereas private hospitals have a higher proportion of visiting medical officers. Once again, essentially identical services are being provided to the patient, but differences in the way costs are charged/recovered suggest a difference in the underlying efficiency of the two sectors that is not necessarily appropriate.

This discussion suggests that the while the complexity of cases is being controlled for through the use of AR-DRGs, a valid comparison between public and private hospitals with the use of the casemix-adjusted NHCDC remains problematic. This is because it is difficult to attribute any variance observed between public and private hospitals to differences in their relative performance, given differences in the cost structures they face.

Comparing Performance on the Basis of Competitive Neutrality

Competitive neutrality involves competition between the public and private sector on the basis that face the same tax, incentive and regulatory environment. Comparing the relative performance of public and private hospitals needs to account for where such neutrality does not exist so that valid comparisons can be made between the two sectors. Two obvious areas where such neutrality may not exist relate to the user cost of capital and taxes.

The user cost of capital is the cost of financing the acquisition of an asset and comprises two components: the cost of financial capital; and depreciation on the asset. As an asset may be acquired using debt or equity, the cost of capital will be

related respectively to either market interest rates or the risk adjusted required return to capital. Note that the acquisition of assets includes the initial capital outlay to acquire or build a hospital.

Among for-profit private hospitals, an adequate risk-adjusted return must be achieved to ensure the ongoing viability of operations. Expressed another way, to the extent that private hospitals incur costs that include the opportunity cost of capital, this cannot be taken in itself as indicative of higher costs and evidence of relatively inefficiency. To the extent this cost is not explicitly recognised in the public hospitals or not-for-profit private hospitals sector, the issue once again becomes one of valid comparability.

The HCP data collection is based on charges to the patient and will therefore include a margin in excess of the direct costs incurred by the hospital in providing an episode of care to a patient to cover the depreciation of assets and an appropriate risk adjusted return to capital. As such, the HCP data collection could potentially be a useful source of data given that it implicitly includes the market user cost of capital.[4] However, to compare the performance of public and private hospitals, public hospital costs (and not-for-profit private hospitals if they do not already) would need to be appropriately adjusted for the user cost of capital. While there is some limited information on depreciation within the public sector, it is not known how comprehensive or consistent these reported figures may be. Furthermore, it is not known if the opportunity cost of capital is determined by the various jurisdictions around Australia. This implies that using HCP to compare hospital performance likely not be appropriate.

In PC (2009) fringe benefits tax (FBT) exemptions and payroll tax regimes are raised as an issue for consideration when comparing the two sectors. While FBT and payroll tax are indeed areas where there are differences within the hospitals sector, the issue of competitive neutrality with respect to taxes is not limited to these two. For example, the deductibility of interest on debt provides an incentive for entities that are subject to company tax to structure their capital position to maximise after-tax returns. Complicating this point is the non-linear trade-off in the risk-adjusted required return to capital as the debt-equity mix changes. Further complicating the issue of equivalising hospital costs between sectors to account for the different tax regimes being faced is the regular changes that are made to the various tax codes. This could potentially have a significant impact on standardising any data capture from all reporting establishments.

While the issue of taxation is clearly important in the context of comparing hospital costs, the Productivity Commission itself concluded in its examination of the private hospital sector that, "Assessing the extent to which input tax exemptions have been used to underwrite inefficiencies in not-for-profit hospitals,

[4] This conclusion relies on the assumption of a fully competitive market for hospital services in which no operator can earn excess returns.

or to bolster their competitiveness against the for-profit sector, is well nigh impossible" (PC 1999, p. 106). While commenting on comparisons within the private sector, the challenges involved in comparing across the public and private sectors are perhaps no less difficult.

Participation in Data Collections

The most viable source of comparative cost data currently available has previously been identified as NHCDC. Yet it is notable that only 47%/36% of public/private hospitals were included in the most recent round (representing 86%/59% of all acute separations respectively). An issue for which public commentary has not been identified is the representativeness of this sample of responding hospitals.

Previous sections have discussed the need to assess the performance of hospitals at an appropriate level of comparability. To inform the debate on hospital efficiency across the two sectors as fully as possible, it is desirable for a larger proportion of hospitals to contribute to the data collection. This would ensure that a more comprehensive picture of overall sector performance is established and also help to alleviate concerns relating to the release of more disaggregated data where sample sizes are small.

It is recognised that there are practical difficulties in achieving this goal. For example, commercial sensitivities are sometimes forwarded as an impediment to the release of performance data. The incremental cost of capturing any necessary data also represents a diversion of resources at the margin from the core activities of a hospital. From the perspective of the health system as a whole, it is desirable for protocols to be established that enable more comprehensive performance data to be provided to a coordinating agency in a manner that appropriately recognises the resourcing implications and confidentially considerations of all responding entities.

Unique Patient Identifiers

A characteristic of the health system in Australia is that individual patients cannot be traced through the system. While a common identification number has long been a sensitive issue in Australian public policy, the absence of such a capacity means that use of hospital services and the patient experience with hospitals can not typically be traced beyond individual episodes of care. In this respect, the recommendation made in Hurley (2009) for the introduction of individual patient electronic health records could be a mechanism for establishing this capacity.

To the extent that the inability to trace individual patients through the health system inhibits the efficient operation of the hospitals sector in Australia, the Productivity Commission may wish to consider in their deliberations the relative costs and benefits of establishing some form of common patient identifier.

5 Selected Performance Indicators and the Available Data

As discussed in Section 2, the performance frameworks proposed in AIHW (2008), SCRGSP (2009) and PC (2009) represent the broadest synthesis of those suggested in the Australian context (see Appendix B for specific details of each performance framework and set of indicators). Common elements to each are performance indicators related to:

- Economic efficiency, often focussing on the complexity adjusted cost;
- Quality of care issues;
- Accessibility of hospital services;
- Patient satisfaction; and
- Workforce sustainability.

As discussed in PC (2009), there is a tension between measuring patient outcomes and the outputs of a hospital. While outcomes are clearly the underlying objective of interest in the provision of hospital services, it is often the case that outputs can be more easily measured both objectively and using existing data systems. This highlights that any given performance indicator must be realistic in terms of what data can be reported, but equally draws attention to where data systems might be improved or extended.

A review of the various performance indicators detailed in Appendix A and Appendix B indicated the broad range of potential indicators that could be measured in each of these dimensions. Consistent with brief for this project, we consider selected performance indicators related to efficiency, hospital infections and other possible indicators.

5.1 Efficiency Performance Indicators

The first item in the terms of reference for the Productivity Commission study is to consider comparative costs for clinically similar procedures performed by public and private sectors. Across the various frameworks put forward, this tends to be assessed in terms of:

- Casemix-adjusted cost of separations
- Some measure relating to length of stay per separation

Within these metrics, it is important to adjust for differing clinical complexity and this typically is achieved by comparing at the DRG level. While this ensures that episodes of care being compared are of comparable complexity and resource usage intensity, the cost data provided by hospitals is subject to a number of caveats that make comparison between public and private hospitals problematic. Section 4.6 discusses some of these issues in more detail.

PC (2009) foreshadows following AIHW (2009a) in comparing twenty AR-DRGs selected on the basis of:

- Homogeneity where variation can be attributed to the performance of the hospital;
- Representativeness across clinical groups;
- Differences between jurisdiction or sectors; and
- Policy interest.

Of note, AIHW (2009a) specifically exclude AR-DRG codes with the greatest patient clinical complexity levels (those DRG codes with an "A" as the final character). This is done on the basis that separations with complications and/or comorbidities will be relatively less homogenous. In terms of assessing relative hospital performance, there may be merit in considering more complicated DRGs and controlling for other factors such as age and other known clinical details. This is particularly the case as the more complicated the condition being treated, the higher will be the resources used. Any differences in relative hospital performance could therefore point to areas of greater potential for efficiency improvements.

Section 2.2 highlighted the importance of comparing hospitals at appropriate levels of homogeneity. The following set of tables show some comparative performance metrics between peer group public hospitals and the private hospitals for the twenty selected DRGs. The range of numbers in these tables not only highlights the need to compare DRGs of comparable complexity, but also between comparable establishments. Although it would be useful to have the private hospital sector disaggregated into more homogenous groups, such details are not available. The tables are as follows:

- Table 5.1 shows the average cost for each DRG
- Table 5.2 shows the DRG cost weight for each DRG
- Table 5.3 shows the average length of stay (ALOS) for each DRG

Average Cost for Selected DRGs

Taken together, Table 5.1 and Table 5.2 reveal that the relative cost of treatment is neither consistently higher nor lower in either the public or private sector. As is expected, an examination of the average cost per DRG within the public sector highlights a far broader range of costs.

Table 5.1 Comparison Between Private Hospitals and Public/Peer Group Hospitals - Total Cost ($)

		Sector		Public Peer Groups								
DRG	DRG Description	Private*	Public	A1	A2	B1	B2	C1	C2	D1	D3	G1
E62C	Respiratory Infectn/Inflamm-Cc	2,563	3,084	3,270	3,374	2,576	2,670	2,677	5,063	3,546	4,982	2,820
E65B	Chrnic Obstrct Airway Dis-Cscc	3,022	3,862	4,141	4,905	3,268	3,086	3,309	3,509	3,907	6,706	3,990
E69C	Bronchitis & Asthma A<50 -Cc	1,334	1,876	1,882	2,078	1,656	1,899	1,816	1,693	1,446	2,846	1,582
F62B	Heart Failure & Shock - Ccc	3,533	4,206	4,377	12,770	4,030	3,386	4,263	3,892	3,972	4,875	5,518
F71B	N-Mjr Arythm&Condctn Dsrd-Cscc	1,688	1,976	2,105	4,618	2,056	1,892	1,828	1,510	1,482	3,015	1,441
G07B	Appendicectomy - Cscc	2,976	5,075	5,129	5,866	4,759	4,459	5,495	4,206	3,674	6,401	******
G08B	Abdom & Oth Hrn Pr 0<A<60-Cscc	2,185	3,570	3,932	1,676	3,394	3,607	3,423	3,211	2,739	3,794	3,469
G09Z	Inguinal&Femoral Hernia Pr A>0	2,356	3,514	3,810	1,625	3,288	3,567	3,263	3,270	2,929	3,623	3,489
H08B	Lap Cholecystectmy-Cde-Cscc	3,197	5,118	5,475	5,674	4,571	4,701	4,438	4,775	4,354	6,348	0
I03C	Hip Replacement - Cscc	17,719	15,587	15,500	******	17,044	15,093	14,366	16,995	------	0	0
I04Z	Knee Replacemt & Reattach	15,382	17,351	17,238	******	17,718	17,045	16,939	19,726	******	0	0
I16Z	Other Shoulder Procedures	3,449	5,213	5,477	4,869	5,246	4,980	4,631	4,456	4,590	******	******
L63B	Kdny & Unry Trct Inf A>69/+Scc	3,481	4,156	5,100	5,563	3,663	3,658	4,076	3,881	5,002	6,274	4,295
M02B	Transurethral Prostectomy-Cscc	3,081	4,957	7,497	0	4,773	4,730	4,411	4,954	4,714	6,248	------
N04Z	Hysterectomy For Non-Malignanc	4,929	7,199	5,467	7,996	6,644	6,411	6,988	5,981	6,526	8,885	7,361
N06Z	Fem Repr Sys Reconstructive Pr	4,327	5,518	6,883	7,837	5,194	4,940	5,221	4,786	5,697	6,601	5,465
O01C	Caesarean Delivery -Cscc	5,097	7,085	3,947	6,181	6,803	7,121	8,962	8,242	7,349	10,696	5,982
O60B	Vaginal Delivery -Cscc	4,090	4,205	7,073	4,049	4,078	4,264	5,371	5,885	4,931	7,129	3,382
R61B	Lymphma &N-Acute Leukaemia-Ccc	3,168	6,617	10,055	9,231	7,107	4,529	4,071	4,219	5,147	4,022	3,241
U63B	Major Affective Dsrd A<70-Cscc	7,915	9,719	0	18,617	9,598	11,273	9,528	5,310	6,823	6,463	5,463

* Estimated

Source: DoHA (2008)

Table 5.2 Comparison Between Private Hospitals and Public/Peer Group Hospitals - AR-DRG Cost Weights

