

THE EXPENSE ASSESSMENTS

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GENERAL APPROACH

- 1 This section outlines the expense assessment processes adopted in the 2004 Review, and followed in this update. Details for each expense category are in Volumes 4, 5, 6 and 7 of the 2004 Review Working Papers.
- 2 The aim of expense assessments is to estimate what it would cost each State to provide the average level service in a particular year. This amount is called its '*assessed expense*'. The average level of service is determined by the average expense per capita, which encapsulates the average policies, practices and circumstances of the States (see Box 1).

Box 1: The Commission's concept of average

The Australian average expense per capita is not a simple average of the experience of the eight States. It is calculated as the total expenses incurred by all States divided by total State population. This is a population weighted average. Population weighting gives equal weight to each Australian's experience. Since more Australians experience the New South Wales level of service, it carries more weight in the calculation of the average. 33 per cent of Australians reside in New South Wales and 1 per cent reside in the Northern Territory. Population weighting gives the experience of New South Wales 33 times the weight of the experience of the Northern Territory. This approach means that the New South Wales expense per capita has a much greater impact on the average than the Northern Territory expense per capita.

The concept of using this average also applies to the assessment of factors. If the Commission were trying to estimate the cost of providing services to Indigenous people living in remote areas, it would give most weight to the Northern Territory's experience (36 per cent of remote Indigenous people live in the Territory) and least to Tasmania (less than 0.2 per cent), Victoria (less than 0.1 per cent) and the ACT (0 per cent).

- 3 The expense assessments start from a presumption that, if all things were equal, each State could provide the average level of service by spending the average amount per capita on it — in this case, assessed expenses per capita would equal the average expense per capita.
- 4 However, all things are not equal. The circumstances of the States are different and these differing circumstances lead to differences in:
 - the use of services; and
 - the cost of providing each unit of service.
- 5 The expense assessments adjust the average expenses per capita up or down to allow for the financial impact of differences in State circumstances — but only to the extent that those circumstances are beyond the direct control of individual State governments.
- 6 The assessments use a model in which State's assessed expenses depend on the quantity of service provided and the assessed cost of each unit of service.
- 7 It is important to note that each State's assessed expenses:
 - are based on the average level of service, not the level of service a State might want to provide or actually does provide; and
 - only make allowances for the effects on the use or assessed unit cost of services that arise for reasons that are beyond the direct control of individual State governments. They

generally reflect differences in the demographic, economic and geographic circumstances of the States. Those influences are called disabilities and are presented as factors in the assessments.

- 8 A State's assessed expenses for a service are likely to differ from its actual expenses. This is because:
- it may decide not to provide the average level of service;
 - it may decide to provide the service more or less efficiently than the average;
 - its circumstances may mean it costs more or less than the average expense per capita to provide the average level of service.
- 9 The assessed expenses do not take account of the effect a State's own decisions have on the level of services provided or how they are provided. Any additional expenses or any savings arising from a State's own decisions accrue entirely to it.

ASSESSMENT GUIDELINES

- 10 In the 2004 Review, the Commission used a set of assessment guidelines to help it make the decisions required for the assessment processes. Those guidelines required it to explain how it came to a decision by making explicit the case it had accepted, the data it had used to quantify the impact on State costs and whether it had used judgment. They also required it to consider how important an assessment was, and whether it was sufficiently confident that proceeding with the assessment would improve the equalisation outcome.
- 11 The assessment guidelines cover concept, data, materiality, margin of error, and reality checking. They are as follows:

The Commission will make an assessment when:

- a conceptual basis for the existence of the assessment is established — for example, it had been established that States experience different use and cost imposts when they apply the standard policy; and
- either:
 - there is empirical evidence that differences existed between States in the levels of use and/or unit costs in providing services or in their capacities to raise revenues; or
 - there is incomplete evidence that the identified influence is causing a difference between States, but the 'in-principle' case is strong, and we judged that sufficient evidence exists and that including the assessment improves the equalisation outcome; and
- the assessment is material; and
- the margin of error associated with the assessment is acceptably small.

If the application of these guidelines leads to a decision that an assessment should be made, the Commission will undertake a reality check of the results.

- 12 In addition to those guidelines, the Commission worked on the premise that it would lean towards, but not be bound by, developing assessment methods that are:
 - as simple as possible, while not materially reducing equalisation; and
 - updateable, so that equalisation continues to be achieved in subsequent updates.
- 13 Application of these guidelines did not mean that the Commission ceased using judgment or ceased making assessments when complete data were not available. There were cases when it considered that there was a strong conceptual case for assessing a disability and that doing so would materially improve the equalisation outcome. In those cases, it often made an assessment using judgment informed by the available qualitative and quantitative information, provided it was confident about the basis of the judgment.
- 14 The guidelines required transparency about the use of judgment. They required the Commission to provide as much information as possible about the basis of its judgment.

