Australian Government
Productivity Commission

Performance of Public and Private Hospital Systems

Productivity Commission Issues Paper

June 2009

KEY DATES

Initial roundtable	30 June 2009
Due date for submissions*	27 July 2009
Release of draft report	September 2009
Draft report roundtable	October 2009
Final report to Government	November 2009

* Submissions should reach the Commission by this date to enable their full consideration prior to the release of the study's preliminary results.

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SENDING YOUR SUBMISSION[+]

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[+] Please read attachment A for further details on how to make a submission, and use the submission cover sheet provided at the end of this paper.

The Productivity Commission

The Productivity Commission is the Australian Government's independent research and advisory body on a range of economic, social and environmental issues affecting the welfare of Australians. Its role, expressed most simply, is to help governments make better policies, in the long term interest of the Australian community.

The Commission's independence is underpinned by an Act of Parliament. Its processes and outputs are open to public scrutiny and are driven by concern for the wellbeing of the community as a whole.

Further information on the Productivity Commission can be obtained from the Commission's website or by contacting the Media and Publications section on 03 9653 2244 or email: maps@pc.gov.au.

Contents

Terms of reference

Productivity Commission research study into public and private hospitals

The Productivity Commission is requested to undertake a study into public and private hospitals, and report back within 6 months of receipt of this reference.

Context

The Government is committed to improving transparency, accountability and performance reporting within the health system. This commitment is evident in the new National Healthcare Agreement and in COAG's agreement to introduce a nationally consistent approach to activity-based funding in public hospitals. It is also shown by the Government's commitment to move towards nationally consistent performance reporting for public and private hospitals.

In furthering the Government's commitment in this area, the Productivity Commission is requested to examine and report on the relative performance of the public and private hospital systems, and related data issues. As part of its study, the Commission should consider:

a) 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.

b) 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.

c) rates of fully informed financial consent for privately insured patients treated as private patients in both public and private hospitals, categorised by type of provider (that is, public hospital, private hospital, medical practitioner [by Speciality]), and by Statistical Local Area (SLA) or equivalent, including:

c (i) the average cost of out of pocket expenses for patients who do not receive enough financial information from the provider to give fully informed financial consent, the range of these costs and the maximum out of pocket cost incurred by in-hospital patients categorised by type of provider (as detailed above).

c (ii) best practice examples where fully informed financial consent is provided for every procedure, (with a specific emphasis on any best practice examples occurring in specialties where lack of fully informed financial consent is most common).

d) other relevant performance indicators, including the ability of such indicators to inform comparisons of hospital performance and efficiency.

e) If any of the foregoing tasks prove not fully possible because of conceptual problems and data limitations, the Commission should propose any developments that would improve the feasibility of future comparisons.

The Commission will also provide advice to the Government on the most appropriate indexation factor for the Medicare Levy Surcharge thresholds.

The Commission is to consult with relevant experts and others as necessary and produce a final report within six months of receipt of this reference. The report will be published.

CHRIS BOWEN
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Abbreviations

ABS	Australian Bureau of Statistics
ACHS	Australian Council on Healthcare Standards
ACSQHC	Australian Commission on Safety and Quality in Health Care
AIHW	Australian Institute of Health and Welfare
AR-DRG	Australian Refined Diagnosis Related Groups
ASGC-RA	Australian Standard Geographic Classification - Remote Areas
ATO	Australian Taxation Office
AWOTE	Average Weekly Ordinary Time Earnings
AWTE	Average Weekly Total Earnings
BSI	Bloodstream infection
CIP	Clinical Indicator Program (ACHS)
COAG	Council of Australian Governments
CPI	Consumer Price Index
DEA	Data Envelopment Analysis
DOHA	Department of Health and Ageing (Australian Government)
DRG	Diagnosis Related Groups
DVA	Department of Veterans' Affairs (Australian Government)
FBT	Fringe benefits tax
HCP	Hospital Casemix Protocol
HDU	High-dependency unit
ICD-10-AM	International Classification of Diseases, Version 10, Australian Modification
ICU	Intensive-care unit
IFC	Informed financial consent
MDC	Major Diagnostic Category
MLS	Medicare Levy Surcharge
MRSA	Methicillin-resistant staphylococcus aureus
NHA	National Healthcare Agreement
NHCDC	National Hospital Cost Data Collection

NHHRC	National Health and Hospitals Reform Commission
NHMD	National Hospital Morbidity Database
PC	Productivity Commission
PHI	Private health insurance
RSI	Relative stay index
SCRCSSP	Steering Committee for the Review of Commonwealth/State Service Provision
SCRGSP	Steering Committee for the Review of Government Service Provision
SLA	Statistical Local Area
SSI	Surgical-site infection
UCC	User cost of capital
WPI	Wage Price Index

Glossary

Acute care hospital	Establishments which provide at least minimal medical, surgical or obstetric services for admitted patient treatment and/or care, and which provide round-the-clock comprehensive qualified nursing service as well as other necessary professional services. They must be licensed by a state/territory health department, or controlled by government departments. Most of the patients have acute conditions or temporary ailments and the average stay per admission is relatively short. Hospitals specialising in dental, ophthalmic aids and other specialised medical or surgical care are included in this category.
Admitted patient	A patient who undergoes a hospital's formal admission process to receive treatment and/or care.
Adverse event	An incident in which harm resulted to a person receiving health care.
Australian Refined Diagnosis Related Groups (AR-DRG)	An Australian system of Diagnosis Related Groups used to provide a clinically meaningful way of relating the number and type of patients treated in a hospital (that is, its casemix) to the resources required by the hospital. Each AR-DRG represents a class of patients with similar clinical conditions requiring similar hospital services.
Casemix	The range and types of patients (the mix of cases) treated by a hospital.
Casemix-adjusted separations	The number of separations adjusted to account for differences across hospitals in the complexity of their episodes of care. Casemix adjustment is an important step to achieving comparable measures of efficiency across hospitals and jurisdictions.
Cost weight	The costliness of an AR-DRG relative to all other AR-DRGs such that the average cost weight for all separations is one. A separation for an AR-DRG with a cost weight of five, therefore, on average, costs ten times as much as a separation with a cost weight of 0.5.
Depreciation	The reduction in an asset's value due to usage and

	obsolescence.
Effectiveness	How successful a hospital is in achieving a particular objective, such as avoiding hospital-acquired infections.
Efficiency	Efficiency, in its broadest sense, refers to how well resources are used to benefit the wellbeing of the community as a whole. This is known as *economic efficiency* and has three components — the degree to which outputs are produced at least possible cost (*productive efficiency*), resources are allocated across different uses so as to generate the greatest community wellbeing at a given point in time (*allocative efficiency*), and over time (*dynamic efficiency*). Productive efficiency incorporates *technical efficiency*, which indicates the extent to which the quantity of input(s) can be reduced without also reducing the quantity of output(s).
Hospital	A healthcare facility established under Commonwealth, state or territory legislation as a hospital or a free-standing day procedure unit and authorised to provide treatment and/or care to patients.
Informed financial consent	The provision of cost information to patients, including notification of likely out-of-pocket expenses (gaps), by all relevant service providers, preferably in writing, prior to admission to hospital or treatment.
Private hospital	A privately owned and operated institution, catering for patients who are treated by a doctor of their own choice. Patients are charged fees for accommodation and other services provided by the hospital and relevant medical and paramedical practitioners.
Private patient	A patient admitted to a hospital who decides to choose the doctor(s) who will treat them and/or to have private ward accommodation. They are charged for medical services, food and accommodation.
Public hospital	A hospital controlled by a state or territory health authority. Public hospitals offer free diagnostic services, treatment, care and accommodation to all eligible patients.
Public patient	A patient admitted to a hospital who has agreed to be treated

	by doctors of the hospital's choice and to accept shared accommodation. This means the patient is not charged.
Same-day establishments	This includes both day centres/hospitals and freestanding day surgery centres. Day centres/hospitals are establishments providing a course of acute treatment on a full-day or part-day non-residential attendance basis at specified intervals over a period of time. Sheltered workshops providing occupational or industrial training are excluded. Freestanding day surgery centres are hospital facilities providing investigation and treatment for acute conditions on a day-only basis and are approved by the Commonwealth for the purposes of basic table health insurance benefits.
Separation	An episode of care for an admitted patient, 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). Separation also means the process by which an admitted patient completes an episode of care either by being discharged, dying, transferring to another hospital or changing type of care.
User cost of capital	The opportunity cost of the capital used to deliver hospital services. That is, the return that could be generated if the funds were employed in their next best use.
Visiting medical officer	A medical practitioner appointed by the hospital to provide medical services for hospital (public) patients on an honorary, sessionally paid or fee-for-service basis.

1. How to use this paper

This paper is intended to assist you in preparing a submission to the Productivity Commission study of the public and private hospital systems. It covers a range of issues that the Commission is seeking information and feedback on. However, please note that **you do not have to limit your comments to the issues mentioned in this paper or answer all of the questions posed.** You are free to submit any information you consider relevant to the study's terms of reference. Where possible, you should give evidence to support your views, such as data and documentation.

Please read attachment A for details about how to make a submission, and use the submission cover sheet provided at the end of this paper. To ensure due consideration of your input prior to release of the study's preliminary results, your submission should reach us by 27 July 2009.

