

RESOURCE DISTRIBUTION FORMULA

TECHNICAL PAPER

1998/99 REVISION

**Structural & Funding Policy Branch
Policy Division
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1. INTRODUCTION

The Health Economic Reform Committee (HERC), which is overseeing the development and implementation of funding policies outlined in the *Economic Statement for Health (1995)*, is being advised by a Resource Distribution Formula Advisory Committee on issues relating to resource distribution in NSW.

Funding to NSW Area Health Services is based on the principle of providing Areas with the resources to provide comparable and comprehensive access to services that meet the health needs of their population, while recognising that high cost and specialised service can only be provided efficiently and effectively in a limited number of locations and people will need to travel for these services.

The Resource Distribution Formula is used as a planning tool to guide the allocation of funding to Area Health Services and to monitor progress towards the achievement of fairness in health funding. Annual funding allocations to Areas will take into account a range of factors including the population based funding needs indicated by the Resource Distribution Formula, recurrent requirements of new facilities as they come into operation and developments in Commonwealth funding arrangements.

The Resource Distribution Formula Advisory Committee is chaired by Jim Pearse, Director of Structural and Funding Policy Branch (telephone 02 9391 9533) and has members with clinical, health administration and academic background. The list of Advisory Committee members who contributed to this version of the Formula are:

Jim Pearse, Structural & Funding Policy (Chair)
Dr Christine Bennett, Westmead Hospital
Ms Sharyn Campbell, Department of Ageing and Disability
Dr Stephen Christley, Northern Sydney Area Health Service
Professor Rufus Clarke, Wentworth Area Health Service
Mr Paul Corben, Mid North Coast Area Health Service
Mr Glenn Desailly, Central Coast Area Health Service
Assoc. Professor Kathy Eagar, University of Wollongong
Dr Gary Eckstein, Essential Equity
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Mr Andrew Gibbs, Structural & Funding Policy (Executive Officer)
Mr Richard Gilbert, Central Sydney Area Health Service
Dr Jim Hyde, Health Services Policy
Mr Grantly Hunt, Hunter Area Health Service
Mr Damien Israel, South Western Sydney Area Health Service
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Dr Lynette Lee, South Eastern Sydney Area Health Service
Dr Colin MacArthur, Liverpool Hospital
Mr Rick Sondalini, Structural & Funding Policy
Mr Alain St Flour, Finance and Commercial Services

The terms of reference of the Resource Distribution Formula Advisory Committee encompass:

- (1) Ongoing refinement of the Resource Distribution Formula;
- (2) Overview of research on a range of matters affecting the Resource Distribution Formula including:
 - a revised health need index
 - treatment of patient severity
 - health needs of special groups.

This Technical Paper outlines refinements to the Resource Distribution Formula which is used by the NSW Health Department in guiding the allocation of Area Health Service budgets.

The Resource Distribution Formula Advisory Committee has also considered a forward research program which will assist in fine-tuning elements of the Resource Distribution Formula. Details of the research program are contained within this document.

Comments on this Report are welcome and can be addressed to:

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2. BACKGROUND AND CONTEXT

2.1 Guiding Principles

The Resource Distribution Formula is a refinement of the Resource Allocation Formula which has been used since the 1980s as a planning tool to guide the distribution of recurrent funds to Areas and plan capital works in order to achieve a distribution of services which more equitably matches the distribution and the health needs of the NSW population.

The Formula identifies an equitable share of available resources that Areas should receive to meet the health needs of their populations. However it does not identify the total level of resources available as this is a matter for Government to decide in the context of the State Budget.

Work on the Resource Distribution Formula has been guided by the following principles:

- (1) To provide a guide for determining Areas' shares of available health resources which, assuming the achievement of reasonable levels of efficiency, enables Areas to provide their local communities with comparable levels of access to health services taking into account:
 - the assessed health needs of the local population;
 - additional cost components in providing services to specific populations (such as additional transport costs in rural areas and the cost of translator services);
 - the local population's utilisation of private health services.
- (2) To safeguard the funding of selected specialty services which benefit the entire health system and are provided in limited locations and which cannot be funded through population funding or cross Area purchasing of patients flows.
- (3) To take account of:
 - additional costs not currently recognised in casemix measures faced by major tertiary referral hospitals and specialist paediatric hospitals;
 - cross boundary flows which cannot be captured in existing data collections. In future years these flows will be dealt with in the context of funding arrangements for cross boundary flows of patients where casemix measures are available.
- (4) To reflect the need for Areas to provide targeted health services to improve the health status of priority population groups which experience significantly lower health status, in particular Aboriginal people and homeless people.
- (5) To reflect the strategic directions set for Health Services in NSW and the funding policies outlined in the NSW *Economic Statement for Health*.

2.2 Role of the Resource Distribution Formula in the context of Area Funding Reforms

The funding reforms introduced in the *Economic Statement for Health* foreshadowed the move to the funding of Areas based on their population's health needs. The Resource Distribution Formula plays an important role in identifying how existing resources should be distributed on a population health basis.

Funding of Areas to meet the health needs of the population is consistent with the role of Areas of coordinating and providing an effective and efficient mix of services to improve the health of the local population. As noted in the principles above, introduction of population-based funding recognises that patients will still need to travel between Areas for certain high cost and specialty services that are more effectively and efficiently provided in a few locations. This requires that the population funded components of the Resource Distribution Formula are supplemented by allowances for the cost of specific high cost and statewide specialty services.

A related funding policy foreshadowed in the *Economic Statement for Health* is the introduction of funding arrangements for the flow of patients between Areas. In 1998/9 an accounting adjustment will be made to Area budgets to reflect the value of acute inpatient flows based on established patterns of flows. Fully devolved Area responsibility for patient flows will be introduced after this transitional phase. Financial responsibility for inter-State patient flows was devolved to Areas from 1997/8.

The Resource Distribution Formula will be used to guide and inform decisions about recurrent and capital allocations to Areas. When population funding and cross Area purchasing is fully introduced, the Resource Distribution Formula will be used to identify the population based funding for Areas. The funds available to Areas will also depend on the net revenue for inter-Area flows and impact of changes in inter-State patients flows.

The *Economic Statement for Health* stated the use of casemix for budgeting purposes will be undertaken at Area level so that Areas fund their hospitals based on their share of casemix output. Hospitals are also required to move to achieve benchmark cost for peer hospitals. The efficiencies achieved from meeting benchmarks will free up resources to use for a range of health priorities. In allocating resources to Areas the Resource Distribution Formula assumes that those services will be provided at reasonable levels of efficiency.

The key steps in using the RDF to guide the allocation to Areas are:

1. Identify the Pool of resources which will be subject to the Resource Distribution Formula. As far as possible the exclusions should be limited so that population health principles guide resource allocation. The net value of flows from Areas are included in the pool since the formula is driven by the population's need for health services, where ever those services are provided.

2. The resources in the Pool are divided into program expenditure categories based on the expenditure reported by Areas across the NSW Health programs. It is important to note that the Resource Distribution Formula is not a tool used to achieve allocative efficiency across programs and it does not dictate how Areas should spend their funding allocations.
3. In each category, expenditure which is not appropriate to allocate on the basis of population health need is identified, such as the direct costs of teaching and research, Statewide services and Nationally Funded Centres (these are non-population-based allocations). The intention is to minimise the number of non-population based allocations as the RDF is designed primarily to be driven by population-based factors.
4. The relevant population health need indicators (such as age/sex related need, socio-economic status, rurality, aboriginality etc) are applied to the remaining expenditure in each category (ie, this is the population-based allocation of each component).
5. The non-population and population allocations in each category are summed for each Area to determine its overall share of the Resource Distribution Formula pool.
6. In order for the Resource Distribution Formula to provide a guide to the level of the Department's allocation to Areas, the level of population funding derived by the RDF has to be adjusted for the value of flows to be comparable with the historical allocation to each Area which includes funding to provide services to patients from other Areas.

