Health care funding in New South Wales: from health care needs to hospital outputs

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Abstract

This paper summarises the structure of the State's health care system, and then focuses on the main processes of resource allocation: needs-based funding of 17 Area Health Services, and output-based funding of specific service providers.

The general model is widely accepted by informed observers to be fundamentally sound. In particular, the resource distribution formula whereby needs-based allocations are made is a largely valid model that has been progressively refined over fifteen years and is probably as good as any in the world.

I conclude that the recent decision to require Area Health Services to use a common framework for out-put-based funding was long overdue, and that many of its features represent best practice. However, I argue that more should be done to refine some of the details and that NSW Health might need to give more consideration to ideas that have been tested and evaluated in other health care systems.

The context

The State of New South Wales (NSW) covers an area of 801600 square kilometres (about 10.4% of Australia) and had a population of 6.2 million in the 1996 Census (34.9% of the Australian total). The age distribution is shown in Figure 1, separately for Indigenous and total population.

The age distribution of the State's population differs hardly at all from that of Australia as a whole. Indeed, New South Wales is closest to the national average of any State or Territory with respect to most economic, social and demographic attributes. For example, 21.4 per cent of the State's population was under age 15 (21.6 per cent for Australia as a whole), 50.6 per cent were female (50.5 per cent), 72.8 per cent were Australia-born (73.9 per cent), 6.2 per cent were attending a tertiary education institution (6.0 per cent), and the median weekly personal income was $298 ($292).

The average annual population growth rate for the State was 1.0 per cent between 1996 and 2001, at which time the total was 6.5 million. The annual growth rate was 2.5 per cent for Aborigines over the same period.

There are more Indigenous people living in New South Wales than in any other State or Territory. In common with other parts of Australia, the Indigenous population is younger than the rest of the population. In 1996, the median ages were 19.9 for Aborigines and 34.4 years for the total population of the State.

Figure 1: Population statistics for New South Wales, 1996 Census

Age group	Males	Females	Persons	Percentage total
Indigenous				
0-4	8,315	8,173	16,488	0.27
5-9	7,708	7,319	15,027	0.24
10-14	6,790	6,446	13,236	0.21
15-19	5,306	5,125	10,431	0.17
20-24	4,937	5,093	10,030	0.16
25-29	4,269	4,868	9,137	0.15
30-34	3,828	4,365	8,193	0.13
35-39	3,270	3,695	6,965	0.11
40-44	2,703	2,990	5,693	0.09
45-49	2,239	2,324	4,563	0.07
50-54	1,611	1,644	3,255	0.05
55-59	1,165	1,242	2,407	0.04
60-64	850	949	1,799	0.03
65-69	521	694	1,215	0.02
70-74	297	390	687	0.01
75 and over	294	505	799	0.01
Subtotal, Indigenous	54,103	55,822	109,925	1.77
All				
0-4	225,288	214,002	439,290	7.08
5-9	224,299	213,920	438,219	7.06
10-14	222,372	212,007	434,379	7.00
15-19	216,359	206,369	422,728	6.81
20-24	234,578	228,714	463,292	7.47
25-29	235,915	236,664	472,579	7.62
30-34	246,593	245,083	491,676	7.92
35-39	246,509	246,612	493,121	7.95
40-44	226,751	227,153	453,904	7.32
45-49	219,654	213,602	433,256	6.98
50-54	176,284	169,624	345,908	5.57
55-59	144,457	140,822	285,279	4.60
60-64	123,508	125,398	248,906	4.01
65-69	119,029	126,433	245,462	3.96
70-74	98,092	117,234	215,326	3.47
75 and over	121,356	200,047	321,403	5.18
Grand total	**3,081,044**	**3,123,684**	**6,204,728**	**100.00**

The organisation of NSW Health

The government of New South Wales exercises its control over health care through the NSW Minister for Health. The Minister's responsibilities are specified in the Health Administration Act 1982 which defines the structure and functions of the health authority (NSW Health), and the Health Services Act 1995 which defines the service delivery elements including the area health services and various affiliated bodies operated by charitable and religious organisations.

NSW Health comprises five main types of agencies. Most important are the 17 geographically defined care provider networks termed Area Health Services, which cover the entire State. Their service populations are indicated in Figure 2.

The other organisational elements are the Corrections Health Service (which mainly provides health care to inmates of correctional facilities in the State), the Ambulance Service of NSW, the New Children's Hospital, and the NSW Department of Health (the Department). This arrangement is primarily a reflection of the way that the NSW government has chosen to allocate and manage its resources, and particularly how it has chosen to implement its needs-based funding model described below.

Figure 2: Population estimates and projections by Area Health Service

Area Health Service	Population estimates and projections			Percentage State population	Percentage change
	June 1996	June 2001	June 2006	June 2001	1996-2006
South West Sydney	731,615	785,570	834,489	12.1	14.1
South Eastern Sydney	743,133	777,913	807,210	11.9	8.6
Northern Sydney	752,339	774,938	790,975	11.9	5.1
Western Sydney	645,132	684,472	720,326	10.5	11.7
Hunter	521,785	543,304	560,406	8.3	7.4
Central Sydney	473,062	494,105	512,299	7.6	8.3
Illawarra	334,904	354,309	372,770	5.4	11.3
Wentworth	301,934	317,491	331,553	4.9	9.8
Central Coast	270,556	295,919	319,700	4.5	18.2
Northern Rivers	248,155	272,662	299,458	4.2	20.7
Mid North Coast	248,496	270,183	293,831	4.1	18.2
Greater Murray	256,658	259,736	262,355	4.0	2.2
Southern	179,002	188,015	196,650	2.9	9.9
New England	178,589	174,373	169,661	2.7	-5.0
Mid Western	165,780	168,421	170,795	2.6	3.0
Macquarie	102,771	104,946	106,313	1.6	3.4
Far West	49,983	47,029	43,857	0.7	-12.3
Whole State	**6,203,894**	**6,513,388**	**6,792,647**	**100.0**	**9.5**

NSW Health has the same kinds of responsibilities that apply to all State and Territory health authorities. The core tasks comprise the funding and operation of public hospitals and community health services, public health services, and some parts of long-term and community care. The facilities under the direct control of NSW

Health comprise about 210 public hospitals, 15 multipurpose services (small facilities mainly in rural areas that provide a mix of hospital and community services), 280 community health centres, 500 early childhood health centres, and 15 nursing homes. It also has regulatory responsibilities with respect to the operation of private hospitals and nursing homes, and public and environmental health.

The Department (the central office) has statewide responsibilities for policy development, planning, performance monitoring, and resource allocation. The chief executive of the Department, the Director-General, is the employer of all staff in NSW Health, which number over 100,000.

The Area Health Services are responsible for health service operations, within rules defined by the Department. In contrast to other states and territories, a considerable degree of autonomy is devolved with respect to methods of care delivery. For example, the Areas have considerable freedom to change the balances between health promotion and treatment, and between hospital and non-hospital services. These changes are reported as expenditure and outputs against the following program structure.

- Population health
- Non-inpatient services i.e., primary care, oral health, emergency, outpatients
- Acute inpatient services
- Mental health
- Rehabilitation and extended care
- Teaching and research.

Hospitals are defined by role, according to a set of criteria described in the NSW Health Services Comparison Data Book (NSW Health 2001f). They are summarised in Figure 4. Furthermore, classifications are applied to other types of health care facilities. Of particular relevance to this paper, components of hospitals are classified, including emergency departments and intensive care units.

A summary of inpatient hospital activity in both the public and private sectors appears in Figure 3.

Figure 3: Overview of Hospital Inpatient Activity in 1999/2000

	Separations	Weighted Separations	Day Separations	Weighted Day Separations	Bed days
TOTAL PUBLIC HOSPITALS (excluding Public Patients under contract to private facilities)					
Public Patients	1,027,234	1,063,945	427,908	201,318	3,971,594
Private Patients	130,489	149,311	51,359	23,530	543,289
Other Private Patients	55,150	70,535	21,382	9,465	346,657
Compensable Patients	13,943	20,259	4,041	2,614	70,691
Medicare Ineligible Patients	7,516	9,750	2,375	1,107	34,245
Nursing Home Type Patients	2,075	3,472	4	24	314,479
Not stated	1	1	-	-	72
Total Recognised Hospitals	**1,236,408**	**1,317,273**	**507,069**	**238,057**	**5,281,027**

Figure 3: (continued)

	Separations	Weighted Separations	Day Separations	Weighted Day Separations	Bed days
TOTAL PRIVATE HOSPITAL FACILITIES					
Public Patients treated under contract with private sector	22,024	22,101	9,803	7,050	73,480
Private Patients	516,376	451,786	318,877	157,657	1,401,294
Other Private Patients	46,918	58,889	21,862	12,589	221,456
Compensable Patients	14,135	14,475	6,640	4,819	34,499
Ineligible Patients	2,818	2,063	1,969	844	5,142
Nursing Home Type Patients	54	53	19	15	882
Not stated	7	7	6	1	45
Total Private Hospital Facilities	**602,332**	**549,374**	**359,176**	**182,975**	**1,736,798**
TOTAL STATE					
Public Patients	1,027,234	1,063,945	427,908	201,318	3,971,594
Public Patients treated under contract w/priv. sector	22,024	22,101	9,803	7,050	73,480
Private Patients	646,865	601,097	370,236	181,187	1,944,583
Other Private Patients	102,068	129,425	43,244	22,054	568,113
Compensable Patients	28,078	34,735	10,681	7,433	105,190
Ineligible Patients	10,334	11,813	4,344	1,950	39,387
Nursing Home Type Patients	2,129	3,525	23	38	315,361
Not stated	8	7	6	1	117
TOTAL FOR STATE	**1,838,740**	**1,866,647**	**866,245**	**421,032**	**7,017,825**

Figure 4: hospital, ED, and ICU levels used by NSW Health in 2000-01*

Short definitions of hospital peer groups	
A1	Principal referral acute hospitals with 25,000 or more acute casemix weighted separations per annum
A2	Paediatric specialist establishments providing acute services
A3	Ungrouped acute establishments providing acute services of a specialised nature
B1	Major metropolitan acute hospitals with 10,000 to 25,000 acute casemix weighted separations per annum
B2	Major non-metropolitan establishments providing acute specialist and referral services
C1	District Group 1 acute hospitals with 5,000 to 10,000 acute casemix weighted separations per annum
C2	District Group 2 acute hospitals with 2,000 to 5,000 acute casemix weighted separations per annum, or more than 2,000 separations per annum
D1	Community acute hospitals with fewer than 2,000 acute separations per annum, and with less than 40 per cent non-acute and outlier bed days of total bed days.
D2	Community non-acute hospitals with fewer than 2,000 acute separations per annum, and with more than 40 per cent non-acute and outlier bed days of total bed days.
F1	Psychiatric establishments
F2	Nursing homes
F3/F4	Multi-purpose services
F5	Hospices
F6	Rehabilitation establishments
F7	Mothercraft establishments
F8	Other non-acute establishments
Short definitions of emergency department categories*	
1	No planned Emergency Service. Able to provide first aid and treatment prior to moving to higher level of service, if necessary.
2	Emergency service in small hospital. Designated assessment and treatment area. Can cope with minor injuries and ailments.
3	As Level 2 plus designated nursing staff available 24 hours and nursing unit manager.
4	As Level 3 plus can manage most emergencies, including stabilisation and assisted ventilation and provide definitive care for most. Designated Medical Director with training and experience in emergency medicine. Experienced medical officers and registered nurses on site 24 hours.
5	As Level 4 plus can manage all emergencies including stabilisation and assisted ventilation, and provide definitive care for most.
6	As Level 5 plus has neurosurgery and cardiothoracic surgery on site. Sub-specialists available on rosters. Has advanced sub-specialty registrar on site 24 hours.