2. What the Commission has been asked to do

The Australian Government has asked the Productivity Commission to examine and report on the relative performance of the public and private hospital systems, and related data issues (the full terms of reference for the study are provided on pages iii–iv). As part of the study, the Commission has been requested to consider:

- comparative hospital and medical costs for clinically similar procedures performed by public and private hospitals
- the rate of hospital-acquired infections by type, reported by public and private hospitals
- rates of fully-informed financial consent by privately-insured patients, out-of-pocket expenses for patients who do not give such consent, and best-practice examples where fully-informed financial consent is provided for every procedure
- other relevant performance indicators, including the ability of such indicators to inform comparisons of hospital performance and efficiency.

If any of the above tasks prove not fully possible because of conceptual problems or data limitations, the Commission is to propose developments to improve the feasibility of future comparisons.

The Commission has also been asked to advise the Government on the most appropriate indexation factor for the Medicare Levy Surcharge (MLS) thresholds.

The Government has requested the Commission to consult with relevant experts and others as necessary. The Commission has already held initial discussions with a cross-section of interested parties to identify relevant issues and sources of data. The Commission is also calling for submissions to the study. A roundtable will be held with a limited number of experts and interested parties at an early stage in the project. A draft report containing the Commission's preliminary results will be released before preparing the final report. Interested parties will be given an opportunity to comment on the draft report through further submissions and/or attendance at another roundtable.

The Commissioner overseeing this study is David Kalisch, and the research team is located in our Melbourne office.

Various related reviews are currently being undertaken by other bodies, or have recently been completed. This includes a report on long-term health reform, due to be provided to the Australian Government in late June 2009 by the National Health and Hospitals Reform Commission (NHHRC), and the recently completed Garling Review of NSW public hospitals (Special Commission of Inquiry 2008). There is also a range of relevant recent and foreshadowed changes to health policy. This includes the National Healthcare Agreement (NHA) and proposed changes to the MLS and Private Health Insurance Rebate (Swan and Roxon 2009). The Commission will take account of such reviews and policy developments, and consult with relevant agencies as appropriate.

Why measure and compare hospital performance?

Health care consumes a large amount of Australia's resources — $94 billion or around 9 per cent of gross domestic product in 2006-07 — and recent projections commissioned by the NHHRC suggest that health spending will grow at a faster rate than national income for at least the next quarter century, due to factors such as new technologies, changes in treatment methods, and an ageing population (AIHW 2008b; Goss 2008). One of the largest components of health expenditure is hospital services — accounting for $34 billion or almost 40 per cent of Australia's health spending in 2006-07 (equivalent to about 3.5 per cent of gross domestic product) — and it is expected to remain relatively significant in coming decades (AIHW 2008b; Goss 2008; NHHRC 2008; PC 2005; Treasury 2007).

The consequences of inefficiency in the health system, and hospitals in particular, could therefore potentially be significant. Such inefficiency would mean that spending is more than necessary to deliver the current level of services, and that there is an opportunity to treat more people and/or improve service quality without using more resources.

Monitoring and comparing hospital performance has the potential to drive improvements in efficiency, as well as service quality, particularly given the limited role of competitive markets in the health sector. For this reason, state and territory governments — in their capacity as providers of public hospitals and regulators of private hospitals — regularly measure hospital performance. In conjunction with the Australian Government, they are also moving towards nationally-consistent reporting. This is evident in the NHA, in which governments agreed to report consistent 'progress measures' for public hospitals to the COAG Reform Council (COAG 2008a, 2008b). As noted in the terms of reference, the Australian Government also aims to have nationally-consistent reporting for private hospitals.

3. Australia's public and private hospital systems

Australia's health system consists of an array of different health services that together contribute to the nation's health outcomes. The system includes services provided by general practitioners, hospitals and sub-acute providers (such as rehabilitation). Hospitals are an integral part of this health system, providing complex and costly care for millions of Australians every year. In 2007-08, public and private hospitals provided 4.7 and 3.1 million episodes of care respectively for people admitted to hospital (AIHW 2009). These episodes of care consisted of a wide variety of different types of patient treatments, such as for cancer, cardiovascular disease, and skin conditions.

To some extent, public and private hospitals complement each other by specialising in the provision of different services. For instance, the latest comparable data for both private and public hospitals shows that public hospitals provide roughly 95 per cent of outpatient occasions of service, which includes emergency department services (ABS 2008d; AIHW 2008a). In contrast, private hospitals tend to provide more elective procedures than public hospitals, with approximately 64 per cent of elective surgery separations occurring in private hospitals (AIHW 2009).

There are currently 767 public hospitals in Australia, the majority of which are acute hospitals (DOHA 2009).[1] There are 551 private hospitals, of which 283 are acute hospitals and 268 day hospitals. Private hospitals tend to be concentrated in major cities, while public hospitals are more widespread (table 1).

1 Latest available data show that, in 2007-08, around 97 per cent of public hospitals were acute hospitals (AIHW 2009).

Table 1 **Public and private hospitals by region, 2009[a]**

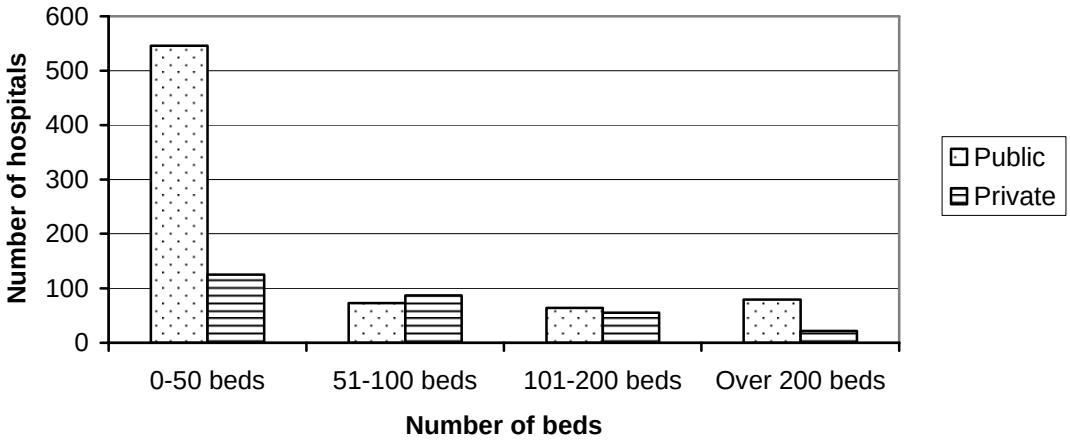
Region	Public Hospitals	Private Hospitals		
		Day hospitals	Other	Total
Major City	164	231	201	432
Inner Regional	205	30	64	94
Outer Regional	236	7	18	25
Remote	79	0	0	0
Very Remote	83	0	0	0
Total	*767*	*268*	*283*	*551*

a Regional classifications are based on the Australian Standard Geographical Classification (ASGC) detailed in ABS (2005).

Source: DOHA (2009).

A large proportion of acute hospitals are relatively small. The latest available data show that around 72 per cent of public acute hospitals and psychiatric hospitals, and 43 per cent of private acute hospitals and psychiatric hospitals, had less than 50 beds (figure 1). Almost a quarter of public hospitals had ten beds or less. Small hospitals are unlikely to be able to utilise their resources (or be able to spread their resources across different functions when workflows vary) to the degree that large hospitals can. Small hospitals are thus more likely to be relatively inefficient compared to large hospitals. However, a number of larger public hospitals are also required to maintain a capability for major trauma events that is rarely used to capacity.

Figure 1 **Number of public and private hospitals by number of beds[a]**
Acute and psychiatric hospitals



a Data for private hospitals are for 2006-07, while data for public hospitals are for 2007-08.

Data sources: ABS (2008d); AIHW (2009).

Of the 289 private acute hospitals in Australia in 2006–07, 165 were run on a for-profit basis and 124 were not-for-profit operations (table 2).

Table 2 **Number of private acute and psychiatric hospitals by profit/not-for-profit status, 2006-07**

		Not-for-profit		
	For-profit	*Religious or Charitable*	*Other*[a]	*Total*
NSW	**np**	18	**np**	85
VIC	50	18	14	82
QLD	27	24	6	57
SA	6	7	17	30
WA	**np**	10	**np**	23
TAS, NT and ACT[b]	**np**	6	**np**	12
Australia	165	83	41	289

a Comprising bush nursing, community and memorial hospitals. **b** Tasmania, the Northern Territory and ACT have been aggregated to protect the confidentiality of the small number of hospitals in these states/territories. **np** Not available for publication but included in totals where applicable, unless otherwise indicated.

Source: ABS (2008d).

Not all patients in public hospitals are public patients, nor are all patients in private hospitals private patients. A number of state governments have arrangements that allow public patients to be treated in private hospitals. According to the AIHW (2009), the percentage of public patients that are treated in private hospitals is roughly 9 per cent in Western Australia, and 3 per cent in Queensland. Nevertheless, the majority of patients in public hospitals are treated as public patients, and the majority of patients in private hospitals are privately or self insured (table 3).

Table 3 **Hospital separations by election status, 2007-08**
(per cent)

	Public	*Privately Insured*	*Self-funded*	*Transport or workplace accident cover*	*Department of Veterans Affairs*	*Other*	*Total*
Public Hospitals	85.9	8.8	1.2	0.9	2.6	0.6	100.0
Private Hospitals	2.4	79.8	8.5	1.8	6.4	1.1	100.0
All Hospitals	52.7	37.0	4.1	1.3	4.1	0.8	100.0

Source: AIHW (2009).