2.3 Components of the Resource Distribution Formula

There are nine components of the Resource Distribution Formula aligned to the program structure as in Table 1.

Table 1: Program Alignment

RDF Component	Health Program	
Population Health	1.1	Population Health Services
Oral Health Services	2.1	Primary & Community Based Services
Primary & Community Based Services	2.1	Primary & Community Based Services
	2.2	Aboriginal Health
Outpatients	2.3	Outpatient Services
Emergency Department Services	3.1	Emergency Services
Acute Inpatient Services	3.2	Overnight Acute Inpatient Services
	3.3	Same Day Acute Inpatient Services
	4.1	Mental Health Services
Mental Health Services	5.1	Rehabilitation and Extended Care Services
Rehabilitation and Extended Care	6.1	Teaching and Research
Teaching and Research		

The presentation of the Resource Distribution Formula has been improved in a number of ways. For each component, there is a population related set of factors and a cost related or non-population-based set of factors. For all programs other than acute inpatients, the population-based factors have been presented as weighted populations. For acute inpatients the population factors have been expressed in terms of expected casemix weighted activity. The cost related factors are presented in dollar terms.

A further column has been added to each table which normalises or scales back the weighted populations (or in the case of acute care the casemix weighted activity) so they sum to the projected population for NSW for December 2001. Note that the relative shares of Areas are unaffected by this process as it is designed only to aid the reader in interpreting the effect of applying the needs factors to the raw Area populations. The normalisation factor is equal to the NSW Population Projection for Dec 2001 divided by the Sum of weighted populations of Areas.

The presentation has been expanded so that the impact of all relevant factors can be identified.

Table 2 illustrates schematically, the treatment of each component of the Resource Distribution Formula.

Table 2: Resource Distribution Formula Components

<i>Components:</i>	<i>Population Health</i>	<i>Non-Inpatient Services</i>				<i>Acute Inpatient Services</i>			<i>Direct Teaching and Research</i>	<i>Rehab & Extended Care</i>				<i>Mental Health</i>	
		<i>Oral Health</i>	<i>Primary & Community</i>	<i>Outpatients</i>	<i>Emergency Depts</i>	<i>General Acute</i>	<i>Tertiary</i>	<i>Obstetrics</i>		<i>Rehabilitation</i>	<i>Palliative Care</i>	<i>Other (Maintenance and GEM)</i>	<i>Psycho-geriatrics</i>		<i>PADP</i>
<i>Population elements:</i>	Population	Needs Weighted Population Aged 0-14 years	Weighted Population	Weighted Population	Weighted Population	Weighted Population	Weighted Population	Weighted Population		Weighted Population	Weighted Population	Weighted Population	Weighted Population	Weighted Population	Under Development
	Need Index	Age weighted Adult Concession Card holders	Need Index	Need Index	Need Index	Need Index for General Services		Need Index based on Total Fertility Rate		Blended Need Index	Oncology SMRs Need Index	Blended Need Index	Blended Need Index	ABS EDOCC Need Index	Currently Based on Historical Costs
	Aboriginality Factor	Aboriginality Factor	Aboriginality Factor	Aboriginality Factor	Aboriginality Factor	Private Hosp. Substitution	Private Hosp. Substitution	Private Hosp. Substitution			Private Hosp. Substitution		C/W Aged Care Assessment Program		
	Homeless Factor	NESB factor Rurality	Homeless Factor	Homeless Factor	Homeless Factor Tourism Effect	Public/ Private Mix Transient Workers	Public/ Private Mix	Public/ Private Mix							
<i>Non-Population elements:</i>		Specialist Supra Regional & Indirect Teaching & Research	NESB factor Dispersion factor	Non-Inpatient Statewide Services AIDS funding		IPTAAS/ Ambulance Dispersion factor Specialist Paediatrics	Severity/indirect Teaching & Research Dispersion factor Nationally Funded Centres	Dispersion factor	% Share of Expenditure from 1994/5 survey applied to current expenditure pool	Statewide Brain & Spinal Injury Dispersion factor NHTPs	Dispersion factor	Dispersion factor	Dispersion factor	Dispersion factor	
	<i>Treatment of Cross Boundary Flows:</i>	None	Flows for Dental Hospitals Built into Formula	None	Built into Formula	Built into Formula	Built into Formula	Built into Formula	Built into Formula	None	Built into Formula	None	None	None	None

3. FINANCIAL ISSUES IN THE APPLICATION OF THE RESOURCE DISTRIBUTION FORMULA

The pool of funds used for calculating the Resource Distribution Formula is based on:

- (1) Annualised Department Cash Subsidy to Areas for 1998/9 (including the subsidy for Repairs, Maintenance and Replacement over \$5,000)
- (2) Plus 1998/9 Patient Fees Budgets (excluding Special Purpose & Trust Funds)
- (3) Plus 1998/9 Other Revenue Budgets (excluding Special Purpose & Trust Funds)
- (4) Plus an adjustment to include revenues for Third Schedule Hospitals
- (5) Plus the value of interstate flows and flows to the New Children's Hospital based on the most recent data
- (6) Less excluded funding.

The approach reflects the recurrent resources (including RMR over \$5,000) available to Areas to support health services. All revenue to Special Purpose & Trust Funds is excluded as this relates to funding for a wide variety of purposes such as research grants, patient facilities and donations which should be at the discretion of the Area.

3.1 Exclusion and Inclusion of Funding Elements

Excluded funding means those funds which are totally excluded in the build-up of the Resource Distribution Formula pool. Often, these funds are short-term in nature or are subject to a specific policy development process in which the funds are quarantined from redistribution to other types of program expenditure such as expenditure on State Government Nursing Homes (SGNHs).

Other excluded funds include those distributed throughout the year to meet Commonwealth Government expenditure requirements or special project funds distributed by the Department (examples include Special Health Promotion and Commonwealth casemix grants). Including these funds in the Resource Distribution Formula would effectively mean their intended distribution would be obscured by the Resource Distribution Formula. In most cases these funds are distributed based on some assessment of need or using factors derived by the Resource Distribution Formula so their exclusion does not compromise the principles underlying the Resource Distribution Formula.

Excluded funding also applies to expenditures from Special Purpose and Trust Funds, Managed Fund Insurance benchmark premiums, funding to Non-Government Organisations, NSW Health Corporate Office functions, the New Children's Hospital, Corrections Health and Ambulance Service. Historically, most of these expenditures were not counted in the Resource Distribution Formula pool as they were not available for distribution across Areas. Expenditure data on these exclusions are readily available from Annual Reports of the NSW Health Department.

The following funds have been excluded from the application of the Resource Distribution Formula:

1. State or Commonwealth Grants to specific projects that are material in size and where projects are either unique to a particular Area, short term in nature, have a level of funding which is not at the Area's discretion due to externally imposed conditions or the viability of an essential service would be threatened if allocated on a population basis.
2. Special Purpose and Trust Funds which includes donations and bequests and relate to specific purposes such as research grants. There would be financial disincentives to raise SP&T funds if they were included in the Resource Distribution Formula pool. Managed Fund Insurance benchmark premiums are also excluded as the risk profiles of Areas are largely unrelated to the populations they serve and the benchmark premium is based largely on private sector experience which is outside of the control of Areas. Funding to Non-Government Organisations is excluded as the management and location of these organisations is largely outside the control of Areas and therefore Areas should not be penalised for having NGOs (particularly those NGOs providing supra-Area services) located within their boundaries.
3. Expenditures related to Head Office functions, the New Children's Hospital, Health Care Complaints Commission, Corrective Health Services and Ambulance Service are excluded as these funds are not distributed through Area Health Services.
4. Expenditures related to Commonwealth approved State Government Nursing Homes in view of agreed transfer to Commonwealth adjusted fee funding. Funding and location of SGNH beds is to be dealt through this separate strategic process.