DRG	DRG Description	Sector		Public Peer Groups								
		Private*	Public	A1	A2	B1	B2	C1	C2	D1	D3	G1
E62C	Respiratory Infectn/Inflamm-Cc	0.93	0.83	0.80	0.69	0.83	0.89	0.93	1.97	1.21	1.51	1.03
E65B	Chrnic Obstrct Airway Dis-Cscc	1.1	1.04	1.02	1.01	1.05	1.03	1.15	1.36	1.33	2.03	1.46
E69C	Bronchitis & Asthma A<50 -Cc	0.48	0.5	0.46	0.43	0.53	0.64	0.63	0.66	0.49	0.86	0.58
F62B	Heart Failure & Shock - Ccc	1.28	1.13	1.07	2.62	1.30	1.13	1.48	1.51	1.35	1.47	2.02
F71B	N-Mjr Arythm&Condctn Dsrd-Cscc	0.61	0.53	0.52	0.95	0.66	0.63	0.64	0.59	0.50	0.91	0.53
G07B	Appendicectomy - Cscc	1.08	1.36	1.26	1.20	1.53	1.49	1.91	1.64	1.25	1.94	******
G08B	Abdom & Oth Hrn Pr 0<A<60-Cscc	0.79	0.96	0.96	0.34	1.09	1.21	1.19	1.25	0.93	1.15	1.27
G09Z	Inguinal&Femoral Hernia Pr A>0	0.86	0.94	0.93	0.33	1.06	1.19	1.14	1.27	1.00	1.10	1.28
H08B	Lap Cholecystectmy-Cde-Cscc	1.16	1.38	1.34	1.16	1.47	1.57	1.55	1.86	1.48	1.92	0.00
I03C	Hip Replacement - Cscc	6.43	4.19	3.80	******	5.49	5.05	5.00	6.61	------	0.00	0.00
I04Z	Knee Replacemt & Reattach	5.58	4.66	4.23	******	5.70	5.71	5.90	7.67	******	0.00	0.00
I16Z	Other Shoulder Procedures	1.25	1.4	1.34	1.00	1.69	1.67	1.61	1.73	1.56	******	******
L63B	Kdny & Unry Trct Inf A>69/+Scc	1.26	1.12	1.25	1.14	1.18	1.22	1.42	1.51	1.70	1.90	1.58
M02B	Transurethral Prostectomy-Cscc	1.12	1.33	1.84	0.00	1.54	1.58	1.54	1.93	1.61	1.89	------
N04Z	Hysterectomy For Non-Malignanc	1.79	1.93	1.34	1.64	2.14	2.15	2.43	2.33	2.22	2.69	2.70
N06Z	Fem Repr Sys Reconstructive Pr	1.57	1.48	1.69	1.61	1.67	1.65	1.82	1.86	1.94	2.00	2.00
O01C	Caesarean Delivery -Cscc	1.85	1.9	0.97	1.27	2.19	2.38	3.12	3.21	2.50	3.24	2.19
O60B	Vaginal Delivery -Cscc	1.49	1.13	1.73	0.83	1.31	1.43	1.87	2.29	1.68	2.16	1.24
R61B	Lymphma &N-Acute Leukaemia-Ccc	1.15	1.78	2.46	1.89	2.29	1.52	1.42	1.64	1.75	1.22	1.19
U63B	Major Affective Dsrd A<70-Cscc	2.87	2.61	0.00	3.82	3.09	3.77	3.32	2.07	2.32	1.96	2.00

* Estimated

Source: DoHA (2008)

Table 5.3 Comparison Between Private Hospitals and Public/Peer Group Hospitals - Average Length of Stay

		Sector		Public Peer Groups								
DRG	DRG Description	Private*	Public	A1	A2	B1	B2	C1	C2	D1	D3	G1
E62C	Respiratory Infectn/Inflamm-Cc	5.06	3.36	3.42	2.50	3.05	3.23	2.98	5.97	5.04	3.68	4.16
E65B	Chrnic Obstrct Airway Dis-Cscc	7.11	4.69	4.58	3.71	4.58	4.70	4.53	4.91	6.17	5.34	6.77
E69C	Bronchitis & Asthma A<50 -Cc	2.05	1.60	1.67	1.43	1.51	1.63	1.62	1.67	1.59	2.06	1.81
F62B	Heart Failure & Shock - Ccc	7.75	5.09	4.79	7.21	5.17	4.84	5.28	5.85	6.02	4.22	8.73
F71B	N-Mjr Arythm&Condctn Dsrd-Cscc	2.2	2.30	2.24	2.81	2.26	2.46	2.30	2.49	2.72	2.02	2.34
G07B	Appendicectomy - Cscc	2.45	2.76	2.74	3.37	2.61	2.77	2.58	2.71	2.67	2.50	******
G08B	Abdom & Oth Hrn Pr 0<A<60-Cscc	1.44	1.56	1.76	1.04	1.43	1.57	1.41	1.25	1.64	1.80	1.25
G09Z	Inguinal&Femoral Hernia Pr A>0	1.35	1.41	1.51	1.06	1.24	1.58	1.28	1.23	1.51	1.33	1.33
H08B	Lap Cholecystectmy-Cde-Cscc	1.78	1.90	2.07	2.40	1.64	2.02	1.46	1.58	1.50	2.93	0.00
I03C	Hip Replacement - Cscc	7.15	6.95	7.24	******	6.67	6.20	6.10	6.87	------	0.00	0.00
I04Z	Knee Replacemt & Reattach	7.44	7.38	7.75	******	6.76	6.69	6.62	6.91	******	0.00	0.00
I16Z	Other Shoulder Procedures	1.61	1.58	1.66	1.56	1.45	1.51	1.49	1.52	2.15	******	******
L63B	Kdny & Unry Trct Inf A>69/+Scc	7.14	5.12	3.10	5.15	4.99	5.13	5.36	5.73	7.19	5.23	6.20
M02B	Transurethral Prostectomy-Cscc	3.11	2.93	3.90	0.00	2.73	3.03	2.48	2.82	2.63	3.14	------
N04Z	Hysterectomy For Non-Malignanc	4.09	3.80	2.70	3.91	3.63	3.62	3.76	3.45	3.84	3.69	3.27
N06Z	Fem Repr Sys Reconstructive Pr	2.97	2.68	4.14	2.99	2.63	2.62	2.71	2.70	3.55	2.10	1.87
O01C	Caesarean Delivery -Cscc	5.14	4.27	2.75	4.47	4.13	4.31	4.26	4.35	5.71	4.58	4.63
O60B	Vaginal Delivery -Cscc	4.17	2.89	5.15	2.89	2.74	2.99	3.03	3.18	4.56	3.41	3.31
R61B	Lymphma &N-Acute Leukaemia-Ccc	4.35	4.74	13.71	3.94	4.54	3.96	3.56	2.93	5.60	2.06	2.69
U63B	Major Affective Dsrd A<70-Cscc	19.82	12.31	0.00	9.99	13.26	11.27	11.65	4.56	6.58	3.89	6.11

* Estimated

Source: DoHA (2008)

While this is an interesting set of comparative metrics, as a performance indicator it is not clear what can be definitively inferred in terms of relative performance between these groups of hospitals. Section 4.6 discussed a number of reasons why DRG cost weights are not directly comparable. For the reasons discussed there, the information provided in Tables 5.1 and 5.2 does not allow a conclusion to be reached about how efficient different hospitals are, or more importantly, the source of any ostensible superior efficiency. Even within the public sector, while the peer group structure controls for significant differences in the scale of operations in a hospital, it is not clear what can be inferred from the relative differences in casemix adjusted costs that are revealed.

Table 4.1 showed differences in the cost structure between public and private hospitals by focussing on different cost centres within hospitals. Appendix H shows the difference in direct and overhead costs for the twenty selected DRGs considered here. Table H1 shows total direct and overhead costs and Table H2 focuses on medical ward costs specifically.[5] Once again, a considerable range of costs are shown across the hospital types and the selected DRGs. However, as previously discussed, definitive conclusions cannot be drawn from this data.

Average Length of Stay

Table 5.3 show the ALOS across the different groups of hospitals. Because the underlying length of stay metric is only counted in integer increments, this might obscure a more precise distinction in the performance of each group of hospitals. In general, the relative differences in ALOS are less than they are for average costs. However, there are some notable exceptions, for example, with the final two DRGs shown (R61B and U63B).

As a performance indicator, differences in the relative ALOS between groups of hospitals could be attributable to differences in clinical practices, quality of care, profile of the patient population or administrative efficiency. This of course highlights the danger of looking at any given metric in isolation from other related aspects of hospital performance.

An alternative to ALOS is a relative stay index (RSI) which compares the observed and expected number of patient days standardised for casemix. Perhaps the key advantage of an RSI is that the distribution of the patient population can be controlled through age standardisation techniques. This effectively recognises that while the DRG classification system adjusts for the relative complexity of treatments, patients categorised within a given DRG may still be quite heterogeneous with respect to the level of resources provided in the course of their treatment. This might most typically occur with older patients.

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5 A breakdown of costs between direct and overheads for each cost centre identified in Table 4.1 is available, but has been excluded for brevity.

5.2 Quality of Care Performance Indicators

The second item in the terms of reference of the Productivity Commission study is to consider "the rate of hospital-acquired infections, by type, reported by public and private hospitals" by examining "baseline data to be provided by states and territories under the new National Healthcare Agreement, and existing data provided to the Government by private hospitals".

Hospital-acquired infections are only one performance indictor for monitoring and assessing quality and safety of hospital care. As discussed in Section 3, a range of specific indicators have been identified within this domain that focus on patient outcomes eg mortality rates, unplanned re-admissions or return to care, and rates of adverse events including the rate of hospital acquired infections, therapeutic accidents/misadventures, or medication errors.

Under the National Health Performance Framework, "safety" has been defined in terms of the avoidance or reduction to acceptable limits of actual or potential harm from health care management or the environment in which health care is delivered (AIHW 2009a). Similar definitions are in common use - the former Australian Council for Safety and Quality in Health Care, now succeeded by the Australian Commission for Safety and Quality in Health Care (ACSQHC) defined safety as the degree to which potential risk and unintended results are avoided or minimised (www.aihw.gov.au/safequalityhealth/definitions.cfm). From this perspective, an adverse event is an incident in which harm results to a person receiving health care (Runciman 2006 and AIHW 2009a).

At an aggregate level, "quality" is assessed in terms of the extent to which a health care service or a product produces a desired outcome. At a more detailed level, as described in the National Health Performance Framework, quality is seen as a guiding principle in assessing how well the health system is performing in its mission to improve the health of Australians (www.aihw.gov.au/safequalityhealth/definitions.cfm).

Cruickshank and Ferguson (2008, p. 3) note that the, "fragmented state of (health care associated infections) surveillance in Australia means that information is scarce, unreliable and difficult to generalise from". As discussed in Section 4.4, the Clinical Indicator Program appears to be the most detailed source of information on hospital infections around Australia. Yet the known limitation to the collection undermines its usefulness in comparing relative hospital performance in this important area relating to the quality of care provided to patients. While an examination of specific ICD-10-AM codes in the National Hospital Morbidity Database may represent a prospective alternative source of data on nosocomial infections, Curtis et al. (2004) recommend against the use of ICD codes based on their retrospective review surgical-site infections for the procedures they considered.

5.3 Other Performance Indicators

As has been discussed elsewhere in this report, a wide range of indicators have been suggested to monitor different aspects of hospital performance and the patient experience with the treatment they receive. Another common theme has been the general lack of data that is either complete in its coverage or able to be validly compared between the public and private sector in the form that it is collected. While there is considerable data collected by hospitals, it is often not available nor in a form that lends itself to comparative performance assessment.

It is also notable that many performance indicators are primarily (if not exclusively) related to the public sector or are perhaps most appropriately viewed from a whole-of-sector perspective as opposed to a public versus private sector performance issue. An example of the latter is waiting lists for elective surgery. It is notable that despite the scope of the Productivity Commission study, PC (2009) identifies two performance indicators that are specifically only proposed for public hospitals (elective surgery and emergency department waiting times). An example of the latter is workforce sustainability issues. It is certainly a valid exercise to collect details from all hospitals on the age distribution of staff in the various occupations that make up the hospitals workforce. However, it is not clear how the relative performance of the public and private hospital sectors might then be assessed in this regard.