ASSESSMENT FRAMEWORK

- 15 The assessment framework adopted for this update was the same as that adopted for the 2004 Review. The framework involved:
 - breaking each expense category into discrete components;
 - measuring the disabilities for each component (assessing factors);
 - combining the factors for each component (calculating component factors); and
 - combining the component factors to derive the total factor for the category (the category factor).
- 16 Assessed expenses were estimated by applying the category factor to the category's average expense per capita. A summary of the framework is in Box 2. Details of each step are outlined in the following sections.

Box 2: Assessment framework

Derive the average expense per capita for each service

This is the total expenses incurred by all States divided by their combined population.

Examine the services and types of expense in each category

Examine the different services and types of expense in each category to decide whether different disabilities affect their use or unit cost. If they do, and if the disabilities on each service or type of expense are materially different, the category is sub-divided into component parts to ensure that the various disabilities are accurately matched with the expenses they affect.

Identify disabilities

Identify the disabilities that affect the use or assessed unit cost of services in each component of the category and the extent to which they are beyond the direct control of individual State governments.

Measure the factors

Measure the size of each influence in each State. A State's relative disability is calculated by relating the State position to the average position. For example, for services to the aged, a State's relative disability (or factor) is measured by comparing the proportion of its population in the 60 years and over age group with the average proportion for the States as a whole. A State has a positive disability if its proportion exceeds the average proportion — that is, its factor (the ratio of the two figures) is greater than one.

Combine the factors for a component

Combine the factors when more than one is assessed for a component. When the effects of two factors compound one another, they are multiplied. When two factors are independent of one another, they are added. The combined assessment is the component factor.

Combine the component factors

The component factors assessed for a category are combined by:

- (i) weighting the component factor to reflect the importance of the component to the category. The weight (also called the '*component weight*') is determined by expressing the component expenses as a proportion of category expenses; and
- (ii) adding the weighted component factors.

Estimate each State's assessed expenses per capita

Each State's assessed expenses per capita (that is, the per capita expense it would incur to provide the average level of service to its population) is derived by applying its category factor to the average expense per capita.

ESTABLISHING EXPENSE CATEGORIES

- 17 The expense assessments cover all expenses that have an impact on the operating budgets of the State governments¹.
- 18 Expenses are classified to categories according to the purpose or function for which they are incurred. There are 39 separate categories of expenses. Those categories are defined on the basis of the government purpose classification used by the Australian Bureau of Statistics (ABS) in its Government Finance Statistics (GFS). The categories include government

¹ More precisely, they cover all expenses in the operating statements of the State general government sector. They exclude the expenses incurred by State trading enterprises (except housing) but they do include any payments from State budgets to or on behalf of trading enterprises and any amounts they pay to the general government sector.

primary schools, government secondary schools, police services, Aged and disabled services, urban transit services and debt charges.

- 19 A full list of expense categories is in Table 1. Definitions of each category are in the next section on the equalisation budget, Table A-1.
- 20 State expense data for each service are obtained from the ABS GFS. The Commission examines the data provided by ABS to verify that, as far as possible, its purpose classifications are applied consistently so that similar activities in each State are classified in the same way.
- 21 The average level of service to which all States are equalised is reflected in the average expense per capita for that service. These average expenses are the starting point for the assessments.
- 22 The average expense per capita is calculated as the total expenses incurred by all States divided by their combined population. That is:

$$\begin{array}{l} \text{Average expense per} \\ \text{capita for a service} \end{array} = \frac{\sum \text{Expenses by each State on the service}}{\sum \text{State populations}}$$

- 23 Table 2 illustrates the process using expenses on Aged and disabled services for 2006-07.

CATEGORY COMPONENTS

- 24 Most expense categories include several different services and several types of costs. Different disabilities affect the use and unit cost of each service. For example, the Aged and disabled services category consists of fixed administrative costs and costs incurred in delivering aged care services, disability support services and municipal rate concessions. Many different types of costs (including wages, accommodation, electricity, travel, freight) are incurred in providing those services.
- 25 Most categories are sub-divided into components. This allows the disabilities (the non-policy disabilities on the use and assessed unit cost of services) to be accurately linked to the expenses they affect. For example, differences in the groups of people who use services in the Aged and disabled services category mean it is divided into the following components:
- aged care services, which are delivered to people aged over 60;
 - disability services, which are provided to the disabled and those aged 60 and under; and
 - municipal rate concessions, which are provided to eligible pensioners.
- 26 Decisions on how a category is sub-divided are made after considering the types of services it includes, what resources are used in providing them, and what affects the level of expenses on each service. Expenses may be affected by how States provide the service, where they are provided and who uses them. Thus in the Aged and disabled services category, the choice of components was influenced by observations that:
- States must provide different quantities of aged care services, disability services and concessions because the size of the groups of people who use those services (measured as a proportion of the total population) differ across States; and
 - interstate differences in wage levels can have different impacts on the cost of providing each service because wages may be a different proportion of the cost for each service.
- 27 In this way, the assessment framework recognises that each category includes expenses on a number of different services, that several different types of expenses (for example, expenses on wages and materials) can be associated with each service and that the disabilities associated with each service or type of expense might be different.