A list of all excluded funds is at Appendix A.

3.2 Revenue

The revenue available to Areas must be taken into account in the Resource Distribution Formula and included in the Pool because the equity objectives of population-based funding would be compromised if a significant share of resources that funded health services were not included. Revenue also has to be taken into account when using the outcome of the Resource Distribution Formula to advise on the allocation of the cash subsidy to Areas.

Whilst there is a strong equity argument to add revenue together with the Department's contribution to Areas to create a pool which represents the resources for health services available to Areas, there is also an argument that treatment of revenue in the Resource Distribution Formula should not distort Departmental policy that creates incentives to collect revenue. Areas have been able to keep non-patient fee revenue above their budget since 1992/3. On 1 July 1997 the underwriting of patient fees was discontinued and Areas now have to meet any shortfalls in patient fees revenue but can keep revenue in excess of budget to fund additional health expenditure.

One concern with the use of a revenue budget to buildup the Resource Distribution Formula pool is that it does not recognise that Areas may have to incur expenses to generate revenue, and accordingly the revenue budget will not reflect the actual resources available for health

services. Further research is required to quantify the level of such expenditure to generate revenue. In terms of the overall impact on the Resource Distribution Formula share the impact would be negligible if it could be assumed that this issue affected all Areas to a similar degree.

For this refinement of the Resource Distribution Formula the sum of 1998/9 revenue budgets has been included in the Resource Distribution Formula pool. This is an interim basis for identifying the contribution of revenue. Ideally, when identifying the Department's contribution to an Area to meet the Resource Distribution Formula expenditure share, the revenue assumed for individual Areas should reflect their revenue raising capacity and should not penalise revenue raising efforts. Therefore, the Department in conjunction with Areas will undertake research into revenue raising capacity during 1998/9 with the aim of developing a model which will enable the Department to develop a fair and transparent approach to treatment of revenue in future refinements of the Resource Distribution Formula.

3.3 Other Financial Adjustments

Other financial adjustments will be required in relation to the following factors:

Interstate patient flows: Overall more patients flow out of NSW for treatment than flow into NSW. As a consequence NSW pays out in net terms around \$50 million per annum under intergovernmental agreements on interstate flows.

Since 1997/8 Areas are financially responsible for funding interstate flows and a notional adjustment has been made to their budget to reflect the net cost of patient flows to other States in 1996/9 valued at the national benchmark price of \$2454 for public patients and \$1123 for private patients. Areas will receive positive (or negative) cash adjustments where the net outflow decreases (increases), creating an incentive to manage flows where it is more efficient to provide the services within NSW. The pool of funds distributed by the Resource Distribution Formula has been increased by the value of interstate patient flows.

Flows to the New Children's Hospital: The New Children's Hospital (NCH) is not part of an Area Health Service and will continue to be excluded from the Resource Distribution Formula, with an adjustment for flows from Areas to the Hospital. The total pool of funds available to all Areas has been increased by the value of flows.

3.4 Program Expenditures

The program expenditure breakdown for 1996/7 as reported by Areas was used as the basis for determining the component weightings of the Resource Distribution Formula funding pool. Before the components are calculated any excluded funding is removed from the relevant program eg, SGNH expenditures are removed from Program 5.1 Rehabilitation & Extended Care, NGO funding is removed from the relevant program etc. Another adjustment is to include the value of net interstate outflows and flows to the New Children's Hospital which increases the total pool as these flows are removed later in the Formula.

The breakdown is based on General Expenses only (ie, non Special Purpose & Trust Fund) and excludes depreciation/superannuation and excluded RDF funding eg, SGNHs. The components which have an increased share since 1995/6 are population health, primary & community, outpatient and teaching and research. These programs have increased at the expense of the overnight and same day acute inpatients programs. However a significant portion of these movements in the relative expenditure shares of programs can be explained by the improved method of dealing with excluded funding in the RDF and on the removal of depreciation and superannuation which in the previous RDF expenditure breakdowns had not been undertaken (this latter adjustment impacts more significantly on acute inpatients).

Given the large variation in Area compliance in reporting of costs for 1996/7 under the Teaching and Research program, for RDF purposes the share of expenditure has been based instead on the 1995/6 average percentage share of total Area expenditure rather than the 1996/7 share of 2%. The dollar difference has been allocated to the Acute Inpatient component of the RDF to ensure the total expenditure of Areas remains consistent with that reported in 1996/7. Section 6.6 discusses the reason for this adjustment in more detail and the method of distributing these funds to Areas in the Formula.

The share of the total budget by program component is represented in Table 3. These include the value of net flows to the New Children’s Hospital and Interstate.

Table 3: RDF Components (based on 1996/7 program expenditures)

RDF Component	%
Population Health	0.65
Non-inpatient Services:	
- Oral Health Services	1.40
- Primary & Community Based	6.94
- Outpatients*	10.07
- Emergency Department Services	5.18
Acute Inpatient Services**	57.40
Mental Health	7.26
Rehabilitation and Extended Care***	9.77
Teaching and Research****	1.33
Total	100.0

* Includes funding for HIV/AIDS services and statewide non-inpatient services such as radiotherapy, MRI
 ** Includes indirect Teaching and Research and Patient Severity factors
 *** Excludes State Government Nursing Homes
 **** Includes only direct expenditures on Teaching and Research

4. POPULATION ESTIMATES AND PROJECTIONS

4.1 Population Estimates

Population estimates and projections are key elements of the Resource Distribution Formula since population is the main factor influencing the distribution of resources.

The outcome of the 1996 ABS Census was that overall the State population grew by just over 1% per annum since 1991 to reach 6.2 million persons. Two rural Areas (Far West and New England) declined while above average growth was experienced along the coast and in the three Western metropolitan Areas. The Central Coast became the fastest growing Area of the State while South Western Sydney recorded the greatest absolute increase. Northern Sydney remains the most populous Area just ahead of South Eastern Sydney and South Western Sydney.

The proportion of children declined and the proportion of the elderly increased in every Area. The Area with the highest proportion of children is Wentworth while the highest proportion of the elderly is found in Mid North Coast.

The 1991 set of projections used in the 1996 Resource Distribution Formula substantially underestimated Sydney and overestimated the non-metropolitan Areas including Hunter and Illawarra. Every Area in Sydney grew faster than the projection except Western Sydney where land releases at Rouse Hill were slower than expected. Every non-metropolitan Area failed to reach its projected 1996 estimate. The Sydney proportion of the State population increased from 62.2% to 62.5%.

Within Sydney, the effect of urban consolidation was especially noticeable in South Eastern Sydney where the previous decline was transformed into growth not far below the State average. Central and Northern Sydney also grew by about one half of a percent per annum. While rural Areas grew less quickly than expected, there is still rapid population growth on the North and South Coast. Inland area growth was confined to a small number of larger commercial centres.