A final observation concerning the state of the extant national data collections and the potential to apply these to assessing the relative performance across the two sectors is that the public sector data collections and disclosures appear to be more developed than for those relating to the private sector. This has largely been achieved through agreements between the states, territories and the Commonwealth governments as part of funding agreements made under various National Healthcare Agreements, whereas such a mechanism does not exist with the private sector beyond limited existing statutory reporting requirements.

6 CONCLUSION

This report provides a survey of a range of possible performance indicators for hospitals, and in particular the availability of data to support these metrics, with reference to the Productivity Commission study into the performance of public and private hospitals systems.

A review of the literature reveals a broad range of potential indicators that have been proposed across a number of domains of hospital performance. While some are applicable across both sectors, others are only appropriate for the public sector.

A range of data collections were surveyed as possible sources for the comparison of relative performance between public and private hospital sectors. These collections have limitations in terms of the coverage provided or the extent to which meaningful comparisons be can be validly made between the performance of the public and private hospital sectors.

The National Hospital Cost Data Collection appears to be the best source of data to compare clinically similar services between the two sectors. However, because of the different cost structures, it is difficult to draw definitive conclusions on the relative efficiency between the two sectors. An additional complicating factor is unresolved issues related to comparing the two sectors on the basis of a competitively neutral environment. Given the compressed timetable that the Productivity Commission has to respond to the Government, it is likely that they will only be able to make recommendations in this area.

The introduction of activity based funding has recently been foreshadowed to, "enhance accountability in the delivery of hospital services across all jurisdictions to drive efficiency and permit direct comparison of the costs of delivering services between hospitals and states and eventually across the public and private hospital sectors." DoHA (2009, pg 65). While the focus of this approach to funding is on the public sector, cost comparisons with the private sector will need to control for underlying differences between the two sectors if direct comparisons are to be made.

Quality of care issues are also seen to be very important in the hospitals sector, but the existing data collections are incomplete. The Productivity Commission study specifically considers hospital-acquired infections. While individual state and territory governments conduct some surveillance of infections in Australia, there is a need for a more consolidated approach in this area.

As an integral part of the Australian health system, developing a set of performance indicators that enable valid comparisons to be made between hospitals in the public and private sector is essential. Despite the broad range of data collected, such comparisons cannot yet be validly performed. Studies such

as those being conducted by the Productivity Commission will hopefully lead to recommendations for more coordinated action on this front.

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APPENDIX A – A SELECTION OF HOSPITAL PERFORMANCE INDICATORS

Table A1 PATH Project Indicators

Dimension/ Sub-Dimension	Performance indicators
Clinical Effectiveness and Safety	
Appropriateness of care	Caesarean section delivery
Conformity of processes of care	Prophylactic antibiotic use for tracers: results of audit of appropriateness
Outcomes of care and safety processes	Mortality for selected tracer conditions and procedures
	Readmission for selected tracer conditions and procedures
	Admission after day surgery for selected tracer procedures
	Return to higher level of care for selected tracer conditions and procedures within 48 hours
	Sentinel events
Efficiency	
Appropriateness of services	Day surgery, for selected tracer procedures
Productivity	Length of stay for selected tracers
Use of capacity	Inventory in stock, for pharmaceuticals
	Intensity of surgical theatre use
Staff Orientation and Staff Safety	
Perspective and recognition of individual needs	Training expenditures
Health promotion and safety initiatives	Expenditures on health promotion activities
Behavioural responses	Absenteeism: short-term absenteeism
	Absenteeism: long-term absenteeism
Staff safety	Percutaneous injuries
	Staff excessive weekly working time
Responsive Governance and Environmental Safety	
System integration and continuity	Average score on perceived continuity items in patient surveys
Public health promotion	Breastfeeding at discharge
Patient centredness	Average score on overall perception/ satisfaction items in patient surveys
Interpersonal aspects	Average score on interpersonal aspect items in patient surveys
Client orientation: access	Last minute cancelled surgery
Client orientation: information and empowerment	Average score on information and empowerment items in patient surveys
Client orientation: continuity	Average score on continuity of care items in patient surveys

Source: Veillard et al. (2005, Table 4).

Table A2 Most Frequently Studies Mortality Rates

- Overall case-mix-adjusted mortality ;
- Mortality following a coronary bypass;
- Mortality following a myocardial infraction;
- Mortality following a severe heart failure;
- Mortality following a stroke;
- Mortality of patients suffering from pneumonia;
- Mortality of patients suffering from obstructive respiratory illness;
- Mortality following intestinal haemorrhage;
- Mortality following a total hip replacement; and
- Mortality of resuscitation patients
- Mortality at birth of underweight infants.

Source: de Pouvourville and Minvielle (2002)

Table A3 Indicators from the "Benchmarking Comparison of Canadian Hospitals"

1. Mortality after surgery
2. Cardiac arrest after major surgery
3. AMI after major surgery
4. Surgical site infections
5. Readmission (via ER) of surgical cases with wound infection
6. Hospitalization of the elderly for falls
7. Rate of reported misadventures for surgical patients
8. Decubitus ulcers in elderly patients
9. Caesarean section rate
10. Primary caesarean section
11. Vaginal birth after caesarean section
12. Use of laparoscopic cholecystectomy
13. Pediatric admissions treated for asthma
14. Use of breast-conserving surgery for breast malignancy
15. Percentage of inpatient days reported as alternate level of care
16. Percentage of admissions classified as may not require hospitalization
17. Short stay admissions
18. Admission via ER
19. Average acute care and ALC days for discharge to rehabilitative or continuing care
20. Percentage of mental health inpatients readmitted within one month
21. Percent of day surgery cases for sentinel procedure groups
22. Utilization of medical beds for pneumonia and influenza by seniors
23. Long term complication of diabetes
24. Percent of stroke patients discharged to inpatients rehabilitation
25. Percent of stroke inpatients discharged home, referred to home care
26. Percent of knee replacement patients discharged to inpatient rehabilitation
27. Percent of knee replacement patients discharged home, referred to home care
28. Post-admission pulmonary embolism or deep vein thrombosis
29. Accidental puncture or laceration
30. Death in low-mortality case mix groups
31. Birth trauma – injury to neonate
32. Obstetric trauma – vaginal delivery with instrument
33. Obstetric trauma – vaginal delivery without instrument
34. Obstetric trauma – caesarean delivery
35. Proportion of vaginal deliveries performed with instrument assistance
36. In-hospital hip fracture of elderly patients

Source: Witt (2007).

Table A4 Health System Performance Indicators

Indicator	Dimension
Separation rates with asthma as principal diagnosis by location	Effective
Separation rates with type 2 diabetes mellitus as principal diagnosis	Effective
Five year survival rates for cancer	Effective
Cervical cancer screening: proportion of females aged 20-69 years screened for cervical abnormalities in a 24 month period by age group	Effective
Breast cancer screening: proportion of females screened through the BreastScreen Australia program in a 24 month period for the target age group (50-69 years)	Effective
Immunisation: proportion of children fully vaccinated at 12 and 24 months of age	Effective
Hospital separation rates for Caesarean sections	Appropriate
Hospital separation rates for myringotomies and tonsillectomies	Appropriate
Prescription of oral antibiotics for upper respiratory tract infection (URTI)	Appropriate
Cost per casemix adjusted separation for selected public hospitals	Efficient
Average length of stay for hospital admissions	Efficient
Per capita fee-for-service expenditure on primary and secondary health services generated by non-specialist attendances	Efficient
Emergency department waiting times	Responsive
Number of Full-time Workload Equivalent GPs by sex and location	
Days waited for admission for elective surgery (50th percentile) Accessible	Responsive
Number of residential care places and community aged care packages per 1,000 persons aged 70 years and over	Accessible
Hospital separations with an adverse event	Safe
Uptake of Medicare Benefits Schedule (MBS) items for enhanced primary care	Continuous
Proportion of workload carried by vocationally registered GPs and other medical practitioners aged over 50 years	Sustainable

Source: NHPC (2002)

Table A5 Hospital Performance Indicators - 2008 NSW Workshop

A. Measures with high potential

The measures with the highest potential as selected by the groups were:-

- Hospital Acquired Infections (bundle of measures including MRSA, VRE, central line infections, surgical site infection prevention, clostridium difficile and ventilator associated pneumonia)
- Pressure Ulcers
- Best Practice Care for Acute Coronary Syndromes (Bundle of evidence-based interventions including provision of medications on discharge)
- Unplanned return to ICU
- Unplanned return to Operating Theatre
- Medication Errors (with associated measures of extent of harm)
- Patient Falls
- Management of the Deteriorating Patient
- Venous Thromboembolism
- 30 day Unplanned overnight readmission rate

B. Other measures

The measures which were considered to have potential included:

- Caesarean section and other women's health intervention rates including hysterectomy and episiotomy
- Stroke/ heart failure best practice care (Bundle of evidence-based interventions as per ACS)
- Mental Health (Readmissions, Number of admissions p.a., follow-up after 7 days)
- Hospital acquired malnutrition
- Mortality from conditions considered amenable to healthcare
- Hospital standardized mortality rates
- Staff satisfaction
- Open disclosure process

Source: http://www.cec.health.nsw.gov.au/moreinfo/hpiw.html

Table A6 Health Performance Indicators in Queensland

Safety and Quality Indicators

A. Surgical-Clinical Indicators
1. Fractured Neck of Femur In-hospital Mortality
2. Fractured Neck of Femur Complications of Surgery
3. Laparoscopic Cholecystectomy Complications of Surgery
4. Colorectal Carcinoma Complications of Surgery (Whole Admission)
5. Hip Replacement (Primary) Complications of Surgery
6. Hip Replacement (Primary)
7. Readmissions within 60 days
8. Hip Replacement Long stay
9. Knee Replacement (Primary) Complications of Surgery
10. Knee Replacement (Primary) Readmissions within 60 days
11. Knee Replacement Long stay
12. Prostatectomy Complications of Surgery
13. Paediatric Tonsillectomy and Adenoidectomy Readmission
14. Paediatric Tonsillectomy and Adenoidectomy Long stay

B. Medical-Clinical Indictors
1. AMI In-hospital Mortality
2. AMI Readmission
3. AMI Long stay
4. Heart Failure In-hospital Mortality
5. Heart Failure Readmission
6. Heart Failure Long stay
7. Stroke In-hospital Mortality
8. Pneumonia In-hospital Mortality

C. Gynaecology/Obstetric Clinical Indicator Table
1. Selected Primiparae Induction of Labour
2. Selected Primiparae Caesarean Section (Public Hospitals)
3. Abdominal Hysterectomy Complications of Surgery
4. Vaginal Hysterectomy Complications of Surgery

D. Mental Health Clinical Indicator Table
1. Depression readmission
2. Depression long stay
3. Schizophrenia readmission
4. Schizophrenia long stay

Efficiency Indicators
1. Cost efficiency (patient cost per weighted separation)
2. Eco efficiency

Source: Queensland Government (2007)

Table A7 Victorian Health Performance Indicators

Domain	Performance Indicator
Financial Performance:	
Finance	Annual operating result Net movements in cash Trade creditors average age Debtors average age Year-to-date public-private weighted inlier equivalent separations activity
Service Performance:	
Elective surgery	Elective surgery admissions
Critical care	Minimum operating capacity of intensive care unit Minimum operating capacity of paediatric intensive care unit Standard and flex operating capacity of Neonatal Intensive Care Unit
Quality and safety	Health service accreditation Residential Aged Care compliance with accreditation standards Cleaning standards Infection surveillance data compliance (VICNISS) VICNISS Infection Surveillance performance Hand Hygiene program compliance
Maternity	Proportion of women who have given birth and on discharge have prearranged postnatal home care
Mental health	Adult Mental Health 28 day readmission rate
Access performance:	
Emergency care	% of operating time on hospital bypass % of emergency patients transferred to an inpatient bed within 8 hours % of non-admitted emergency patients with a length of stay of less than 4 hours No of patients with a length of stay in the emergency department greater than 24 hours % of triage Category 1 patients seen immediately % of triage Category 2 patients seen within 10 minutes % of triage Category 3 patients seen within 30 minutes
Elective surgery	% of Category 2 elective surgery patients waiting less than 90 days % of Category 3 elective surgery patients waiting less than 365 days No of patients on the elective surgery waiting list No of Hospital Initiated Postponements (HiPs) per 100 waiting list scheduled admissions % of Category 1 elective surgery patients admitted within 30 days