Establishing the size of each component

- 28 In principle, the expenses allocated to each component in a category are identified using an approach similar to that for allocating expenses to categories. ABS GFS data for each State are examined and the expenses are classified to the appropriate components. The State amounts are summed to drive the average expense per capita for each component.
- 29 In many cases, however, the detail required to identify the expenses in each component are not available for each State in GFS. The Commission therefore uses information from a variety of sources to estimate the average proportion of category expenses relating to each

component (these proportions are called ‘*component weights*’). The data it uses include GFS data, State public accounts, annual reports of the service delivery agencies and amounts calculated in other parts of the assessments. Judgment may also be used to fill remaining gaps.

- 30 In some cases, such as the fixed costs component, the component weight can be calculated directly by expressing the aggregate fixed costs for each State (estimated as part of the process for deriving administrative scale factors — see the Administrative scale section of Volume 4 of these working papers) as a proportion of total expenses in the category. A similar situation arises for some other components, such as the costs arising from the land rights legislation in the Northern Territory, or costs imposed on the ACT by its status as the national capital.
- 31 Table 2 summarises the component structure for the Aged and disabled services category.

DISABILITIES (OR FACTORS)

- 32 Disabilities are influences beyond the control of individual States that result in a State spending more (or less) per capita than the average to provide the average level of service. Disabilities generally reflect differences between the States in their socio-demographic, physical and economic circumstances because those disabilities are usually beyond the direct control of individual State governments.
- 33 Disabilities can be broadly classified into two groups according to whether they affect:
- the use of services; or
 - the assessed unit cost of services.

Table 3 Component structure for Aged and disabled services, 2006-07

Component	Component size	How the component size was determined
	%	
Fixed costs	0.67	Calculated as total fixed costs relative to total category expenses for all States.
Aged care services	28.39	GFS data indicated these expenses were 28.6 % of total. That percentage was adjusted to exclude the proportion relating to fixed and isolation affected costs — $(28.6 * 0.9922 = 28.38)$.
Disability services	60.55	GFS data indicated these expenses were 61.0 % of total. That percentage adjusted to exclude the proportion relating to fixed and isolation affected costs — $(61.0 * 0.9922 = 60.52)$.
Municipal rates concessions	10.32	GFS data indicated these expenses were 10.4 % of total. That percentage adjusted to exclude the proportion relating to fixed and isolation affected costs — $(10.4 * 0.9922 = 10.32)$.
Isolation	0.07	Calculated as total isolation affected costs relative to total category expenses for all States.

34 In this update, disabilities that mostly relate to the use of services include:

- **socio-demographic composition** — which took account of the effects of the characteristics of State populations (such as age, sex, Aboriginality and income) on the use of services. It is sometimes the case that providing a service to some groups of users (such as Indigenous people, especially those living in remote areas, and people with low English fluency) is more costly. Those unit costs differences are also built into the socio-demographic disabilities;
- **cross-border** — which recognised the additional expense incurred by some States (especially the ACT) because the services they provide are used extensively by residents of other States. The disability also recognises that other States (especially New South Wales) need to provide fewer services and therefore incur relatively lower expenses;
- **economic environment** — which allowed for the effects on the use of State government services arising from the size or complexity of State economies or because it was uneconomic for the private sector to provide services in some parts of States; and
- **urban influences** — which allowed for the effects on the use of services arising from the concentration of population in urban centres of various sizes. It is sometimes the case that providing services in large urban areas can be more costly. Those unit cost differences are also built into the urban influence disabilities.

35 In this update, disabilities that mostly affect the assessed unit cost of services include:

- **administrative scale** — which allowed for the differences between States in the fixed costs per capita incurred in providing central office functions;
- **input costs** — which allowed for differences between States in the price of labour, office accommodation, electricity and borrowing;
- **dispersion** — which reflected the effects of the geographic distribution of population within each State on the cost of services. Generally, States with a larger proportion of their population living in remote areas had higher dispersion disabilities;
- **isolation** — which allowed for the higher costs incurred by some States because they are economically and geographically isolated from the main interstate sources of supply of some goods and services in south-eastern Australia;
- **service delivery scale** — which measured the effects on unit costs of differences between States in the proportion of services provided from small outlets where the staff to client ratios were relatively high. Generally, States with a higher number of small centres per capita had higher service delivery scale disabilities; and
- **physical environment** — which measured mainly the effects of natural hazards on maintenance costs and depreciation.