Not all public hospitals are run by state and territory governments. Some are operated by religious or charitable organisations — such as Mercy Women's

Hospital and Werribee Mercy Hospital in Victoria and Calvary Public Hospital in the ACT — using funds provided by and under contract to the relevant state or territory government.

Implications for measuring and comparing performance

It is evident from the above statistics that a comparison of public and private hospitals needs to take account of marked differences between and within the public and private sectors. Australia effectively has eight different public hospital systems (one for each state and territory) serving populations with different demographic characteristics. Private hospitals are also diverse. Many private hospitals specialise in day procedures, while a similar number provide overnight accommodation; a significant number of facilities are operated on a for-profit basis, while almost as many are run by not-for-profit bodies; and there are large organisations operating many hospitals, as well as smaller bodies running single or only a few facilities.

Another factor to consider is the complexity of managing diverse hospital services. Hospitals are complicated organisations in which many inputs have to be managed to provide a variety of services, the overall benefits of which may not be fully apparent at the time, and service intensity can vary between patients due to factors such as age and pre-existing ailments. In addition, the nature of this production process differs from one hospital to the next because of variation in the range of services provided — such as surgical and medical procedures, outpatient services, emergency departments, teaching, and research and development — and the complexity of treated cases. For example, emergency departments and associated 'access block' can have a major influence on the efficient operation of public hospitals. Few private hospitals have emergency departments, and they tend to specialise more in planned procedures than public hospitals. Performance could also be affected by hospital size and location.

Ideally, hospital performance would be measured in terms of patient *outcomes*, since this is the purpose of having hospitals. Individuals seek hospital services in order to improve their physical and emotional wellbeing relative to what would otherwise be the case. A wide range of measures has been developed to measure outcomes, including changes in mortality rates, life expectancy and quality-of-life.

A popular alternative approach to analysing performance is to focus on the production of hospital services itself. This is often termed the *output* of a hospital, and can also be measured in a variety of ways. Examples include number of patients treated and procedures performed.

Measuring performance in terms of outputs has the disadvantage that it does not directly quantify the degree to which a hospital achieves it primary purpose — to improve health outcomes. Hospital activity may lead to little improvement in health outcomes for some individuals, or in extreme cases lead to worse outcomes. However, outputs tend to be easier to measure than outcomes, because the latter requires tracking of patient health after hospital discharge. Furthermore, outputs can be readily linked to how a hospital manages its resources, whereas attributing cause and effect is far more difficult for outcomes (Hollingsworth and Peacock 2008). It may also be easier to aggregate output data to get an overall view of hospital performance. A further constraint the Commission faces is that it only has a short period to complete the study, which tends to favour an analysis of outputs.

The Commission intends to report measures of both effectiveness and efficiency. Effectiveness refers to how successful a hospital is in achieving a particular objective, such as avoiding hospital-acquired infections. Efficiency, in its broadest sense, refers to how well resources are used to benefit the wellbeing of the community as a whole (which is determined by service quality, as well as financial costs). This broad interpretation is known as 'economic efficiency' and has three components — the degree to which outputs are produced at least possible cost (productive efficiency), resources are allocated across different uses so as to generate the greatest community wellbeing at a given point in time (allocative efficiency), and over time (dynamic efficiency) (box 1).

This study focuses on the efficiency of individual organisations (hospitals), and so the most relevant concept is productive efficiency. Allocative efficiency is determined by factors such as how governments allocate resources across the health sector, and the balance between public and private financing of health care. These issues are largely beyond the study's terms of reference. However, by comparing the performance of public and private hospitals, the study could provide insights into the potential to improve allocative efficiency.

Box 1 **Components of economic efficiency**

Economic efficiency is about maximising the wellbeing of the community. It requires satisfaction of three components.

Productive efficiency is achieved when output is produced at minimum cost. It includes technical efficiency, which refers to the extent to which, in the production of any good or service, it is technically feasible to reduce any input without decreasing the output, and without increasing any other input.

Allocative efficiency is about ensuring that the community gets the greatest return (very broadly defined) from its scarce resources. A nation's resources can be used in many different ways. The best or 'most efficient' allocation of resources is the one that contributes most to community wellbeing.

Dynamic efficiency refers to the allocation of resources over time, including allocations designed to improve economic efficiency and to generate more resources. This can mean finding better products and better ways of producing goods and services, which may involve investments in education, research, development and innovation. Dynamic efficiency can also refer to the ability to adapt efficiently to changed economic conditions, a capacity for optimally modifying output and productivity performance in the face of economic 'shocks'.

Source: PC (2006b, 2008).

Past research comparing public and private hospitals

The question of how well public hospitals perform relative to private hospitals in Australia has been debated for many years (for example, Butler 1988). The issue remains largely unresolved because available research has limitations. While many studies have examined the performance of public hospitals, there is limited and rather dated research on the overall efficiency of private hospitals (PC 2006a). The few Australian studies that compare public and private hospitals appear to typically focus on a specific area of performance. One example is a study of acute myocardial infarction cases in Victoria, which showed that private hospitals consistently outperformed others in terms of mortality rates and unplanned readmissions (Jensen et al. 2007). Such studies provide a useful contribution to the debate, but it would be inappropriate to extrapolate their findings to all hospital services.

The Commission has previously reviewed published research on hospital performance, from which it concluded that the gap between existing and best-practice productivity might be in the order of 20–25 per cent for the Australian (public and private) hospitals sector as a whole (PC 2006a). It was considered that there might be greater scope to improve the productivity of hospitals than other

areas of health care because hospitals are relatively complex, have intricate funding arrangements, are very diverse, and face impediments to changing job design.

There is a more well-developed literature comparing public and private hospitals overseas, and this tends to show that public provision of healthcare is more efficient than private provision (Hollingsworth and Peacock 2008). However, this conclusion is largely based on evidence from the United States and Europe, and so may be of limited relevance to Australia. Cross-country comparisons face the problem that no two health systems are the same, and each system is complex (NHHRC 2009).

4. Partial indicators of performance

The community places importance on various aspects of hospital performance, including safety, timeliness and amount of resources used. It is difficult to capture all of these aspects in a single measure, and so it is common to report a suite of 'partial' indicators that each measure a particular aspect of performance.[2] This approach is reflected in the terms of reference, which asks the Commission to report indicators for specific areas of costs and infections — and other indicators relevant to an assessment of the relative performance of the public and private hospital systems. The Commission's proposed partial indicators are outlined below.

Hospital and medical costs for clinically similar procedures

The terms of reference ask the Commission to report comparative hospital and medical costs for clinically similar procedures performed by public and private hospitals. This is to be based on public hospital data that the states and territories will provide under the new National Healthcare Agreement (NHA), and data that private hospitals currently report.

However, recent policy developments — such as a foreshadowed move to nationally consistent activity-based funding — have yet to lead to the reporting of all costs on a consistent basis between jurisdictions, or between public and private hospitals within jurisdictions. It will therefore be a major challenge for the study to report comparable cost data.

[2] Examples of this multiple-indicator approach are the National Health Performance Framework developed for the Australian Health Ministers' Conference (AIHW 2008b; NHPC 2001), and the 'performance indicator framework' that the Steering Committee for the Review of Government Service Provision uses for public hospitals (SCRGSP 2009).

Cost indicators

There are two commonly used measures of hospital costs that the Commission proposes to report in the study:

- average cost per separation, when comparing costs associated with clinically similar procedures
- average cost per casemix-adjusted separation, when aggregating across different types of treatment/diagnosis for a broader comparison of costs.

Cost per casemix-adjusted separation is the average expenditure for an episode of care (separation), adjusted for differences in the 'casemix' of patients. Casemix is determined by grouping patients into categories with similar diagnoses and resource requirements. Casemix adjustment involves weighting the costs that a hospital incurs for each casemix group by its relative complexity (based on cost weights, as detailed below) so that different hospitals can be compared on a like-for-like basis.

Are there cost measures other than the two proposed by the Commission that you would like to be reported? If so, what are those measures and what are their strengths and weaknesses?

Clinically similar procedures

To compare clinically similar hospital and medical costs, the Commission proposes to compare costs as categorised according to the Australian Refined Diagnosis Related Groups (AR-DRGs) used for Australia's casemix system (box 2).

Because there are hundreds of AR-DRGs, the Commission intends to compare costs across public and private hospitals for a selected number of them. For example, drawing upon the experience of the AIHW (2009), which compared average length of stay in hospital for 20 selected AR-DRGs, the Commission could analyse comparative public and private hospital costs for a limited number of clinically similar procedures that:

- are frequently observed in both public and private hospitals
- represent a high percentage of health expenditures
- are clinically diverse
- are generally without complications or comorbidities (in order to minimise differences within particular AR-DRGs).

The AR-DRGs used by the AIHW (2009), and the associated number of separations, are presented in table 4.

Is the proposed approach to selecting clinically similar procedures appropriate for comparing costs between public and private hospitals? What, if any, other factors should be considered when compiling a list of procedures for such a comparison?

Are the 20 AR-DRGs selected by the AIHW to compare average length of stay appropriate for the comparison of costs? What alternative procedures should be included, and what are the reasons for this?