Source: Department of Human Services (2008)

APPENDIX B – MAIN HOSPITAL PERFORMANCE INDICATOR FRAMEWORKS AND RELATED METRICS

Table B1 Performance Indicator Set Across the Health and Aged Care System, AIHW (2008)

		Currently Reported Nationally	Data Already Available	Development Work Desirable
	Better Health			
1	Life expectancy (incl. gap b/w Indigenous & non-Indigenous)	✓	✓	Yes
2	Infant/young child mortality rate (incl. gap b/w Indigenous & non-Indigenous)	✓	✓	Yes
3	Incidence and prevalence of important preventable diseases and injury	✓	✓	Yes
4	Potentially avoidable deaths	✓	✓	No
	Focus on Prevention			
5	Risk factor prevalence	Most	Most	Yes
6	Prop. of children with all developmental health checks (6, 12, 18 months, 4yrs)	✗	✗	Yes
7	Cancer screening rates (breast, cervical, bowel)	✓	✓	No
8	Prop. of babies who are low birth weight, incl. Indigenous status	✓	✓	No
9	Immunisation rates for vaccines in the national schedule	✓	✓	Yes
10	Public health program expenditure as a proportion of total health expenditure	✓	✓	Yes
	Access			
11	Health service use differentials	Some	Most	Yes
12	Selected potentially preventable hospitalisations	✓	✓	No
13	Waiting times for services (elective surgery, EDs, GPs, public dental services)	Most	✓	Yes
14	Treated prevalence rates for mental illness	✗	✓	Yes
15	Residential and community aged care services per 1,000 pop aged 70+ yrs	✓	✓	No
16	No. hospital patient days by those ACAT assessed, waiting for residential aged care	✗	✓	Yes
17	Out-of-pocket costs as a prop. service cost	✓	✓	Yes
18	People deferring recommended treatment due to financial barriers	✓	✓	Yes
	High Quality - Appropriate			
19	Prop. of diabetics with GP annual cycle of care; prop. with HbA1c below 7%	Most	✓	No
20	Proportion of pregnancies with an antenatal visit in the first trimester	Some	Some	Yes

21	Survival of people diagnosed with cancer (5 year relative rates)	✓	✓	No
22	In-hospital mortality for selected procedures	✖	✓	No
23	Proportion of asthmatics with a written asthma plan	✓	✓	Yes
24	Unplanned readmissions w/in 28 days of surgical/mental health admission	Some	✓	Yes
25	Prop. of health/aged care services accredited	✓	✓	No
	High Quality - Safe			
26	Selected adverse events in acute and other care settings	Some	Some	Yes
27	Independent peer review of surgical deaths	✖	✖	Yes
28	Prop. of admitted adult patients assessed for venous thromboembolism risk	✖	✖	Yes
	Integration and Continuity of Care			
29	Prop. discharge summaries transmitted electronically w/in 1 day of discharge	✖	✖	Yes
30	Discharge plans for complex care needs within 5 days of discharge	✖	✖	Yes
31	Prop. of GPs with register/recall system for patients with chronic disease	✖	✓	Yes
32	Post-discharge community care for mental health patients	✓	✓	Yes
	Patient-Centred			
33	Patient experience (based on domains of concern to patients)	✖	✖	Yes
	Efficiency/Value for Money			
34	Cost per casemix-adjusted separation for acute care hospitals	✓	✓	No
35	Total cost per medical specialist (MBS) service	✖	✓	No
	Sustainable			
36	Health/aged care workforce in/outflows as % of health workforce	Some	Some	Yes
37	C'wealth/State/Territory expenditure on health & aged care as % of GDP	✖	✓	No
38	No. of accredited/filled clinical training positions	✖	✖	Yes
39	Capital expenditure as a prop. of total health/ aged care expenditure	✓	✓	Yes
40	Prop. of GDP (or health expenditure) spent on health R&D	✓	✓	No

Table B2 Performance Indicators for Public Hospitals

Domain		Output Performance Indicator
Equity		
	Access	Equity of access by special needs group[3]
Effectiveness		
	Access	Emergency department waiting times[2]
		Waiting times for elective surgery[2]
	Appropriateness	Separation rates for selected procedures[1]
	Quality	
		Safety	Unplanned re-admission rates[2]
			Pre-anaesthetic consultation rates[2]
			Surgical site infection rates[2]
			Patient Satisfaction Surveys[2]
	Responsiveness	
		Capability	Accreditation[1]
		Continuity	Continuity of care[3]
	Sustainability	Workforce sustainability[1]
Efficiency		Recurrent cost per casemix-adjusted separation[1]
		Total cost per casemix-adjusted separation[1]
		Relative stay index[1]
		Recurrent cost per non-admitted occasion of service[2]

Each of these output performance indicators then lead to the outcome performance indicators of patient satisfaction[2] and sentinel events[2].

Source: SCRGSP (2009)

1 Data for these indicators is comparable, subject to caveats
2 Data for these indicators is not complete or directly comparable

[3] These indicators are yet to be developed

Table B3 Partial Indicators of Hospital Performance, PC (2009)

Domain	Performance Indicator
Quality and patient safety	Hospital-acquired infections Unplanned readmissions and returns Selected adverse events Accreditation
Efficiency	Average cost for selected individual DRGs Average cost per casemix-adjusted separation for all DRGs collectively Relative stay index
Responsiveness	Informed financial consent Patient satisfaction
Access	Waiting times for elective surgery, public hospitals Emergency department waiting times, public hospitals Access to ICU/HDU beds
Workforce characteristics	Age distribution Occupational mix of the hospital workforce Productivity

Source: PC (2009)

APPENDIX C – PEER GROUP CLASSIFICATIONS

The following classification framework for public hospitals has been developed to enable a comparison of costs and activities with a like hospitals, rather than State or National figures.

AIHW Peer Group		Definition
Principal referral and specialist women's and children's	A1	Major city hospitals with >20,000 acute casemix-adjusted separations and Regional hospitals with >16,000 acute casemix-adjusted separations per annum
	A2	Specialised acute women's and children's hospitals with >10,000 acute casemix-adjusted separations per annum
Un-peered and other hospitals	A9	Prison medical services, special circumstance hospitals, Major city hospitals with <2000 acute casemix-adjusted separations, hospitals with <200 separations etc
Large hospitals	B1	Major city acute hospitals treating more than 10,000 acute casemix-adjusted separations per annum
	B2	Regional acute hospitals treating >8,000 acute casemix-adjusted separations per annum, and remote hospitals with >5,000 casemix-adjusted separations
Medium hospitals	C1	Medium acute hospitals in Regional and Major city areas treating between 5,000 and 10,000 acute casemix-adjusted separations per annum
	C2	Medium acute hospitals in Regional and Major city areas treating between 2,000 and 5,000 acute casemix-adjusted separations per annum, and acute hospitals treating <2,000 casemix-adjusted separations per annum but with >2,000 separations per annum
Small acute hospitals	D1	Small Regional acute hospitals (mainly small country town hospitals), acute hospitals treating <2,000 separations per annum, and with less than 40% non-acute and outlier patient days of total patient days
	D3	Small remote hospitals (<5,000 acute casemixadjusted separations but not 'Multipurpose services' and not 'Small non-acute'. Most are <2,000 separations
Small sub-acute and non-acute hospitals	G	Small non-acute hospitals, treating <2,000 separations per annum, and with more than 40% non-acute and outlier patient days of total patient days (D2) plus Multi-purpose service (E2) Hospices Rehabilitation Mothercraft Other non-acute hospitals
Psychiatric		Psychiatric

Source: DoHA (2008b)

APPENDIX D – DATASETS MAINTAINED BY DOHA

	Data Set	Brief description	Purpose	Coverage & Scope	Survey items	Data type (Same color = dataset linkage variable)			
1	**National Admitted Patient Care Dataset**	Patient level hospital separation information	Develop casemix classifications e.g. DRGs	100% admitted patients, public & private	49	**Demographic**	**Clinical**	**Admission**	**Discharge**
			Outcomes measurement	Establishment & Patient level data					
			Performance information	Annual, since 1991-92		Patient Age	Diagnosis (ICD-10-AM)	Mode of Admission	Mode of Separation
			Policy development			Sex	Procedures	Type of Care	Length of stay
						Geographical location of hospital	Severity	Insurance Status	
						Geographical location of patient	Major Diagnostic Group	Funding Source	
						Country of birth	Diagnosis Related Group		
						Indigenous Status			
						Patient ID			
						Public Hospital Id			

	Data Set	Brief description	Purpose	Coverage & Scope	Survey items	Data type (Same color = dataset linkage variable)			
2	**Elective Surgery Waiting Times Additions and Removals**	Patients waiting for elective surgery & patients removed from waiting list	Outcomes measurement	100% admitted patients, public & private.	12	**Demographic**	**Clinical**	**Admission**	**Discharge**
			Performance information	Establishment & Patient level data		Hospital ID	Clinical Urgency	Overdue patient	Reason for removal from waiting list
			Policy development	Includes private patients treated in public hospitals, and may include public patients treated in private hospitals Annual, since 2003-04		Patient ID	Surgical Speciality Indicator procedure	Waiting Time	

	Data Set	Brief description	Purpose	Coverage & Scope	Survey items	Data type (Same color = dataset linkage variable)		
3	**Elective Surgery Waiting Times Census**	Patients on elective surgery waiting lists, yet to be admitted to hospital or removed for another reason	Outcomes measurement	100% patients on elective surgery waiting lists 'ready for care', yet to be admitted.	12	**Demographic**	**Clinical**	**Admission**
			Performance information	Establishment & Patient level data		Hospital ID	Clinical Urgency	Overdue patient
			Policy development	Includes private patients treated in public hospitals, and may include public patients treated in private hospitals Annual, since 2003-04		Patient ID	Surgical Speciality Indicator procedure	Waiting Time

	Data Set	Brief description	Purpose	Coverage & Scope	Survey items	Data type (Same color = dataset linkage variable)			
4	**Non-admitted Patient Emergency Care**	Patients presenting to emergency dept (ED)	Outcomes measurement	100% non-admitted patients registered for care in EDs in Peer A or B public hospitals	19	**Demographic**	**Clinical**	**Admission**	**Discharge**
			Performance information	Establishment & Patient level data		Patient Age	Triage category	Arrival mode	Departure status
			Policy development	Annual, since 2003-04		Sex	Type of visit to ED	Waiting time to service	Length of Stay
						Geographical location of hospital			
						Geographical location of patient			
						Country of birth			
						Indigenous Status			
						Patient ID			
						Public Hospital Id			

	Data Set	Brief description	Purpose	Coverage & Scope	Survey items	Data type (Same color = dataset linkage variable)	
5	**Outpatient Care Dataset**	Non-admitted, non-emergency patients, incl data on outpatient clinic type and total number of occasions of service	Service occasions provided in outpatient care settings.	Limited to aggregate count of occasions of service from designated outpatient clinics.	5	**Establishment**	**Services**
				Establishment level data		Hospital ID	Occasions of Service Total
				Annual, since 2005-06		Outpatient Clinic Type	Group Sessions

	Data Set	Brief description	Purpose	Coverage & Scope	Survey items	Data type (Same color = dataset linkage variable)		
6	**Public Hospital Establishment Collection**	Public hospital information incl. expenditure, revenue, staffing, beds and services	Outcomes measurement	100% public hospitals	201	**Establishment**	**Services**	**Finances**
			Performance information	System & Establishment level data	*42 system level items – establishment type but no establishment identifier	Hospital ID	Occasions of Service – non-admitted patients	Salaries and wages
			Policy development		159 establishment-level items concerning Capital and recurrent indirect care expenditure only	Staffing	Group sessions	Non-salary expenditure
					Annual, since 2003-04	Quality accreditation	Specialised services	Revenue Capital and recurrent indirect care expenditure*