Disabilities that relate mainly to use

- 36 Disabilities that relate mainly to the use of services are specific to each component in each category. They reflect the specific influences (such as the characteristics of the potential users) which affect the use of services within a State. Where possible, they are measured using a common database, such as the population data from the 2006 Census.
- 37 A State has a positive disability if the proportion of its population, from which the user group is drawn, exceeds the average proportion for the States as a whole. The assessment assumes a direct link between the proportions of a State’s population using the service and the per capita cost of providing it. If the proportion of a State’s population aged 65 and over is 10 per cent greater than the average proportion, it is assumed the State’s per capita expenses on aged care services would be 10 per cent above average.
- 38 The way the factor is calculated varies between categories.
- Where there is a single user group, the factor is equal to the proportion of a State’s population, from which the user group is drawn, compared with the average proportion.
 - Where there are multiple user groups, each using the service more or less intensively, a more detailed approach is applied. The approach derives notional users for each State based on the average use rates for each user group². The factor is the State’s share of the total notional user population³ divided by its share of population.

$$\begin{aligned} \text{Factor}_j &= \left(\frac{U_j}{P_j} \right) / \left(\frac{U_a}{P_a} \right) \\ &= \left(\frac{U_j}{U_a} \right) / \left(\frac{P_j}{P_a} \right) = \frac{\text{State's share of notional users}}{\text{State's share of population}} \end{aligned}$$

Where U_j = Notional users in State j
 $= \sum_i \frac{U_{ia}}{P_{ia}} * P_{ij}$

$\frac{U_{ia}}{P_{ia}}$ = Average use rate for subgroup i

i = signifies a sub-group

j = signifies a State

a = signifies an Australian figure

² In many cases, there were several causes of differences in the use of services. For example, Indigeneity, income and age might affect use of a service. Where possible, weights for sub-groups with more than one common characteristic were calculated simultaneously to avoid double counting. For example, if the Commission decided that service use differed by Indigeneity and income, then a separate use weight would be calculated for Indigenous low income people, non-Indigenous low income people, Indigenous high income people and non-Indigenous high income people.

³ Calculated as the sum across all sub-groups of the population in each sub-group multiplied by the Australian use rate for that sub-group.

- 39 The calculations are based on average use rates to ensure they are not affected by an individual State’s policy.
- 40 A further allowance is made if it is more costly to provide the service to particular sub-groups and the States as a whole devote more resources to those sub-groups (such as people with low income or Indigenous people). This was done by applying the average unit cost weight⁴ to the sub-group population. A State’s factor was then equal to its share of the cost-weighted notional user population compared to its share of population.

$$\text{Factor}_j = \left(\frac{C_j}{P_j} \right) / \left(\frac{C_a}{P_a} \right)$$

Where C_j = Cost weighted users for State j

$$= \sum_i \frac{W_{ia} * U_{ia}}{P_{ia}} * P_{ij}$$

W_{ia} = average cost weight for subgroup i

i = signifies a sub-group

j = signifies a State

a = signifies an Australian figure

- 41 Further details of the approach to calculating socio-demographic disabilities are in the section on Joint Factors below and in the Socio-demographic Composition factor section of Volume 4 of these working papers.

Disabilities that mostly affect unit costs

- 42 Most of the disabilities that affect costs per unit of service (such as administrative scale, dispersion, input costs and isolation) are considered to be the same for each service. However, their effects can vary from service to service because the importance of the costs they affect within the cost structure of services varies. For example:

- wages are a higher proportion of the costs of some services than they are of others. Consequently, the interstate differences in average wage levels, which are reflected in the input costs disability, have varying effects on the relative costs of providing services;
- dispersion costs (such as freight, travel and communication costs) are a higher proportion of the total costs of some services than they are of others. So, differences in the proportion of a State’s population living in remote areas (one of the measures of population dispersion) have varying effects on the relative costs of providing services.

⁴ These cost weights reflect the extra (fewer) expenses incurred in providing services to each member of the sub-group relative to all users of the service. Where data are available, they are calculated as the average expenses per user for the relevant sub-group relative to average expenses per user across all users of the service. In cases where data are limited, the extra costs per member of the sub-group may be calculated. For example, the costs of delivering Aged and disabled services to aged and disabled people with low English fluency were assessed to be 50 per cent greater than the average costs of delivering the services to all aged and disabled people. That is, in terms of service delivery costs, an aged or disabled person with low English fluency was equivalent to 1.5 times an ‘average’ aged or disabled person.