4.2 Interim Population Projections

In refining the Resource Distribution Formula interim population projections have been utilised that build 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 based on State Regions which are generally different from Area Health boundaries. As the PPG will not be producing its next set of projections until late 1998, the Department commissioned consultants *Essential Equity* to develop a set of interim population projections for use in the Resource Distribution Formula. Once the PPG projections are available sometime in 1999, the Department will recalibrate the interim projections, although a significant change is not expected.

The process for developing the population projections involved Area input and required the following steps:

- Selecting a set of population projections to be used for calibrating the overall NSW population. ABS publication 3222.0 *Projections of the Populations of Australia: States and Territories* has been selected as the appropriate set of projections;
- Producing a projection for Sydney and for the remainder of the State;
- Undertaking 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 net dwelling approvals;
- Projecting the age and sex profiles for each Area for 2001 and 2006.

The 1996 population estimates from the 1996 ABS Census and interim population projections for each Area Health Service for June 2001 and June 2006 are presented in Table 4. The original interim projections have been re-based using the June 1997 estimated resident populations released by the ABS in June 1998.

Table 4: Population Estimates and Interim Projections for Areas

Area	June 1996 Population Estimate	June 2001 Population Projection	June 2006 Population Projection
Central Sydney	473,062	494,105	512,299
Northern Sydney	752,339	774,938	790,975
Western Sydney	645,132	684,472	720,326
Wentworth	301,934	317,491	331,553
South West Sydney	731,615	785,570	834,489
Central Coast	270,556	295,919	319,700
Hunter	521,785	543,304	560,406
Illawarra	334,904	354,309	372,770
South Eastern Sydney	743,133	777,913	807,210
Northern Rivers	248,155	272,662	299,458
Mid North Coast	248,496	270,183	293,831
New England	178,589	174,373	169,661
Macquarie	102,771	104,946	106,313
Mid Western	165,780	168,421	170,795
Far West	49,983	47,029	43,857
Greater Murray	256,658	259,736	262,355
Southern	179,002	188,015	196,650
Total	6,203,894	6,513,388	6,792,647

NOTE: The final interim population projections used to calculate the Area shares in this document are the 30 June 2001 population projections for Areas adjusted forward six months to 31 December 2001 (ie, midpoint of 2001/02 financial year).

5. GENERIC HEALTH NEED INDEX

The Resource Distribution Formula attempts to quantify characteristics of the population that reflect their health needs and impact on the utilisation of health services. It incorporates age/sex adjustments and a Generic Need Index, to reflect the impact of age, sex, mortality, socio-economic and geographic factors on the use of health services. In the early versions of the Formula, age, sex and mortality were used as the indicators of health need. More recent versions have included a composite indicator of health need which combines premature mortality, socio-economic status and geographic location.

The use of the health need index remains a core element of the Resource Distribution Formula. The index is a measure of a population's need for health services that cannot be explained by its ages and sex composition. The Generic Need Index is applied to Population Health, Primary & Community Based Services, Outpatients, Emergency and Acute Inpatients components. Alternative needs indices are recommended for the Oral Health Services and Rehabilitation and Extended Care Services component that reflect the population characteristics that correlate with need for these services. Details of these specific Need Indices are in sections 6.2.1 Oral Health and 6.4 on Rehabilitation and Extended Care Services.

The Generic Need Index is a composite index of relative need for health services derived in the following manner:

$$\text{Need Index} = 97.51 + 0.4 (\text{SMR} < 70) - 0.4 (\text{EDOCC}) - 0.9 \text{RUR}$$

where $\text{SMR} < 70$ is the indirect Standardised Mortality Ratio for age less than 70, EDOCC is the ABS index "EDOCC" (level of education achieved and occupational status) and RUR is the rurality index calculated by Eckstein and Gibberd (1994)¹. Indirect SMRs are calculated by applying the age/sex-specific death rates in the standard (NSW) population to the study (Area) population, to obtain the expected number of deaths. Indirect SMRs are used because they are generally regarded as more robust for small Areas in particular and are also used by the ABS for comparisons across LGAs and ethnic populations.

The Index was based on an analysis of NSW inpatient statistics where 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 LGAs. The measurement of rurality, termed the Health Related Rural Status (HRRS), was constructed from the following components:

1. Zone Category: Remote
Rural
Major Urban
Metropolitan

¹ Eckstein, G and Gibberd, R. "A Relative Health Needs Index for NSW Areas and Districts", Health Services Research Group, University of Newcastle. 1994

The zone categories were based on a Department of Community Services and Health and Department of Primary Industry study (1990) which grouped each LGA into these zones.

2. For Remote and Rural Categories, further categorisations were included based on (a) distance from a referral/base hospital and (b) land use. For (a) a 'distant' key was set at one hour's journey by motor vehicle to a referral/base hospital (this varied between 70 and 120 km depending on terrain). A 'very distant' key was set at three hour's drive or 300 km.

For (b), a farming community was considered as one where over 40% of the population were employed in agriculture. If less than 25% these were considered as non-farming (note: very few communities were between 25 and 40% and these were classified as 'mixed').

3. Major Urban was segregated based on the presence of a referral hospital within the local area.
4. Metropolitan was split into 'outer' or 'built-up' area. The 'built up' area was further segregated based on population density (ie, the predominance of single or multi dwelling housing sites). The 'outer' category was further split depending on whether a referral hospital was within the local area.

As indicated above, the presence of a referral/base hospital impacts on the degree of rurality of an Area.

The rurality index was the strongest single predictor of utilisation, followed by SMR and socio-economic status. The three variables together produced a coefficient of determination of 57%. Details of the Generic Need Index for Area Health Services are in Table 5.

Table 5: Generic Health Need Index for Areas

Area	Index
Central Sydney	102.88
Northern Sydney	82.46
Western Sydney	99.40
Wentworth	97.72
South Western Sydney	101.11
Central Coast	102.87
Hunter	103.20
Illawarra	100.19
South Eastern Sydney	93.85
Northern Rivers	103.70
Mid North Coast	105.54
New England	113.49
Macquarie	115.34
Mid Western	110.82
Far West	168.06
Greater Murray	108.56
Southern NSW	107.50

The Department is currently undertaking a review of the Generic Need Index in to reflect more recent data and consider alternative socio-economic measures of health need. The results of the review should be available in the first half of the 1999 calendar year.

6. RESOURCE DISTRIBUTION FORMULA COMPONENTS

6.1 POPULATION HEALTH SERVICES

Population health services are distributed according to a formula reflecting:

- Population
- Generic Need Index
- Aboriginality (ATSI) factor
- Homeless factor.

No adjustment is made for flows in this program given that the population health services are directed to the population at large and not to treatment of individuals.

The Generic Need Index has been applied to this category of expenditure, although it is recognised that further work is required to understand the relationship between the utilisation of these services and population characteristics.

An estimate of the ATSI population was obtained from the ABS 1996 Census which is based on place of enumeration and not usual place of residence. This figure was then weighted by 2.5. As the ATSI population is already counted in the population for the Area, the factor is based on adding 1.5 times the ATSI population to the total Area population.

The Homeless factor is applied in a slightly different way, as the homeless are not counted in the resident population. A weighting of 2.5 is therefore applied to the estimated homeless population and then adding this figure to the total Area population. The estimate of the homeless population is obtained from a Department of Community Services survey.

In future revisions of the Resource Distribution Formula there is an opportunity to base the Homeless factor on more recent estimates of the population. In 1996 the ABS launched the Homeless Enumeration Strategy to target the homeless population of Australia. The first part of the strategy deals with ensuring the coverage of the homeless population is maximised including counting in the 1996 Census. The second part of the strategy involves the provision of information from the Census to policy makers.