Figure 4: (continued)

Short definitions of intensive care unit categories*	
2	Recovery area for post-operative patients, and different high dependency area for general ward patients requiring observation above that available in general ward area. RN equivalent to 4 hours per patient-day.
3	As Level 2 plus 24-hour access to Medical Officer on site or available within 10 minutes. RN equivalent to 6 hours per patient-day. Specialist paediatrician for children.
4	As Level 3 plus mechanical ventilation and simple invasive cardiovascular monitoring for several hours. Self-contained facility providing basic, multi-system life support usually for less than 24 hours. Medical Director with training and experience in intensive care. At least one RMO available at all times.
5	As Level 4 plus mechanical ventilation, extra-corporeal renal support services and invasive cardiovascular monitoring for a period of several days. Self-contained facility providing complex multi-system life support. Medical Director accredited intensive care specialist or consultant physician in intensive care. At least one specialist accredited with appropriate experience in intensive care. Plus one RMO predominantly in the Unit and exclusively rostered to the Unit at all times. NUM with post-registration qualifications in intensive care or the clinical specialty of the Unit. All nursing staff of Unit responsible for direct patient care are RNs.
6	As Level 5 plus mechanical ventilation, extra-corporeal renal support services and invasive cardiovascular monitoring for an indefinite period. Self-contained Unit providing complex, multi-system life support for an indefinite period. Referral centre for intensive care patients. Medical Director accredited intensive care specialist or consultant physician in intensive care. Plus one RMO predominantly in the Unit and exclusively rostered to the Unit at all times. NUM with post-registration qualifications in intensive care or Units clinical specialty. Majority of nursing staff have post-registration qualifications in intensive care or Unit clinical specialty. At least 1:1 care for ventilations or equivalent critically ill. More than two RNs present in the Unit if patient in the Unit. Physiotherapy and other allied health services are accessible. Biomedical engineering services on site.

*More details are available in the 'Guide to the role delineation of health services' (NSW Health 2001e)

The three types of funding models used by NSW Health

There are three main models that can be used to allocate resources among care providers. NSW Health makes use of them all, and it is therefore important to understand their main features.

Input-based (cost- or expenditure-based) funding

This approach involves making use of information about what the provider spent (or is expected to spend) on provision of care. The cost data may relate to single episodes of care, or even components of episodes such as actual radiology or operating room procedures. Alternatively, they may be estimates of total cost of care provided over a prolonged period such as a financial year.

Regardless of the level of aggregation, cost-based models have few advantages apart from operational simplicity. There are many serious weaknesses. The most important may be that they create incentives to spend in order to generate revenues. A hospital can generate additional revenue by providing more billable services: more diagnostic tests and procedures, longer lengths of stay, and so on.

In contrast, there are few rewards for cost containment. It is often the case that many of the savings made by one health care delivery unit are passed over to other units, which are less effective in cost control.

Needs-based funding

This option makes use of estimates of the needs for care in the population serviced by the provider. The population may be defined in several ways, such as geographically or on the basis of social, demographic, or health attributes.

Regardless of the method of delineation, there are likely to be significant practical problems because the service areas may overlap. For example, a person may go to a local hospital for basic services, but to a more distant teaching hospital for specialised care. It is necessary to take account of these kinds of circumstances, which are generally termed "cross-boundary flows".

There are also significant practical problems with respect to measurement of need. In principle, it should be based on estimation of the gap between actual and desirable health status, but there is no established methodology or mechanism to support this task. In practice, needs are typically estimated by adjusting the number of persons according to age, sex, and other factors known to be correlated with health status such as remoteness and socio-economic status.

Needs-based models are attractive, because funding is not affected by the type of service actually provided. Therefore they encourage integration across different types of health care services, the shifting of resources between facilities, continuity of care, and equity.

Perhaps equally important, they encourage health care providers to measure unmet needs. For example, a hospital with more than the average number of migrants in its service area would have a financial incentive to show that they have lower than average health status, and are being under-serviced.

Output-based (or casemix-based) funding

This option makes use of information about what the hospital produced. Since the main products of hospitals are episodes of patient care, this approach is often termed casemix-based funding.

A classification is required that defines all types of hospital products. Then the level of funding is based on the number of episodes of each type, adjusted to take account of the relative costs of each type.

There are three main variants of output-based funding. Payment models involve the setting of a funding (or payment) rate in advance for each type of episode of care. Thereafter, the hospital receives that amount every time an episode occurs. It follows that the revenue of each hospital (and consequently total payments made by the funder) will change according to changes in casemix and the number of episodes.

The second model, which has been termed the budget share formula, is most relevant where a large insurer such as a State health authority is responsible for providing most of the revenue of a group of hospitals. The insurer has a fixed (or capped) total budget, and it must be shared in an appropriate way among the hospitals.

In this case, the available budget is divided among the hospitals in proportion to their casemix-adjusted workload. A hospital that has more episodes of care would receive a larger share. However, account is also taken of its casemix: episode types, which are higher-cost on the average, would count more when its share is being determined. The key distinctive feature here is that, since the total budget is fixed in advance, only the shares for each hospital would be affected by changes in volume or casemix. If more patients were processed, or if casemix became more complicated, hospitals would normally have to do the extra work without additional compensation.

The third model for casemix-based funding has been termed the purchasing formula. Its main distinctive feature is that contracts are negotiated between multiple funders (or purchasers) and providers in respect of groups of patient care episodes, rather than for each one in turn.

All forms of casemix-based models present technical difficulties associated with the requirement to determine a comprehensive classification of products, and to update it regularly to take account of changes in clinical practice. Nor is there any direct encouragement of equity of access and provision.

However, there are extremely important potential benefits. In particular, there is increased equity of funding across hospitals and other health care units. Incentives are created for cost containment, because revenues are not automatically cut if costs are reduced. Third, greater opportunities are provided for clinician involvement. The knowledge they possess and their role in data capture become crucial to the financial wellbeing of the health care facility.

Funding of areas: the Resource Distribution Formula

The key component of health services funding in New South Wales is a needs-based model called the Resource Distribution Formula, or simply the RDF. In this section, I will briefly summarise the history of the RDF, and then describe its current features.

I have drawn heavily on official documentation from the Department. In particular, much use has been made of a paper issued in 1999 (NSW Health 1999). It is available in full on the Department's website (health.nsw.gov.au).

A brief history of needs-based funding in New South Wales

Like other state health authorities, NSW Health had traditionally funded hospitals largely on an input basis. There had been a growing concern about this approach, for the kinds of reasons noted above. NSW Health had therefore begun to consider possible improvements in the 1970s.

There were also some particular reasons. The most important was a realisation that needs for health care had been changing as a consequence of demographic trends. There had been a rapid growth of population in the western suburbs of Sydney, while populations were relatively stable or declining in the older areas of Sydney where most of the hospitals were located. Similar problems existed in some retirement areas with rapid population growth like the Central Coast, and the elderly are known to be high users of hospital services.

By the mid-1980s, NSW Health had already decided in principle to change to a form of needs-based funding that was based in part on the Regional Allocation Working Party (RAWP) model introduced in the United Kingdom a decade earlier. In brief, the main ideas were as follows:

- parts of the State (Areas) would be defined on a predominantly geographical basis (although other factors might be taken into account including the actual distribution of health care facilities)
- government health care services would be re-arranged, so that each Area had a single agency (to be called an Area Health Service or AHS) with responsibility for all kinds of health services
- each AHS would receive a share of the available health care budget in proportion to the relative needs for health care of the resident population of its Area.

The first version involved the creation of two main types of service areas, called Areas and Districts. Over the last decade, they have been adjusted several times, and now comprise 17 Area Health Services (termed Areas in the remainder of this paper). Various elements have been excluded from the scope of the funding model over the years. At the time of writing, the major exclusions are the New Children's Hospital, Corrections Health, the Blood Transfusion Service, and the Ambulance Service.

The first model, which was activated in 1988, was called the Resource Allocation Formula (RAF). The measure of need was the total resident population in each area with adjustments for differences in attributes that predict per capita variations in need such as mortality, age, sex, nursing-home-type workload, usage of private hospitals, and interstate flows. The focus was on prediction of needs for hospital services, and other elements of the health care system were largely ignored.

It was agreed that the model should not be fully implemented immediately, because of the high level of investment in infrastructure. Most obvious, the teaching hospitals in central Sydney could not suddenly be closed or reduced significantly in size, and the equivalent infrastructure created in growing areas, without major losses in efficiency and effectiveness. The RAF would therefore be progressively implemented over several years, as opportunities arose to do so without loss of performance of the health care system as a whole. It was envisaged that the transitional period would be ten years.

It is interesting to note that some people believed the new model would be sufficient in itself. Not only would input-based funding disappear, but there would be no need to make use of output-based funding - which was generating considerable interest in other parts of Australia at the time. This erroneous view was not formally acknowledged until 1992, when NSW Health published two policy papers that stated

- casemix data should be used to facilitate improvements in the RAF
- an output-based funding approach should be dominant for the purpose of allocation of budgets to health care facilities within each Area.

Refinements of the detail of the RAF were made each year, both in terms of data and the computational formulas. Inter alia, several important changes were made as a consequence of a policy statement titled the New South Wales Government's Economic Statement for Health (NSW Health, 1995). The refinements in this period included

- renaming the model the Resource Distribution Formula (RDF)
- incorporation of measures of actual service provision (production) measured largely by DRG
- splitting of the model into two main parts, tertiary services and other (primary and secondary).