43 In each of these cases, the Commission measured the underlying disability. But, before it was applied to each category, it was weighted to reflect the proportion of the total service costs it affected. For example:

- average wages in New South Wales were estimated to be 3.73 per cent above average in 2006-07. The wages input costs disability for the aged care services component of the Aged and disabled services category was weighted by 70 per cent because wages were 70 per cent of aged services costs. The interstate differences in wage levels mean that providing the average level of aged care services in New South Wales costs 1.02508⁵ (3.73 * 0.70) times the average per capita cost; and
- the proportion of the New South Wales population living in areas where staff might receive locality allowances under the average policy of all States was 58.5 per cent below average. The cost of remote area allowances paid by States is considered to be driven by the number of people in those areas. Remote area allowances were 0.027 of one per cent of total costs. The remote area allowances element of the dispersion disability for the aged care services component reduced New South Wales' costs by 0.017 per cent (58.5 * 0.0002). So, the less dispersed nature of the population of New South Wales resulted in the cost of providing the average level of aged care services being 0.99983 (1 – 0.00017) times the average per capita cost.

44 Table 4 contains a summary of the factors assessed for one or more expense components in each expense category.

⁵ This illustration covers only the wages part of the input costs factor. The input costs factor shown in the working papers for the Aged and disabled services category in Volume 3 is the combined effect of disabilities for wages (an underlying disability of 3.15% applied to 72% of costs or a weighted disability of 2.268% above the average), disabilities for office accommodation (an underlying disability of 18.57% applied to 2% of costs, which equals a weighted disability of 0.371%) and disabilities for electricity costs (an underlying disability of –1.76% applied to 0.5% of costs, which equals a weighted disability of –0.009%). Thus the aggregate weighted input cost disability is 2.63% above average — a factor of 1.0263.

Table 4 Summary of disabilities applied

	Socio-demographic composition	Urban influences	Administrative scale	Input costs	Dispersion	Service delivery scale	Economic environment	Physical environment	Isolation	Land rights and Native title	Cross-border	National capital	Other
Education													
4010	*		*	*	*	*			*				
4020	*		*	*	*	*			*				
4030	*		*	*									(a)
4040	*		*	*	*	*			*		*		(b)
4050	*		*	*							*		(a)
4060	*		*	*	*	*			*		*		
4065													
4070	*				*								
Health and community services													
4110	*		*	*	(c)	(c)	(e)		*				(d)
4115	*		*	*	*		*		*		*		
4120	*		*	*	*		*		*		*		
4130	*		*	*	*				*		*		
4135	*		*	*	*				*		*		
4140	*		*	*	*						*		
4160	*		*	*	*				*	*			(f), (g) & (h)
4164													
4180	*		*	*	*	*			*	*			

The expense assessments

Table 4 Summary of disabilities applied (continued)

	Socio-demographic composition	Urban influences	Administrative scale	Input costs	Dispersion	Service delivery scale	Economic environment	Physical environment	Isolation	Land rights and Native title	Cross-border	National capital	Other
Law, order and public safety													
4440	*	*	*	*	*	*			*		*	*	
4450	*		*	*	*		*		*	*	*		
4465	*		*	*	*				*		*		
4470		*	*	*	*			*	*			*	
Culture and Recreation													
4710			*	*	*		*		*		*	*	
4720	*		*	*	*		*	*	*	*		*	(i)
Economic activities													
5415	*		*	*	*		*						
5420	*		*	*	*		*		*	*			(m) & (s)
5425	*		*	*	*		*						
5430		*	*	*	*			*	*	*		*	(j) & (k)
5435			*	*								*	(h), (n) & (q)
5440			*	*	*		*	*	*	*			(l)
5450			*	*	*		*		*	*			
5455			*	*			*		*				
5490			*	*			*						
5491													
5492													(p)

The expense assessments

Table 4 Summary of disabilities applied (continued)

	Socio-demographic composition	Urban influences	Administrative scale	Input costs	Dispersion	Service delivery scale	Economic environment	Physical environment	Isolation	Land rights and Native title	Cross-border	National capital	Other
General Public Services													
5505 Superannuation													(o)
5520 GST administration #													
5525 General public services	*		*	*	*		*		*	*		*	
5530 Debt charges													(r) & (t)
5540 Depreciation	*	*	*		*	*							(g) & (h)

Other includes:

- a non-government school costs
- b grade cost
- c the hospital costs factor measures dispersion and service delivery scale
- d cost of patient travel/transport factor
- e the socio-demographic composition factor also measures the impact of economic environment
- f dispersion construction cost factor
- g natural hazards
- h wages input costs
- i marine parks factor
- j includes bridge operations, local roads, national highways, road length and road use factors
- k urban traffic management factor
- l NAPSWQ payments and State expense factors
- m water and sewerage cost factor
- n factors were assessed for pricing and capital subsidies