Box 2 **Classifying episodes of care — Diagnosis Related Groups**

The Diagnosis Related Group (DRG) system is a taxonomy of hospital outputs that is used to document, apportion and control costs in hospitals. As the mix of patients or services offered by a hospital significantly impacts on the costs of that hospital, the grouping of similar outputs is necessary to allow a meaningful comparison of the costs incurred in producing those outputs (Bridges, Haas and Mazevska 1999).

The DRG system currently used in Australia reflects local clinical practise and is referred to as Australian Refined Diagnosis Related Groups (AR-DRGs), with the latest version (6.0) released in 2008.

An effective DRG classification system is based on three main principles:

- clinical meaning — diagnoses within each DRG are to be clinically similar
- resource homogeneity — treatment of diagnoses within each DRG should utilise a similar type and amount of resources
- exclusivity — diagnoses should only correspond to a single DRG.

A DRG taxonomy groups episodes of patient care into categories differentiated by factors such as main diagnosis, clinical procedures, gender, age, and the presence of additional diagnoses or complications. At the highest level, episodes of care are classified into a Major Diagnostic Category (MDC). Diagnoses in each MDC correspond to a single body system or aetiology, broadly reflecting the specialty providing care. All possible principal diagnoses in the AR-DRG classification system fall into one of 23 mutually exclusive MDCs, from which there are a total of 665 AR-DRGs.

Sources: Bridges, Haas and Mazevska (1999); Erlandsen (2008).

Table 4 **Separations for 20 selected AR-DRGs, by public/private status of hospital, 2007-08[a]**

AR-DRG	*Description*	*Total Separations*	
		Public	*Private*
E62C	Respiratory Infections/Inflammations W/O CC	25 869	4 706
E65B	Chronic Obstructive Airways Disease W/O Catastrophic or Severe CC	25 178	5 201
E69C	Bronchitis and Asthma Age <50 W/O CC	28 051	1 302
F62B	Heart Failure and Shock W/O Catastrophic CC	24 281	6 356
F71B	Non-Major Arrhythmia and Conduction Disorders W/O Catastrophic or Severe CC	30 590	11 432
G07B	Appendicectomy W/O Catastrophic or Severe CC	18 463	4 679
G08B	Abdominal and Other Hernia Procedures Age 1 to 59 W/O Cat or Sev CC	7 274	7 527
G09Z	Inguinal and Femoral Hernia Procedures Age>0	16 330	22 712
H08B	Laparoscopic Cholecystectomy W/O Closed CDE W/O Cat or Sev CC	19 149	17 052
I03C	Hip Replacement W/O Catastrophic or Severe CC	7 584	12 711
I04Z	Knee Replacement and Reattachment	11 827	22 239
I16Z	Other Shoulder Procedures	5 749	28 715
L63B	Kidney and Urinary Tract Infections Age >69 or W Severe CC	17 529	4 068
M02B	Transurethral Prostatectomy W/O Catastrophic or Severe CC	6 492	11 862
N04Z	Hysterectomy for Non-Malignancy	11 880	14 193
N06Z	Female Reproductive System Reconstructive Procedures	6 539	10 690
O01C	Caesarean Delivery W/O Catastrophic or Severe CC	41 597	28 335
O60B	Vaginal Delivery W/O Catastrophic or Severe CC	104 404	34 498
R61B	Lymphoma and Non-Acute Leukaemia W/O Catastrophic CC	7 728	6 430
U63B	Major Affective Disorders Age <70 W/O Catastrophic or Severe CC	17 057	12 167

a The AR-DRGs in the table were selected by the AIHW (2009) for the purpose of comparing average length of stay. The selection was made on the basis of (i) homogeneity, where variation is more likely to be attributable to the hospital's performance rather than variations in the patients themselves; (ii) representativeness across clinical groups (major diagnostic categories, MDCs) and surgical and medical AR-DRGs; (iii) differences between jurisdictions and/or sectors; and (iv) policy interest as evidenced by inclusion of similar groups in other tables of *Australian Hospital Statistics* (such as indicator procedures for elective surgery waiting times), high volume and/or cost, or changes in volume over years. The AIHW also stated that only non-complication and/or comorbidity (non-CC) AR-DRGs were chosen from groups of adjacent AR-DRGs. This was because AR-DRGs with CCs may be relatively less homogeneous, as they potentially include a range of complications and/or comorbidities.

CC refers to complications and or comorbidities; W/O means without; W means with; and CDE refers to common duct exploration.

Source: AIHW (2009).

Data sources

The Commonwealth Department of Health and Ageing (DOHA) manages two important sources of information on hospital and medical costs — the National Hospital Cost Data Collection (NHCDC) and the Hospital Casemix Protocol (HCP).

The NHCDC is a voluntary survey of cost and activity data from public and private acute care hospitals throughout Australia (DOHA 2008a). The latest published results (2006-07) were based on responses from 47 per cent of all public hospitals (89 per cent of public acute separations) and 36 per cent of all private hospitals (59 per cent of private acute separations).

The NHCDC is used to produce AR-DRG cost weights — the average cost of a particular AR-DRG, relative to the average cost for all separations. Cost weights are often used within states to allocate funding across public hospitals. In this process, the funding level for individual hospitals is determined by the number of separations for each AR-DRG and the relevant cost weights. Allocating funding in this way provides an incentive for hospitals to ensure that their average cost is not above the average of their peers, after taking account of casemix differences.

The NHCDC does not include costs for a large proportion of medical and pharmaceutical expenditure in private hospitals because these items are often billed directly to patients. A further problem is that private hospital data is not available in the NHCDC for 2003-04, 2004-05 and 2005-06. The latest available NHCDC data (2006-07) does, however, include private hospitals.

Because of these limitations, the Commission proposes to use the HCP as a source for at least some private hospital costs. The HCP data are collected as part of the regulation of private health insurance, and include financial, clinical and demographic information for separations involving payment of a private-insurance benefit. The HCP does not include information about episodes of care that are paid for directly by the patient, or by the Department of Veterans Affairs (DVA). It also important to note that the NHCDC has data on hospital expenditure (costs), whereas the HCP has the amounts charged to patients and benefits paid by insurers.

It may useful to supplement the analysis of NHCDC/HCP data with information collected by other organisations. For example, DVA collects financial data in carrying out its role of funding health services for war veterans and their families. In 2007-08, DVA patients accounted for 4.1 per cent of all hospital separations (2.6 per cent of separations in public hospitals and 6.4 per cent in private hospitals) (AIHW 2009).

What, if any views, do you have about the Commission's proposed use of NHCDC and HCP data to compare hospital and medical costs for clinically similar procedures performed by public and private hospitals? Where you identify problems, what suggestions do you have to address them?

What, if any, other sources of cost information do you recommend that the Commission consider? What are the strengths and weaknesses of those data?

Proposed disaggregations

The Commission considers it would be useful to investigate whether there are significant differences in public and private hospital costs within and between jurisdictions, regions, and peer groups of similar-sized hospitals. At this stage, it appears that each of these disaggregations will be feasible in isolation, but small sample sizes are likely to prevent disaggregation by all of the categories simultaneously.

Jurisdictions

Public hospital costs are reported for every individual state and territory by the AIHW (2009) and Steering Committee for the Review of Government Service Provision (SCRGSP 2009). In contrast, the ABS only reports private hospital costs separately for each mainland state, and combines data for Tasmania, the Northern Territory and ACT to 'protect the confidentiality of the small number of hospitals in these states/territories' (ABS 2008d, p 8).[3] The Commission expects to encounter the same confidentiality issues regarding private hospitals, and so it is proposed that the study also groups Tasmania, the Northern Territory and ACT together when reporting jurisdiction-level data.

Regions

It is proposed that the Commission's regional analysis would disaggregate the data into the following three groups from the Australian Standard Geographical Classification (ASGC)[4]:

- major cities (for example, Sydney)
- inner regional (for example, Bendigo)

3 DOHA (2009) reported that Tasmania, the Northern Territory and ACT only had seven, one and three private hospitals respectively.

4 The ASGC is detailed in ABS (2005).

- outer regional (for example, Mackay).

The Commission intends to exclude the two other ASGC regions (remote and very remote), as DOHA (2009) data show that there are no private hospitals in either of them. There are currently 79 public hospitals in the remote region and 83 in the very remote region (DOHA 2009). There is no available information on the percentage of public separations that these hospitals provide. However, approximately 4 per cent of all public patients reside in remote or very remote regions (AIHW 2009).

Hospital peer groups

Diversity across hospitals may not be completely controlled for by the casemix adjustment mentioned above. The Commission therefore proposes to also compare public and private hospitals within particular peer groups. For acute hospitals, the peer groups are to be defined by the number of annual patient separations (table 5).

Table 5 **Proposed peer group classification system**

Peer group	*Criteria*
Acute hospitals	
Very Large	20 001 + separations per year
Large	10 001 to 20 000 separations per year
Medium	5001 to 10 000 separations per year
Small	2001 to 5000 separations per year
Very Small	Up to 2000 separations per year
Other hospitals	
Psychiatric	Psychiatric
Other	Other ungrouped hospitals, including prison medical facilities

What views do you have regarding the Commission's proposed disaggregations by jurisdiction, region and peer group? What, if any, alternative disaggregations do you recommend and what are their strengths and weaknesses?