The last point is important. The funding for primary and secondary health services was to be distributed on much the same needs basis as in previous versions. However, funding for tertiary services would take partial account of actual service use defined by DRG data. Note that tertiary services are restricted to a subset of hospitals that are defined to be tertiary as noted above. However, not all patients in tertiary hospitals are 'tertiary' in the context of the RDF. Rather, a subset of the more complicated DRGs is used for identification.

The main aim was to estimate the additional costs incurred by the areas in Sydney because they were net importers through cross-boundary flows (and had some additional costs associated with higher severity and teaching functions), and to pay additional amounts to those areas before splitting the funds among the areas and districts. This reflected the reality that many kinds of tertiary services were actually (and in some cases probably should continue to be) located in a subset of Areas.

The structure of the current model

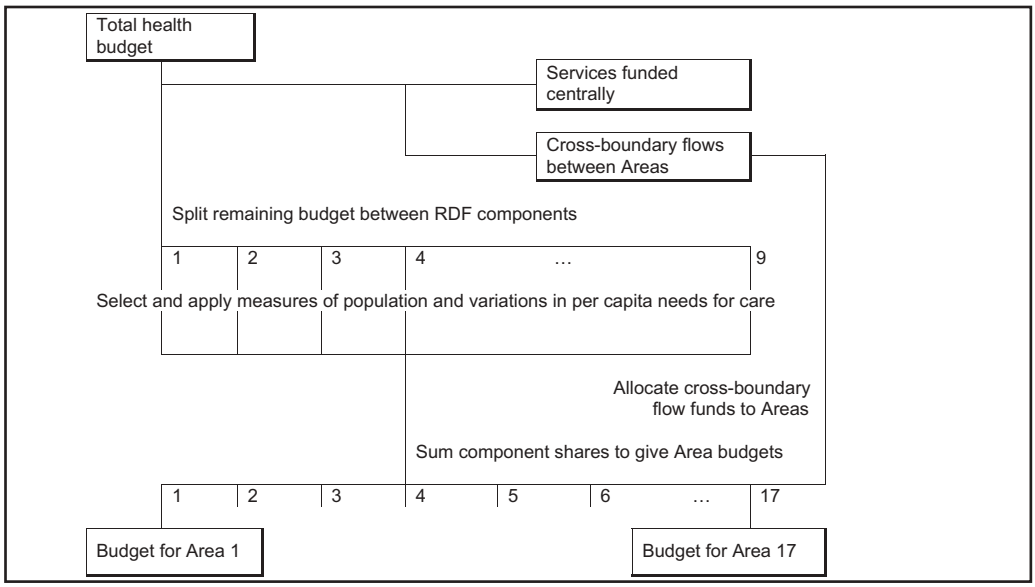
As noted above, the model is under continual review. NSW Health has a committee that is required to consult widely and make recommendations for change on an annual basis. The model described below applied to financial year 1998-99. I have drawn heavily from Departmental documentation throughout this section (NSW Health 1999).

The key steps in application of the RDF are summarised in Figure 5. The first step involves deciding the services that should be funded mainly according to needs (and hence allocated by use of the RDF). Some resources are excluded at this stage.

A key element is removal of funds that are associated with cross-boundary flows between Areas. In principle, each Area's allocation would reflect the needs of its resident population, and payments would be made when any of the residents received care outside of the Area. In practice, NSW Health removes some of the funds before allocations are made, and subsequently allocates them among the Areas that have net inflows of patients from other Areas.

The second step involves dividing the available resources among nine types of health care services. This is necessary, because different allocation rules apply. In other words, the RDF is actually a set of similar models, each of which applies to a different set of health service needs.

Figure 5: outline of budget allocation process



The third step involves applying the measures of need to each of the components in the model, in order to split the total budget for the component among the Areas. The two main tasks are selection of the best measures of population and of predictors of per capita variations in need.

The proposed funding shares for each area are then determined by summing the allocations across the components of the RDF, and adding the allocations that originate outside the RDF (that is, from budget elements that were excluded in the first step). Note, however, that final budget allocations take account of other factors in addition to the RDF computations.

NSW Health is committed to full implementation of needs-based allocations to Areas. Progress towards this goal is indicated by the mean difference between the budgets an Area actually received and the amount computed by the RDF model. This fell from 10 per cent in 1994-95 to 4.4 per cent in 1998-99. The three-year 'growth funding' announced by the NSW government in 2000 is directed in part at ensuring that no Area is 'underfunded' by more than 2 per cent by 2002-03. It is envisaged that growth funding in subsequent years will be directed for the most part to those areas with the largest population increases including the west of Sydney and the central and northern coasts.

Cross-boundary flows

There are two categories of service provision that are outside the Area: interstate flows, and flows between Areas. Each of these is discussed in turn below.

Interstate patient flows

There is a net outflow - that is, more residents of New South Wales receive treatment outside the State than enter it for care. As a consequence, NSW Health makes a net payment of around $50 million per annum under intergovernmental agreements on interstate flows.

The Central Office pays for these patient flows under the terms specified in the Australian Health Care Agreements. The amounts are computed on a per case basis. NSW Health has recently introduced a refinement whereby total payments to the Australian Capital Territory are capped. A similar approach is being considered for flows involving other States and Territories.

NSW Health wants the Areas to play a greater role in managing interstate flows in due course. Inter alia, this would create a financial incentive to provide services within the Area where it is cost-effective to do so. The

Areas are better placed to make decisions on these matters than the Central Office. This matter is currently the subject of negotiation, and it is hoped that responsibilities will be transferred in the near future.

Flows between Areas

Actual flows in previous years are used as the basis for estimation of flows in the next financial year. Each Area gains or loses the net value when its budget allocation is determined.

This approach is administratively convenient, and it protects the Areas with large net inflows (mostly in central Sydney) from sudden or unpredictable losses of revenue. However, it restricts innovation and deters Areas from giving thorough consideration to increasing the convenience of access to services for their residents. As for interstate flows, discussions are taking place between the Central Office and the Areas, with a view to devolution to the Areas of responsibility for managing the flows in 2001-02.

Excluded funds

In principle, all available resources should be distributed according to a general measure of need that applies to all Areas. In practice, it makes sense to apply different rules for some types of funds, as follows:

- where funds are not directly linked to services provided by Areas (such as Central Office services)
- where there are externally applied rules that govern allocation (such as those applied by the Commonwealth Department of Health and Aged Care)
- where the services to be provided are unique to a subset of Areas
- where the funds are raised by an Area through its own efforts, and where redistribution would remove the incentives to raise such funds (as in the case of competitively earned research grants or general fund-raising projects).

The services with significant costs that are funded outside the RDF are listed in Figure 6. Most of the large-cost elements need no explanation - such as head office functions, Corrective Health Services, and the Ambulance Service. The New Children's Hospital is funded directly by the Department using the episode funding guidelines for acute care (see below) and adjustments to historical expenditures for other services.

Figure 6: services whose funding is outside the Resource Distribution Formula

Statewide services and activities	
Head Office functions	Bone Marrow Registry
Health Care Complaints Commission	Cervical Cancer Screening
Corrective Health Services	Breast Cancer Screening
Ambulance Service	Aboriginal Health Promotion
Services not related to population needs	
Commonwealth Casemix Development Grants	Ambulatory Care Reform
State Casemix Development Grants	External Research Grants
Nationally targeted services and activities	
Health Outcomes	National Mental Health
National Drug Strategy	National Women's' Health
Female Genital Mutilation	
Other	
New Children's Hospital	Managed Fund Insurance benchmark premiums
Special Purpose and Trust Funds	Non-Government Organisations
Patient Access Scheme	State Government Nursing Homes

The liability and other insurance premiums that cover Area operations (termed Managed Fund Insurance benchmark premiums in New South Wales) are also excluded. This is because the risks (and consequent premium levels) are largely unrelated to the health care needs of each Area's populations.

Funding to Non-Government Organisations (NGOs) is excluded because their location is largely outside the control of Areas. They should therefore not be penalised for having NGOs (particularly those NGOs providing services to more than one Area) located within their boundaries.

The treatment of care provider revenues

There are two main options with regard to the treatment of revenues. First, they could be returned to NSW Health, and would then be included in funds to be distributed using the RDF. Second, revenues could be kept by the Area where they are generated, and then an equivalent amount removed from the budget computed by use of the RDF.

After 1992, Areas were able to keep the revenues they generate locally, excepting revenues from patient fees. In 1997, the underwriting of patient fees was discontinued and Areas now have to meet any shortfalls, but they can keep revenue in excess of budget to fund additional services.

It has been decided that the revenues that Areas generate should be taken into account when determining needs-based budgets. This is because an Area's locally generated revenues reduce the need for external funding from the State budget. Some Areas have more opportunity to generate revenues than other Areas, and they would consequently have a financial advantage if revenues were ignored.

There have been opposing views. In particular, it has been argued that, if revenues are taken into account, Areas have less reason to make the effort to generate income. Moreover, it has been noted that Areas incur expenses in order to generate local revenue, and this has not been taken into account in the needs-based funding process.

Splitting of the budget according to RDF component

As noted earlier, the RDF comprises a set of nine component models, each of which requires the use of different measures of need. Other factors have, however, affected the classification of components including NSW Health's program structure. Programs have been defined to serve several purposes including strategic management of resource allocation according to policy objectives.

The basis for splitting funds among the components of the RDF is the pattern of actual expenditures in a recent period. NSW Health argues that this is appropriate: the RDF is not intended to be used to "... achieve allocative efficiency across programs" because this is a task best left to each AHS.

Figure 7: expenditures by component of the RDF (based on 1996/7 program expenditures)

Component	Percentage total expenditure	Adjustments for cross-boundary flows?
Population health	0.65	No
Non-inpatient services:		
Oral Health Services	1.40	No
Primary and community-based	6.94	No
Outpatients	10.07	Yes
Emergency Department Services	5.18	Yes
Acute inpatient services (including indirect teaching and research)	57.40	Yes
Mental health	7.26	(Admitted patients only)
Rehabilitation and extended care	9.77	(Rehabilitation only)
Teaching and research (direct expenditures only)	1.33	No
Total	**100.0**	

The relative magnitude of the nine components is shown in Figure 7. There has been a trend over recent years towards increased spending on population health, primary and community services, outpatient services, and teaching and research. Acute inpatient expenditures have experienced the largest fall in relative share, but continue to be the most important component by far.

The expenditure data vary considerably in terms of their accuracy. In recent years, the least accurate have been measures of spending on teaching and research. Several adjustments have had to be made to increase the plausibility of the statistics.

Population estimates and projections

Since activation of the RAF in 1988, there has continued to be the need to make use of the best source of population estimates, and to project those estimates where they are not updated on an annual basis. Every year, the RDF-RAF has experienced difficulties in ensuring that unintentional imprecision did not lead to serious inequities.