- o the factors assessed were accrued expenses, historical factor, cost of borrowing and quantity of borrowings
- p cellar door subsidy, low alcohol wine subsidy and other subsidies
- q concessional passenger use factor
- r ACT phase in adjustment
- s salinity factor
- t the factors assessed were cost of borrowing and quantity of borrowings
- # actual per capita assessment
- ## equal per capita assessment

COMBINING DISABILITIES

- 45 Since more than one disability is generally assessed for each service, a decision has to be made on how they should be combined.
- 46 The component structure of each category is designed to ensure that, as far as possible, expenses influenced by different disabilities are in different components. In particular, separate components are created for expenses affected by disabilities that do not generally interact with others (such as isolation, land rights, native title administration and national capital). Only one disability is assessed in each of those components.
- 47 A separate component is also created in most categories for the minimum fixed costs incurred in administration and policy development. An administrative scale and an inputs cost factor are assessed for this component. Those two factors are compounded because the administrative scale factor reflects the level of resources required to provide the minimum service and the input costs factor allows for differences between States in the prices of those resources. Thus:

$$\begin{array}{l} \text{fixed costs} \\ \text{component factor} \end{array} = [\text{administrative scale factor} * \text{input costs factor}]$$

- 48 Disabilities are usually compounded for the main service delivery components because they interact with each other. For example if a State has above average use of services and also above average cost per unit of service, the total effect on expenses is obtained by compounding the two disabilities.
- 49 The main exception is the input costs and dispersion disabilities which affect mutually exclusive cost items. These disabilities are weighted (according to the proportion of total expenses within the component affected by them) and added. They are combined by addition because the two factors influence different types of expenses and so do not interact.
- 50 The resulting combined input cost-dispersion factor is compounded with the other disabilities assessed for the component. They are compounded because the combined input cost-dispersion factor measures the cost per unit of service whereas the other disabilities (socio-demographic composition and cross border) measure the assessed use of services. Thus the component factor for each service delivery component in the Aged and disabled services category is calculated as follows:

aged care services component factor = [socio-demographic composition factor for aged care services * (dispersion + input costs – 1)]

disability services component factor = [socio-demographic composition factor for disability services * cross border factor for disability services * (dispersion + input costs – 1)]

municipal rate concessions component factor = [socio-demographic composition for municipal rate concessions]

Note: In each case, the dispersion and inputs cost factors are weighted to apply to the relevant proportion of the expenses in the component.

CALCULATING THE CATEGORY FACTOR

51 The category factor is obtained by summing the component factors, weighted according to the contribution of the component to the average expenses for the category.

52 The category factor for the Aged and disabled services category is calculated as follows:

$$\begin{aligned} \text{category factor} &= 0.0067 * \text{Fixed costs Component factor} \\ &+ 0.2839 * \text{aged care component factor} \\ &+ 0.6055 * \text{disability services component factor} \\ &+ 0.1032 * \text{municipal rate concessions component factor} \\ &+ 0.0007 * \text{isolation component factor.} \end{aligned}$$

CALCULATING ASSESSED EXPENSES

53 Each State's assessed expenses per capita for a category are calculated as the average expenses per capita for the category multiplied by the State's total category factor.

$$\begin{aligned} \text{Assessed expenses} &= \text{Average expenses per capita} * \text{category factor} \\ \text{per capita} & \end{aligned}$$

54 The State's assessed difference per capita for the category (the extent to which it has to spend more or less per capita than the Australian average to provide the average level of service) is calculated as the difference between its assessed expense per capita and the average expense per capita. The assessed difference is reflected in the extent to which the State's factor is above or below one.

$$\begin{array}{l} \text{Assessed difference} \\ \text{per capita} \end{array} = \begin{array}{l} \text{Assessed expenses per capita} - \text{average expenses} \\ \text{per capita} \end{array}$$

