



# ACERH

AUSTRALIAN CENTRE FOR ECONOMIC RESEARCH ON HEALTH

## A review of the proposed approach to the assessment of Community and Other Health services

A report prepared for the Commonwealth Grants Commission

James RG Butler  
Professor and Director  
Australian Centre for Economic Research on Health  
The Australian National University

14 January 2009



Associate Professor LB Connelly  
Director, ACERH (UQ)  
T: + 61 7 3346-4838  
F: + 61 7 3346-4603  
E: [l.connelly@uq.edu.au](mailto:l.connelly@uq.edu.au)



James RG Butler, PhD  
Professor and Director  
T: +61 2 6125-3688  
F: +61 2 6125-9123  
E: [jim.butler@anu.edu.au](mailto:jim.butler@anu.edu.au)



THE UNIVERSITY OF WESTERN AUSTRALIA

Dr Rachael Moorin  
Director, ACERH (UWA)  
T: +61 8 6488-1416  
F: +61 8 6488-1188  
E: [rachael.moorin@uwa.edu.au](mailto:rachael.moorin@uwa.edu.au)

<This page is blank>

## Contents

1	Introduction.....	1
1.1	Background.....	1
1.2	Purpose of this Report .....	1
2	The Subtraction Model .....	2
2.1	Overview of the model.....	2
2.2	Clarification of 'substitution' .....	3
2.3	Crowding out .....	4
2.4	Queues and waiting lists .....	6
2.5	The NSW Resource Distribution Formula .....	9
2.6	Overall appraisal.....	10
3	Other factors affecting State or non-State expenses.....	11
3.1	State policy differences in service provision.....	11
3.2	Medical workforce supply .....	12
4	Desirable characteristics of datasets.....	13
	References .....	15

<This page is blank>

## 1 Introduction

### 1.1 Background

Following the 2004 meeting of Ministerial Council for Commonwealth-State Financial Relations, the Commonwealth Treasurer reported (Commonwealth Treasurer 2004):

A majority of the States and Territories, with the support of the Australian Government, agreed to a work program on the CGC's [Commonwealth Grants Commission's] methodology, which is used to distribute the GST revenue between the States and Territories. This work will be undertaken by Heads of Treasuries, and will draw upon the expertise of the CGC.

The review will consider:

- whether the present approach, which is based on a comprehensive assessment of virtually all receipts and expenses in the operating statements of States, is appropriate and necessary;
- the size and trend of the redistributions;
- simplification; and
- data issues.

Subsequently, the 2005 meeting of the Ministerial Council discussed the outcome of a review by the Heads of Treasuries which examined aspects of the CGC's methodology. The review found the Commission's methodology, while generally robust, could be simplified without compromising the underlying principle of horizontal fiscal equalisation. All States, with the support of the Australian Government, agreed that the Commission be provided with terms of reference to guide it in simplifying its methodology by 2010.

In reviewing and simplifying the methodology to be applied to its assessment of the health sector, the Commission proposes to group all health services into two categories – Admitted Patients, and Community and Other Health. The Community and Other Health category includes all health expenses except those related to admitted patients and patient transport. Further, in contrast to the assessment of many other categories, the Commission proposes to use a subtraction model for the Community and Other Health category.

### 1.2 Purpose of this Report

The Commission has sought independent advice from the author on three aspects of the proposed Community and Other Health services assessment:

- the conceptual validity of the subtraction model approach being proposed for the assessment;
- evidence of any other factors that may be impacting on State shares of either State or non-State sector expenses that are not being captured in the estimate of State shares; and
- important characteristics that datasets in the model should possess.

This Report provides such advice. The following three sections address these three aspects respectively. Given the importance of the proposed subtraction model to the CGC's approach in this expenditure category, by far the most attention is paid to the first aspect.

## 2 The Subtraction Model

### 2.1 Overview of the model

In assessing the fiscal capacities of the States, the CGC begins by calculating the national average per capita tax revenue and government expenditures across a range of revenue and expenditure categories. These averages are then subject to adjustment to reflect non-policy differences between the States which may affect a particular State's assessed revenue raising capacity and/or its need for State government expenditure. In the case of health expenditures, for example, a State which has a disproportionate number of older residents in its population could expect to incur higher per capita health expenditures on that account, and an upward adjustment to assessed per capita health expenditures would be included by the CGC to reflect this non-policy effect.

An issue of particular importance to assessments in the Community and Other Health category is the treatment of services funded by the non-State sector. Expenses funded by the non-State sector include those funded by the Commonwealth government, private health insurers, and private individuals as out-of-pocket expenses. To the extent that increased funding of health expenses through the non-State sector alleviates the fiscal burden of providing health services on the State sector, the extent of such non-State sector funding should be taken into consideration in determining a State's assessed per capita expenditure.