With the implementation of the Homeless Enumeration Strategy, the ABS regards the 1996 Census as the most effective yet in enumerating the homeless population. Although the ABS is not proposing to publish, as census output, estimates of the number of homeless people, this may occur as a by product of the Strategy although there would still be a degree of interpretation required. The ABS has advised that it may convene a working party to determine whether such an estimate would be possible, however it has not set any time frame or given any assurances that this will occur.

Table 6 provides details of the weighted Aboriginal and Homeless populations applied to Areas.

Table 6: Weighted Aboriginal and Homeless Populations

Area	Aboriginal population*	Homeless population**
Central Sydney	7,297	3,558
Northern Sydney	2,835	503
Western Sydney	13,017	590
Wentworth	7,239	643
South Western Sydney	14,725	1,088
Central Coast	5,781	388
Hunter	14,465	1,258
Illawarra	9,709	115
South Eastern Sydney	7,827	3,098
Northern Rivers	10,960	277
Mid North Coast	12,222	274
New England	17,543	175
Macquarie	13,246	105
Mid Western	8,667	169
Far West	11,051	47
Greater Murray	10,015	261
Southern NSW	5,749	190

* Based on enumeration from the 1996 ABS Census provided by Epidemiology and Health Surveillance Branch, NSW Health Department

** Based on a 1994 Department of Community Services Survey (due to lack of data from the survey we have assumed that .001% of rural Area populations are homeless)

Special Health Promotion and Special Public Health funds are excluded from the Resource Distribution Formula pool and are distributed each year by the Department to Areas.

Table 7 provides details of the formula under this component.

Table 7: Population Health

	<i>Population estimate Dec 2001</i>	<i>Generic Need Index</i>	<i>Need Adjusted Population</i>	<i>Aboriginal Factor</i>	<i>Homeless Factor</i>	<i>Total Need Adjusted Population</i>	<i>Normalised Population</i>	<i>Percentage Share</i>
100 Central Sydney	495,925	102.9	510,207	7,297	3,558	521,062	506,497	7.74%
105 Northern Sydney	776,542	82.5	640,337	2,835	503	643,674	625,682	9.6%
120 Western Sydney	688,058	99.4	683,929	13,017	590	697,536	678,038	10.4%
125 Wentworth	318,897	97.7	311,626	7,239	643	319,508	310,577	4.7%
130 South West Sydney	790,462	101.1	799,236	14,725	1,088	815,049	792,266	12.1%
135 Central Coast	298,297	102.9	306,858	5,781	388	313,026	304,276	4.7%
140 Hunter	545,014	103.2	562,455	14,465	1,258	578,177	562,015	8.6%
145 Illawarra	356,155	100.2	356,832	9,709	115	366,656	356,407	5.4%
155 South Eastern Sydney	780,842	93.5	730,345	7,827	3,098	741,269	720,549	11.0%
400 Northern Rivers	275,341	103.8	285,804	10,960	275	297,038	288,735	4.4%
410 Mid North Coast	272,547	105.5	287,659	12,222	273	300,154	291,763	4.5%
420 New England	173,902	113.5	197,427	17,543	174	215,143	209,130	3.2%
430 Macquarie	105,083	115.3	121,140	13,246	105	134,492	130,732	2.0%
440 Mid Western	168,658	110.8	186,935	8,667	169	195,771	190,299	2.9%
450 Far West	46,712	167.7	78,345	11,051	47	89,442	86,942	1.3%
460 Greater Murray	259,998	108.6	282,466	10,015	260	292,742	284,559	4.4%
470 Southern NSW	188,879	107.3	202,742	5,749	189	208,681	202,847	3.1%
Total	6,541,314		6,544,344	172,348	12,729	6,729,421	6,541,314	100.0%

6.2 NON-INPATIENT SERVICES

6.2.1 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 accounted for 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 (approximately \$68.5 million). Expenditure of the two dental hospitals is included within this program.

Given the nature of the target groups for oral health services, a specific distribution formula is applied to this element of funding. There are three main components of funding for oral health services:

- Oral Health Services for Children targeting children aged 0-14 years;
- Oral Health Services for Adults targeted at 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 (dmft + DMFT) rate as the indicator of dental health status, to the population in each Area aged 0-14. A factor for the higher need in rural Areas is also applied based on evidence from the National Oral Health Survey 1987/88 that people from non-metropolitan areas have a dmft + DMFT rate (the I is for Indicated Extraction) which is 10% higher than people from capital cities. The ATSI population aged 0-14 in each Area has been further weighted by 0.63 based on data from NSW Health Dental Branch which shows caries experience of ATSI children being 63% higher than the average for all children (average dmft + DMFT ATSI children is 2.05 teeth to 1.26 teeth for all children). The NESB child population (defined by NESB country of birth) aged 0-14 has been given a further weighting of 0.38 based on similar dmft + DMFT data relating to the child NESB population.

For adults, the target population is the total number of adult concession card holders by Area. As data from Centrelink showing the age breakdowns at Area level were not available when this was being written, the total card holder population in each Area was converted to age categories based on a blend of each Area's total population age profile and the age profile of card holders across the State. Centrelink data by postcode are currently being obtained and will be incorporated into the next version of the formula.

The eligible adult population is then split into two sub-populations. Both sub-populations sum to the total number of people in each Area who are eligible card holders. The split between the two groups is based on estimates of the percentage of people with caries (ie, people with teeth) with the remainder being those people requiring dentures (ie, those with no teeth or the edentulous population). The data were obtained from the 1993 NSW Dental Health Strategy which shows that overall, 13.5% of the population aged over 15 wear dentures. Within the edentulous sub-population, the percentage of the population wearing

dentures decreases from 44% for 65+ year olds to 3.1% for 35-44 year olds.

For the caries sub group, Statewide age weights for Decayed/Indicated Extraction (DI) teeth have been derived from data from the National Oral Health Survey and have been applied to the eligible population in each Area by age group. For the edentulous population, a standard cost weight of 0.51 has been applied to the eligible population in each Area based on an analysis by NSW Health Dental Branch using Commonwealth Dental Health Program Reporting data which indicates that on an *annual* basis, the standard cost of care for patients with dentures is 51% of the cost of treating people with caries².

The rurality weighting of 10% has been applied to the Adult caries age weighted population. A separate rurality weighting of 16% has been applied to the edentulous population based on data from the 1993 NSW Dental Health Strategy which shows that the average rate of edentulousness in non-metropolitan areas to be 14.2% versus a rate of 12.2% in metropolitan areas ($14.2/12.2 = 116\%$). In the absence of oral health data about the adult ATSI population, the ATSI population in each Area has been further weighted by .63% based on the differential caries experience of ATSI/non-ATSI children. A factor for the adult NESB population has not yet been applied as data relating to Centrelink card holders by ethnicity is still being obtained and analysed.

Apart from the dental hospitals and services provided by Central Sydney to eligible adult card holders of South Eastern Sydney, no adjustment is made for flows in this program as it is assumed that there are minimal patient flows and dental services are provided primarily to Area residents. Under the adult component South Eastern Sydney receives an amount of funding under Adults specifically for dentures.