Taxes and the cost of capital

The terms of reference ask the Commission to take account of the cost of capital, fringe benefits tax (FBT) exemptions, and other relevant factors when reporting costs. This is desirable because:

- taxes and capital costs could account for a significant proportion of expenditure
- cost differences between hospitals could be partly due to different tax regimes and financing arrangements between jurisdictions, and for different corporate structures (public, for-profit, and not-for-profit).

Tax issues

The tax obligations of hospitals differ between public and private facilities and across jurisdictions. Public and not-for-profit hospitals are eligible for FBT exemptions, subject to a capping threshold of $17 000 per employee (ATO 2007), while for-profit private hospitals are not exempt from FBT. Public and not-for-profit hospitals are also exempt from paying payroll taxes. To ensure that hospitals are analysed on a comparable basis, the Commission proposes to remove FBT and payroll taxes from the reported costs of hospitals that pay those taxes. However, this may be difficult to implement if the Commission has to rely on HCP charge data on for-profit private hospitals, as the data do not explicitly identify fringe benefits or payroll taxes.

What, if any, suggestions do you have to take account of differences between hospitals in the fringe benefits and payroll tax regimes they face? What alternative approaches could be used and what are the strengths and weaknesses of these approaches?

Cost of Capital

The cost of capital consists of depreciation and the user cost of capital (UCC), both of which should be included when comparing the total cost measures of public and private hospitals. Both depreciation and the UCC are implicitly included in the charge data in the HCP, and thus the cost of capital for private hospitals is already accounted for.

Depreciation is the reduction in value of an asset due to usage and obsolescence. The NHCDC reports depreciation costs by DRG for public hospitals in Australia except Victorian public hospitals (DOHA 2008a). There is however a statewide measure of depreciation for Victorian public hospitals, which is published by SCRGSP (2009). One possible option would then be to somehow apportion this statewide measure of depreciation for Victoria to individual DRGs.

The UCC is the opportunity cost of the capital used to deliver services (that is, the return that could be generated if the funds were employed in their next best use). The Commission proposes to calculate the UCC for public hospitals using the same method employed by the AIHW (2009) and SCRGSP (2009). This involves multiplying the value of assets by a UCC rate of 8 per cent to calculate the UCC. Interest payments represent a user cost of capital, so are deducted from capital costs in all jurisdictions to avoid double counting.

The value of public hospital assets is not included in the NHCDC data. The Commission therefore intends to source asset values for public hospitals from the states and territories.[5] The Commission proposes to apportion the UCC for public hospitals to specific DRGs using the depreciation weights of the NHCDC.

What, if any, comments do you have about the proposed approaches to dealing with the cost of capital? What alternative approaches could be used, and what are the strengths and weaknesses of those approaches?

Rate of hospital-acquired infections

The terms of reference ask the Commission to report the rate of hospital-acquired infections, disaggregated by type of infection. This is an important indicator of service quality because healthcare-associated infections are the most common complication affecting hospital patients, and in many cases are preventable.

In 2008, the Australian Commission on Safety and Quality in Health Care (ACSQHC) published a review of Australia's monitoring and reporting arrangements for healthcare-associated infections. The review found deficiencies in the arrangements and recommended strengthened surveillance, including for:

- bloodstream infections (BSIs) categorised as staphylococcus aureus bacteraemia, such as methicillin-resistant staphylococcus aureus (MRSA); central-line associated BSIs in intensive care units; and haemodialysis-access associated BSI
- surgical-site infections (SSIs), including coronary artery bypass graft surgery, major-joint prosthesis insertion, and other procedures that have higher than expected SSI rates at the local level
- bacterial sepsis in the first week of life, including meningitis (Cruickshank and Ferguson 2008).

This provides a useful guide to the type of infections that might ideally be given high priority in comparing public and private hospitals. However, this study will be constrained by what data are collected under existing arrangements. Government monitoring of hospital-acquired infections occurs largely at the state and territory level, with each jurisdiction often using different approaches and typically only collecting data for public hospitals (CHRISP 2003; DHHS 2009; DHS 2008; NSW Department of Health 2008; Richards and Russo 2007; WA Department of Health 2008).

[5] As in SCRGSP (2009), the Commission intends to exclude land from all UCC calculations as property value differences between states would obscure differences in operational efficiency.

The most detailed published data on hospital-acquired infections that are nationally-consistent and cover both public and private hospitals appear to be those from the Clinical Indicator Program (CIP). This is managed by the Australian Council on Healthcare Standards (ACHS), a private nonprofit body. The CIP has a large number clinical indicators, including 47 of which measure healthcare-associated infections linked to specific procedures.[6] These are grouped into five broad categories:

- SSIs (18 indicators)
- central-line associated BSIs (14 indicators)
- BSIs associated with dialysis (5 indicators)
- neonatal infections (6 indicators)
- methicillin-resistant staphylococcus aureus (MRSA) cases (4 indicators).

The most recent published data suggest that infection rates rarely differ significantly between public and private hospitals. In 2006 and 2007, only four of the 47 indicators had a statistically significant difference between public and private hospitals (ACHS 2007, 2008). However, the CIP indicators have some weaknesses:

- 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.

In addition, the ACSQHC review raised concerns about data collection and validation methods used for the CIP (Cruickshank and Ferguson 2008).

Nevertheless, the Commission may have to rely largely on the CIP indicators to analyse infection rates. In doing so, it will be mindful of the data limitations. Another issue to consider is whether the study should focus on comparing infections of greatest concern, rather than all 47 indicators. It is also possible that some indicators will only be relevant to either public or private hospitals, and so cannot be compared across the sectors.

What hospital-acquired infections should the study compare between public and private hospitals? Why have you nominated those infections, and are there likely to be any limitations on the availability of accurate and comparable data?

6 Healthcare-associated infections are measured by 47 out of 49 indicators collected under the ACHS Infection Control Indicators Version 3 (two indicators measure staff exposure to blood and bodily fluids, which may not necessarily result in an infection).

What, if any, views do you have about using data from the ACHS Clinical Indicator Program to analyse rates of hospital-acquired infections? What suggestions do you have to address any concerns you may have?

The data collected by state and territory governments could provide a more comprehensive indication of hospital-acquired infections in a particular jurisdiction than the CIP. However, as noted, government surveillance is often limited to public hospitals. The exceptions appear to be the Queensland, SA and WA Governments, which monitor infections in both private and public hospitals (HQCC 2009; Richards and Russo 2007). The Commission intends to explore this option with the relevant state agencies.

Another potential data source on infection rates could be the National Hospital Morbidity Database (NHMD) maintained by the AIHW. This contains patient-level data from almost all hospitals in Australia on diagnoses, procedures and external causes of injury. The coding system used to record these data may enable the identification of hospital-acquired infections and their comparison between public and private hospitals.[7]

What, if any, other data sources do you recommend to compare the rate of hospital-acquired infections between the public and private hospital systems? What are their strengths and weaknesses?

Other relevant indicators

The terms of reference ask the Commission to consider other relevant indicators, including the ability of such indicators to inform comparisons of hospital performance and efficiency.

Unplanned readmissions and returns

Patients readmitted or returned to care unexpectedly can indicate that the initial care or treatment was ineffective or unsatisfactory, that post-release planning was inadequate, or for other reasons outside the control of the hospital (for example, inadequate or poor post-release care) (SCRGSP 2009).

The ACHS collects and reports data for:

- unplanned readmission after 28 days

[7] NHMD data are coded according to the International Statistical Classification of Diseases and Related Health Problems, Tenth Revision, Australian Modification (ICD-10-AM).

- unplanned return to theatre (operating room)
- unplanned return to intensive care unit (ICU).

Available data show that, from 2005 to 2007, there was a statistically significant difference between public and private hospitals for unplanned readmissions after 28 days (ACHS 2007, 2008). No significant difference was evident for unplanned returns to theatre and ICU. However, as noted previously for infection rates, ACHS data could be affected by sampling problems and the voluntary nature of the collection. In addition, the ACHS (2008) has noted that its readmission and return rate data are not adjusted for differences in casemix and patient risk.

Selected adverse events

Adverse events are incidents in which harm resulted to the patient (AIHW 2009). This includes infections, falls, other injuries, and medication and medical device problems. Some of these events may be preventable, and many typically involve subsequent additional hospital resources to correct for the effects of the event.

Adverse event data are reported in the AIHW's National Hospital Morbidity Data Collection, a census of all Australian hospitals. However, the identified events are only those that have led to, or affected hospital admissions, rather than all adverse events (AIHW 2009). An alternative source of information is the CIP managed by the ACHS. It gathers information on *selected* adverse events, such as inpatients who develop one or more pressure ulcers during their admission, patient falls and adverse transfusion events.

The AIHW (2009) data suggest that, in 2006-07, private hospitals had a lower adverse event rate than public hospitals. In contrast, the ACHS (2008) data show no statistically significant difference between public and private hospitals for the selected adverse events.

Accreditation

Accredited hospitals would be expected to provide better quality and patient safety than other hospitals, all other things being equal. Accreditation is available through the ACHS, Business Excellence Australia, the Quality Improvement Council, or certification with the International Organization for Standardisation's (ISO) 9000 quality family. The AIHW (2009) reports data on the number and proportion of hospital and beds that are accredited. At a national level, the proportion of hospital beds that are accredited is broadly similar for public and private hospitals.