The CGC proposes to take non-State sector funding of Community and Other Health services into account by subtracting such expenditures from a State's assessed total health expenditure. A State's assessed total health expenditure is arrived by, first, calculating the national total health expenditures funded by the Australian government, State governments and non-government bodies, and second, apportioning these expenses across States to reflect State-specific age-sex distributions of the population. Location disabilities, administrative scale and any other non-policy factors are to be included in the adjustment process. Total Australian government and non-government funded health expenses are then distributed across the States to reflect the actual expenses funded from these sources in each State. Finally, the Australian government and non-government funded expenses in each State are subtracted from that State's assessed total health expenditure to arrive at the assessed expenses to be funded by that State.

The subtraction model as proposed by the CGC is based upon an assumption of perfect substitution between State and non-State funded services. By 'perfect substitution' is meant that one dollar of additional expenditure funded from non-State sources alleviates a State's assessed expenses by one dollar. This model can be regarded as a specific case of a more general 'substitution' model which can be articulated as follows. Let

$ATE_i$  = assessed total expenditure in the Community and Other Health category for State  $i$

$OE_i$  = other non-State funded expenditure for this category in State  $i$

$AE_i$  = assessed total expenditure in this category for State  $i$ , and

$\alpha$  = the substitution parameter.

The assessed expenses for State  $i$  ( $AE_i$ ) are then be calculated as:

$$AE_i = ATE_i - \alpha OE_i$$

In this more general formulation, the substitution parameter shows by how much a State's assessed expenses are reduced when an additional dollar of non-State funded services is provided. The range of possible values for this substitution parameter and their interpretation are summarised in Table 1.

**Table 1: Range of possible values for substitution parameter and their interpretation**

Value of substitution parameter	Interpretation
$\alpha > 1$	More than perfect substitution – one additional dollar of non-State expenditure causes assessed expenses to fall by more than a dollar
$\alpha = 1$	Perfect substitution – one additional dollar of non-State expenditure causes assessed expenses to fall by a dollar
$0 < \alpha < 1$	Imperfect substitution – one additional dollar of non-State expenditure causes assessed expenses to fall by less than a dollar
$\alpha = 0$	No effect - one additional dollar of non-State expenditure has no effect on assessed expenses
$\alpha < 0$	Complementarity - one additional dollar of non-State expenditure causes assessed expenses to increase

In the CGC model, the substitution parameter is set to unity ( $\alpha = 1$ ) implying dollar-for-dollar substitution between non-State-funded and State-funded services. The validity of the CGC approach can then be seen to hinge on an empirical question – does the evidence support this value for the substitution parameter? Further, if the evidence is equivocal or non-existent, is it reasonable to assume this value for the substitution parameter?

## 2.2 Clarification of 'substitution'

In appraising the CGC proposal, it is important to clarify the exact nature of the 'substitution' that underlies the subtraction approach. In particular, it is important to distinguish between the following different types substitution with respect to health services:

- a) substitution between inputs in producing any given output (e.g. between nurse practitioners and general practitioners in producing outpatient consultations);
- b) substitution between different types of outputs (e.g. substitution between different modalities of care such as inpatient and outpatient treatment); and
- c) substitution between the same or similar outputs funded through different sources (e.g. publicly funded and privately funded dental services).

The first type of substitution has been the subject of some research and has received considerable attention in policy debates in recent years in Australia. An earlier and often cited study in health economics is that by Reinhardt (1972) who investigated the productivity of general practitioners in private practice in the USA and found that doctors were underutilising nurse aides based on relative marginal products and relative wage rates. This conclusion was re-affirmed in a later study by Brown (1988), also in the USA.<sup>1</sup> In Australia, the Productivity Commission report on the health workforce (Productivity Commission 2005) provided the impetus for a growing policy debate regarding the possibility of listing various services provided by allied health professionals on the Medicare Benefits Schedule (MBS) to encourage substitution between different types of labour in providing health services.

The second type of substitution has received less attention in empirical studies. An earlier study by Davis and Russell (1972) found that the demand for outpatient treatment in the USA was positively associated with occupancy rates in hospitals and with the price of inpatient hospital treatment. However, very few other studies of this type of substitution have been undertaken. One reason for this may be that, in many countries, there is extensive insurance coverage against the cost of hospital treatment so the type of study undertaken by Davis and Russell cannot be done in other countries because of lack of data. Another reason may be that, in health service provision, the first type of substitution is considerably more important and has attracted a good deal of attention from researchers.

The third type of substitution appears to be the most relevant to the CGC subtraction model and will be considered in the remainder of this section of the Report. Limited evidence on this type of substitution has emerged from a small but growing literature that investigates crowding out between public and private funding of services. The term ‘crowding out’ refers to the effect of an increase in public funding of a service which causes a decline in private funding of the same service as consumers substitute away from, and hence are crowded out by, the increase in public funding.<sup>2</sup> Other issues that are relevant in the Australian context are the effect of queues and waiting lists on substitution, and the manner in which substitution is incorporated in the Resource Distribution Formula used in the regional funding model in New South Wales.