JOINT FACTORS

- 55 This section provides more detail on how the Commission calculates factors when more than one aspect of State demographic characteristics affects the use or unit costs of services.
- 56 The effects of many of the following influences on expenses interact:
- the number of potential users;
 - the age and gender composition of those potential users;
 - their Indigenous status;
 - their income; and
 - the size of the urban centre, or the region, in which users live.
- 57 However, a model that simply compounds the effects of separate measures of each influence could produce inappropriate interactions and double-counting.
- 58 The Commission's assessments avoid unintended interactions and double-counting by measuring the joint effects of several influences. They do so by using data on the population and users of government services that are cross-classified according to age, sex, Indigenous status, socio-economic status and other characteristics.
- 59 In this update, the socio-demographic composition factors were almost always calculated as joint factors. That is, separate use or cost weights were assessed for each population sub-group with more than one common characteristic (such as 60 to 70 year old Indigenous males with low incomes). Those cross-classifications enabled each combination of characteristics to be examined and specific decisions made about the weights to be attached.
- 60 The general approach to constructing a joint factor calculation includes the following steps:
- determine the population sub-groups relevant to the service;
 - extract population data (usually Census) for each sub-group;
 - estimate the number of users in each sub-group;
 - calculate use weights for each sub-group by dividing the number of users by the number of people;
 - estimate the amount/proportion of expenses on each sub-group;
 - calculate cost weights for each sub-group by dividing the amount of expenses by the number of users;
 - calculate the notional number of users for each sub-group by multiplying use weights, the cost weights and State populations;

- calculate each State's total user population by adding its assessed user population for each sub-group;
 - calculate each State's user population per capita; and
 - calculate a factor by dividing its per capita figure by the average per capita figure.
- 61 A specific population sub-group is included in the calculation if:
- the cost of providing services to it was materially different from the average cost; or
 - the sub-group's use of services was materially different from the average use of services; and
 - those differences could be demonstrated to be beyond the control of individual States.
- 62 The number of users in each sub-group and the cost of servicing each sub-group are measured using:
- actual data for each sub-group where it was available; and
 - estimation where it was not.
- 63 The estimation of user numbers might be based on:
- user data — for example, in Homeless and General Welfare, where the percentage of Indigenous users of supported accommodation services was known but their age-sex distribution was not, the percentage of Indigenous users was set at the same value across all age-sex groups;
 - Census data — for example, for each age-sex sub-group, the percentage of the population who lived in remote locations was calculated and used to estimate the percentage of users living in remote locations; or
 - judgment, using available evidence.
- 64 Cost per user was the variable for which least information was available. It was more common for judgment to be used to determine these figures when a strong conceptual case existed for existence of cost differentials.
- 65 The advantages of assessing disabilities jointly are that:
- the cost and use weights for each sub-group are calculated separately; and
 - the results for each sub-group were added not multiplied (there was no need to calculate age-sex adjusted use weights).
- 66 The disadvantage of this approach is that the calculations were larger. For example, if the calculation covered:
- 6 age bands;
 - 2 sex bands;
 - 2 Indigeneity bands;
 - 2 remoteness bands;

- 2 income bands; and
- 2 English proficiency bands,

67 The number of weights to be calculated would be 192 (6*2*2*2*2*2) cost weights and 192 use weights.

68 In summary, the expenses framework and the wide use of joint factors reduce the presentational simplicity of the assessment processes. However, it improves accuracy. This approach also improves the transparency of the assessments by providing extra information on the relationships between service costs and the factors that affect them and by making judgments more explicit.

A worked example of a joint factor calculation

69 This section provides details of one of the less elaborate joint factor calculations undertaken in this update. The steps described here are common to most joint factor calculations. The exposition concentrates on the mechanics of the calculation. Details of the reasons why particular data were used as the basis of the assessment are provided in the section of the working papers that describes the category assessment.

70 In the Other Public Health component of the Population and Preventive Health category the socio-demographic composition factor was calculated based on differential use rates for Indigenous and non-Indigenous people and people with low and high income and on differential costs for Indigenous people and for people with low English fluency. Table 5 shows the Australian population, derived from the 2006 Census, broken down into the sub-groups relevant to the assessment.

Table 5 Population profile

Population	Characteristics		Number
Indigenous	Low income	Adequate proficiency	236 676
		Low proficiency	9 450
	High income	Adequate proficiency	265 494
		Low proficiency	5 324
Non-Indigenous	Low income	Adequate proficiency	5 255 175
		Low proficiency	341 696
	High income	Adequate proficiency	14 303 094
		Low proficiency	282 200
Total			20 699 108

Source: 2006 Census

71 Table 6 shows the estimated total Australian users of other public health services broken down into the sub-groups relevant to this assessment. Details of the derivation of these estimated user numbers are provided in the Population and Preventive Health section of Volume 4 of the 2004 Review working papers and in the accompanying calculation sheets.