	Data Set	Brief description	Purpose	Coverage & Scope	Survey items	Data type (Same color = dataset linkage variable)		
7	**National Hospital Cost Data Collection**	Component costs per DRG based on patient-costed and cost-modelled information	Development of public & private sector DRG cost weights, peer groups, and average costs for DRGs for acute in-patients	Voluntary collection from public & private hospitals, covering 86% and 56% of public & private separations respectively	38	**Establishment**	**Discharge**	**Finances**
				Annual, since 1996-97 (excl. private seps 2003-04 to 2005-06)		Hospital groupings e.g. Peer groups, State, Hospital type	Number of separations	DRG cost weights by Hospital groupings
							Number of days	Depreciation
							Avg length of stay	Avg cost per DRG
								Avg component cost per DRG

	Data Set	Brief description	Purpose	Coverage & Scope	Survey items	Data type (Same color = dataset linkage variable)		
8	**The Hospital Casemix Protocol data collection**	Information on privately insured admitted patients' hospital episodes & separations, including clinical, demographic, financial info	Services evaluation, regulation and research for industry and government	92% of all separations for privately insured patients	Varies (see below)	**Demographic**	**Clinical**	**Finance**
				Monthly (reported Annually), since 1995-06	HCP – 65 items (Episode record) + 19 items (AN-SNAP)	Provider ID	Hospital separations	Hospital charges
					HCP1 – 83 items (Episode record) + 10 items (Medical record) + 6 items (Prosthesis record)	Insurer ID	Hospital episodes	Medical information & charges
					HCP2 – 16 items (Service record)	Patient demographics incl name, DoB	Service episode	Prosthetic items & charges
							Clinical information (ICD-10-AM)	Health fund benefits
								Consumer out of pocket expenses

	Data Set	Brief description	Purpose	Coverage & Scope	Survey items	Data type (Same color = dataset linkage variable)		
9	**Private Hospital Data Bureau**	Information on private hospital separations for all patients in private hospitals	Benchmarking, clinical analysis, contract reviews by by health funds, private hospitals and day surgeries	Private hospitals (86% of admissions) and day surgeries (74% of separations)	65 items	**Demographic**	**Clinical**	**Finance**
				Monthly (reported Annually), since 1995		Patient demographics incl name, DoB	Hospital episodes	Hospital charges
						Provider ID	Clinical information (ICD-10-AM)	
						Insurer ID	Diagnosis Related Group	

APPENDIX E – DATASETS MAINTAINED BY AIHW

The primary source for most of the information in this Appendix is AIHW homepage (www.aihw.gov.au).

E1. National Hospital Morbidity Data collection (NHMD)

Brief Description

This database is compiled by the AIHW based on data supplied by each state and territory health department. It is a collection of separations from all public and private hospitals. The first collection was 1993-94 and the latest available is 2006-07.

Scope

Almost all hospitals in Australia are included in the database: public acute and public psychiatric hospitals, private acute and psychiatric hospitals, and private free standing day hospital facilities. The total number of records for 2006-07 was 7.6 million.

Comparability Over Time:

The following changes have occurred over the series:

- Principal diagnosis codes:
  - ICD_9_CM until 1997-98
  - ICD_10_AM since 1998-99
- Diagnosis codes:
  - AR-DRG Version 4.0/4.1/4.2 1997-98 to 2004-05
  - AR-DRG Version 5.0/5.1 1998-99 to 2006-07
- Procedure codes:
  - ICD-10-AM (2000-01 to 2001-02) or ACHI (version 3 for 2002-03 to 2003-04, version 4 for 2004-05 to 2005-06, version 5 for 2006-07)

Data Accessibility

Publicly available data cubes (discussed in more detail below)

CURFs and additional data extracts:

- Custom data extracts from the NHMD can be obtained.
- Confidentialised unit record files (CURFs) can also be accessed, however, approval from individual state and territory health departments is required.

Types of Data:

Clinical data:

- Urgency of admission
- Principal diagnosis (the diagnosis established after study to be chiefly responsible for occasioning the patient's episode of care in hospital)
- Additional diagnoses (include co-existing conditions and/or complications)

- Procedures (surgical and non-surgical)
- Major Diagnostic Category (MDC) and Australian Refined Diagnosis Related Group (AR-DRG)
- Care type (for example acute, rehabilitation, palliative, newborn) (from 1995-96 for some jurisdictions; the newborn category was introduced in 1998-99)
- Admission mode (source from which the person was transferred/referred)
- Separation mode (status at separation: discharge/transfer/death and place to which person is released)
- Intended length of stay (same day or overnight)
- External causes of injury or poisoning
- Places of occurrence of external cause
- Activity when injured (from 1998-99)

Establishment data:

- State or territory of the hospital
- Sector (public/private hospital)
- RRMA (Rural, Remote and Metropolitan Areas) and other characteristics of the hospital (for public hospitals only, from 1995-96)
- ARIA (Accessibility/Remoteness Index of Australia) of the hospital (from 1998-99, and for some jurisdictions only)
- Remoteness Area of the hospital (from 2000-01).

Financial data:

- Estimated average cost for the AR-DRG (for the public and private sectors)
- Funding source

Quality of care/length of stay data:

- Admission and separation dates
- Leave days
- Same day flag (to indicate separation/discharge on the same day as admission)

Patients:

- Demographic data
- Country of birth (from 1996-97)*
- Indigenous status*
- State and local area of residence (Statistical Local Area, Statistical Subdivision, Statistical Division; from 1997-98)*
- RRMA of patient's residence (from 1995-96)*
- Remoteness Area of patient's residence (from 2000-01)*

* Individual state and territory jurisdictions may impose limitations on the use of these variables.

Additional Information and Limitations

The term 'separation' refers to the episode of care, which can be a total hospital stay (from admission to discharge, transfer or death), or a portion of a hospital stay beginning or ending in a change of type of care (for example, from acute to rehabilitation). A record is included for each separation, not for each patient. So patients who separate more than once have more than one record in the database.

The actual definitions used by the data providers may vary from year to year and between jurisdictions and sectors. Comparisons between the states and territories, reporting years and hospital sectors should be therefore made with caution.

The major exceptions within the public sector are hospitals operated by the Department of Defence, correctional facilities and hospitals located in off-shore territories. There are also some exceptions within the private sector. The scope of the data collection has also varied from year to year. Comparisons between the states and territories, reporting years and hospital sectors should be therefore made with caution.

NHMD Data Cube 1: Principal Diagnosis

The following tables are available:

- Table 1: Separation statistics by principle diagnose in ICD_9_CM, Australia, 1993-94 to 1997-98
- Table 2: Separation statistics by principle diagnose in ICD_10_AM, Australia, 1998-99 to 2006-07
- Table 3: Separation statistics for mental health-related separations by principle diagnose in ICD_10_AM, Australia, 2001-02 to 2004-05
- Table 4: Separation statistics for separation with specialised psychiatric care by principle diagnose in ICD_10_AM, Australia, 1998-99 to 2004-05

The measures (values) in the data cubes are:

- Total separations
- Patient days
- Average length of stay (Tables 1 and 2 only)
- Psychiatric care days (only for specialised psychiatric care in Tables 3-4)

The common category variables for all tables:

- Year (1993-94 to 2006-07)
- Sex
- Age group (5 year groupings, i.e. <1, 1-4, 5-9, . . ., 80-84, 85+, not reported)
- Same day (same day/overnight)
- Principal diagnosis (ICD_9_CM until 1997-98 or ICD_10_Am since 1998-99)

The category variables only for Table 3-4:

- Mental health legal status (voluntary, involuntary, not reported)

The categories variables only for Table 3.

- Mental health flag (admitted patient with/without specialised psychiatric care; ambulatory with/without specialised psychiatric care)
- Sector (public acute hospital, private hospital, public psychiatric hospital)

Note that in order to maintain confidentiality in relation to private hospital activity, some data has been suppressed at the three-digit/character level of the diagnosis classification. Data for the suppressed three-digit categories will not appear in the principal diagnosis cubes, but will be included in the sub-chapter and chapter totals.

NHMD Data Cube 2: AR-DRG

The following tables are available:

- Table (1): AR-DRG version 4.0/4.1/4.2, 1997-98 to 2006-07
- Table (2): AR-DRG version 5.0/5.1, 1998-99 to 2004-05

The measures (values) in the data cube are:

- Total separations
- Patient days
- Average length of stay (ALOS)

The categories variables in the data cube are:

- Year
- Sex
- Age group (5 year groupings, i.e. <1, 1-4, 5-9, . . ., 80-84, 85+, not reported)
- Same day flag (Same day/Overnight)
- By major diagnostic category (MDC) by AR-DRG

Confidentiality

In order to maintain confidentiality in relation to private hospital activity, some data have been suppressed. This has been applied at:

- The three-digit/character level for the principal diagnosis data cube;
- At the procedure code level and the block level for the procedures data cubes; and
- At the DRG level for the diagnosis related groups data cubes.

Data have been suppressed for a particular diagnosis/procedure/block or DRG if:

- There are fewer than three reporting units (hospitals or states/territories where the hospitals are not individually identified); or
- There are three reporting units and one contributed more than 85% of the total separations; or
- There are three or more reporting units and two contributed more than 90% of the total separations.
- Data for the suppressed DRGs will not appear in the AR-DRG cubes, but will be included in the MDC totals.

- Data for the suppressed three-digit categories will not appear in the principal diagnosis cubes, but will be included in the sub-chapter and chapter totals.
- Data for the suppressed categories will not appear in the procedure cubes, but will be included in the upper level totals. That is, data for the suppressed procedure codes will be included in the block, sub-chapter and chapter totals, and data for the suppressed blocks will be included in the sub-chapter and chapter totals.

NHMD Data Cube 3: Procedures

Data cubes are available on the total number of procedures performed on patients as follows:

- 2000-01 to 2001-02, classified using ICD-10-AM Second Edition;
- 2002-03 to 2003-04, classified using ACHI Third Edition;
- 2004-05 to 2005-06, classified using ACHI Fourth Edition;
- 2006-07, classified using ACHI Fifth Edition;

The variables in the data cubes are:

- Year
- Sex
- Age group (5 year groupings, i.e. <1, 1-4, 5-9, . . ., 80-84, 85+, not reported)
- Same day flag (same day or overnight)
- Procedure

Note that one or more procedures can be reported for each separation and that not all separations will be associated with a procedure.

Confidentiality

In order to maintain confidentiality in relation to private hospital activity, some data have been suppressed at the block number and procedure code level of the procedure classification. Data have been suppressed for a particular block or procedure if:

- There are fewer than three reporting units (hospitals or states/territories where the hospitals are not individually identified); or
- There are three or more reporting units and one contributed more than 85% of the total procedures: or
- There are three or more reporting units and two contributed more than 90% of the total procedures.

NHMD Data Cube 4: Mental Health Admitted Patients

The interactive mental health admitted patients data cubes contain information on patients admitted to hospital who receive specialised psychiatric care ie who are in a public psychiatric hospital or a psychiatric unit of an acute care hospital or who had a mental health-related principal diagnosis. For definitions, see AIHW publication Mental Health Services in Australia 2005-06.

There are two interactive data cubes. The first data cube contains information on all mental health-related hospital separations from 2001-02 to 2005-06. The second cube contains information on only those hospital separations which involved specialised psychiatric care from 1998-99 to 2005-06. This is part of the principal diagnosis cube for 1993-94 to 1997-98 and 1998-99 to 2006-07.

The following tables are available:

- Table 1: Separation statistics for mental health-related separations by principle diagnose in ICD_10_AM, Australia, 2001-02 to 2005-06
- Table 2: Separation statistics for separation with specialised psychiatric care by principle diagnose in ICD_10_AM, Australia, 1998-99 to 2005-06

The measures (values) in the data cubes are:

- Total separations
- Patient days
- Psychiatric care days

The common category variables for all tables:

- Year
- Sex
- Age group (5 year groupings, i.e. <1, 1-4, 5-9, . . ., 80-84, 85+, not reported)
- Same day separation flag (same day/overnight)
- Principal diagnosis (ICD_10_AM since 1998-99)
- Mental health legal status (voluntary, involuntary, not reported)

The categories variables for Table 1 only:

- Mental health flag (Admitted patient with/without specialised psychiatric care; Ambulatory with/without specialised psychiatric care)
- Hospital type (Public Acute hospital, private hospital, public psychiatric hospital)

Note that in order to maintain confidentiality in relation to private hospital activity, some data have been suppressed at the three-digit/character level of the diagnosis classification. Data for the suppressed three-digit categories will not appear in the principal diagnosis cubes, but will be included in the sub-chapter and chapter totals.