### **2.3 Crowding out**

One of the first studies of crowding out in the health sector was by Cutler and Gruber (1996). This study related to crowding out in insurance coverage rather than health expenditure. Their interest was

---

<sup>1</sup> Other examples are studies of the substitution between various inputs in producing inpatient treatment in hospitals in the USA (Jensen and Morrisey 1986), dental services in Norway (Grytten and Dalen 1997) and outpatient mental health care in the USA (Deb and Holmes 1998).

<sup>2</sup> The term originally developed in macroeconomics in relation to fiscal policy, and referred to the effect of a rise in government expenditures which caused a fall in, or ‘crowding out’ of, private consumption and investment expenditures.

in whether expansions of publicly funded Medicaid programs in the USA caused a reduction in private health insurance cover.<sup>3</sup> They found that 50% of the increase in Medicaid coverage was offset by reductions in private insurance (in terms of the discussion in section 2.1 above, the substitution parameter was 0.5). Subsequently reviewing the evidence on crowding out, Cutler (2002) reported that, from all studies of Medicaid crowding out of private insurance, the crowd-out was estimate to be in the range of 10-50%. This issue, however, is not settled with a recent paper by Shore-Sheppard (2005) arguing that there is little consensus about the impact of the Medicaid expansion for low income children (as opposed to mothers) and finding no evidence of crowding out in her own empirical work.

Turning to studies of health expenditure, Gouveia (1996), using OECD data on health expenditure in 24 countries from 1965 to 1989, found public expenditures crowding out private expenditures at a rate of 70 cents per dollar ( $\alpha = 0.70$ ). More recently, Aristei and Pieroni (2008), using quarterly UK data for the period 1964 to 2002, have investigated crowding out using a small number of aggregated expenditure categories. Health is included in a category with education, social protection, recreation and culture. They found that “public expenditure has a large negative contemporaneous influence on private consumer spending on health, education, recreation and social protection” (p.162). Their results, which are presented as elasticities, suggest  $\alpha > 1$  for this category, i.e. public expenditures are more than perfect substitutes for private expenditures.

While there has been no major study of crowding out in the health sector in Australia, Butler (1998) tabulated data on Medicare funded private medical services and services provided to non-admitted patients in public hospitals for selected years over the period 1985-86 to 1993-94. These data are reproduced here in Table 2. Considering first the Medicare-funded services, both the total and the per capita number of such services increased over the time period shown, with per capita consumption of medical services increasing from 7.6 to 10.1 services person between 1985-86 and 1993-94 – an increase of 2.5 services per person. However, the total number of public hospital services for non-admitted patients showed a downward trend, at least from 1987-88 onwards, with the per capita consumption of such services falling from 2.6 services per person in 1987-88 to 1.7 services per person in 1993-94. When the two types of services are summed, the overall per capita consumption of services actually declined between 1987-88 to 1991-92, from 10.8 to 10.7 services per person.

The data presented by Butler suggest that some substitution between State-funded and Commonwealth-funded medical services did take place. To be sure, over the complete time period shown in Table 2, overall per capita consumption of services did increase from 9.9 to 11.8 services

---

<sup>3</sup> Medicaid was introduced in 1965 as a Federal-State matched funding program to provide health insurance to specified low income and vulnerable groups. Within broad guidelines laid down by the Federal Government, States have considerable flexibility in the design of the Medicaid program within their jurisdictions.

**Table 2: Total and per capita numbers of services, Medicare-funded private medical services and non-admitted patient services in public hospitals, Australia, selected years**

	Total numbers of services ('000)			Per capita number of services		
	Medicare-funded	Non-admitted patient services in public hospitals	Total	Medicare-funded	Non-admitted patient services in public hospitals	Total
1985-86	121,357	37,666	159,023	7.6	2.4	9.9
1987-88	134,839	43,711	178,550	8.2	2.6	10.8
1989-90	144,736	38,209	182,945	8.5	2.2	10.7
1991-92	156,579	30,676	187,255	9.0	1.8	10.7
1992-93	172,049	33,093	205,142	9.7	1.9	11.6
1993-94	180,226	30,562	210,788	10.1	1.7	11.8

**Notes:** Medicare-funded services are private medical services listed in the Medicare Benefits Schedule and subsidised by the Commonwealth government under the Medicare program, based on year of processing, and exclude MBS services funded by the Department of Veterans' Affairs. Non-admitted patient services in public hospitals refer to services provided by a functional unit of a public hospital to a patient who is not admitted as an inpatient.