It should be noted that whilst population-based components have been updated (although further refinement is expected), the data used to determine the non-population-based components (ie, the Dental Hospitals factor and Specialist & Indirect Teaching and Research factor) need updating. Although the Department has some data which can be used to inform the calculation of these components (such as the 1996/7 NSW Public Hospitals Comparison Data Book and 1996/7 inpatient flows), more detailed information similar to that provided previously by the Dental Hospitals is needed. A separate issue which has impacted on the need to refine the non-population-based component of the Oral Health RDF (ie, the Dental Hospital and Specialist Teaching and Research factors for CSAHS and WSAHS), is the new partnership agreement yet to be negotiated between the Department, Dental Hospitals (CSAHS/WSAHS) and the Faculty of Dentistry (University of Sydney). Part of this process of agreement is to obtain relevant information on a wide range of factors including utilisation and costs (such as for teaching and research).

To obtain data for both the RDF and new partnership agreement, SFPB and Oral Health Branch have requested the relevant data on flows, utilisation and costs from the two Areas in question. These data, when obtained, will be used to inform any refinements to the next

² The weighting for dentures is based on an average cost over seven years of \$450 versus an average annual cost of \$125 for caries treatment ($450/7/125 = .51$).

version of the oral health formula.

Table 8 provides details of the formula under this component. Recognising the funding constraints imposed by the loss of Commonwealth Dental Health Program funding and increased demand on oral health services, the Department is investigating strategies to maintain funding to services at least 1997/8 levels whilst addressing needs of underfunded Areas in this program.

Table 8: Oral Health

<i>Children</i>									
	<i>2001 Population 0-14</i>	<i>dmft + DMFT Rate</i>	<i>Need Index</i>	<i>Need Adj pop</i>	<i>Rurality factor</i>	<i>Aboriginal Factor</i>	<i>NESB Factor</i>	<i>Total Adjusted Population: Children</i>	<i>Share: Children</i>
100 Central Sydney	80,836	1.34	1.06	85,969	85,969	1,061	3,711	90,740	6.4%
105 Northern Sydney	135,020	1.03	0.82	110,373	110,373	412	3,809	114,595	8.0%
120 Western Sydney	151,795	1.36	1.08	163,842	163,842	1,864	5,300	171,006	12.0%
125 Wentworth	73,549	1.12	0.89	65,377	65,377	1,025	680	67,082	4.7%
130 South West Sydney	186,405	1.34	1.06	198,240	198,240	2,105	5,390	205,736	14.4%
135 Central Coast	64,242	1.03	0.82	52,515	52,515	825	225	53,565	3.8%
140 Hunter	113,040	1.11	0.88	99,583	109,378	2,064	426	111,868	7.8%
145 Illawarra	74,432	1.14	0.90	67,343	73,967	1,384	497	75,849	5.3%
155 South Eastern Sydney	128,255	1.09	0.87	110,951	110,951	1,126	3,161	115,238	8.1%
400 Northern Rivers	58,013	1.66	1.32	76,430	83,948	1,562	150	85,660	6.0%
410 Mid North Coast	57,014	1.54	1.22	69,684	76,538	1,735	122	78,395	5.5%
420 New England	37,939	1.27	1.01	38,240	42,001	2,473	154	44,627	3.1%
430 Macquarie	25,497	1.38	1.10	27,925	30,672	1,877	32	32,581	2.3%
440 Mid Western	37,371	1.36	1.08	40,337	44,304	1,239	93	45,636	3.2%
450 Far West	9,999	1.55	1.23	12,301	13,510	1,556	18	15,084	1.1%
460 Greater Murray	57,672	1.38	1.10	63,165	69,378	1,419	176	70,972	5.0%
470 Southern NSW	39,608	1.33	1.06	41,809	45,921	826	198	46,945	3.3%
Total	1,330,688	1.26	1.00	1,324,084	1,376,885	24,552	24,142	1,425,579	100.0%

<i>Eligible Adults</i>								<i>Special</i>		
		<i>Caries</i>	<i>Edentulism</i>	<i>Rurality factor (combined Caries and Edentulism)</i>	<i>Aboriginal Factor</i>	<i>Total Adjusted Population: Adults</i>	<i>Share (inc. adj. for SESAHS)</i>	<i>Dental Hosp</i>	<i>Indirect T&R</i>	<i>Total</i>
100	Central Sydney	116,326	11,233	127,559	1,699	129,259	14.4%	7,000	4,700	24.4%
105	Northern Sydney	82,031	8,507	90,538	661	91,199	6.2%			4.3%
120	Western Sydney	122,797	11,595	134,392	2,987	137,379	9.3%	6,000	7,500	26.2%
125	Wentworth	51,011	4,725	55,736	1,643	57,379	3.9%			2.6%
130	South West Sydney	157,223	14,791	172,014	3,373	175,388	11.8%			8.1%
135	Central Coast	65,104	7,386	72,491	1,322	73,813	5.0%			2.9%
140	Hunter	128,221	13,499	156,545	3,307	159,853	10.8%			6.2%
145	Illawarra	83,069	8,874	101,569	2,218	103,787	7.0%			4.1%
155	South Eastern Sydney	101,253	10,010	111,263	1,805	113,068	2.0%			2.6%
400	Northern Rivers	68,249	7,763	83,997	2,503	86,500	5.8%			3.7%
410	Mid North Coast	70,775	8,501	87,631	2,780	90,411	6.1%			3.7%
420	New England	40,771	4,379	49,878	3,962	53,840	3.6%			2.2%
430	Macquarie	23,337	2,488	28,528	3,008	31,536	2.1%			1.4%
440	Mid Western	35,328	3,706	43,116	1,985	45,101	3.0%			2.0%
450	Far West	14,028	1,516	17,172	2,493	19,664	1.3%			0.8%
460	Greater Murray	50,837	5,398	62,120	2,274	64,393	4.3%			2.9%
470	Southern NSW	38,303	4,254	47,023	1,323	48,346	3.3%			2.1%
<i>Total</i>		<i>1,248,665</i>	<i>128,623</i>	<i>1,441,572</i>	<i>39,344</i>	<i>1,480,915</i>	<i>100.0%</i>	<i>13,000</i>	<i>12,200</i>	<i>100.0%</i>

6.2.2 Primary and Community Based Services

The formula for the Primary and Community Based Services component includes:

- Age weighted population with the following weights applied:

0-14:	3
15-64:	1
65 and over	4
- Generic Need index
- Aboriginality factor
- Homeless factor
- NESB factor
- Dispersion cost factor

No adjustments have been made for cross boundary flows for this component as it is assumed that there are minimal patient flows. Any specific cross boundary effects within this program should be addressed through specific arrangements between affected Areas rather than the Resource Distribution Formula. In the future, when appropriate casemix classifications are available for primary and community based care and data are able to be routinely collected, flows may be introduced for this component.

It is noted that there are differences across Areas in the mix of services provided under this program which would impact on the age-mix of clients. For example, some Areas provide services under this program which are targeted more towards children, mothers and young families whilst other Areas provide services more in tune with the needs of the elderly such as community home nursing.

Whilst there is significant information from some Areas on the age/sex weights that could be applied for these services, this information is not currently aggregated in a format that allows sufficient conclusions on the weighting that should be applied for these services. In the absence of data, advice was sought from a group of Public Health Officers to derive a set of age weights. The lack of data on age/sex weights for these services is not satisfactory and needs to be remedied through further research in 1998/9. It should be noted that there remain problems in identifying activity which related to this program and activity that is related to the Rehabilitation and Extended Care program.

The Generic Need Index has been applied to this category of expenditure, although it is recognised 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.

Additionally, the Northern Rivers Area Health Service population has been increased by 10,000 under this component to reflect the portion of the SE Queensland population served by this Area. The figure was based on a 1997 study undertaken into this issue for the Area by the Centre for Health Services Development (University of Wollongong).