Table 6 User profile, Australia, 2006

Population	Characteristics		Number
Indigenous	Low income	Adequate proficiency	40 004
		Low proficiency	1 677
	High income	Adequate proficiency	32 839
		Low proficiency	659
Non-Indigenous	Low income	Adequate proficiency	1 294 200
		Low proficiency	84 150
	High income	Adequate proficiency	1 036 574
		Low proficiency	20 452
Total			2 512 554

72 The data in the above tables were used to calculate use rates and these are shown in Table 7.

Table 7 Use rates

Population	Characteristics		Use weights
Indigenous	Low income	Adequate proficiency	0.1775
		Low proficiency	0.1775
	High income	Adequate proficiency	0.1237
		Low proficiency	0.1237
Non-Indigenous	Low income	Adequate proficiency	0.2463
		Low proficiency	0.2463
	High income	Adequate proficiency	0.0725
		Low proficiency	0.0725
Total			0.1214

73 A cost weight of 2.49 was applied to all Indigenous people and a cost weight of 1.50 was applied to all people with low English fluency. Details of the derivation of these weights are provided in the Population and Preventive Health section of Volume 4 of the 2004 Review working papers. Table 8 shows the matrix of cost weights used in the calculation.

Table 8 Cost weights

Population	Characteristics		Indigenous weight	Low fluency weight	Combined cost weight
Indigenous	Low income	Adequate proficiency	2.4889	1.0000	2.4889
		Low proficiency	2.4889	1.5000	3.7334
	High income	Adequate proficiency	2.4889	1.0000	2.4889
		Low proficiency	2.4889	1.5000	3.7334
Non-Indigenous	Low income	Adequate proficiency	1.0000	1.0000	1.0000
		Low proficiency	1.0000	1.5000	1.5000
	High income	Adequate proficiency	1.0000	1.0000	1.0000
		Low proficiency	1.0000	1.5000	1.5000

74 Table 9 shows each State's population broken down into the population sub-groups relevant to this assessment.

Table 9 State population, 2006 Census

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT
Indigenous								
low income, adequate fluency	74 072	14 253	59 659	36 870	13 324	6 891	1 308	30 298
low income, low fluency	143	149	1 336	1 057	458	16	4	6 288
high income, adequate fluency	73 818	16 339	84 127	39 398	12 096	9 990	2 724	27 003
high income, low fluency	145	98	1 307	604	166	3	8	2 993
Non Indigenous								
low income, adequate fluency	1 744 235	1 310 037	1 040 850	476 486	454 594	157 461	51 401	20 111
low income, low fluency	149 417	120 246	26 316	19 201	21 344	1 347	2 830	994
high income, adequate fluency	4 646 976	3 575 328	2 852 806	1 467 378	1 053 088	313 295	272 720	121 503
high income, low fluency	128 375	91 860	25 146	18 052	13 135	919	3 231	1 483
Total	6 817 182	5 128 310	4 091 546	2 059 045	1 568 204	489 922	334 225	210 674

Source: ABS Census 2006

75 Table 10 shows the notional number of users for each population sub-group and State. The notional users figure in each cell of this table was calculated by multiplying the population figures shown in Table 9 by the use weight for that cell shown in Table 7 and the corresponding cost weight shown in Table 8.

Table 10 Notional users

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT
Indigenous								
low income, adequate fluency	32 719	6 296	26 353	16 286	5 885	3 044	578	13 383
low income, low fluency	95	99	885	700	303	10	2	4 166
high income, adequate fluency	22 725	5 030	25 899	12 129	3 724	3 076	839	8 313
high income, low fluency	67	45	604	279	77	1	3	1 382
Non Indigenous								
low income, adequate fluency	429 555	322 625	256 332	117 345	111 953	38 778	12 659	4 953
low income, low fluency	55 196	44 420	9 721	7 093	7 884	498	1 045	367
high income, adequate fluency	336 776	259 111	206 749	106 344	76 319	22 705	19 765	8 806
high income, low fluency	13 955	9 986	2 734	1 962	1 428	100	351	161
Total notional users	891 089	647 612	529 276	262 138	207 575	68 212	35 242	41 532

76 Table 11 shows the cost weighted notional users and the derivation of the joint socio-demographic composition factor for the 2008 Update.

Table 11 Derivation of socio-demographic composition factor, other public health services component, 2006-07

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Aust
Notional users	891 089	647 612	529 276	262 138	207 575	68 212	35 242	41 532	2 682 674
State population	6 817 182	5 128 310	4 091 546	2 059 045	1 568 204	489 922	334 225	210 674	20 699 108
Users per capita	0.13071	0.12628	0.12936	0.12731	0.13236	0.13923	0.10544	0.19714	0.12960
Raw factor ^(a)	1.00856	0.97437	0.99811	0.98231	1.02130	1.07428	0.81359	1.52108	1.00000

(a) For reasons set out in the Population and Preventive Health section of Volume 4 of the 2004 Review working papers, this factor was weighted by 50 per cent in the final assessment.

77 This chapter was prepared by the Expense — Law and Order section of the Commonwealth Grants Commission. If you have any questions about its content please contact Daniel Dwyer on (02) 6229 8856 or daniel.dwyer@cg.gov.au.

Date: 29/02/08