**Source:** Butler (1988, Table 3.6).

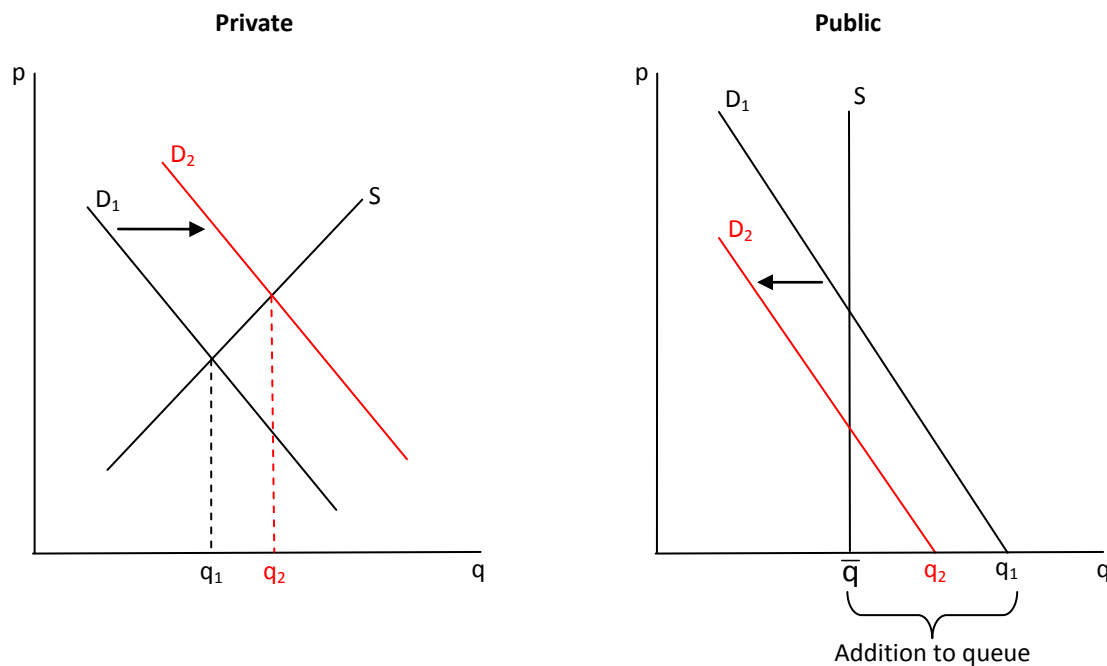
per person, an increase of 1.9 services person. However, this increase is about 25% less than the increase in the per capita consumption of Medicare-funded services alone (2.5 services per person), suggesting substitution of Commonwealth- and State-funded services has taken place. And over the four-year period 1987-88 to 1991-92, the decline in the per capita number of public hospital services for non-admitted patients was such that it more than offset the increase in per capita consumption of Medicare-funded services. This suggests that  $\alpha > 1$  for these services over this period.

Unfortunately there has been no more recent work on these data series since Butler's work was published. Improvements in the quality of the data collection on non-admitted patient services in public and private hospitals, coupled with a much longer time series now being available, imply that the extent of substitution could be investigated more thoroughly than in Butler's earlier work.

## 2.4 Queues and waiting lists

It could be argued that the extent of substitution between State-funded and non-State-funded services is constrained if there are waiting lists for State-funded services, e.g. public dental services. This argument is best illustrated with the diagram shown in Figure 1. In this Figure, the terms 'private' and 'public' refer to a service that is available both through a private market and through a publicly funded hospital or clinic. The lines labelled D are demand curves showing that, as the price of the service (P on the vertical axis) falls, the quantity demanded of the service increases (q on the horizontal axis). The supply curve S shows the relationship between the quantity of the service supplied and the price of the service. In the private market, S slopes upward indicating that higher prices can be expected to result in a higher quantity supplied. In the public market, supply is shown as being unresponsive to price, reflecting the assumption that supply of the service in the public market is independent of price.

**Figure 1: Demand for, and supply of, a medical service available through both private and public markets**



The lines  $D_1$  and  $S$  show the initial positions of the demand and supply curves in the two markets. In the private market, price will vary until demand and supply are equated and the quantity of services traded in this market is  $q_1$ . In the public market, it is assumed that services are provided to consumers free of charge so the price is set to zero. At this price,  $q_1$  publicly-funded services are demanded but only  $\bar{q}$  services are supplied, i.e. there is excess demand for the publicly funded service. In the absence of price rationing, non-price rationing occurs and those with unsatisfied demand are added to a queue or waiting list, to be supplied with the service some time in the future.