Responsiveness

Responsiveness refers to the extent to which a hospital takes account of patient preferences and needs. Informed financial consent is one indicator of responsiveness. Another is patient satisfaction, which has been measured in various surveys (SCRGSP 2009). The data collected from such surveys can cover both clinical and non-clinical care. The extent to which hospitals routinely use surveys, and the level of reported satisfaction, may be indicative of hospital responsiveness.

Access

Governments have the goal of providing hospital services that are accessible to the public, and insured patients expect to access private hospital services in a timely manner. While governments routinely collect and publish data on waiting times for emergency departments and elective surgery in public hospitals, the Commission is not aware of comparable data for private hospital services.

The ACHS publishes four indicators of access to intensive care units (ICUs) for both public and private hospitals where applicable[8]:

- non-admission of patients to an ICU
- elective surgery deferred or cancelled due to lack of lack of an ICU bed
- patients who were transferred due to unavailability of an ICU bed
- delay on discharge from an ICU of more than 12 hours (ACHS 2008).

Even though relatively few hospitals reported these indicators (between 31 and 60 hospitals), there was a statistically significant difference between public and private hospitals for each of these indicators in 2006-07.

Relative stay index

The relative stay index (RSI) of a hospital is the average length of stay of the hospital relative to the average of all hospitals, after adjusting for casemix differences. It is sometimes used as an indicator of efficiency because it is thought to reflect the resources used to provide inpatient services.

8 ICU here includes high-dependency units.

Workforce characteristics

Hospitals are labour-intensive organisations. For example, about two-thirds of public-hospital costs (excluding land) are attributable to labour (SCRGSP 2009). The availability of staff and flexibility of work arrangements are therefore potentially significant contributors to the performance of hospitals.

Three possible indicators of the hospital workforce are:

- age distribution — for example, the shares of medical practitioners, nurses and midwives that are close to retirement may provide an indication of the sustainability of the hospital workforce
- occupational mix of the hospital workforce — for example, the ratio of registered to enrolled nurses and the ratio of medical practitioners to nurses may provide an indication of the flexibility of work arrangements
- labour productivity — for example, separations per full-time equivalent nurse and separations per medical practitioner could provide an indication of the consequence of workplace arrangements on hospital performance.

Care would need to be exercised with these indicators, since public hospitals tend to employ salaried medical officers, whereas private hospitals rely more on visiting medical officers (practitioners exercising their private rights of practice). There is limited data on the number of the latter in private hospitals.

What, if any, views do you have on the suitability of the Commission's other proposed indicators for comparing public and private hospitals? Where you identify potential weaknesses, please provide supporting evidence if possible, and suggest alternative approaches.

Are there any of the other indicators that should not be reported? If not, please explain your reasoning.

Are there any data sources that might assist with reporting these indicators?

Summing up

In summary, the Commission proposes a range of partial indicators to compare the performance of public and private hospitals. These are listed in table 6.

Does the proposed set of partial indicators cover a sufficiently broad range of the various dimensions of public and private hospital performance? If not, what additional indicators do you suggest and what are their strengths and weaknesses?

Table 6 **Proposed partial indicators of hospital performance**

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

5. Multivariate analysis

Partial indicators are attractive because they are usually easy to calculate, well understood, and accepted by the relevant sector. However, their partial nature means that:

- a large number of indicators are needed to capture the many aspects of a hospital's performance, particularly for hospitals providing a wide range of medical and surgical procedures and outpatient services
- there are many factors outside the control of hospitals that shape their performance on any given partial indicator, and it is not practicable to take account of all factors that influence every partial indicator.

This means that it is difficult to form an overall assessment of performance (for example, how should one weight up the tradeoffs hospitals make between reducing costs and increasing quality and patient safety?).

Many of these problems can be addressed by using multivariate frontier analysis. This involves the use of statistical techniques to benchmark hospital costs (or outputs) in a way that takes account of the various factors that influence them (such as the amount of activity and quality of service provided). After accounting for these factors, the least cost (or most productive) hospitals are identified as being on

a best-practice frontier. The further away that other hospitals are from the frontier, the lower is their efficiency.

The Commission proposes to use two well-known multivariate frontier techniques — stochastic frontier analysis and data envelopment analysis. Details about these techniques are provided in the technical appendix to this paper. Extensive literature reviews of studies using these methods are provided by Hollingsworth and Peacock (2008), O'Neill et al. (2008), and Peacock et al. (2001).

In order to adequately control for differences between hospitals, the proposed multivariate analysis would best be conducted using hospital-level data. The Commission intends to use data held by the ABS on the characteristics of private hospitals and data held by the AIHW on the characteristics of public hospitals and the treatments provided to admitted patients (morbidity data) in all hospitals. The Commission proposes to use the AIHW-held private-hospital morbidity data because the ABS data are not as detailed, and so are less well suited to controlling for inter-hospital differences. The Commission will ensure proper use of this data for these analytical purposes. The identity of hospitals would not be known to the Commission, and the Commission does not plan to publish data that would identify individual hospitals. Since the morbidity data would be aggregated to the hospital level, it would not be possible to identify individual patients.

A number of studies in Australia have used multivariate techniques to measure the relative efficiency of either public hospitals (SCRCSSP 1997; Yong and Harris 1999; Wang and Mahmood 2000a, 2000b; Mortimer 2002; Paul 2002; Mangano 2003; Queensland Department of Health 2004) or private hospitals (Webster, Kennedy and Johnson 1998). The success of these studies have been mixed. The proposed analysis here represents a significant advance on these studies because:

- It includes private hospitals and public hospitals from all jurisdictions. Previous studies included either private hospitals or public hospitals from a single jurisdiction.
- Considerably more effort will be placed on accounting for the various factors that otherwise account for the differences between hospitals (such as patient risks, and hospital caseload complexity). Failure to account for these factors can lead to erroneous conclusions about the relative efficiency of hospitals.
- Improvements in the methodology in recent years have the potential to address some of the shortcomings of earlier studies, such as improved methods to address the effects of random error.

In this regard, it is useful to consider three possible sources of differences between hospitals:

- roles and functions — as noted previously, the range of services offered can differ markedly between (and within) the public and private sectors
- quality of care — cost or output differences between hospitals could reflect differences in the quality of care, rather than any inefficiency
- patient-risk characteristics — hospitals serve different populations, each exhibiting various patient-risk factors.

Differences in the roles and functions of hospitals could be addressed by:

- ensuring that hospital separations are adjusted for casemix differences
- including hospital outpatient services and emergency department visits as hospital outputs
- excluding free-standing day facilities, psychiatric and non-acute hospitals from the sample of acute care hospitals
- accounting for the role of teaching and research and development functions
- including variables that reflect the proportion of beds that are long-stay or non-acute, and the proportion of separations that are surgical
- including an index of the complexity of cases faced by each hospital, such as that developed by Evans and Walker (1972).

The Commission could also take account of movements within and between hospitals by including the proportions of:

- admissions that are transfers from other hospitals, and from emergency departments
- separations that are transfers to other acute hospitals, and transfers to residential aged care, or other non- or sub-acute care.

Quality-of-care variables could also be included in the analysis, such as:

- in-hospital mortality
- number of separations involving adverse events.

The different mix of patients could be addressed by including variables such as:

- an estimate of the average comorbidity of the hospital population (based on the Charlson Index (Charlson et al. 1987) or possibly the Multipurpose Australian Comorbidity Scoring System (Holman et al. 2005)
- proportions of cases that are female, young and old.

While every attempt will be made to account for the complex interactions between hospitals, given the nature of the hospital-level analysis, each hospital's morbidity data will not be not linked to the datasets of other hospitals and non-hospital datasets, such as mortality and cancer registries. Since the study proposes to use hospital-level data, it is not possible to link datasets in this way.

What, if any, views do you have on the proposed use of multivariate techniques to compare public and private hospitals? What other factors should the study use to adjust for differences between hospital structures that can influence relative hospital efficiency? Where you identify potential weaknesses, please provide supporting evidence if possible, and suggest alternative approaches.

6. Informed financial consent

The terms of reference ask the Commission to examine aspects of informed financial consent for privately-insured patients. Informed financial consent (IFC) is defined as being:

> … the provision of cost information to patients, including notification of likely out-of-pocket expenses (gaps), by all relevant service providers, preferably in writing, prior to admission to hospital or treatment. (DOHA 2008b)

In recent years, DOHA commissioned three surveys on IFC in Australia. These were conducted by Ipsos Australia in 2004, 2006 and 2007. The surveys asked patients who had recently made a private health insurance claim for an episode of hospitalisation, about the costs they incurred and the information they received about those costs prior to treatment (Ipsos Australia 2005, 2007, 2008). As detailed below, the Commission proposes to use the Ipsos survey data as its primary source for analysing IFC.

The samples for the 2004, 2006 and 2007 surveys were individuals who had made a recent insurance claim for hospital treatment as a private patient, and whose claim had been settled prior to 1 September 2004, 15 September 2006 and 1 May 2007 respectively. This excludes private patients who funded their treatment solely from their own funds (self insured) and private hospital patients whose treatment was funded by the Department of Veterans' Affairs (DVA). AIHW (2009) data show that approximately 21 per cent of private patients are self insured, DVA funded, or funded through some other form of compensation. Any results arising from the Ipsos surveys will therefore need to be interpreted in light of the sample used.