An example is the set of data used in the 1996 formula. They depended heavily on estimates from the 1991 Census, projected to 1996. It was subsequently shown that the projections had substantially underestimated Sydney's population and overestimated the population of non-metropolitan Areas including Hunter and Illawarra. Every Area in Sydney had grown faster than the projection except Western Sydney where land releases for new housing were slower than expected.

The typical approach to population estimation may be illustrated by the calculations used for the RDF for 1998-99. Interim population projections were made that were based on the 1996 Census results. Population projections for NSW are issued twice every five years by the Population Projections Group (PPG), an interdepartmental committee convened by the Department of Urban Affairs and Planning. The projections are made by State Regions, which differ to a significant extent from the Areas.

Because the PPG would not be producing its next set of projections until late-1998, the Department commissioned consultants to develop a set of interim population projections for use in the RDF. Once the PPG projections had become available in 1999, the Department recalibrated the interim projections, although there were no significant changes. The projections were made separately for Sydney and for the remainder of the State.

It was then necessary to undertake a cohort component projection by Area taking into account age/sex specific mortality, interstate and overseas migration and the fertility rate in conjunction with a factor reflecting the level of new housing developments. The final step involved projecting the age and sex profiles for each Area.

Adjusting populations for per capita variations in health care needs

In the early versions of the RDF, health need was estimated by the use of age, sex and mortality rates. Over time, refinements have been made to the functional form of the model, and other socio-economic and geographic variables have been added.

In recent years, a composite model has been introduced called the Generic Need Index. This is intended to cover all the factors that affect per capita needs for acute health care that cannot be explained by an Area's age and sex composition. The Generic Need Index has the following structure:

Generic Need Index = 97.51 + 0.4 (SMR < 70) - 0.4 (EDOCC) - 0.9 RUR

where

SMR<70 is the indirect standardised mortality ratio for age less than 70

EDOCC is the socio-economic index developed by the Australian Bureau of Statistics (ABS) which measures the level of 'education achieved and occupational status'

RUR is the rurality (health-related rural status) index calculated by Eckstein and Gibberd (1994) specifically for the RDF.

The Generic Need Index was derived by regression analysis of NSW inpatient statistics. The dependent variable was hospital utilisation measured by the standardised DRG-weighted separation ratio and the independent variables were mortality, rural-urban differences and socio-economic status. The data were analysed over 154 local government areas (LGAs).

Indirect SMRs are calculated by applying the age/sex-specific death rates in the NSW population to the Area population to obtain the expected number of deaths. Indirect SMRs are used because they are generally regarded as more robust, especially for small Areas, and are also used by the ABS for a range of comparisons across LGAs and ethnic populations.

The measurement of rurality was constructed by first assigning each LGA to one of four zones: remote, rural, major urban, and metropolitan. The zones were defined in a 1990 study by State government departments.

The LGAs defined to be remote or rural were then further categorised according to distance from a referral or base hospital and land use. For distance, a "distant" category was defined where there was a journey of over one hour by motor vehicle to a referral or base hospital. One hour equated to a distance of between 70 and 120 km depending on terrain. A "very distant" category represented over three hours' drive or 300 km.

For land use, a farming community was considered to be one where over 40% of the population were employed in agriculture. If the proportion was less than 25%, the community was considered to be non-farming. Very few communities were between 25 and 40% and these were classified as "mixed".

Major urban LGAs were split according to the presence of a referral hospital. Finally, metropolitan LGAs were split into "outer" or "built-up" areas. The "built up" areas were further segregated according to population density as measured by the mix of single or multi-dwelling housing sites. The "outer" category was further split depending on whether a referral hospital was within the local area.

The rurality index was the strongest single predictor of utilisation, followed by SMR and socio-economic status. In combination, the three variables produced a coefficient of determination of 57%. Values for the Generic Need Index ranged from 168 in the Far West to 82 in Northern Sydney.

The Generic Need Index is applied to five of the nine components of the RDF: population health, primary and community based services, outpatients, emergency and acute inpatients. Different measures of relative need are used for the oral health services and rehabilitation and extended care services components.

Summary of the nine components of the RDF

Population health services

The budget for population health services is distributed according to a formula reflecting population, the Generic Need Index, an Aboriginality (Aboriginal and Torres Strait Islander, or ATSI) factor, and a homeless factor. No adjustment is made for cross-boundary flows, because population health services are directed to the population at large and not to treatment of individuals.

Although the Generic Need Index has been applied, it is recognised that further work is required to understand its relationship to the use of these services. There is less uncertainty about the relevance of an adjustment for Aboriginality. An estimate of the ATSI population was obtained from the ABS 1996 Census (although the data are based on place of enumeration and not usual place of residence - which would clearly be more appropriate). The population values were then weighted by 2.5. As the ATSI population is already counted in the population for the Area, the factor effectively adds 1.5 times the value.

The homeless factor has been applied in a slightly different way, because the homeless are not counted in the resident population. A weighting of 2.5 is applied to the estimated homeless population and then the result is added to the total Area population. Estimates of the homeless population have been obtained from a Department of Community Services survey. In 1996, the ABS launched the Homeless Enumeration Strategy, which has led to the production of much more accurate estimates.

Oral health services

Other than specialist dental surgery undertaken on an inpatient basis in hospitals and some Teaching and Research Funding, Oral Health Services expenditure is currently handled under the program "Primary and Community Based Services". However, as expenditure on Oral Health Services is not reported separately to the Department, the pool of funds for this component is based on the annual allocation given to Areas specifically for oral health services. Expenditure of the two dental hospitals is included within this program.

The need for services in this category is estimated in three main parts, as follows:

oral health services for children aged 0-14 years

oral health services for adult health care card holders

teaching and research and specialist activities of the two dental hospitals.

The formula for children applies a relative need index based on the caries experience by Area for 1997, using the decayed-missing-filled teeth rate as the indicator of dental health status. A factor for the higher need in rural Areas is also applied, as are weightings for the higher needs in the ATSI and non-English speaking background (NESB) child populations.

For adults, the target population is the total number of adult concession cardholders by Area. The eligible adult population is then split into two sub-populations: those with dental caries and those requiring dentures. Further weightings are applied for rurality and Aboriginality.

Apart from the dental hospitals and services provided by Central Sydney to eligible adult cardholders of South Eastern Sydney, no adjustment is made for cross-boundary flows. It is assumed that dental services are mostly provided to Area residents.

Primary and community-based services

This component of the model uses six variables: age, the Generic Need Index, Aboriginality, homelessness, NESB, and population dispersion. Age groups are weighted as follows:

0 to 14 years:	3
5 to 64 years:	1
65 years and over:	4

In the absence of suitable information for all Areas, the judgements of a group of Public Health Officers were used to derive the age weights. Another complexity is that the boundary between this component and the Rehabilitation and Extended Care program is unavoidably imprecise.

The Generic Need Index has been applied to this component. However, NSW Health recognises that further work is required to understand the relationship between the utilisation of these services and population characteristics.

A weighting of 2.5 has been applied for Aboriginal people and homeless people. The Northern Rivers AHS has been given an increase in its allocation to reflect a flow of patients from southeast Queensland. Other adjustments have been made for Ethnic Health Workers and Interpreter Services.

A dispersion costs factor has been included in this component. This factor captures the higher costs of providing services in rural and remote areas of NSW. I will discuss this further in the context of the acute inpatients component below.

No adjustments have been made for cross boundary flows. NSW Health argues that they are minimal and best addressed through local arrangements between affected Areas. However, flows may be measured in future, when appropriate casemix classifications are available for primary and community based care and data are able to be routinely collected.

Outpatient services

This component of the model uses six main variables: age-sex adjustments based on the 1994 Outpatient Survey, the Generic Need index, Aboriginality, homelessness, HIV/AIDS, radiotherapy and other Statewide Services. Use is made of the Generic Need Index, and the weightings for Aboriginal people and homeless people, in much the same way as for primary and community-based services.

Expenditures for HIV-AIDS services are included in this component, although they are a mix of outpatient, population health, acute inpatient and palliative care services. The main factor used to distribute resources is HIV/AIDS prevalence. Funding for radiotherapy, MRI and other specialist statewide non-inpatient services is also captured under this component reflecting the current distribution of these services and catchment populations.

An adjustment is made for cross boundary flows. It is based on 10% of the cost of net inpatient cross boundary flows. The Department intends to begin the routine collection of outpatient data by clinic type from 2001-02, and this will allow the flows to be measured more directly and precisely.

Emergency Departments

The formula for Emergency Departments (EDs) makes use of five main variables: age-sex adjustments based on application of ED cost weights to Triage Category data, the Generic Need Index, Aboriginality, homelessness, and population adjustments relating to tourist and working population effects.

Sample survey data from EDs were used to calculate age and sex weights. The analytical approach took account of a study by Erwicj-Nijhout et al (1996) which reported on the variables that are important in explaining ED costs. Priority (triage category) and outcome (admitted, died, or dead on arrival; discharged; did not wait) explained around 40% of cost variation. Addition of an age grouping (<15, 15-34, 35-64, >64) increased this to 50%. The cost weights were applied to the routine data on volumes of ED attendances to give the required age-sex weights.

The Generic Need Index, Aboriginality, and homelessness were applied in much the same way as for outpatients. Further adjustments were made for tourism populations, flows across the Queensland border, and itinerant workers in three rural Areas.

An adjustment was made for cross boundary flows for these services. It was set at 5% of the cost of net inpatient flows. It is intended that a better basis will be established in the near future, as a consequence of the progressive extension of computerised data systems in EDs.

Acute inpatient services

The formula for acute inpatient services is by far the most complicated, and this is justified if only because of the dominance of this component in terms of allocated funding. The main variables are shown in Figure 8.

Figure 8: the main factors used in allocating resources for acute inpatient services

For general acute services:	Age and sex weightings Generic Need Index
For tertiary acute services:	Age and sex weightings using HCCC AN-DRGs
For obstetric services:	Age weightings using obstetrics AN-DRGs and actual births Fertility rates for each Area
Private hospital substitutable activity	
Private patients in public hospitals	
Health service ambulance costs	
The Isolated Patient Transport and Accommodation Assistance Scheme	
Patient severity and indirect teaching and research	
Specialist paediatric services	
Nationally funded centres	
Dispersion costs factor	

Age-sex weights are derived from the hospital inpatient data collection. The weights for 'tertiary services' are based on casemix-weighted separation rates for a defined list of high-cost and complex DRGs (termed HCCC services). The weights for 'general services' are derived from casemix-weighted separation rates for all other DRGs (but excluding obstetric DRGs). Separations occurring in freestanding day only private hospitals with a cost weight greater than 0.5 have been weighted at 0.5.