Now suppose that demand for this service in the private market increases from  $D_1$  to  $D_2$ . This may be due to, for example, a change in private health insurance coverage following a Commonwealth policy initiative. The quantity of service traded in the private market then increases to  $q_2$ . Suppose this increase in demand in the private market is a direct transfer of demand from the public market, with demand in the public market decreasing from  $D_1$  to  $D_2$  and the quantity demanded at the zero price in the public market falling to  $q_2$ . This is the case of perfect substitution as assumed by the CGC's proposed subtraction model ( $\alpha = 1$ ). However, it is apparent that the reduction in demand in the public market has no impact on the quantity of services delivered through that market which remains at  $\bar{q}$ . This is because the substitution which occurs is having its impact on excess demand in the public market by reducing additions to the queue, rather than by reducing the quantity of services provided. Fewer people may be joining waiting lists in the public market but there is no reduction in the quantity of services provided and hence no budgetary relief for the public sector.

While this may appear to challenge the conceptual basis of the CGC's subtraction model, there are two important counterarguments that mitigate this challenge. One relates to the practical importance of queues and waiting lists in the Community and Other Health services category and whether any queues which do exist reflect non-policy effects. The other relates to the conceptual argument itself. These two arguments will be considered in turn.

The provision of many services covered by the Community and Other Health category in Australia is not subject to non-price rationing. Patients receiving Commonwealth-funded private medical services through the MBS are subject to minimal queues and waiting times, and likewise for many services provided by allied health professionals. Outpatient and emergency services at public hospitals and public dental services are non-price rationed, but the availability of such State-funded services reflects a policy decision by the States as to the amount of funding to be committed to such services. This is illustrated in Figure 2 which shows the public market from Figure 1 above and incorporates a decision by the State to expand service provision sufficiently to eliminate excess demand. This causes the supply curve to increase to  $S'$  so that  $q_1$  services are now supplied and demand is fully met. A reduction in demand for publicly-funded services from  $D_1$  to  $D_2$ , reflecting substitution of services in the private market, would now be fully reflected in the quantity of services provided in the public market. The substitution that takes place does now manifest itself in terms of services provided rather than reductions in the number of people joining a queue.

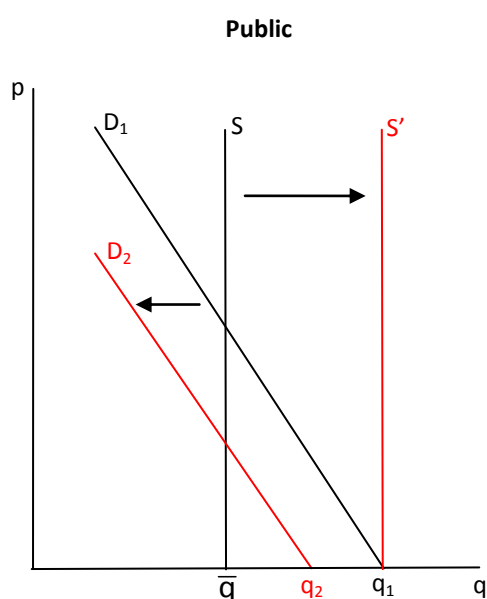
The second counterargument concerns the underlying nature of the response in the public market as illustrated in Figure 1. While it is the case that, in the presence of excess demand in the public market, the quantity of publicly funded services may not change, this actually reflects an underlying two-step process. The first step is the avoidance of a person being added to the queue and, sooner or later, receiving the service. This does generate a real resource saving to the public sector. The second step reflects a decision by the public sector to commit the resources so saved to treatment of another person on the waiting list. Hence, even in the absence of any change in the quantity of services provided in the public market (as illustrated in Figure 1), a real resource saving has occurred.

Support for the logic of this second argument and its application in a practical setting is provided by the Guidelines for economic evaluations of drugs submitted for listing on the Pharmaceutical Benefits Scheme (PBS) in Australia. Not uncommonly, new drugs lodged for listing on the PBS have evidence produced from clinical trials that they reduce lengths of patient stays in hospital or avoid episodes of hospitalisation altogether. These avoided days/stays in hospital give rise to real resource savings, and these cost savings can be offset against the cost of the drug in calculating the net cost of the drug as part of the economic evaluation submitted with the PBS listing application. The Guidelines explicitly refer to cost offsets arising from avoided hospitalisations (Commonwealth Department of Health and Ageing 2002, p.68):

The net costs are costs of any increase in resource use minus savings resulting from any improvement in outcome. Thus, for instance, an expensive drug may result in fewer hospitalisations and the net direct costs might be less than those of a cheaper competitor.

The substitution of drug therapy for hospital treatment is also referred to elsewhere in the Guidelines with regard to the financial implications of PBS listing of a drug for government health budgets. An offset against the financial impact calculation is allowed for “the financial savings in medical costs met by Commonwealth or State governments from fewer competing procedures (eg drug substitutes for an operation)” (p.43). This position is held irrespective of the existence or length of waiting lists for hospital services and whether observed hospital throughput will vary in response to the introduction of the drug.