A factor to reflect the additional costs to Areas of providing Ethnic Health Workers and Interpreter Services is included under this component. Interpreter Services are not based in

each Area. Currently Interpreter services in the Illawarra and Hunter Areas service rural communities and those in Central Sydney and Western Sydney service other Area populations. The distribution of these services and catchment populations is reflected in the Resource Distribution Formula, although consideration could be given to including these into cross boundary funding arrangements in future years. The current expenditure on Ethnic Health Workers is \$5.5 million and on Interpreter Services is \$7.5 million. The allocation of funds for Ethnic Health Workers is based on the distribution of the population who speak a language other than English with a minimum cost of \$70,000 in rural Areas and for Interpreter Services based on poor/no English speakers. These data have been obtained from the ABS 1996 Census.

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. For convenience, discussion of this factor has been included under section 6.3 *Acute Inpatient Services*.

Table 9 provides details of the formula under this component.

**Table 9: Non-Inpatient Activity
Primary and Community Based Services**

	<i>Age Weighted Population</i>	<i>Generic Need Index</i>	<i>Need Adjusted Population</i>	<i>Aboriginal Factor</i>	<i>Homeless Factor</i>	<i>Total Need Adjusted Population</i>	<i>Normalised Population</i>	<i>Percentage Share</i>	<i>NESB Factor \$'000</i>
100 Central Sydney	838,936	102.9	863,097	7,297	3,558	873,952	478,233	7.31%	3,679
105 Northern Sydney	1,367,738	82.5	1,127,837	2,835	503	1,131,175	618,987	9.5%	1,231
120 Western Sydney	1,187,755	99.4	1,180,629	13,017	590	1,194,236	653,495	10.0%	2,215
125 Wentworth	548,600	97.7	536,092	7,239	643	543,974	297,666	4.6%	130
130 South West Sydney	1,390,984	101.1	1,406,424	14,725	1,088	1,422,236	778,258	11.9%	3,403
135 Central Coast	580,067	102.9	596,715	5,781	388	602,883	329,902	5.0%	70
140 Hunter	1,000,236	103.2	1,032,243	14,465	1,258	1,047,966	573,455	8.8%	308
145 Illawarra	660,710	100.2	661,965	9,709	115	671,789	367,608	5.6%	568
155 South Eastern Sydney	1,344,203	93.5	1,257,273	7,827	3,098	1,268,197	693,967	10.6%	836
400 Northern Rivers	537,821	103.8	558,257	10,960	275	569,492	311,630	4.8%	70
410 Mid North Coast	535,886	105.5	565,599	12,222	273	578,093	316,337	4.8%	70
420 New England	321,697	113.5	365,215	17,543	174	382,931	209,543	3.2%	70
430 Macquarie	197,611	115.3	227,807	13,246	105	241,159	131,964	2.0%	70
440 Mid Western	309,324	110.8	342,844	8,667	169	351,680	192,442	2.9%	70
450 Far West	85,976	167.7	144,198	11,051	47	155,296	84,979	1.3%	70
460 Greater Murray	483,087	108.6	524,834	10,015	260	535,109	292,816	4.5%	70
470 Southern NSW	352,049	107.3	377,890	5,749	189	383,828	210,033	3.2%	70
Total	11,742,680		11,768,918	172,348	12,729	11,953,995	6,541,314	100.0%	13,000

6.2.3 Outpatient Services

The formula for the Outpatients Services component includes:

- Age/Sex adjustment based on the 1994 Outpatient Survey
- Generic Need index
- Aboriginality factor
- Homeless weighting
- HIV/AIDS factor
- Radiotherapy and other Statewide Services factor.

An adjustment for cross boundary flows for these services has been included based on 10% of the cost of net inpatient cross boundary flows (see Appendix C). Research in 1999 should identify a more appropriate empirical basis for this adjustment.

Information from the 1994 Outpatient Survey was analysed to refine the age/sex weights to be applied to these services. The age/sex weights are in Table 10.

The Generic Need Index has been applied to this category of expenditure, although it is recognised 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.

For administrative convenience specific funding for HIV/AIDS services has been included under this program, although expenditures occur across a range of programs including population health, acute inpatients and palliative care. A factor reflecting the current distribution principles for these services is included in this component. The most significant component of the current funding which is reflected in the Resource Distribution Formula is distribution according to a weighted formula based on HIV/AIDS prevalence and population.

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. Table 11 details the list of Statewide Services under the Outpatients program. The costs associated with these services have been updated to reflect more recent estimates of expenditure. The Department is currently undertaking a review of funding arrangements for Statewide Specialty Services in tandem with the review of plans for Selected Specialty Services. The full list of all Statewide Services (including the outpatient services in Table 11) currently in the Resource Distribution Formula is at Appendix B. Although the review has not yet been completed, the results will be incorporated into future versions of the Formula.

Table 12 provides details of the formula under this component.

Table 10: Age/Sex Weights for Outpatient Services

Total Direct Staff Time for clients attending outpatient clinics by age and gender from 1994 Outpatient Survey*										
Age	Total Cost			Population 1996			Utilisation Rates		Calibrated Utilisation Rates	
	M	F	Total	M	F	Total	M	F	M	F
0-4	20,198	16,455	36,653	225,508	214,170	439,678	0.0896	0.0768	0.9438	0.8096
5-9	17,870	11,172	29,042	224,303	213,903	438,206	0.0797	0.0522	0.8395	0.5504
10-14	10,688	6,243	16,931	222,339	211,968	434,307	0.0481	0.0295	0.5066	0.3104
15-19	8,725	11,005	19,730	216,342	206,321	422,663	0.0403	0.0533	0.4250	0.5621
20-24	11,755	21,255	33,010	234,363	228,501	462,864	0.0502	0.0930	0.5285	0.9802
25-29	10,618	23,815	34,433	235,748	236,514	472,262	0.0450	0.1007	0.4746	1.0611
30-34	18,118	26,607	44,725	246,561	245,023	491,584	0.0735	0.1086	0.7743	1.1443
35-39	15,610	24,031	39,641	246,441	246,550	492,991	0.0633	0.0975	0.6675	1.0271
40-44	15,275	19,901	35,176	226,728	227,123	453,851	0.0674	0.0876	0.7099	0.9233
45-49	16,514	21,913	38,427	219,613	213,579	433,192	0.0752	0.1026	0.7924	1.0812
50-54	16,649	19,905	36,554	176,248	169,606	345,854	0.0945	0.1174	0.9954	1.2367
55-59	17,312	22,915	40,227	144,448	140,814	285,262	0.1198	0.1627	1.2629	1.7148
60-64	20,441	21,928	42,369	123,508	125,412	248,920	0.1655	0.1748	1.7440	1.8425
65-69	23,449	23,418	46,867	119,026	126,464	245,490	0.1970	0.1852	2.0760	1.9513
70-74	17,783	21,553	39,336	98,097	117,233	215,330	0.1813	0.1838	1.9103	1.9373
75-79	11,278	17,501	28,779	64,080	87,562	151,642	0.1760	0.1999	1.8546	2.1062
80-84	5,449	11,812	17,261	37,072	62,685	99,757	0.1470	0.1884	1.5489	1.9857
85 & over	3,756	5,813	9,569	20,233	49,808	70,041	0.1856	0.1167	1.9562	1.2298
Total	261,488	327,242	588,730	3,080,658	3,123,236	6,203,894				
					All	0.0949				