For obstetric services, use is made of the age-specific fertility rate, which is a measure of births per woman. Obstetric demand is more closely related to life cycle factors than chronological age. Fertility is higher in the outer metropolitan zones because people tend to change residence when they enter the family formation stage of the life cycle. The Generic Need Index is applied only to general acute services.

'Private hospital substitutable activity' refers to acute inpatient services provided in private hospitals. Because private hospitals are not funded from Area budgets, a casemix-weighted level of activity is deducted from the total expected activity for the Area.

Not all private hospital activity is counted. Some services, including cosmetic surgery and various diagnostic tests that would normally be performed on an outpatient basis, are defined to be 'non-substitutable' and therefore not taken into account.

There are adjustments for the number of private patients treated in public hospitals. NSW Health believes there are lower costs for public hospitals when they treat privately insured patients. This is mainly due to medical costs being met in part by the patient, private health insurers, and the Commonwealth. The RDF therefore discounts these episodes. In 1998-99, the discount factor was 88%.

Ambulance costs incurred by Areas vary with distance to services. For example, remote areas are more likely to require fixed wing aircraft for rapid retrieval and long-range land ambulance transport for less urgent cases. Thus the proportion of budget required for transport rises with increasing distance from metropolitan centres, and this is taken into account in the RDF. A similar approach is applied to the Isolated Patient Transport and Accommodation Assistance Scheme (IPTAAS).

Account is also taken of the related factors of severity of illness, and indirect teaching and research costs. With respect to severity, the aim is to adjust for the tendency for higher-level referral hospitals to treat more complicated and costly patients within each DRG. The indirect teaching and research factor is intended to adjust for the higher costs of providing care in a teaching hospital for such reasons as the tendency for medical students to order more diagnostic services.

A relatively crude approach is taken. In short, it is assumed that efficiency levels of principal referral hospitals are equivalent to those of other hospitals on the average. Therefore any difference in actual overall costs between these two groups of hospitals is an indication of the effects of severity and indirect teaching and research.

The RDF approach therefore comprises little more than measurement of the difference in total costs (which was $191 million in 1996-97), and distribution of this amount according to each hospital's share of high-cost and complex DRGs. There are several complications in practice, which add to the validity of the allocation method. However, a fundamental weakness remains: this element of the model allocates resources largely on the basis of actual costs rather than according to an independent estimate of the need for care.

A similar approach is taken with regard to specialised paediatric services. As noted above, the New Children's Hospital is excluded from the RDF. However, there are also specialised paediatric services at Sydney Children's Hospital and John Hunter Hospital. An adjustment is made to the allocations that is based on their unexplained costs.

Nationally Funded Centres are directly provided with budgets that reflect their specific services. Therefore the patient flows to these facilities are removed from the RDF, together with the associated costs. In recent years, the services have comprised heart-and-lung transplants (St Vincent's Hospital), liver transplants (Royal Prince Alfred Hospital, and the Royal Alexandra Hospital for Children), cerebrovascular embolisation (Royal Prince Alfred Hospital, and Royal North Shore Hospital), and pancreas transplants (Westmead Hospital).

A variable called the 'dispersion costs factor' is included that is intended to reflect the higher costs of health care services in rural and remote regions. It is based on the method used by the Commonwealth Grants Commission.

The core of the adjustment involves identification of services whose costs are affected by dispersion such as telephone calls, travel in connection with the provision of services (by motor vehicle and air), transportation costs for materials, and compensation of staff for working in remote locations.

For each cost item, the RDF calculates a set of distance-weighted population units to form an index of relative dispersion for each Area. This index is applied to the Statewide per capita cost for each of the cost items (based on reported data for 1997-98) to give an estimate of total expected expenditure on these items for each Area. The aim is to estimate the marginal additional costs of these components, and therefore only those Areas with costs above the average per capita cost in metropolitan Areas for each cost item were included.

Finally, cross-boundary flows for acute inpatient services have to be taken into account. As noted earlier, these comprise flows between Areas, to the New Children's Hospital, and between States and Territories.

Rehabilitation and extended care services

The formula for this component has recently been extensively modified. The main change has been the introduction of statistics from subacute and non-acute patient (SNAP) studies (Eagar 1999). Indeed, considerable use is now being made of age and sex weights that are derived in part from the SNAP national costing study and related work in New South Wales.

Rehabilitation services make use of the SNAP data for age and sex weights. The formula also includes terms that relate to brain injury services, which are concentrated in a subset of Areas for reasons of cost-effectiveness.

In addition to SNAP data, palliative care resource allocations take account of a palliative care need index. A key element of the index is a set of cancer-standardised mortality ratios. Similar approaches are used for psychogeriatrics, geriatric evaluation and management, and maintenance care.

Use is made of the 'Blended Need Index' for rehabilitation and community services. This takes account of several factors including age-adjusted rates of people living alone, the ABS socio-economic status index of 'relative disadvantage', and a rurality variable.

Expenditures on State Government nursing homes are largely excluded from the RDF. However, the model takes account of the additional burden on Areas of nursing-home-type patients (NHTPs) where they are accommodated in public hospitals because of a shortage of residential aged care places. The estimated number of additional NHTP inpatient days in an Area is funded at the estimated average cost per maintenance care inpatient day derived from the SNAP study.

An adjustment has been made for flows of patients to non-acute facilities for rehabilitation. The flows are based on all rehabilitation episodes, and the adjustment uses the average core cost per inpatient day of $265 from the SNAP study.

It is considered that palliative care services should be provided in the local community and therefore no specific adjustments have been made for cross boundary flows. Similarly, no adjustments are made for psychogeriatrics, geriatric evaluation and management, and maintenance care.

Finally, a dispersion costs factor has been included in this component. It has the same structure as that described above for the acute inpatients component of the RDF.

Mental health services

This component has been handled by simply allocating resources in accordance with reported expenditures of each Area in a previous period. The Department is, however, currently near to completion of a mental health component of the RDF that applies relevant needs factors to three age groups: children and adolescents, 15 to 64, and 65 and over.

Direct costs of teaching and research

Some expenditures on teaching and research are difficult to isolate, but three important elements are directly identified. First, there are expenditures from Trust Funds, and these are excluded from the RDF. Second, there are expenditures funded from local revenue, and they are also excluded from the RDF.

Finally, there are activities that are funded by NSW Health. These are in scope, and are distributed by the RDF in proportion to costs reported by each Area in a previous period. However, the Department is developing output and performance measures that will be used to validate the reported expenditures.

Funding of health services within Areas

When the Areas were established in the late 1980s, they inherited a variety of health care facilities and management processes that were poorly suited to the new context. Services and service provider agencies were largely funded on the basis of expenditure history, and there were poor data on which to base judgements about efficiency and effectiveness.

Introduction of the RAF (and the associated geographical integration of services) was clearly a step forward, and it created opportunities for improvement. However, it also presented the new Area managers with many challenges - in addition to the task of establishing administrative arrangements. It is therefore not surprising that some Areas were not able immediately to embrace and implement the kinds of output-based funding models that were being developed elsewhere in Australia.

There were other constraints. One was that official policy did not favour the use of 'casemix' data for funding purposes. Another was that NSW Health wanted to focus on health outcomes rather than exclusively on cost containment - and DRG-based payment models seemed to lead to excessive emphasis on the latter.

In spite of the difficulties, most Areas recognised the relevance of output-based funding to their resource allocation tasks. By 1990, some were already calculating the shares of each hospital by use of DRG data weighted by average cost.

The Illawarra Area Health Service is one example of an output-based funding model that was implemented at this time. In outline, resources provided through the RAF were separated into major product types (acute hospital care, community health, etc) largely on the basis of historical expenditures. Then resources were allocated to particular health care delivery units in a variety of ways.

Most use was made of output (casemix) data with respect to the funding of hospital inpatient services. A target production level was set for each hospital, and then its share of the Area's budget was determined by computation of its casemix-weighted share of production. The AN-DRG grouper was used, together with national cost weights. There were several additional complexities including the use of low length of stay outliers, intensive care cases defined as high-cost outliers, and different payment rates for same-day cases.

NSW Health did not disagree with this approach, and similar ones being developed by other Areas. However, it considered the matter best left to the Areas themselves. In the absence of a clear Statewide policy, the Areas began increasingly to share ideas and information. This included the establishment of a formal collaborative arrangement in 1994, termed the Casemix Area Network.

In 1995, NSW Health commissioned a report on its health funding strategies by Eagar and Hindle (1995). The recommendations, which were endorsed by the Department for the most part, included the following.

- All areas and districts should be required to use a common model of casemix-based funding, with a core model involving budget-share for most service types.
- The tertiary increment payments should cease, because they simply encouraged inertia in provision of services. Instead, all funding should be provided to areas and districts by the RAF, and payments for cross-boundary flows should be based on bilateral contracts that employ a standard set of casemix classifications.
- Critical care should be defined as a separate service, and measured and funded by use of a purpose-built classification (along the lines of that developed by the private sector).
- Rehabilitation, palliative care, and ambulatory (including same-day) care should be measured and funded by use of purpose-built classifications.
- The remainder of acute admitted patient care should be classified by DRG. High outliers would be needed, and low outliers were probably not necessary.
- There should be no retrospective payments according to actual volumes, along the lines of the throughput pools in Victoria and elsewhere. Rather, all volumes should be pre-determined, for the purpose of avoiding inappropriate incentives for admission. However, like South Australia, there should be provision for competitive contracting to undertake additional work to meet temporary bottlenecks in access to services.

The new Labor Government indicated its commitment to changes of these types through the Economic Statement for Health (NSW Health, 1995), which envisaged a staged implementation beginning in 1996-97. However, this deadline was not met, in part because of the significant public debate over the proposals to change the location of St Vincent's Hospital. There is also little doubt that developments were disrupted by the Carr government's electoral promise to halve waiting lists - and the consequent waste of energy (and money) on ensuring that the numbers were in fact halved within the promised period, after which they quickly returned to their previous levels.

The Economic Statement for Health re-emphasised the principles of needs-based funding. It re-committed the government to full implementation - whereby Areas would receive virtually all of the available funds and begin to act as purchasers across boundaries.

During this period, most Areas increased the degree to which casemix data were applied to resource allocation. The central office of NSW Health increased its involvement in providing support to Areas through the undertaking of costing studies, the appraisal of optional ways of measuring and funding, and refinement of accounting and patient care activity reporting systems.