**Figure 2: Effect of public policy decision to increase supply of publicly-funded services**



### 2.5 The NSW Resource Distribution Formula

Since 1989, NSW has used a Resource Distribution Formula (RDF) (originally Resource Allocation Formula) to assist in decision-making on the distribution of additional or new funding to Area Health Services. The current Formula divides health services into nine groups or components: Population Health; Oral Health Services; Primary & Community Based Services; Outpatients; Emergency Department Services; Acute Inpatient Services; Mental Health Services; Rehabilitation and Extended Care; and Teaching and Research (NSW Department of Health 2005).

The RDF is based upon an assessment of need for, and cost of delivering, health services in each Area. However, the factors included in assessing need and cost differ between components. In addition to need and cost, the extent of ‘Substitutable Private Sector Activity’ is taken into account in the Formula for two components only – Acute Inpatient Services, and Rehabilitation and Extended Care. While the degree of substitutability assessed for these two components is relatively high

(72.9%), no allowance is made for any substitutability of non-inpatient services in the other seven components of services.

## **2.6 Overall appraisal**

The CGC's proposed subtraction model for the Community and Other Health services category is based upon an assumption of perfect substitutability between State-funded and non-State funded services. The literature on crowding out of the private sector by the public sector in health has concentrated mainly on insurance coverage and in particular on the expansion of Medicaid coverage in the USA. The extent of crowding out in those studies has mostly been found to be in the range 10-50% although there are also studies that have found no crowding out. The few studies that have considered crowding out of private health expenditures by public expenditures suggest a value for the substitution parameter of 0.70 to over 1.0, indicating a very high degree of substitutability and supporting the CGC's adoption of the assumption of perfect substitution. An earlier Australian paper that reported time series data on Medicare-funded private medical services and non-admitted patient services provided by public hospitals also found evidence of a high degree of substitutability between the two, again supporting the CGC's proposed approach.

This Report has also considered the role of queues and waiting lists in relation to the issue substitutability. Although many services in the Community and Other Health services category are not subject to non-price rationing, some important categories of services (e.g. outpatient, emergency, and publicly funded dental services) are rationed in this way. In the presence of non-price rationing, it could be argued that expansion of the private market alleviates the length of the waiting list rather than the level of service provision in the public sector, suggesting no substitution occurs.

Two counterarguments, however, suggest that this does not invalidate the CGC's proposed approach. First, to the extent that services in the Community and Other Health category are subject to non-price rationing and hence have service provision levels that do not vary in response to changes in non-State-funded service levels, this can be considered a State policy effect. If State-funded service provision levels were increased to eliminate excess demand, substitution could be expected to occur in response to changes in the levels of non-State-funded service provision. Second, even in the presence of excess demand, the constant level of State-funded service provision and reduction in waiting lists in response to an increase in non-State-funded services provision conceals a real resource saving. Maintaining a constant level of State-funded services reflects an underlying two-step process – real resource savings being generated, and the commitment of those real resource savings to maintain State-funded service provision levels. Hence substitution of non-State-funded services for State-funded services would manifest itself in changes in levels of State-funded service if the State chose to commit the real resource savings to other areas.

Overall, considering the above evidence and arguments, it is concluded that the CGC's proposed subtraction model is conceptually valid, and that the assumption of perfect substitution underlying that model is supported by the empirical evidence that exists.

### **3 Other factors affecting State or non-State expenses**

#### ***3.1 State policy differences in service provision***

The CGC's proposed methodology first produces an assessment of total health expenses for each State, however funded. This assessment allows for need- and cost-based factors outside the control of States that affect total health expenses. The assessment of State-funded health expenses is then obtained by subtracting non-State-funded expenses from the total, on the assumption that the level of non-State-funded service provision is not affected by State policy.

Undoubtedly, differences in policy between States may affect the relative share of State-funded *vis-à-vis* non-State-funded services. For example, a State may choose to fund community health centres to provide primary health care, engaging salaried medical practitioners with no charge for consultations. This will tend to increase the share of State-funded services in that State and reduce the demand for Medicare-funded services. Another State may decide to reduce the supply of outpatient services at public hospitals on the expectation that patients can obtain such services through Medicare-funded private medical practices.

The effects of these policy differences will be reflected in the assessment of State-funded expenses. In the first case, to the extent that the State's reliance on Medicare-funded services is reduced, an upward adjustment to these non-State expenses will be made by the CGC to reflect the effect of State policy. This will result in a larger subtraction of non-State expenses from its total assessed expenses, thereby removing the effect of State policy on its assessed expenses. A similar adjustment would be made in the second example. However, in circumstances where the change in non-State expenses is not the result of State policy, no adjustment will be made for such non-policy influences. For example, a change in Australian Government policy as to what areas were designated districts of workforce shortage (therefore affecting the ability of international medical graduates working in these areas to obtain a Medicare provider number) would be considered as a non-State policy effect and therefore no adjustment would be required to non-State expenses before they are subtracted from assessed total health expenses.