What, if any, views do you have about the suitability of the Ipsos surveys as a data source for analysing informed financial consent? What suggestions do you have to address any concerns you may have?

What, if any, other data sources relating to informed financial consent are you aware of? What is your view on their usefulness for this study?

Rates of informed financial consent

The terms of reference ask the Commission to examine rates of fully-informed financial consent for privately-insured patients treated as private patients in both public and private hospitals. The Commission has also been asked to categorise rates of fully-informed financial consent by type of provider — that is, public hospital, private hospital, and medical practitioner (speciality) — and by Statistical Local Area (SLA) or equivalent.

Published results from the 2007 Ipsos survey show that 19 per cent of private patients in private hospitals incurred out-of-pocket expenses without first receiving full information about the costs of their treatment, compared to 9 per cent for private patients in public hospitals.

The published Ipsos results also disaggregate rates of IFC by type of provider and jurisdiction, but not by SLA. The Commission suggests it would be inappropriate to disaggregate the unpublished survey data by SLA because there are insufficient survey respondents in many SLAs to ensure that the results are an accurate representation of the population of all patients in an SLA. It is thus proposed that the data instead be disaggregated by (broader) ASGC-RA regions, similar to what was mentioned previously for the analysis of costs. While this will enable the Commission to simultaneously disaggregate rates of IFC by public/private hospital and region (ASGC-RA), small sample sizes are likely to prevent simultaneous disaggregation by public/private status, region and medical speciality.

What, if any, suggestions or comments do you have regarding the proposed disaggregation of informed financial consent data by type of provider and region? What alternative disaggregations could be used and what are the strengths and weaknesses of these disaggregations?

Out-of-pocket expenses for patients not given sufficient information

The terms of reference ask the Commission to report the average out-of-pocket expenses for patients who do not receive enough financial information from the provider to give fully-informed financial consent. The Commission has also been asked to report the range (the minimum to maximum) of these costs, and to categorise the data by type of provider (public/private hospital and medical speciality).

The published Ipsos survey data include average out-of-pocket expenses (but not the range) down to the jurisdiction level and by type of provider. For 2007, the average out-of-pocket expenses for all private patients who paid a gap was reported to be $787, representing an increase of 26 per cent from 2006. For private patients who paid a gap in 2007, the average out-of-pocket expenses was $520 in public hospitals, compared to $806 in private hospitals. The medical specialist or service provider in which patients paid the greatest average out-of-pocket expenses was Vascular Surgeon/Cardiologist, with patients having average out-of-pocket expenses of $1 189. The category in which patients paid the lowest average out-of-pocket expenses (among specialities with a sufficient sample size) was Physiotherapist, with patients on average paying $136.

The published Ipsos data on out-of-pocket expenses are not broken down according to whether the patient was given sufficient information to provide IFC. However, the Commission expects that it will be able to derive this from the unpublished survey data.

Another source of information on out-of-pocket expenses paid by private patients is the data that the Private Health Insurance Administration Council (PHIAC) collects quarterly from private health insurers. However, PHIAC has advised the Commission that its data do not identify whether a patient was given sufficient information to provide IFC.

What, if any, views do you have regarding the suitability of the out-of-pocket expenses data collected in the informed financial consent surveys for the Department of Health and Ageing?

What, if any, other data sources on out-of-pocket expenses for patients who do not give informed financial consent are you aware of? What is your view on their usefulness for this study?

Best-practice examples of informed financial consent

The terms of reference ask the Commission to provide best-practice examples of where fully-informed financial consent is provided for every procedure, especially for specialities where consent rates tend to be low.

The results of the latest Ipsos survey suggest that patients are most likely to pay a gap without receiving sufficient information to provide IFC when using the services of an anaesthetist, tests/pathology/radiology/ultrasound/x-ray etc, specialist's or surgeon's assistant, or a paediatrician (table 7). However, these results should be interpreted with care as they do not necessarily provide an accurate indication of

which specialities have the lowest IFC rates. In particular, the sample sizes in the Ipsos survey for a number of medical specialist or service providers were too small to make robust conclusions about rates of IFC.

What, if any, best-practice examples are you aware of where informed financial consent is provided for every procedure?

Are there best-practice examples of informed financial consent in those services and specialities which have the lowest rates of informed financial consent?

Table 7 **Prevalence of gap payments without IFC by medical specialist/service provider, 2007[a]**

Percentage

Medical specialist/service provider	*Percentage of patients that used provider*	*Percentage of patients using provider that had a gap*	*Percentage of patients using provider that had a gap and did not receive IFC information*
Paediatrician	6	44	38
Tests/Pathology/Radiology/ Ultrasound/X-ray etc	37	22	21
Anaesthetist	69	28	14
Specialist's or Surgeon's Assistant	25	23	12
General Surgeon	17	21	7
Oncologist	9	13	7
Orthopaedic Surgeon	13	40	6
Obstetrician/Gynaecologist	12	32	6
Cardiologist	10	7	5
Hospital (accommodation)	100	4	2

a Ophthalmologist-related treatments are not included in this table as there was an insufficient sample size. The Ipsos survey gave respondents the option to report data for types of specialists and medical practitioners not listed in the survey form. All treatments from these other specialists or medical practitioners were also not included in this table due to insufficient sample sizes.

Source: (Ipsos Australia 2008).

7. Indexation of Medicare Levy Surcharge thresholds

The Medicare Levy Surcharge (MLS) is levied on Australian taxpayers who earn above a specified income threshold and do not have private health insurance (PHI). The MLS is currently calculated at the rate of 1 per cent of taxable income.[9] It was

9 For the purposes of the MLS, taxable income includes reportable fringe benefits, such as salary packaged superannuation contributions.

recently proposed that an extra two higher rates of MLS be introduced for higher income earners (box 3).

Background to the MLS

The MLS was introduced in 1997, as part of a suite of measures designed to arrest a decline in the level of PHI among the Australian community, and to maintain the private hospital system as a 'vital complement to the long term viability of Medicare and the public hospital system' (Wooldridge 1997). Other measures included a 30 per cent rebate on PHI premiums (introduced in January 1999) and the Lifetime Health Cover community rating scheme (introduced in July 2000).[10]

Box 3 **Recent changes to the Medicare Levy Surcharge**

Amendments to the Medicare Levy Surcharge (MLS) were passed in October 2008, coming into effect for the 2008-09 financial year. This involved increasing the income thresholds at which the MLS becomes payable to:

- $70 000 for singles (previously $50 000)
- $140 000 for couples and families with one dependent child (previously $100 000).

For families with more than one dependent child, the income threshold increases by $1500 for each additional child. For example, the MLS threshold for a family with three children is $143 000. The threshold increase for an additional child has remained unchanged since 1997.

The amendments also introduced the indexation of the income thresholds on an annual basis in accordance with changes in Average Weekly Ordinary Time Earnings.

The Australian Government recently proposed changes that would increase the MLS for higher income earners without PHI to:

- 1.25 per cent, for single people earning more than $90 000 and for families earning more than $180 000.
- 1.5 per cent, for single people earning more $120 000 and for families earning more than $240 000.

Source: *Tax Laws Amendment (Medicare Levy Surcharge Thresholds) Bill (no. 2)* 2008, Treasury (2009).

In 2008, a number of changes were made to the MLS. These included provision for annual increases in the thresholds by means of indexation, and an increase in the income threshold levels, which had remained unchanged since 1997.

[10] In 2005, the rebate was increased to 35 per cent for people aged 65–69, and to 40 per cent for those aged over 70. The recent federal budget proposes to means test eligibility for the rebate (Treasury 2009). The Lifetime Health Cover rating scheme provides for progressive increases in premiums payable by those taking up PHI after the age of 30.

The introduction of threshold indexation was accompanied by extensive discussion regarding the appropriate approach to indexation. While the amendments to the MLS provided for indexation of the thresholds on the basis of changes to Average Weekly Ordinary Time Earnings (AWOTE), the terms of reference for this study request the Commission to provide advice to the government on the most appropriate indexation factor for the MLS thresholds. In considering an appropriate indexation factor, both the reasons for indexation and the properties of potential index measures are discussed below.

Why index the MLS thresholds?

When introduced in 1997, the MLS was focused on encouraging 'high income earners who can afford to take out private health insurance to do so', and the threshold levels at which the MLS was applied were set accordingly (Wooldridge 1996, p. 8576).

The income thresholds set in 1997 remained unadjusted until October 2008. As taxable incomes generally increased over this time, an increasing proportion of taxpayers became subject to the MLS legislation. The income thresholds at which the MLS applied went from being significantly above to well below average earnings:

- In 1997, the MLS threshold for single people was 29 per cent *greater than* average total earnings for a full-time adult worker.
- Prior to revision in 2008, the singles threshold was around 20 percent *less than* average total earnings for a full-time adult worker (ABS 2008a).

As such, the MLS income thresholds were specifically adjusted in order to 'refocus the MLS on those with higher income' (Treasury 2008, p. 33). When the MLS was introduced, around 8 per cent of single taxpayers exceeded the singles threshold. Had the threshold remained unadjusted, it is estimated that around 36 per cent of single taxpayers would have exceeded it in 2008 (Robinson 2008, p. 21).

The primary purpose for indexing the MLS thresholds is to ensure that the policy remains targeted at the 'high' income group for which it was intended. That is, the income target group is defined by the level at which the thresholds are set, and the focus on this group is maintained over time via indexation. Without automatic indexation, the MLS would become less effective over time in targeting high income earners.