A review of the State's health care system was conducted by the Independent Pricing and Regulatory Tribunal in 1998 (IPART 1998). It was generally satisfied with operations. In particular, it supported organisation by Areas and needs-based funding on the grounds that

- it enables management to have a closer affinity for local conditions and the faster resolution of any issues in local facilities
- Areas are large enough to exploit economies of scale yet small enough to avoid diseconomies likely under a centralist model
- it avoids the practical difficulty of monitoring the performance and budget compliance of 223 public hospitals from one central body.

However, IPART made several important recommendations for change, and four are particularly relevant to this paper. First, there should be "... a progressive transition toward 'live' Resource Distribution Formula (RDF) based budget allocations." This should be associated with the establishment of a system of "dollars-following-patients" whereby an Area purchases the most appropriate services to meet the health needs of its population.

Second, greater use of output-based (casemix) funding models. IPART argued that "... casemix-based benchmarking will define which hospitals have the least cost for a procedure. The clinical pathways can then be replicated in other hospitals to reduce total costs."

Third, Areas should be encouraged to enter into service agreements ("quasi-contracts") with each of their major facilities to cover funding, outputs, and minimum standards of quality. Finally, a transparent capital charge should be established (such as 8% real on net assets) within the RDF funding allocations. This would reduce the risk of failing to recognise opportunity costs.

The IPART review was one of the factors that led the government to conduct its own detailed study of the New South Wales health care system. It was undertaken in 1999 by a body established by the government and named the NSW Health Council. This body made wide-ranging recommendations, most of which were accepted by the government and incorporated into the NSW Government's Action Plan for Health. Inter alia, the Health Council concluded that the State government health care sector was under increasing financial pressure due to increased care needs and rising input costs, uncertainties in budget allocations restricted care providers' ability to undertake strategic changes, more was required to be done to promote continuity of care, incentives were needed to encourage innovation, and clinicians and consumers should be more involved and informed.

The government responded by promising to increase the health budget from $6.9 billion to almost $8.1 billion over three years. It confirmed its commitment to full implementation of needs-based funding to Areas, and announced that there would be more structure in the way that Areas allocated their funds. In particular, an output-based funding model would be established as described below.

The episode funding model, 2000-01

A major change in direction occurred for financial year 2000-01. One of the main elements of the Action Plan for Health was the introduction of a requirement that Areas must make use of an output-based funding model - termed episode funding - in order to distribute resources allocated through a largely unchanged RDF.

It was decided that there would not be a central funding model of the kind used in Victoria or South Australia. Rather, each Area would continue to be funded on a needs basis but would be required to implement a set of output-based resource allocation methods. There would be some general performance requirements, but each Area would have considerable flexibility to take account of local factors.

Another interesting difference is that introduction of these Statewide policies on output-based funding was associated with increased funding (termed enhancement funding in the policy papers). Whereas Victoria introduced its casemix funding model (at least in part) as a means of minimising the adverse effects of a major cut in expenditure, NSW Health saw the opportunity to use episode funding as a way of "... ensuring value in the use of enhancement funding".

NSW Health would simply negotiate global activity targets with each Area, which would then continue to be responsible for most of the decisions regarding the ways in which the targets would be met. In particular, the model would not directly affect the Area's responsibilities for allocating resources between programs. Each Area would continue to decide how much to spend on (say) hospitals relative to community health. NSW Health stated that Areas would need to take account of many factors when deciding the allocations between programs including its strategic plans for "... changing the shape of service delivery".

Furthermore, the aim was to facilitate resource allocation between hospitals, and not to inform the processes of resource allocation between clinical services within a hospital. The latter task was a matter for Area Health Services and hospitals to resolve.

No significant increase in reporting requirements was envisaged. NSW Health believed it already had adequate access to the information that it needed on patient care activities and finance. It recognised that Areas might need more information, but that was a matter best resolved by themselves.

The episode funding model was restricted to acute inpatients, and only to large and mid-size hospitals. Other hospitals, which are predominantly in rural areas, would not be subject to episode funding.

NSW Health defined the scope as admissions to hospital that are within the programs named same day acute inpatient services and overnight inpatient services. Other service types might involve output-based funding at the discretion of the Area, but NSW Health gave no instructions on how this could or should be done.

NSW Health did, however, suggest some possibilities in due course. In particular, the episode funding approach might be extended to rehabilitation, mental health, palliative care, extended care, community, primary and ambulatory services. It also noted that there should eventually be an extension of the acute episode to include aftercare and discharge planning, and that different funding streams should be developed for patients with complicated and recurring conditions often involving frequent hospital admissions.

Episode funding was defined to exclude Emergency Department (ED) and Intensive Care (ICU) services. This was justified on the grounds that these services involve some element of standby facilities, emergency and critical care patients often require additional resources, and patient costs are affected by "... different factors to those typically recognised in acute episode classifications - such as triage category and severity". NSW Health argued that, by dealing with the ED and ICU separately "... the acute episode funding model will work more appropriately."

Four main objectives of episode funding were specified. It would create an explicit relationship between funds allocated and services provided; shift the focus of management to outputs, outcomes and quality; encourage clinicians and managers to identify variations in costs and practices so these can be managed at local level in the context of improving efficiency and effectiveness; and provide mechanisms to reward good practice and support quality initiatives. Efficiencies arising from implementing the episode funding model would be retained by Area Health Services for use in meeting increased service demand, expanding services in high priority areas, introducing better models of care and investing in research, technology and training.

Figure 9: Area funding model, 2000-01

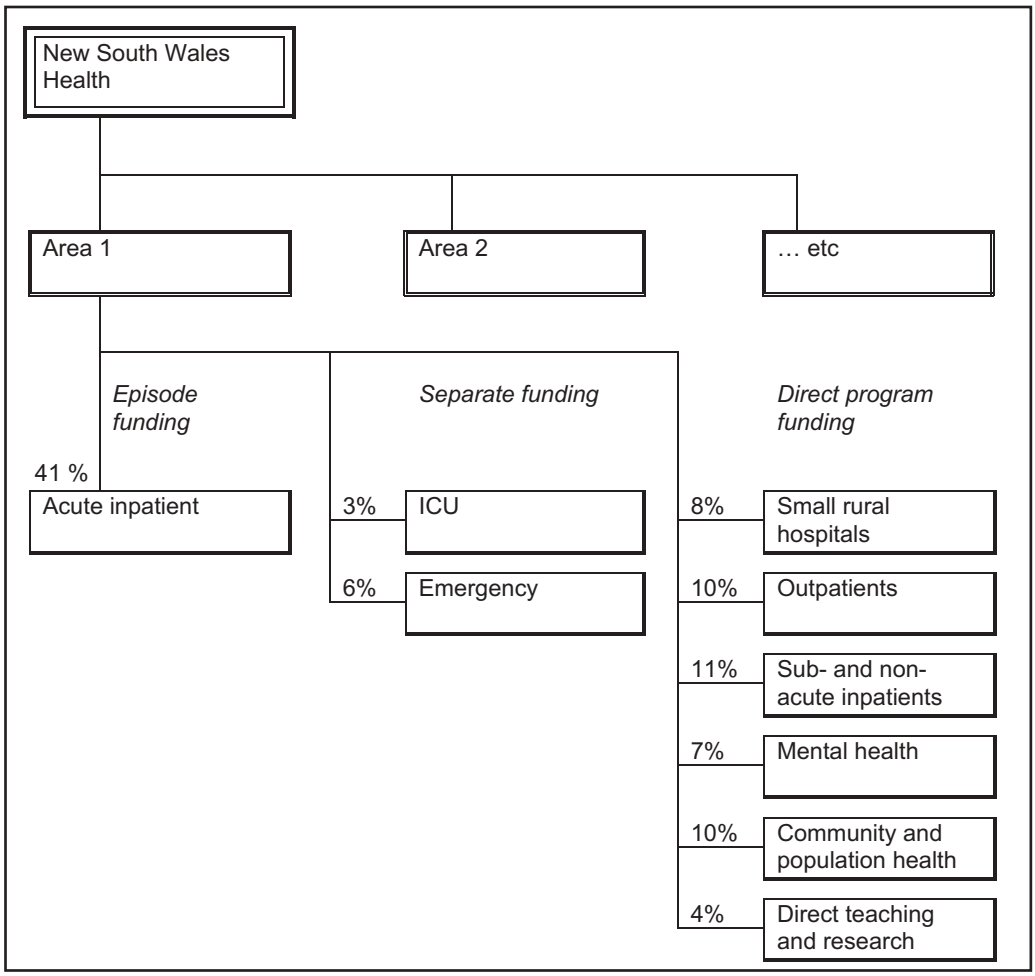


Figure 9 summarises the model that applied for 2000-01. The percentages indicate the shares of total expenditure.

It was envisaged that each Area would undertake an annual cycle of budget determination. NSW Health's documentation described a recommended process comprising the seven steps summarised below.

Step 1: determine in-scope hospitals

As noted earlier, NSW Health uses a classification of hospitals for comparative and other purposes, as summarised in Figure 4. Application of the model was mandatory in 2000-01 for all hospitals in peer group C1 (District Group 1) and above. However, each Area could choose to include some hospitals from peer group C2 (District Group 2). This was suggested because the intention was to make the inclusion of the latter group mandatory in 2001-02.

Step 2: determine in-scope services

For each hospital in scope, the patient care activities in scope (and the associated costs) were required to be separated from the remainder. This involved removing activity and costs for

- patients treated in designated psychiatric facilities

- sub-acute and non-acute inpatients - that is, rehabilitation, palliative care, maintenance care (non-acute care including nursing-home-type patients), geriatric evaluation and management, psychogeriatric, and other
- emergency department services
- intensive care services.

The guidelines indicated suitable estimates of the costs of these kinds of patients, so they might be easily removed when determining the residual expenditures for activities in scope. For example, sub-acute and non-acute patient categories had costs ranging from $330 per inpatient day (for maintenance care, geriatric evaluation and management, and other) to $706 per day (for palliative care). Advice was also given with regard to separating appropriate shares of overhead costs (both hospital and Area).

For 2000-01, the activity and costs of neonatal intensive care units were not separated - but rather treated as acute inpatient and hence in scope. It was considered that these services were adequately represented by DRGs.

Emergency Department (ED) services

ED services were largely excluded from episode funding, although there were complexities. Four kinds of circumstances were defined, as follows.

First, most ED services were to be handled in the separate ED pool. If the ED were Level 4 or above, the activities and costs were to be placed in the ED funding pool. This meant not only the ambulatory episodes, but also a portion of each acute inpatient episode. Second, this rule might apply to an ED at or below Level 3 if it had "... appropriate medical staffing and provides primarily an ED service."