E2. National Public Hospital Establishments Data Collection (NPHE)

Brief Description

This database is compiled by the AIHW based on data supplied by each state and territory health department. It is a collection of electronic records for public hospitals within Australia. It is collated from the routine administrative collections of public acute hospitals, psychiatric hospitals, drug and alcohol hospitals and dental hospitals in all states and territories. Data is held for the years 1993-94 to 2006-07.

Scope

Most public acute hospitals, psychiatric hospitals, drug and alcohol hospitals and dental hospitals in all states and territories. More detail on the coverage of this collection is included in Appendix 2 of Australian Hospital Statistics 2006-07.

Data Accessibility

Publicly available data cubes (discussed in more detail below)

CURFs and additional data extracts:

- Custom extracts from the NPHE database can be obtained.
- Confidentialised data based on records included in the collection are available.

Data Cubes

The following data cubes are available:

- Capacity measures, 2003-04 to 2006-07 (including number of hospitals, number of beds, separations, bed days and occasions of service)
- Financial and staffing measures, 2003-04 to 2006-07 (note financial measures are in $'000)

Publication: Australian Hospital Statistics

An annual report is published on hospital activity and operations for years 1995-96 to 2006-07. Establishment data is reported on public hospitals which are described in terms of their size, distribution of beds, staff employed and specialized services provided. Information and summary tables on public hospital recurrent expenditure and revenues are also provided.

Types of Data

Types of services:

- Specialised service indicators (obstetric/maternity service, specialist paediatric service, psychiatric unit/ward, intensive care unit (level III), hospice care unit, nursing home care unit, geriatric assessment unit, domiciliary care service, alcohol and drug unit, acute spinal cord injury unit, coronary care unit, cardiac surgery unit, acute renal dialysis unit, maintenance renal dialysis centre, burns unit (level III), major plastic/reconstructive surgery unit, oncology unit, neonatal

intensive care unit (level III), in-vitro fertilisation unit, refractory epilepsy unit, transplantation unit—bone marrow, transplantation unit—renal, transplantation unit—heart (including heart/lung), transplantation unit—liver, transplantation unit—pancreas, clinical genetics unit, sleep centre, neurosurgical unit, infectious diseases unit, aids unit, diabetes unit, rehabilitation unit)

- Type of non-admitted patient occasions of service (accident and emergency, dialysis, pathology, radiology and organ imaging, endoscopy and related procedures, other medical/surgical, mental health, alcohol and drug, dental, pharmacy, allied health services, community health services, district nursing services, other outreach services)
- Type of admitted patient episode (mental health, alcohol and drug, nursing home type, rehabilitation, intellectual handicap, dental, non-medical and social, dialysis, endoscopy, perinatal, medical/surgical/obstetrics)

Administrative data:

- Full time equivalent staff: Salaried medical officers, registered nurses, enrolled nurses, student nurses, trainee/pupil nurses, other personal care staff, diagnostic and health professionals, administrative and clerical staff, domestic and other staff
- Number of hospitals
- Number of available beds for admitted patients

Establishment data:

- State or territory of the hospital
- Sector (public hospitals only)
- Charging status (public patients, private patients, DVA patients, compensable and ineligible patients)

Financial data:

- Total revenue
- Patient revenues
- Recoveries
- Other revenues
- Total expenditure
- Total salaries and wages expenditure by staffing categories
- Total non-salary expenditure (payments to visiting medical officers, drug supplies, superannuation payments, medical and surgical supplies, food supplies, domestic services, repairs and maintenance, patient transport, administrative expenses, interest payments, depreciation, other recurrent expenditure)
- Average admitted patient cost proportion

Quality of care (relative stay index):

- Number of Separations from public hospitals for admitted patients
- Number of Patient days for admitted patients

Demographic data:

- Sex
- Age group (in 5-year groups)
- Indigenous status

Additional Information and Limitations

The actual definitions used by the data providers may vary from year to year and between jurisdictions and sectors. Comparisons between the states and territories, reporting years and hospital sectors should be therefore made with caution.

Public hospitals operated by the Department of Defence, correctional facilities and hospitals located in off-shore territories are not included.

NPHE Data Cube

Some of the information available in the NPHE is presented as interactive data tables. They contain information for:

- Capacity measures, 2003-04 to 2006-07
- Financial and staffing measures, 2003-04 to 2006-07

The measures (values) of capacity:

- Number of hospitals
- Number of available hospital beds (<10, 10-50, 50-100, 100-200, 200-500, 500+)
- Bed days
- Overnight/same-day/total separations
- Individual occasions of services (as values)

The category variables in the data cubes are:

- Year
- State/territory
- Hospital peer groups
- Remoteness area (major cities, inner region, outer-region, remote, very remote)
- Sector (public acute hospital, public psychiatric hospital)

Financial and staffing measures, 2003-04 to 2006-07. The measures (values) of financial and staff:

- Expenditure (excluding depreciation): salaried medical officers, nurses, admin and clerical staff, personal/diagnostic/domestic, staff not further category, visiting medical officers, superannuation, drug supplies, medical and surgical supply, food supply, domestic supply, repairs and services, patient transport, administrative, interest, other not further category)
- Full time equivalent staff numbers (medical officers, nurses, admin and clerical staff, personal/diagnostic/domestic, staff not further category)

The category variables in the data cubes are:

- Year
- State/territory
- Staff type: medical officers, nurses, admin and clerical staff, personal/diagnostic/domestic, staff not further category
- Expenditure type: wages and salaries; drug supplies, medical and surgical supply, food supply, domestic supply, repairs and services, patient transport, administrative, interest, other not further category

E3. Expenditure Data Cubes

The AIHW maintains two datasets relating to aggregate expenditure on health and funding sources:

- Health expenditure data cubes
- Public health expenditure data cubes

Health Expenditure Data Cubes

There are two cubes for both national and state and territory data sets because of a break in time series between 2002-03 and 2003-04. Cubes containing data up to and including 2002-03 report public hospital expenditure. Cubes covering the period 2003-04 to 2006-07 contain expenditure on public hospital services.

- National health expenditure, current and constant prices, 1960-61 to 2002-03
- National health expenditure, current and constant prices, 2003-04 to 2006-07
- State and territory health expenditure, current and constant prices, 1996-97 to 2002-03
- State and territory health expenditure, current and constant prices, 2003-04 to 2006-07

The following data cube includes information on total Australian Government specific purpose payments (SPPs) to states and territories. Data is also available that splits SPPs to public hospitals between payments made under Australian health care agreements funding and other SPPs.

- Australian Government SPPs to states and territories, public hospitals, 1999-00 to 2006-07

Public Health Expenditure Data Cubes

- Funding of public health activities by source, 1999-00 to 2006-07
- Public health expenditure by area of expenditure 1999-00 to 2006-07
- Public health expenditure by jurisdiction 1999-00 to 2006-07

E4. National Elective Surgery Waiting Times Data Collection (NESWTDC)

Brief Description

The National Elective Surgery Waiting Times Data Collection relates to public acute care hospitals. All public hospitals that undertake elective surgery were generally included. The first collection was 1995-96 and the latest available is 2006-07.

More detail on the coverage of this collection, including a list of hospitals in the data collection for 2006-07, is included in Appendix 2 of Australian Hospital Statistics 2006-07.

Scope

The collection is based on public acute care hospitals only. However data for some smaller public hospitals are not collected. Private hospitals are generally not included. The total number of admissions from elective surgery waiting lists reported to the NESWTDC for 2006-07 was more than 557,000

Data Accessibility

Publicly available data cubes (discussed in more detail below).

CURFs and additional data extracts:

- Custom data extracts from the NESWTDC can be obtained.
- Confidentialised unit record files (CURFs) can also be accessed, however, approval from individual state and territory health departments is required.

Publication: Australian Hospital Statistics

An annual report is published on hospital activity and operations. The current report, Australian Hospital Statistics 2006-07, includes analyses of the majority of the data elements included in the database.

Chapter 6 waiting times for elective surgery contains summary tables on various waiting time statistics such as the distribution of days waited, admissions for waiting lists and additions and removals from waiting lists. Information is also included by the specialty of surgeon who was to perform the elective surgery and by indicator procedure.

Earlier data on elective surgery waiting times have been reported and can be accessed online via the links below.

- Elective surgery in Australia: new measures of access, 2008
- Waiting for elective surgery in Australian public hospitals, 1995
- Waiting times for elective surgery 1995-96 and 1996-97
- Waiting times for elective surgery 1997-98
- Waiting times for elective surgery 1998-99
- Waiting times for elective surgery 1999-00
- Australian hospital statistics 2000-01 (Chapter 5)

- Australian hospital statistics 2001-02 (Chapter 5)
- Australian hospital statistics 2002-03 (Chapter 5)
- Australian hospital statistics 2003-04 (Chapter 6)
- Australian hospital statistics 2004-05 (Chapter 6)
- Australian hospital statistics 2005-06 (Chapter 6)
- Australian hospital statistics 2006-07 (Chapter 6)

Types of Data and Broad Categories

Elective Surgery Waiting Times:

- Number of records (admissions)
- Waiting time at the 50th percentile (days)
- Waiting time at the 90th percentile (days)
- Proportion of patients waiting more than 365 days

Clinical data:

- Reason for removal from elective surgery waiting list: Elective admission, emergency admission, not contactable/died, not reported, surgery not required or declined, transferred to another hospital waiting list, treated elsewhere, additions
- Surgical specialty: Cardio-thoracic surgery, ear, nose and throat surgery, general surgery, gynaecology, neurosurgery, ophthalmology, orthopaedic surgery, plastic surgery, urology, vascular surgery, combined and other
- Indicator procedure: Cataract extraction, cholecystectomy, coronary artery bypass graft, cystoscopy, haemorrhoidectomy, hysterectomy, inguinal herniorrhaphy, myringoplasty, myringotomy, prostatectomy, septoplasty, tonsillectomy, total hip replacement, total knee replacement, varicose veins stripping and ligation, not applicable/not stated

Establishment data:

- State/territory
- Public hospital peer group

Additional Information and Limitations

Patients can be removed from the elective surgery waiting list for admission or other reasons eg if they were admitted as an emergency patient for the awaited procedure, they could not be contacted, had died, had been treated elsewhere or had declined the surgery.

The actual definitions used by the data providers may vary from year to year and between jurisdictions. Comparisons between the states and territories and reporting years should be therefore made with caution.

Data Cubes

Three data cubes are available on elective surgery waiting times. They contain information for:

- Reason for removal, 2002-03 to 2006-07
- Surgical specialty, 2001-02 to 2006-07
- Indicator procedure, 2001-02 to 2006-07

The measures (values) in the data cubes are:

- Number of records (admissions)
- Waiting time at the 50th percentile (days)
- Waiting time at the 90th percentile (days)
- Proportion of patients waiting more than 365 days

The category variables in the data cubes are:

- Year
- State/territory
- Reason for removal: Elective admission, emergency admission, not contactable/died, not reported, surgery not required or declined, transferred to another hospital waiting list, treated elsewhere, additions
- Surgical specialty: Cardio-thoracic surgery, ear, nose & throat surgery, general surgery, gynaecology, neurosurgery, ophthalmology, orthopaedic surgery, plastic surgery, urology, vascular surgery, combined and other
- Indicator procedure: Cataract extraction, cholecystectomy, coronary artery bypass graft, cystoscopy, haemorrhoidectomy, hysterectomy, inguinal herniorrhaphy, myringoplasty, myringotomy, prostatectomy, septoplasty, tonsillectomy, total hip replacement, total knee replacement, varicose veins stripping & ligation, not applicable/not stated

APPENDIX F – DATASETS MAINTAINED BY ABS

F1 Private Health Establishment Collection (PHEC)

Brief Description

This collection contains statistical information for 1992-93 to 2006-07 financial years, obtained from an annual census of all licensed private hospitals in Australia. It contains details about the facilities, activities, staffing and finances of all private hospitals, including both private acute and/or psychiatric hospitals and free-standing day hospital facilities.

Note that the PHEC will not be conducted for 2007-08. It is anticipated that the next collection will be for 2008-09 and will be released in 2010.

Scope

Acute hospitals, psychiatric hospitals and free-standing day hospital facilities.