The conclusion is therefore that State policy differences will not affect total assessed health expenses, but that they will be captured in the analysis through an adjustment to non-State-funded expenses and hence on assessed State-funded health expenses.<sup>4</sup> In closing however, it should be

---

<sup>4</sup> In stating that State policy differences will not affect total assessed health expenses, it is recognised that there can be an attenuated effect because the assessed standard is an internal national standard. Increased State-funded expenses then feed into the calculation of the national standard but the effect is attenuated to a greater or lesser degree according to the State's share in total national health expenses.

noted that these adjustments will be subject to the materiality requirement – if they are not material then no adjustment will be made.

### **3.2 Medical workforce supply**

The discussion in this Report has so far not considered the potential effect of supplier-induced demand on the proposed assessment model. If doctors have a capacity to generate demand for their services and cause patients to consume more services than they otherwise would, then an increase in non-State-funded services might not reflect substitution for State-funded services but rather an additional service load on top of that already provided. The proposed subtraction model will reduce the assessment of State-funded health expenses in response to an increase in non-State-funded expenses even if that increase is supplier-induced.

The extent of this problem depends upon the magnitude of supplier-induced demand. Supplier-induced demand has been a controversial topic in health economics. The general trend in the results of empirical research on the issue has been towards a downward revision in the magnitude of inducement. A penetrating critique by Ramsey and Wasow (1986) who had difficulty replicating the results of earlier work, an influential paper by Dranove and Werner (1994) who found evidence of physician inducement in a market when it almost certainly does not exist (the market for childbirths), and more recent studies employing more sophisticated econometric techniques have all contributed to this trend.

Some contemporary Australian evidence has been produced on this subject. Richardson (2001), whose work has generally found inducement elasticities at the higher end of the spectrum, estimated that the elasticity of demand with respect to the supply of GPs was 0.43 (so a 10% increase in the number of GPs would lead to a direct increase of 4.3% in demand for services, all other things constant). A very similar result (0.46) was found for GP markets in a more recent study by Peacock and Richardson (2007). In contrast, Connelly (1999) estimated a much lower elasticity of 0.17, while McRae (2008), using a panel data model, estimated the elasticity to be 0.129, leading him to conclude that inducement in GP markets in Australia is not material.

The important considerations for policy are summarised nicely in a review of the literature undertaken by the Productivity Commission: “Critical challenges in developing appropriate policy responses relate to problems with identifying SID [supplier-induced demand], the fact that SID comes in different forms and doubts about the extent of SID” (Bickerdyke *et al.* 2002, p.89). More pointedly, if SID exists, is its quantitative significance sufficiently large that markets for medical services can no longer be relied upon to achieve an optimal outcome? Is inducement sufficiently strong to overcome and counteract market forces? In his textbook, Phelps (2003, p.248) suggests not: “Market forces apparently limit actual demand inducement, however, so that many observable phenomena (such as a physician’s location) correspond closely to those that would occur without inducement”.

While the evidence base on supplier inducement in medical services markets continues to evolve, the current state of knowledge tends to suggest that the quantitative magnitude and significance of inducement is sufficiently small that it does not present a serious policy challenge in Australia. As such, it does not pose a serious challenge to the CGC's proposed methods for assessing Community and Other Health services.

#### **4 Desirable characteristics of datasets**

The CGC's assessments of State health expenses require the use of various datasets on health services in Australia. The following characteristics of such datasets are important in enabling the Commission to undertake its assessments:

##### *Comprehensiveness*

This refers to both geographic and service level comprehensiveness. The data should cover all States and territories and allow a disaggregation to the State/territory level, and should cover all health services relevant to the category. Difficulties arise, for example, with data compiled by the Australian Institute of Health and Welfare (AIHW) on services provided by hospitals to non-admitted patients - considerably less than 100% reporting characterises these data.

##### *Accuracy*

The datasets used in assessments should be accurate, that is, they should measure with precision what they purport to measure. A dataset may be less than comprehensive but might still be accurate in that the data that are included accurately measure the phenomenon of interest.

##### *Comparability*

The data should be comparable between States, e.g. the services included and excluded should not differ across the States. This is particularly important for the CGC as interstate comparisons are fundamental to its work. Data on services for non-admitted patients provided by hospitals may have problems on this criterion if their coverage varies markedly between States, for example.

##### *Consistency*

Data collections should be consistent through time. If the definitions of key variables change over time, this can introduce a random component into assessments.

##### *Timeliness*

Data should be as timely as possible so that assessments are being done in 'real time'. Basing assessments on data that are several years old may mean that States in which relevant circumstances have changed (e.g. an influx of Indigenous residents) may be disadvantaged until the assessments 'catch up' with their circumstances.