This is different from most other applications of casemix funding, where the ED components of any acute inpatient episode are simply elements of the complete episode (typically categorised by DRG). NSW Health argues that separation of all ED services is justified because there should be a single pool of resources that covers "... the full range of services managed by clinical managers of EDs so funding and clinical decisions are aligned."

Third, the services of some small EDs might be defined as outpatient services. If the ED were Level 3 or below, its activities might mainly be primary care and outpatient services. In this case, it should be classified as an outpatient service for funding purposes. It would therefore be out of scope for episode funding in 2000/2001.

However, the services of some small EDs might be defined as wholly acute inpatient services. This would be the case if it functions as an ED, and there would be little point in separating the costs of each acute inpatient episode.

A difficult technical matter was that of separating ED services from the acute inpatient component. This might be straightforward for ambulatory patients (those who are treated wholly in the ED and never admitted). The same might be true of patients who are admitted, but remain in the ED until discharge.

The more complicated cases are where the patient is treated partly in the ED and partly elsewhere including in the ward. NSW Health recognised the potential problems and suggested a simple approximation for 2000-01: that patients should be removed where they were same-day patients and the source of the referral was the Emergency Department. The imprecision was recognised, and NSW Health undertook to develop a more satisfactory approach for 2001-02.

Complexities of cost separation were also noted. The principle was clear - if a patient is defined to be 'ED' then the associated costs must be removed from the acute inpatient account and put in the ED funding pool. An example of a practical difficulty is where tests are ordered in the ED but not used until the patient has moved to a ward. Another is where drug therapy begins in the ED and continues after the patient is moved to a ward.

Intensive care (ICU) services

The same general ideas applied to ICU as were noted above for ED services. Thus episodes of care in large ICUs were split into the ICU component and the remainder. The former was to be handled in a separate ICU funding pool, while the remainder comprised acute inpatient episodes.

This rule applied to all Level 5 and 6 ICUs in urban Areas, and to Level 4 ICUs in rural Areas. If a Level 4 rural ICU provided an integrated ICU and coronary care unit (CCU) service, it was classified as an ICU and its patients and costs handled by the ICU funding pool.

All other types of special care services were not separated from the acute inpatient funding pool. These included CCUs and neonatal intensive care units (NICUs).

The same analytical processes were involved as for the ED stream. For example, it was necessary to split costs between the ICU and non-ICU elements of each inpatient episode. If drugs and diagnostic tests were ordered by ICU staff, they were associated with the ICU funding pool. Splits had to be made of hospital-wide overheads such as building services and administration.

Renal dialysis services

Separate funding arrangements were to be applied to renal dialysis. In outline, all renal dialysis services were to be handled through a special funding pool but Areas were given two choices with regard to the basis for funding.

The preferred approach was capitation, whereby an amount would be paid to service providers for each patient-year. Victorian rates were provided as a starting point. Areas could use the Victorian payment relativities, but determine absolute values from their own expenditure data. The other option was to continue with existing arrangements - which might involve a mix of per visit payments for hospital-based dialysis, global budgeting of satellite centres, and so on.

Areas also had the option of treating other kinds of cases in a special way - along the lines of renal dialysis. For example, NSW Health suggested that same-day chemotherapy might be bundled with outpatient services. Other candidates were low-volume and high-cost quaternary services.

Step 3: define incentive funding

Areas were required to set aside a portion of the available budget to provide incentives for changes in service provision. Target services might be those for which there were long waiting times. Alternatively the rewards might relate to generic improvements, such as achievement of targets for patient outcomes or lengths of stay.

It was mandatory to set targets within an overall development plan, and to provide financial rewards. However, Areas were given discretion with respect to the level of financial reward and the nature of the targets.

Step 4: determine activity levels

NSW Health required Areas to set overall targets for patient volumes, and to specify targets separately for four service areas: surgery, medical admissions, neonatal intensive care and obstetrics-perinatology.

The targets had to be set for each care provider. These could be defined to be hospitals, or 'clinical streams' that involved multiple sites for a particular kind of care need. Other arrangements were possible. NSW Health correctly stated that the way that care providers were defined is not critical, as long as there was an adequate way of linking funding levels to "expectations of output."

The starting point for volume targets was the level in a recent period. Adjustments could then be made to take account of such matters as strategic directions, unmet needs, and demographic changes in the service population.

As in all budget share models, activity levels had to be balanced against the available funding and judgements regarding reasonable prices. This is therefore a step that is performed iteratively with Steps 5 and 6.

Step 5: determine prospective budget allocation for volume of activity

Steps 5 and 6 involved calculation of budgets for each care provider. Funding levels had to be a mix of fixed (infrastructure) and volume-dependent amounts, approximately in the ratio of 35% to 65%.

A standard amount was specified by NSW Health for the volume-dependent component in 2000-01: $1300 per patient on the average. As in all other casemix models, the actual rate for each DRG was determined by multiplying the 'unit rate' by the cost weight. New South Wales used its annual costing survey to compute average costs and cost weights for inliers, same-day cases, private patients, long-stay outliers, and transfers out.

For the purpose of comparison with the funding models of other States and Territories, I have reported in Figure 10 the average costs that were used in the funding of NSW hospitals in 1999-00 for two DRGs: appendicectomy without complicating factors (G07B) and vaginal delivery without complicating diagnosis (O60D).

Figure 10: average costs for DRGs G07B and O60D for 1998/99 in New South Wales

DRG version 4.1	G07B (appendicectomy without complicating factors)			O60D (vaginal delivery without complicating diagnosis)		
	Cost per case in $			Cost per case in $		
Cost component	Direct	Overhead	Total	Direct	Overhead	Total
Clinical	346	128	474	215	144	358
Procedures	486	148	634	69	13	82
Pathology	94	22	117	16	5	21
Imaging	28	6	33	3	1	5
Ward	576	339	915	733	293	1026
Emergency	114	43	157	3	1	4
ICU	12	8	20	4	2	6
Pharmacy	81	11	92	23	7	30
Allied health	11	6	16	5	5	10
Prostheses	20	1	21	6	0	6
Depreciation	52	56	108	26	42	68
Oncosts	84	73	158	49	59	109
Totals	1904	841	2744	1153	573	1726
Number of separations			5592			40866

Note that these are costs rather than payment (or funding) amounts. For reasons outlined above, actual rates of payment vary from one hospital to another. One factor is that some cost elements (and particularly ED and ICU costs) are taken into account only for those hospitals that have these services.

Step 6: determine prospective budget allocation for infrastructure

Areas were allowed to vary the infrastructure payment rate within limits. This was a reflection of the many uncertainties. If the rate for a particular care provider were different from the average for similar hospitals, the Area was required to explain the reasons in an open way. Any allocation above the cost benchmark for the peer group to which the hospital belonged that could not be justified in terms of patient needs was deemed to constitute "... a transition grant to be phased out within 3 years."

Possible reasons that might justify an infrastructure payment different from the average were specified by the Department. They could include differences in the care provider's role, higher within-DRG severity, unusually high fixed costs associated with low-volume but high cost services (such as transplant units), location factors such as remoteness, and social factors such as a high proportion of Aboriginal patients.

Step 7: implementation

The new model had to apply from 1 July 2000 for the financial year. The activities were as might be expected, although the intention that there would be formal contracts between the Area and each service provider did not eventuate in most cases.

The Department provided a variety of tools to assist Areas in budget planning and monitoring. It also facilitated a range of educational activities.

Developments for 2001-02

Episode funding will continue to be expanded in subsequent years to cover more types of services. NSW Health recognises, however, that progress depends on being able to implement suitable classification systems and to make reasonable estimates of average costs. At the time of writing, the Department is using a classification design as illustrated in Figure 11.

Figure 11: the classification model of NSW Health

Setting or type of care		Primary and community	Acute	Sub-acute and non-acute
Inpatient	*Emergency Department*	*AR-DRGs*	*ICU*	*AN-SNAP*
Same-day	*Emergency Department*	*AR-DRGs with same-day weights*		*AN-SNAP*
Outpatient	*Emergency Department*	*Select and modify existing clinic-based classification*		*AN-SNAP*
Community	*Progressive development of modules for primary and community care. Linkage with AN-SNAP and MH-CASC*			*AN-SNAP*

The next phase of implementation of the 'episode funding model' is expected to include sub-acute and non-acute care. The Department claims this will be possible because of the progressive implementation since 1998-99 of the SNAP classification in NSW. Costing and data collection planned in 2001-02 will enable the episode funding model to be extended to sub-acute and non-acute care for admitted patients in designated units in due course.

Existing methods of funding will continue for the remaining services. However, NSW Health notes that episode funding may be extended to mental health, community, primary and ambulatory services when "... there are standard measures of output and implementation of agreed service classifications."

The emergency department funding model

A policy document was released in early 2001 that outlined the method of funding for EDs in 2001-02 (NSW Health, 2001a). It was only a draft, and important aspects may have changed since this paper was written. However, it gives a general idea of the strategies.

There are several uncertainties and approximations within the policy document itself, and the Department envisages that three years or more will be needed in order to complete implementation as intended. As noted above, ED episodes are defined to comprise all the care that patients receive in an ED irrespective of whether they are subsequently admitted or discharged.

The main features are much the same as those applying to acute inpatients in 2000-01. Thus, it is intended that the Department will negotiate global activity targets with each Area with respect to ED services. The Area will then negotiate funding and activity levels with each care provider. The budget will be prospectively determined.

The model must be applied to EDs at Level 4 or above. These are defined on the basis of being able to "... manage most emergencies, including stabilisation and assisted ventilation" and having "experienced medical officers on site 24 hours a day." The Area may, however, choose to apply the model to a Level 3 ED.

Again, there are two main components. For the activity (or volume) component, each ED will be paid on the basis of marginal costs. The rate will be standard across the State during the first year. The rate is based on 20% of the average ED case in New South Wales, after removing overhead costs and depreciation. The Department argues that 20% is a good estimate of the volume-dependent costs of care, and has been derived from empirical studies.

As in the acute inpatient model, the budget allocation is expected to be reconciled with cost benchmarks for comparable EDs. An ED may receive an allocation higher than the benchmark to reflect its unavoidable (or justifiable) higher fixed costs. If it receives a higher amount for other reasons, the difference is again defined to constitute a transitional payment that must be eliminated over three years.

The size of the budget will be influenced by several factors. They include volume, the facility's role (in terms of factors like retrievals and health professional education), layout and other environmental factors affecting efficiency, and casemix in terms of variations in complexity, urgency, and severity.

In 2001-02, a modified urgency classification will be used. Complexity will be measured by the use the variable 'disposition'. Two classes will be recognised: 'ED only' (where the patient is treated only in the ED, either as an outpatient or an inpatient), and 'subsequently admitted to ward' (where the patient is treated in the ED and then admitted to a ward, either at the same hospital or another). The Department says this is necessary because of the difficulty in distinguishing severity differences from variations in the interpretation of rules for same-day admission.