Data Accessibility

The ABS publish a summary report on each private hospital survey. A publicly available data cube is also available (discussed in more detail below). The ABS also state that there may have other relevant data available, but to preserve confidentiality, data below state level is not usually provided.

Types of Data

General data items:

- States/territories
- Staff type (salaried medical officers, registered nurses, enrolled nurses, diagnostic and health professionals, administrative and clerical staff, domestic staff, other staff)
- Age group: 1-4, 5-14, 15-24, . . ., 75-84, 84+
- Sex
- Election status (public and private patients)

Clinical data:

- Number of patient separations from public hospitals for admitted patients
- Number of patient days for admitted patients
- Average length of stay for admitted patients
- The average number of sessions per operating theatre per week
- The total number of procedures
- Principle diagnosis
- Mode of separation
- Occasions of service in non-admitted patients services
- Major diagnostic category

- Procedure
- External causes of principle diagnose
- Specialized units: Neonatal intensive care unit (level II and level III), separate intensive care unit and/or separate coronary care unit, high dependency unit, combined intensive/coronary care units, rehabilitation unit, hospice care unit.

Administrative data:

- Number of hospitals
- Number of hospitals with operating theatres, number of operating theatres
- Number of hospitals with dedicated day surgery units, number of dedicated day surgery units
- Number of available beds for admitted patients
- Full time equivalent staff : Salaried medical officers, Registered nurses, Enrolled nurses, Student nurses, Trainee/pupil nurses, Other personal care staff, Diagnostic and health professionals, Administrative and clerical staff, Domestic and other staff.

Establishment data:

- State or territory of the hospital
- Sector (acute hospitals, psychiatric hospitals and free-standing day hospital facilities)

Financial data:

- Total revenue
- Patient revenues
- Recoveries
- Other revenues
- Total expenditure
- Total salaries and wages expenditure by staffing categories
- Total non-salary expenditure (payments to visiting medical officers, drug supplies, superannuation payments, medical and surgical supplies, food supplies, domestic services, repairs and maintenance, patient transport, administrative expenses, interest payments, depreciation, other recurrent expenditure)
- Average admitted patient cost proportion
- Proportion of patient separations reported as being covered by health insurance

Demographic data:

- Sex
- Age group (in 5-year groups)
- Election status (public and private patients, self-paying patients)

Details on source of funding:

- Election status (public and private patients, self-paying patients)

Additional Information and Limitations

Comparable data for public hospitals are available in Australian Hospital Statistics 2005–06, produced by the Australian Institute of Health and Welfare (AIHW).

Any differences between the data presented in this publication and the data shown in other reports on private hospital activity are due to differences in scope and coverage, relative completeness of the data sources and differing error resolution procedures.

Data on private hospitals in Tasmania, the Northern Territory and the Australian Capital Territory is aggregated to protect the confidentiality of the small number of hospitals in these states/territories.

While data is collected at the establishment level, to preserve confidentiality, data below state level is not usually provided.

ABS Data Cube 1: Private Health Establishments: Acute and Psychiatric Hospitals

Years: 1992-93 to 2006-07

Category variables:

- States and territories:
- Specialized units: neonatal Intensive care unit (level II and level III), separate intensive care unit and/or separate coronary care unit, high dependency unit, combined intensive/coronary care units, rehabilitation unit, hospice care unit.
- Staff type (salaried medical officers, registered nurses, enrolled nurses, diagnostic and health professionals, administrative and clerical staff, domestic staff, other staff)
- Age group (1-4, 5-14, 15-24, . . ., 75-84, 84+)
- Election status (public or private patient)
- Principle diagnose

Measurements:

Capacities (beds, staff, nurses, operating theatre, labour wards, psychiatric wards, emergency department):

- Number of hospitals, average number of beds, number of occurrences, number of patient days, average length of stay, by specialized units and by states and territories
- Number of full-time equivalent staff and average number of staff per occupied bed by staff type and by states and territories
- Nursing staff turnover, number of nurses, teaching hospital and staff by states and territories
- Sessions used, time used and nursing staff (registered with postgraduate theatre qualifications, other registered, non-registered) in theatres, hospitals with operating theatres, day surgery units.

- Number of hospitals with labour wards, number of beds in labour wards and their nursing staff (registered with postgraduate midwifery qualifications, other registered, non-registered)
- Number of hospitals with psychiatric wards/beds, number of psychiatric beds, and their nursing staff (registered with postgraduate qualifications, other registered, non-registered), allied health professionals (occupational therapists, social workers, psychologists).
- Number of hospitals treating accident/emergency cases, number of hospitals with an emergency department, total accident and emergency patients treated, total accident and emergency patients admitted, total patient days for these admitted patients, by states and territories
- Number of staff (medical practioners, registered nurses, non-registered nurses) in emergency departments and other emergency service units

Cost:

- Average recurrent expenditure per occupied bed, per separation, per patient day by state and territories: total salaries and wages expenditure including on-costs, drug supplies, medical and surgical supplies, surgically implanted prostheses and homograft items, food supplies, domestic services (fuel. light and power and other), repairs and maintenance, patient transport, administrative expenses, interest payments, depreciation, contract service, other recurrent expenditure
- Contract expenditure by service type: laundry, cleaning, waste disposal, catering, building maintenance, plant and equipment maintenance, medical and allied health professionals. management of services, security, information technology
- Gross capital expenditure by capital type and by state and territories: land buildings and building services constructions (other than buildings), information technology, major medical equipment, transport, other equipment intangible assets.

Relative stay index:

- The number of hospitals, separations, patient days and average length by election status (public and private patients)
- The number of hospital, separation, patient days and average length by compensation status (compensable and non-compensable patients), by states and territories, separation, patient days by self-paying patients and others, by states and territories
- Separation by patient age group and sex, by states and territories:
- Hospitals and separation by principle diagnose, by major diagnostic category, by procedure, by external causes of principle diagnose, by states and territories

ABS Data Cube: Private Health Establishments: Free Standing Day Hospital Facilities

Years: 1992-93 to 2006-07

Category variables:

- States and territories:
- Specialized units: neonatal Intensive care unit (level II and level III), separate intensive care unit and/or separate coronary care unit, combined intensive/coronary care units, high dependency unit, rehabilitation unit, hospice care unit.
- Staff type (salaried medical officers, registered nurses, enrolled nurses, diagnostic and health professionals, administrative and clerical staff, domestic staff, other staff)
- Age group: 1-4, 5-14, 15-24, . . ., 75-84, 84+
- Sex
- Election status (public and private patients)
- Principle diagnose
- Major diagnostic category
- Procedure, by
- External causes of principle diagnose

Measurements:

Capacity:

- The number of hospitals with operating theatres, with procedure rooms, the number of theatres
- The number of sessions and time used by operating theatres and procedure rooms, by states and territories.
- The number of hospitals and beds/chairs by states and territories.
- The number of hospitals offering the specialized services: gynaecology, IVF/assisted reproduction, interventional radiology, oncology, opthalmic, oral/dental, orthopaedic, paediatric, plastic/hand, renal dialysis, urology, therapeutic anaesthesia, other specialised services),
- Number of full-time equivalent staff by staff type and states and territories

Cost:

- Total and Average recurrent expenditure per separation by state and territories: total salaries and wages expenditure including on-costs, drug supplies, medical and surgical supplies, surgically implanted prostheses and homograft items, food supplies, domestic services (fuel. light and power and other), repairs and maintenance, patient transport, administrative expenses, interest payments, depreciation, contract service, other recurrent expenditure
- Contract expenditure by service type: laundry, cleaning, waste disposal, catering, building maintenance, plant and equipment maintenance, medical and allied health professionals. management of services, security, information technology
- Gross capital expenditure by capital type and by state and territories: land buildings and building services constructions (other than buildings), information

technology, major medical equipment, transport, other equipment intangible assets.

Relative stay index:

- The number of hospital, separation, patient days and average length by election status (public and private patients)
- Separation, patient days by self-paying patients and others, by state and territory
- Separation by patient age group and sex, by state and territory
- Hospitals and separation by principle diagnose, by major diagnostic category, by procedure, by external causes of principle diagnose, by state and territory

APPENDIX G – ADVERSE EVENTS

Separations with an Adverse Event by Hospital Sector

External cause codes:

Y40–Y59 Adverse effects of drugs, medicaments and biological substances

Y60–Y82 Misadventures to patients during surgical and medical care

Y83–Y84 Procedures causing abnormal reactions/complications

Y88 & Y95 Other external causes of adverse events

Place of occurrence codes

Y92.22 Health service area

Diagnosis codes

E89, G97, H59, H95, I97, J95, K91, M96, N99 Selected post-procedural disorders

T81.0 Haemorrhage and haematoma complicating a procedure, not elsewhere classified

T81.4 Infection following a procedure, not elsewhere classified

T82–T85 Complications of internal prosthetic devices, implants and rafts

Other diagnoses of complications of medical and surgical care (T80 to T88 and T98.3, not including above)

Source: AIHW (2009a)

APPENDIX H – COST COMPARISONS BETWEEN PRIVATE HOSPITALS AND PUBLIC/PEER GROUP HOSPITALS

Table H1 Overheads (O/H), Direct and Total Costs by Hospital Type for Selected AR-DRGs – All Cost Centres

								Public Peer Groups											
		Private*			Public			A1			A2			B1			B2		
DRG	DRG Description	Total	Direct	O/H	Total	Direct	O/H	Total	Direct	O/H	Total	Direct	O/H	Total	Direct	O/H	Total	Direct	O/H
E62C	Respiratory Infectn/Inflamm-Cc	2,563	1,565	998	3,084	2,254	830	3,270	2,495	775	3,374	2,527	847	2,576	1,919	657	2,670	1,999	671
E65B	Chrnic Obstrct Airway Dis-Cscc	3,022	1,811	1,211	3,862	2,836	1,026	4,141	3,200	941	4,905	3,882	1,024	3,268	2,415	853	3,086	2,305	781
E69C	Bronchitis & Asthma A<50 -Cc	1,334	879	455	1,876	1,377	499	1,882	1,430	452	2,078	1,499	579	1,656	1,242	414	1,899	1,430	469
F62B	Heart Failure & Shock - Ccc	3,533	2,083	1,450	4,206	3,110	1,096	4,377	3,397	980	12,770	10,533	2,236	4,030	2,971	1,059	3,386	2,560	825
F71B	N-Mjr Arythm&Condctn Dsrd-Cscc	1,688	1,144	545	1,976	1,492	485	2,105	1,646	459	4,618	3,488	1,130	2,056	1,534	522	1,892	1,481	411
G07B	Appendicectomy - Cscc	2,976	2,049	927	5,075	3,884	1,191	5,129	4,021	1,108	5,866	4,531	1,334	4,759	3,688	1,070	4,459	3,382	1,078
G08B	Abdom & Oth Hrn Pr 0<A<60-Cscc	2,185	1,536	650	3,570	2,742	829	3,932	3,117	815	1,676	1,294	382	3,394	2,698	696	3,607	2,784	823
G09Z	Inguinal&Femoral Hernia Pr A>0	2,356	1,679	676	3,514	2,681	834	3,810	3,024	786	1,625	1,256	369	3,288	2,616	672	3,567	2,716	851
H08B	Lap Cholecystectmy-Cde-Cscc	3,197	2,262	936	5,118	3,951	1,167	5,475	4,348	1,127	5,674	4,336	1,337	4,571	3,627	944	4,701	3,593	1,107
I03C	Hip Replacement - Cscc	17,719	14,004	3,715	15,587	12,880	2,707	15,500	12,924	2,576	******	******	******	17,044	14,028	3,015	15,093	12,373	2,720
I04Z	Knee Replacemt & Reattach	15,382	12,002	3,379	17,351	14,406	2,945	17,238	14,442	2,796	******	******	******	17,718	14,636	3,082	17,045	14,044	3,001
I16Z	Other Shoulder Procedures	3,449	2,518	931	5,213	4,057	1,156	5,477	4,386	1,091	4,869	3,876	993	5,246	4,093	1,154	4,980	3,825	1,155
L63B	Kdny & Unry Trct Inf A>69/+Scc	3,481	2,077	1,404	4,156	3,073	1,083	5,100	3,976	1,124	5,563	4,431	1,133	3,663	2,718	945	3,658	2,664	994
M02B	Transurethral Prostectomy-Cscc	3,081	2,046	1,035	4,957	3,795	1,161	7,497	5,860	1,637	0	0	0	4,773	3,792	981	4,730	3,660	1,070
N04Z	Hysterectomy For Non-Malignanc	4,929	3,342	1,587	7,199	5,452	1,747	5,467	4,303	1,163	7,996	6,244	1,752	6,644	5,181	1,462	6,411	5,022	1,389
N06Z	Fem Repr Sys Reconstructive Pr	4,327	3,093	1,234	5,518	4,196	1,323	6,883	5,257	1,627	7,837	6,217	1,620	5,194	4,037	1,157	4,940	3,886	1,054
O01C	Caesarean Delivery -Cscc	5,097	3,450	1,647	7,085	5,330	1,755	3,947	2,953	994	6,181	4,769	1,413	6,803	5,098	1,705	7,121	5,432	1,689
O60B	Vaginal Delivery -Cscc	4,090	2,703	1,387	4,205	3,093	1,112	7,073	5,579	1,494	4,049	3,122	927	4,078	2,878	1,200	4,264	3,198	1,066
R61B	Lymphma &N-Acute Leukaemia-Ccc	3,168	2,075	1,093	6,617	5,181	1,436	10,055	7,968	2,087	9,231	7,744	1,487	7,107	5,546	1,561	4,529	3,537	992
U63B	Major Affective Dsrd A<70-Cscc	7,915	4,166	3,750	9,719	7,547	2,172	0	0	0	18,617	14,133	4,484	9,598	7,409	2,190	11,273	8,340	2,933