*Incapable of being affected by ‘gaming’ or State policy*

States should not be able to affect assessments by gaming behaviour that distorts datasets in their favour. An example would be recoding of certain services provided to day-stay patients as being provided to inpatients, if such re-coding benefitted the State. The incentives for gaming can be stronger in States which use incentive-based contracts and organisations attempt to re-define activities to benefit themselves.<sup>5</sup> The datasets should also either not be affected by State policy or, to the extent that they are, should be adjusted to reflect the effect of State policy (see section 3.1 above).

---

<sup>5</sup> Lu (1999) provides a discussion of the difficulties of separating gaming effects from true effects under incentive-based contracting in health care.

---

## References

- Aristei D and Pieroni L (2008) “Government consumption and the composition of private expenditure: A conditional error correction model”, *Scottish Journal of Political Economy*, Vol.55 No.2, May, pp.143-66.
- Bickerdyke I, Dolamore R, Monday I and Preston R (2002) “Supplier-induced demand for medical services”, Staff Working Paper, Productivity Commission, Canberra.
- Brown DM (1988) “Do physicians underutilize aides?”, *Journal of Human Resources*, Vol.23 No.3, Summer, pp.342-55.
- Butler JRG (1998) “Health Expenditure” in G Mooney and RB Scotton (eds) *The Economics of Australian Health Policy*, Allen & Unwin, Sydney, Ch.3.
- Commonwealth Department of Health and Ageing (2002) *Guidelines for the pharmaceutical industry on preparation of submissions to the Pharmaceutical Benefits Advisory Committee including major submissions involving economic analyses*, Commonwealth of Australia, Canberra.
- Commonwealth Treasurer (2004) *Meeting of the Ministerial Council for Commonwealth-State Financial Relations and Outcome of the Australian Loan Council*, Press Release No.016, 26 March, The Treasury, Canberra. ([web link](#))
- Connelly LB (1999) “An analysis of fee-for-service medical practice in Australia : Results for general practitioner markets”, unpublished PhD thesis, University of Queensland, Brisbane.
- Cutler DM (2002) “Health care and the public sector” in AJ Auerbach and M Feldstein (eds), *Handbook of Public Economics Volume 4*, Elsevier, North-Holland, Ch.31.
- Cutler DM and Gruber J (1996) “Does public insurance crowd out private insurance?”, *Quarterly Journal of Economics*, Vol.111 No.2, May, pp.391-430.
- Davis K and Russell LB (1972) “The Substitution of Hospital Outpatient Care for Inpatient Care”, *Review of Economics and Statistics*, Vol. 54 No. 2, May, pp.109-20.
- Deb P and Holmes AM (1998) “Substitution of physicians and other providers in outpatient mental health care”, *Health Economics*, Vol.7 No.4, June, pp.347-61.
- Dranove D and Wehner P (1994) “Physician-induced demand for childbirths”, *Journal of Health Economics*, Vol.13 No.1, pp.61-73.
- Gouveia M (1996) “The public sector and health care”, *International Tax and Public Finance*, Vol.3 No.3, July, pp.329-49.
- Grytten J and Dalen DM (1997) “Too many or too few? Efficiency among dentists working in private practice in Norway”, *Journal of Health Economics*, Vol.16 No.4, August, pp.483-97.
- Jensen GA and Morrissey MA (1986) “The role of physicians in hospital production”, *Review of Economics and Statistics*, Vol.68 No.3, August, pp.432-42.
- Lu M (1999) “Separating the true effect from gaming in incentive-based contracts in health care”, *Journal of Economics & Management Strategy*, Vol.8 No.3, Fall, pp.383-431.
- McRae IS (2008) “Doctors at work : determinants of supply and demand in the Australian GP market”, unpublished PhD thesis, Australian National University, Canberra.
- NSW Department of Health (2005) *Resource Distribution Formula Technical Paper*, NSW Department of Health, Sydney.
- Peacock SJ and Richardson JRJ (2007) “Supplier-induced demand: Re-examining identification and misspecification in cross-sectional analysis”, *European Journal of Health Economics*, Vol.8 No.3, September, pp.267-77.

Phelps CE (2003) *Health Economics*, 3rd edn, Addison Wesley, Boston.

Productivity Commission (2005) *Australia's Health Workforce*, Research Report, Canberra.

Ramsey JB and Wasow B (1986) "Supplier induced demand for physician services: Theoretical anomaly or statistical artefact? An econometric evaluation of some important models in physician service markets" in R Basmann and G Rhodes (eds) *Advances in Econometrics*, JAI Press, Greenwich, pp.49–77.

Reinhardt UE (1972) "A production function for physician services", *Review of Economics and Statistics*, Vol.54 No.1, February, pp.55-66.

Richardson J (2001) "Supply and demand for medical care: Or, is the health care market perverse?", *Australian Economic Review*, Vo.34 No.3, September, pp.336-52.

Shore-Sheppard LD (2005) "Stemming the tide? The effect of expanding Medicaid eligibility on health insurance", NBER Working Paper No.11091, National Bureau of Economic Research, Cambridge MA.