Urgency and severity will be measured by use of the variable 'triage category'. In 2001-02, the hospital's peer group average for triage level will be used, rather than hospital-specific levels.

In the first year, there is no intention to implement the benchmarking practices that have been applied to the acute inpatient model because of weaknesses in the available information. NSW Health has stated, however, that when benchmarking is activated, any efficiencies arising from implementing the episode funding model will be retained by Areas and used to invest in service improvements.

Finally, note that there is no requirement for the total funds distributed in this way to sum to the amount allocated by way of the RDF's emergency services component. However, there is a reasonable degree of correlation.

The intensive care funding model

A draft policy document was released in early 2001 that proposes an ICU funding model for implementation in 2001-02 (NSW Health 2001b). In most respects, the model is more or less identical to that for ED services and therefore I will focus on the differences.

The model is in two quite different parts - for Levels 5 and 6 ICUs, and for Levels 3 and 4 ICUs. For hospitals with Level 5 and 6 ICUs, the same approach of separate funding for activity and infrastructure is to be used. On average, the infrastructure payment will represent 80% of the cost of the average ICU inpatient day multiplied by expected volume, after deleting the costs of Area overheads and depreciation. The level of funding for any particular ICU will vary according to its volume, casemix, functions and other local factors that affect costliness.

There will be marginal payment rates for activity (patient volumes), and the rate will be fixed for all ICUs in the State. The rate will apply to the inpatient day.

NSW Health recognises there are casemix differences within the ICU population. It notes that the inpatient day cost "... is thought to be higher for some patients, especially transplant and severe burns patients." However, it has decided not to use any casemix adjustment in the first year, pending better information. The funding will not apply to high dependency unit and coronary care unit patients, even if there is a joint ICU-CCU or ICU-HDU unit in operation.

For Level 3 and 4 ICUs, whether in metropolitan or rural areas, the payment will be within the acute inpatient module described earlier. However, one change is to be made. Additional payments will apply to ICUs that are able to provide short-term mechanical ventilation. The additional payment will be based on the number of hours of mechanical ventilation expected to be required in the budget year, regardless of where in the health care facility the care is provided (whether in an ICU or elsewhere in the hospital). The additional payments will be added to the infrastructure component of the acute inpatient funding model.

Other aspects of the ICU model are unclear at the time of writing. For example, consideration is being given to providing financial disincentives for unnecessary care by limiting the additional payment for mechanical ventilation to a maximum of three days in any one period of hospitalisation.

Other planned developments

Several ideas for refinement are being considered, in addition to those indicated from the earlier sections of this paper. Some are outlined in general terms in a recent strategic planning document (NSW Health 2000). With respect to health financing and resource allocation, the Department's goals for 2005 include the closer linking of funding to agreed levels of activity, making use of a more diverse range of funding sources, continued

development of service classifications and costing, and better recognition of the cost of capital and how it might be used in more cost-effective ways.

One important area of current research concerns moving towards more integrated funding of chronic care, as a stimulus to desirable changes in methods of care delivery. The Department has shown initial interest in three groups of chronic conditions - cardiovascular disease, respiratory illness and cancer.

Another set of related ideas is termed 'budget holding' by the Department. One manifestation is that of providing all funds for health care to Areas so they may act as purchasers of services that may be needed outside the Area. This appears to be little different from the ideas embedded in a complete implementation of the RDF. Moreover, there appears to be less unanimity today about the meaning of 'complete implementation' or of its worth.

One factor is that the Health Council (2000), while supporting a move towards greater equity of allocations to Areas, was not supportive of giving Areas more or less complete freedom to make their own purchasing decisions. Rather, the Health Council preferred a collaborative process, controlled by NSW Health, whereby changes in the locations of services would be made on the basis of centralised planning in the best interests of the State as a whole.

A quite different manifestation of budget holding would involve the pooling of Commonwealth and State funds. The Department is interested in this possibility as an extension of the Commonwealth's ongoing co-ordinated care trials - and NSW is advantaged in this regard by virtue of its Area Health Service model. Care co-ordination makes more sense when it is the normal method for the entire population (rather than simply for a small and largely self-selected sample). Another factor is that NSW Health wishes to explore the pooling of funds from health, aged care and human service agencies (rather than merely from Commonwealth and State health departments).

The Department released a discussion paper on this topic in early 2001 (NSW Health, 2001c). In a foreword, the Minister for Health proposed a pilot scheme be undertaken in 2001-02. The scheme, called "Healthshare", would pool State and Commonwealth funds, and could involve private insurers as well.

Finally, NSW Health is planning to change the way in which capital and recurrent funding are linked. At present, there are two separate budgets, and responsibilities for their allocation and use are not always well integrated. NSW Health spends nearly $0.5 billion per year on new capital works, and the capital stock is valued at $6 billion after depreciation.

The Department recognises that the current approach has significant weaknesses. One is that capital resources are often seen as a free good, and the opportunity costs may be underestimated or largely ignored. Another problem is that opportunities to manage the balance between capital and recurrent expenditure are often missed because of failures of integration.

A system of capital asset charging is being developed, with a view to its activation on a shadow basis in 2001-02 (NSW Health, 2001d). It is recognised that complicated issues will arise, but this kind of change is widely considered to be overdue.

It is unclear how much will be done to encourage greater involvement of non-government agencies in capital funding. The Health Council (2000) was relatively enthusiastic about this, and made specific mention of the UK's experiences with regard to its Private Financing Initiative (PFI) program. However, no mention was made of the considerable negative criticism that has been expressed about PFI in the UK, nor of the absence of any evidence of significant benefits relative to the more traditional approach of government financing and ownership of health infrastructure.

It is likely that decisions on private investment will be made at the government rather than at the health sector level. The NSW government has recently released a Green Paper on private sector involvement in public infrastructure. Inter alia, it proposes that the private health care sector be encouraged to build, own, and manage facilities while clinical services remain in the hands of the public sector.

The Health Council justified its interest in private sector involvement mainly in terms of the benefits of risk-sharing. It is assumed that there would be gains for both sides - government and private investor. However, there is more evidence to support other conclusions: that private investors are not really interested in sharing any kind of risk, that their goal is to maximise their own gains rather than the sum of gains, and that the risks for governments are increased through their inability to compete with for-profit companies rather than reduced through sharing.

There is stronger evidence to support the Health Council's views about private sector involvement in health care delivery. Even here, however, it is not yet clear how far the Department will pursue the idea. It has recently established a Private Sector Reference Group and negotiated a statement of collaboration with the NSW Private Hospital Association.

Finally, the RDF needs estimation model was reviewed in 2000 and 2001. Several new variables were tested in terms of their ability to predict actual volumes of cost-weighted hospital discharges, and a revised model defined. It includes a measure of rurality (the Accessibility-Remoteness Index of Australia, or ARIA) to replace the RUR variable, and a new variable measuring the proportion of Aboriginal and Torres Strait Islanders. The revised model is intended to be introduced for resource allocation after 2002-03.

Conclusion

The government health care sector in New South Wales has a long history of cost-effective care, provided by skilled and committed staff. It has taken the lead in many important aspects of health care financing and resource allocation, and NSW Health has reason to be proud of its accomplishments.

Particular mention should be made of its commitment to needs-based funding, and its reluctance simply to make use of measures of cost without regard to health outcomes. It would have been better to take a statewide approach to output-based funding at an earlier date. However, it should be understood that the main constraint was politics (in that the NSW Labor government wished to distance itself from the Coalition government in Victoria, and hence from the erroneous perception that 'casemix funding' was no more than an excuse for budget cuts). Health care professionals in NSW were as aware of the potential benefits as their counterparts elsewhere in Australia.

A claimed advantage of having no statewide policy on output-based funding was that the Areas were able to develop applications that were sensitive to local peculiarities. Another was that it was possible to avoid the risk of system-wide mistakes that have occurred elsewhere, and which are typically hard to correct once the process of resource allocation has begun. However, there have been some penalties including unnecessary duplication of development work. Perhaps more important, there was slower progress towards realisation of the many benefits that accrue from the more purposeful financial incentives for clinical practice change that are a consequence of well-designed output-based funding.

It is hard to dispute the logic of the general model: needs-based funding to easily identifiable populations of reasonable size and coherence, output-based funding of specific care providers, and cost reimbursement for activities whose efficiency is outside the care providers' control. Extension of this model to incorporate other sources of funding (and particularly the Commonwealth's funding through the Pharmaceutical Benefits and Medicare Benefits Schedules) would further enhance the logic.

There is an understandable degree of debate over full implementation of the RDF. There is no obviously good and simple answer to decisions that depend on trade-offs between easy access to services (which might favour full devolution of purchasing to Areas) and overall efficiency (which favours central control over the siting of specialised services). The Department's current view - that there should be central control supported by thorough consultation - may be about right.

However, there appear to be opportunities for improvement of the output-based funding components. Many features are obviously sensible, such as the separation of intensive care from other acute care categorised by DRG, but other features are debatable. For example, it could be argued that the separation of payments into infrastructure and volume-dependent components gives only marginal gains in precision at the expense of increased administrative complexity. This approach is rarely used elsewhere, and several health care systems (including the South Australian public hospital sector) have tried and then abandoned it.

There are similar levels of doubt about the combining of ambulatory and admitted patient components of care in emergency departments. NSW Health correctly notes the benefits, including a better basis for managing the entire workload of the ED. However, this is also an unusual approach worldwide, and it is unclear whether NSW Health fully took the disadvantages into account. There are not only the administrative difficulties of

assigning the costs of admitted patients between the ED and the ward (and hence to the DRG-classified episode). Difficulties have also been reported with respect to increased risks of cost-shifting between the ED and other parts of the hospital.

A few elements seem to have been poorly developed thus far. For example, the model proposed for intensive care funding has elements that may be of concern. One is the seemingly arbitrary exclusion of coronary care, and another is the proposal that payments might be limited to three days '... to discourage unnecessary care'. I have not personally seen any evidence to suggest that public hospitals in Australia would keep a patient on mechanical ventilation longer than was clinically appropriate simply to qualify for a trivial increase in their budgets.

Perhaps the origin of my concern over this and other components of the episode funding model is that little attention seems to have been paid to the many useful experiences that have been gained in other parts of the Australian health care system and overseas in recent years. At least, NSW Health might have mentioned the approaches of other agencies if only to reject them on the basis of reasoned argument.

This said, the general principles are sound. There is every reason to believe that NSW Health is on the right track. The main challenge may be to ensure that the resource allocation skills of Areas are not overlooked in this period of increased central direction.

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