Possible indexation factors

Indexation involves adjusting a nominal value over time in line with changes in a price or wage measure — the initial value is updated so as to maintain a constant value relative to a price or wage measure. There are a number of potential index measures that could be used as a basis to increase the nominal MLS threshold values in order to maintain the targeting of the MLS policy over time (table 8).

Table 8 **Possible indexation factors for the Medicare Levy Surcharge**

Indexation factor	*Description*
Average Weekly Ordinary Time Earnings (AWOTE)	• Measures growth in average weekly pre-tax earnings from standard hours of full-time work for adult wage and salary earners. • Includes award, workplace and enterprise bargaining payments, penalty payments, shift allowances, commissions and retainers, bonuses, incentives, profit sharing payments, workers compensation and salary payments to directors. • Excludes amounts that are salary sacrificed, non-cash components of salary packages, overtime payments, retrospective pay, pay in advance, leave loadings, severance, termination and redundancy payments and other sources of income such as capital gains. • Does not cover a number of workers, including self-employed persons and owners of unincorporated businesses. • Index varies not only with changes in wage levels but also according to changes in average hours worked and composition of the workforce.
Average Weekly Total Earnings (AWTE)	• Includes both ordinary time (AWOTE) and overtime earnings.
Consumer Price Index (CPI)	• Measures changes in the price of a specified 'basket' of goods and services, which comprise a high proportion of household expenditures.
Wage Price Index (WPI)	• Measures change over time in wages paid for a fixed amount of labour. • Controls for changes in income levels resulting from increases in hours worked, or changes in the composition of the workforce. • Does not cover other sources of income such as capital gains.

Source: ABS (2008a, 2008b, 2008c).

AWOTE, average weekly total earnings (AWTE) and the wage price index (WPI) all reflect growth in wages over time.

Of the wage-based indices, AWOTE and AWTE have the advantage that they take account of how changes in workforce composition and hours worked affect incomes. However, AWOTE and AWTE have the disadvantage that they exclude certain groups of taxpayers, such as the self-employed, and exclude certain forms of taxable income, such as interest, dividends, rental income and capital gains.

On balance, AWTE appears more likely to maintain the MLS thresholds at a fixed point in the income distribution because it includes payments for overtime, which is included in taxable income. In this sense, it is a more complete measure of change for income that is subject to assessment under the MLS, and will reflect any changes in the use of overtime pay. However, there appears to be little practical difference in the indexation effects of either AWTE or AWOTE as they have historically increased at very similar rates.

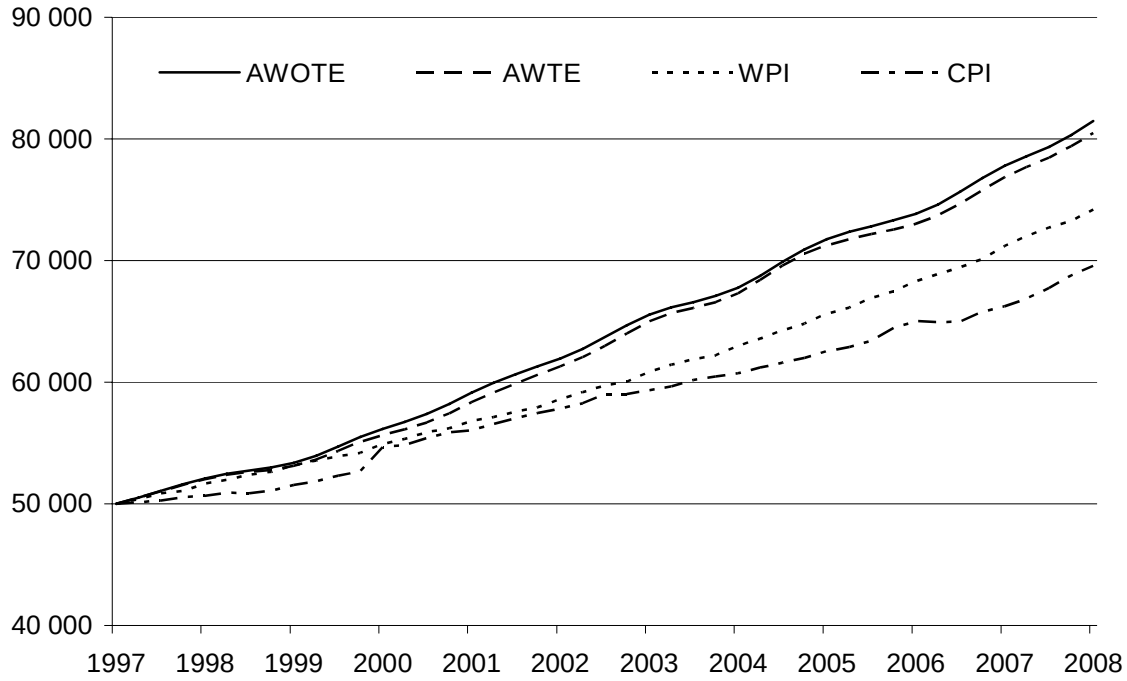
By contrast, the CPI is designed to track changes in the price of goods and services over time.

Historically, the CPI has increased at a slower rate than wages, meaning that indexing the MLS thresholds by the CPI would be unlikely to maintain the focus of the MLS on high income earners in the long term. Had the MLS thresholds for single taxpayers been indexed from their initial levels in 1997, in 2008 they have been around 17 per cent higher if indexed by AWOTE or AWTE rather than the CPI (figure 2).

In addition to those indexation factors mentioned in this paper (AWOTE, AWTE, CPI and WPI), are there alternatives that you would like the Commission to consider? If so, what are they and why do you favour including them in the Commission's analysis?

What is the most appropriate indexation factor for the MLS thresholds, and why do you favour the measure you have nominated?

Figure 2 **Single thresholds, indexed since 1997**



Data source: ABS (2008a, 2008b, 2008c).

8. Improving the feasibility of future comparisons

Where the analysis requested in the terms of reference proves not fully possible because of conceptual problems or data limitations, the Commission has been requested to propose developments to improve the feasibility of future comparisons.

Various potential constraints on the analysis have been noted above, such as differences in the way costs are measured for public and private hospitals (including for doctors and the user cost of capital), and sampling problems and inter-jurisdictional inconsistency for the reporting of hospital-acquired infections.

To some extent, these issues are already being addressed. Arguably the most significant development will be implementation of the NHA, under which governments have agreed to report nationally-consistent 'progress measures' through the COAG Reform Council, and to adopt a nationally-consistent approach to activity-based funding for public hospitals by 2014-15 (NHHRC 2009). This will involve the development and reporting of indicators using the same methodologies across Australia. In addition, the NHHRC (2008) interim report on health system

reform proposed the use of activity-based funding for both public and private hospitals using casemix classifications.

Nevertheless, there may be other areas where it would be useful for the study to propose further improvements.

What conceptual and data problems do you anticipate will prevent the study from completing all of the tasks requested in the terms of reference? How will foreshadowed policy developments, including those under the National Healthcare Agreement, address the problems?

What developments should the study consider in order to improve the feasibility of future comparisons? What problem does your proposed change address, and what are the strengths and weaknesses of your proposal?

Technical appendix

The Commission proposes to model hospital costs with a cost function, which generally takes the form of:

$$C = C(\mathbf{w}, \mathbf{y}, \mathbf{Z})$$

where C is the total operating expenditure of public and private hospitals, **w** is the vector of input prices (such as nursing salaries, medical and drug supplies), **y** is the vector of outputs (such as casemix-adjusted inpatient separations, emergency department visits, outpatient clinic occasions of services, and possibly newborns), and **Z** is a vector of variables describing the roles and functions of hospitals, quality and patient safety, and patient-risk characteristics.

The production of hospital services is likely to be modelled using a distance function, where the output distance function takes the form:

$$D_O(\mathbf{y}, \mathbf{x}, \mathbf{Z}) = \min\{\mu : \mathbf{y}/\mu \in P(\mathbf{x}, \mathbf{Z})\}$$

where **y** and **Z** are defined above, **x** represents the vector of factor inputs (such as the number of full-time equivalent nurses), and μ represents the minimum amount that the output vector can be reduced with given vectors of **x** and **Z**.

These two aspects of hospital activity will be estimated using both stochastic frontier analysis (SFA) and data envelopment analysis (DEA). SFA was originally developed by Aigner, Lovell and Schmidt (1977) and Meeusen and van den Broeck (1977) and has been subject to numerous extensions. An introductory summary can be found in Coelli, Rao and Battese (1998) and more advanced discussions in Greene (1997) and Kumbhakar and Lovell (2000).

DEA was first developed by Charnes, Cooper and Rhodes (1978) following the ideas of Farrell (1957). It has been widely applied to the measurement of hospital efficiency and an introductory review can be found in Coelli, Rao and Battese (1998).

The relative distance to the frontier for a cost function is cost efficiency, while that of an input distance function is input-oriented technical efficiency. The cross-product of the two is input-oriented allocative efficiency, which is a measure of the extent to which a hospital is making the most beneficial use of its inputs given the input prices it faces. Consideration will also be given to indirect distance and cost functions. A detailed examination of these functions, and their relationship in efficiency measurement, can be found in Färe and Primont (1990) and Kumbhakar and Lovell (2000).

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