Public Peer Group

DRG	DRG Description	C1			C2			D1			D3			G1		
		Total	Direct	O/H	Total	Direct	O/H	Total	Direct	O/H	Total	Direct	O/H	Total	Direct	O/H
E62C	Respiratory Infectn/Inflamm-Cc	2,677	1,834	842	5,063	3,380	1,682	3,546	2,380	1,166	4,982	2,445	2,537	2,820	1,661	1,159
E65B	Chrnic Obstrct Airway Dis-Cscc	3,309	2,253	1,056	3,509	2,289	1,220	3,907	2,450	1,457	6,706	3,501	3,205	3,990	2,205	1,785
E69C	Bronchitis & Asthma A<50 –Cc	1,816	1,235	581	1,693	1,112	581	1,446	984	461	2,846	1,412	1,433	1,582	946	636
F62B	Heart Failure & Shock – Ccc	4,263	2,902	1,362	3,892	2,520	1,373	3,972	2,468	1,504	4,875	2,479	2,397	5,518	2,786	2,732
F71B	N-Mjr Arythm&Condctn Dsrd-Cscc	1,828	1,225	604	1,510	988	522	1,482	862	620	3,015	1,845	1,170	1,441	758	683
G07B	Appendicectomy – Cscc	5,495	3,818	1,677	4,206	2,907	1,298	3,674	2,248	1,427	6,401	2,601	3,801	******	******	******
G08B	Abdom & Oth Hrn Pr 0<A<60-Cscc	3,423	2,511	912	3,211	2,226	984	2,739	1,694	1,045	3,794	2,083	1,711	3,469	2,031	1,437
G09Z	Inguinal&Femoral Hernia Pr A>0	3,263	2,378	885	3,270	2,246	1,024	2,929	1,748	1,181	3,623	1,905	1,718	3,489	2,327	1,162
H08B	Lap Cholecystectmy-Cde-Cscc	4,438	3,214	1,224	4,775	3,245	1,530	4,354	2,640	1,714	6,348	3,096	3,251	0	0	0
I03C	Hip Replacement - Cscc	14,366	11,559	2,808	16,995	12,739	4,257	------	------	------	0	0	0	0	0	0
I04Z	Knee Replacemt & Reattach	16,939	13,760	3,179	19,726	15,344	4,382	******	******	******	0	0	0	0	0	0
I16Z	Other Shoulder Procedures	4,631	3,465	1,166	4,456	2,928	1,529	4,590	2,812	1,778	******	******	******	******	******	******
L63B	Kdny & Unry Trct Inf A>69/+Scc	4,076	2,762	1,314	3,881	2,544	1,337	5,002	3,222	1,780	6,274	3,157	3,118	4,295	2,307	1,988
M02B	Transurethral Prostectomy-Cscc	4,411	3,397	1,014	4,954	3,213	1,741	4,714	3,052	1,662	6,248	3,047	3,201	------	------	------
N04Z	Hysterectomy For Non-Malignanc	6,988	4,822	2,166	5,981	4,005	1,976	6,526	4,205	2,321	8,885	3,849	5,037	7,361	4,839	2,521
N06Z	Fem Repr Sys Reconstructive Pr	5,221	3,608	1,612	4,786	3,244	1,542	5,697	3,533	2,164	6,601	2,749	3,853	5,465	3,841	1,624
O01C	Caesarean Delivery -Cscc	8,962	6,486	2,476	8,242	5,740	2,503	7,349	5,228	2,121	10,696	5,708	4,987	5,982	3,603	2,379
O60B	Vaginal Delivery -Cscc	5,371	3,795	1,576	5,885	3,991	1,895	4,931	3,645	1,286	7,129	3,478	3,650	3,382	2,327	1,055
R61B	Lymphma &N-Acute Leukaemia-Ccc	4,071	2,912	1,160	4,219	2,940	1,278	5,147	3,690	1,457	4,022	2,500	1,521	3,241	2,076	1,165
U63B	Major Affective Dsrd A<70-Cscc	9,528	7,125	2,403	5,310	3,836	1,474	6,823	4,982	1,841	6,463	3,656	2,807	5,463	3,449	2,014

* Estimated

Table H2 Overheads (O/H), Direct and Total Costs by Hospital Type for Selected AR-DRGs – Medical Ward

					Public Peer Group														
		Private Sector*			Public Sector			A1			A2			B1			B2		
DRG	DRG Description	Total	Direct	O/H	Total	Direct	O/H	Total	Direct	O/H	Total	Direct	O/H	Total	Direct	O/H	Total	Direct	O/H
E62C	Respiratory Infectn/Inflamm-Cc	20	14	6	433	388	45	449	398	51	591	514	77	325	288	37	448	424	24
E65B	Chrnic Obstrct Airway Dis-Cscc	32	26	6	569	501	68	625	540	85	961	833	128	515	443	72	443	417	26
E69C	Bronchitis & Asthma A<50 -Cc	6	2	4	270	244	26	251	224	27	264	229	35	208	194	14	450	426	24
F62B	Heart Failure & Shock - Ccc	32	29	3	550	485	65	570	490	80	2,755	2,562	193	508	453	55	476	449	27
F71B	N-Mjr Arythm&Condctn Dsrd-Cscc	14	13	1	254	224	30	257	220	37	974	822	152	175	158	17	283	266	17
G07B	Appendicectomy - Cscc	17	13	4	701	621	80	690	608	82	816	745	71	613	560	53	584	553	31
G08B	Abdom & Oth Hrn Pr 0<A<60-Cscc	17	16	1	551	500	51	554	489	65	203	177	26	480	440	40	598	564	34
G09Z	Inguinal&Femoral Hernia Pr A>0	16	15	1	531	483	48	528	468	60	187	165	22	474	433	41	498	469	29
H08B	Lap Cholecystectmy-Cde-Cscc	26	24	2	737	667	70	743	662	81	573	520	53	670	620	50	675	635	40
I03C	Hip Replacement - Cscc	79	70	9	1,415	1,240	175	1,365	1,169	196	******	******	******	1,322	1,151	171	1,747	1,658	89
I04Z	Knee Replacemt & Reattach	88	78	10	1,597	1,403	194	1,575	1,341	234	******	******	******	1,429	1,256	173	2,104	1,987	117
I16Z	Other Shoulder Procedures	21	19	2	707	647	60	640	570	70	471	398	73	731	689	42	845	799	46
L63B	Kdny & Unry Trct Inf A>69/+Scc	29	24	5	508	441	67	791	686	105	1,220	1,072	148	487	423	64	422	395	27
M02B	Transurethral Prostectomy-Cscc	39	36	3	896	800	96	1,149	1,019	130	0	0	0	870	794	76	1,019	964	55
N04Z	Hysterectomy For Non-Malignanc	54	46	8	1,249	1,129	120	765	673	92	1,389	1,294	95	1,209	1,053	156	1,221	1,152	69
N06Z	Fem Repr Sys Reconstructive Pr	45	40	5	976	870	106	1,035	894	141	1,616	1,448	168	989	844	145	1,025	974	51
O01C	Caesarean Delivery -Cscc	90	77	13	1,106	987	119	540	484	56	817	721	96	1,102	1,023	79	1,315	1,234	81
O60B	Vaginal Delivery -Cscc	61	54	7	582	528	54	674	537	137	432	373	59	567	527	40	788	741	47
R61B	Lymphma &N-Acute Leukaemia-Ccc	40	29	11	665	547	118	1,512	1,300	212	1,192	1,026	166	705	610	95	480	449	31
U63B	Major Affective Dsrd A<70-Cscc	461	406	55	1,529	1,367	162	0	0	0	2,383	2,082	301	1,520	1,504	16	1,838	1,717	121

Public Peer Group

DRG	DRG Description	C1			C2			D1			D3			G1		
		Total	Direct	O/H	Total	Direct	O/H	Total	Direct	O/H	Total	Direct	O/H	Total	Direct	O/H
E62C	Respiratory Infectn/Inflamm-Cc	369	353	16	626	596	30	334	312	22	500	392	108	349	340	9
E65B	Chrnic Obstrct Airway Dis-Cscc	453	429	24	494	470	24	396	367	29	648	520	128	300	281	19
E69C	Bronchitis & Asthma A<50 -Cc	275	266	9	303	293	10	251	240	11	362	259	103	323	319	4
F62B	Heart Failure & Shock - Ccc	566	538	28	448	425	23	437	418	19	522	383	139	446	436	10
F71B	N-Mjr Arythm&Condctn Dsrd-Cscc	251	237	14	236	226	10	183	173	10	277	216	61	218	207	11
G07B	Appendicectomy - Cscc	806	766	40	651	601	50	591	591	0	839	265	574	******	******	******
G08B	Abdom & Oth Hrn Pr 0<A<60-Cscc	628	602	26	578	560	18	431	419	12	454	332	122	468	453	15
G09Z	Inguinal&Femoral Hernia Pr A>0	561	534	27	538	518	20	382	367	15	406	290	116	621	620	1
H08B	Lap Cholecystectmy-Cde-Cscc	694	663	31	626	595	31	858	841	17	680	465	215	0	0	0
I03C	Hip Replacement - Cscc	1,198	1,156	42	1,969	1,906	63	------	------	------	0	0	0	0	0	0
I04Z	Knee Replacemt & Reattach	1,210	1,178	32	2,048	2,004	44	******	******	******	0	0	0	0	0	0
I16Z	Other Shoulder Procedures	712	684	28	883	862	21	722	709	13	******	******	******	******	******	******
L63B	Kdny & Unry Trct Inf A>69/+Scc	468	437	31	426	396	30	394	361	33	514	403	111	313	299	14
M02B	Transurethral Prostectomy-Cscc	1,066	1,013	53	863	812	51	990	944	46	980	684	296	------	------	------
N04Z	Hysterectomy For Non-Malignanc	1,441	1,382	59	1,035	1,004	31	1,173	1,124	49	1,433	670	763	2,123	2,123	0
N06Z	Fem Repr Sys Reconstructive Pr	1,162	1,111	51	946	897	49	870	827	43	1,225	565	660	1,496	1,496	0
O01C	Caesarean Delivery -Cscc	1,681	1,637	44	1,022	966	56	998	974	24	1,046	724	322	972	972	0
O60B	Vaginal Delivery -Cscc	961	929	32	625	592	33	554	539	15	762	504	258	484	484	0
R61B	Lymphma &N-Acute Leukaemia-Ccc	501	468	33	449	422	27	611	567	44	694	627	67	128	108	20
U63B	Major Affective Dsrd A<70-Cscc	1,413	1,399	14	1,454	1,403	51	1,800	1,767	33	1,568	1,202	366	1,462	1,442	20

* Estimated