**Note: Excludes missing age, gender and patient care time values, and group and telephone consultancies*

Table 11: Statewide Services built into Outpatient Services

	<i>Radio-therapy</i>	<i>MRI</i>	<i>Home Dialysis Fluids</i>	<i>STARTT</i>	<i>CEIDA/Health-quest</i>	<i>ICP&MR*</i>	<i>Neonatal & Paediatric/ Adult Retrieval</i>	<i>Statewide Genetics</i>	<i>Total</i>
	\$m	\$m	\$m	\$m	\$m	\$m	\$m	\$m	\$m
100 Central Sydney	3.60	1.20	2.51		4.50			0.77	12.58
105 Northern Sydney	3.60	1.20	1.27					0.50	6.57
120 Western Sydney	4.80	1.20	1.99			1.40	2.70		12.09
125 Wentworth	1.20								1.20
130 South West Sydney	3.60		1.06	1.10					5.76
135 Central Coast			0.39						0.39
140 Hunter	3.60	1.20	1.72					0.38	6.90
145 Illawarra	2.40		0.67						3.07
155 South Eastern Sydney	12.00	1.20	1.68				0.66	0.42	15.95
400 Northern Rivers									
410 Mid North Coast									
420 New England									
430 Macquarie									
440 Mid Western									
450 Far West									
460 Greater Murray									
470 Southern NSW									
Total	34.80	6.00	11.29	1.10	4.50	1.40	3.36	2.07	64.51

*Institute of Clinical Pathology & Medical Research

**Table 12: Non-Inpatient Activity
Outpatient Services**

	<i>Age/Sex Weighted Population</i>	<i>Generic Need Index</i>	<i>Need Adjusted Population</i>	<i>Aboriginal Factor</i>	<i>Homeless Factor</i>	<i>Total Need Adjusted Population</i>	<i>Normalised Population</i>	<i>Percentage Share</i>
100 Central Sydney	502,646	102.9	517,122	7,297	3,558	527,977	506,738	7.7%
105 Northern Sydney	801,855	82.5	661,210	2,835	503	664,548	637,815	9.8%
120 Western Sydney	667,811	99.4	663,805	13,017	590	677,411	650,161	9.9%
125 Wentworth	302,967	97.7	296,059	7,239	643	303,941	291,714	4.5%
130 South West Sydney	758,932	101.1	767,356	14,725	1,088	783,168	751,664	11.5%
135 Central Coast	315,953	102.9	325,021	5,781	388	331,189	317,867	4.9%
140 Hunter	557,051	103.2	574,876	14,465	1,258	590,599	566,841	8.7%
145 Illawarra	368,325	100.2	369,025	9,709	115	378,849	363,609	5.6%
155 South Eastern Sydney	796,471	93.5	744,963	7,827	3,098	755,888	725,481	11.1%
400 Northern Rivers	290,817	103.8	301,867	10,960	275	313,102	300,507	4.6%
410 Mid North Coast	296,729	105.5	313,181	12,222	273	325,676	312,575	4.8%
420 New England	178,186	113.5	202,290	17,543	174	220,007	211,157	3.2%
430 Macquarie	107,103	115.3	123,469	13,246	105	136,821	131,317	2.0%
440 Mid Western	170,617	110.8	189,106	8,667	169	197,942	189,979	2.9%
450 Far West	48,050	167.7	80,589	11,051	47	91,687	87,999	1.3%
460 Greater Murray	265,084	108.6	287,992	10,015	260	298,268	286,269	4.4%
470 Southern NSW	197,940	107.3	212,469	5,749	189	218,407	209,622	3.2%
Total	6,626,538		6,630,401	172,348	12,729	6,815,478	6,541,314	100.0%

6.2.4 Emergency Departments

The formula for Emergency Departments includes:

- Age/sex adjustment based on application of ED cost weights to Triage Category data from EDIS
- Generic Need Index
- Aboriginality factor
- Homelessness factor
- Population adjustments relating to tourist and working population effects.

An adjustment for cross boundary flows for these services has been included based on 5% of the cost of net inpatient flows (see Appendix C). In future years the cross boundary flow element will be dealt with through separate funding arrangements when appropriate casemix measures are available.

To calculate age/sex weights, EDIS data for the period November 1995 to October 1996 have been analysed. In the calculation of age/sex weights, presentations were weighted according to disposition and triage category using data derived from a study undertaken at Flinders Medical Centre (FMC)³ which reported on the variables that are important in explaining costs in Emergency Departments. The study indicated that Priority (triage category), Outcome (Admitted/Died/DOA, Discharged, Did not wait) both explained around 40% of cost variation. The analysis also found that the addition of a simple age grouping (<15, 15-34,35-64,>64) explained around 50% of the variance. The mean costs from the study can be translated into relative cost weights as set out in Table 13.

Table 13: Cost Weights from FMC Study

	<i>Triage Cat 1</i>	<i>Triage Cat 2</i>	<i>Triage Cat 3</i>	<i>Triage Cat 4</i>	<i>Triage Cat 5</i>
Age			Non Admitted		
0-14	1.2347	0.7946	0.7192	0.6878	0.6216
15-34	1.2347	1.0412	0.9425	0.7675	0.6216
35-64	1.2347	1.0828	0.9834	0.7692	0.6216
65 +	1.2347	1.0993	1.0481	0.8583	0.6216
			Admitted		
0-14	2.9560	1.0318	0.8747	0.8217	1.1873
15-34	2.8646	1.7459	1.3280	1.1130	1.1873
35-64	2.4089	1.4475	1.4406	1.1862	1.1873
65+	1.9548	1.5545	1.5637	1.4039	1.1873

Application of these cost weights to the EDIS data on presentations yields population age/sex weights. The age sex weights are set out in Table 14 and were used for calculating weighted population shares in the formula.

³ Erwicj-Nijhout MA, Bond MJ, Baggoley C (1996) Costings in the Emergency Department, Study conducted in the Emergency Department at Flinders Medical Centre September 1995 - August 1996.

Table 14: Age/Sex Weights for Admitted/Non-Admitted Emergency Department Services

	Males	Females
0-4	1.77	1.38
5-9	0.71	0.55
10-14	0.69	0.49
15-19	1.01	0.86
20-24	1.18	0.99
25-29	1.10	0.89
30-34	0.89	0.71
35-39	0.83	0.67
40-44	0.77	0.61
45-49	0.79	0.64
50-54	0.88	0.71
55-59	0.96	0.75
60-64	1.07	0.80
65-69	1.42	1.04
70-74	1.86	1.37
75-79	2.42	1.87
80-84	3.18	2.48
85 & over	4.14	3.30
Total	1.09	0.91

The Generic Need Index has been applied to this category of expenditure, although it is recognised 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.

An adjustment is included for a tourism population effect based on data from the NSW Tourism Commission on tourist nights by Statistical Local Area. Additionally, the Northern Rivers Area Health Service Tourism Factor has been increased by 36,900 to reflect the portion of the SE Queensland population served by this Area. The figure was based on a 1997 study undertaken for the Area by the Centre for Health Services Development (University of Wollongong). In the previous RDF the estimate of the SE QLD population served by NRHS was 50,000. A factor reflecting itinerant workers in three affected rural Areas has also been included in this adjustment based on estimates from the Department of Agriculture and the Commonwealth Employment Service.

Table 15 provides details of the formula under this component.

**Table 15: Non-Inpatient Activity
Emergency Department Services**

	<i>AgeSex Weighted Population</i>	<i>Generic Need Index</i>	<i>Need Adjusted Population</i>	<i>Aboriginal Factor</i>	<i>Homeless Factor</i>	<i>Tourist Factor</i>	<i>Total Need Adjusted Population</i>	<i>Normalised Population</i>
100 Central Sydney	497,259	1029	511,581	7,297	3,558	(1,709)	520,726	500,466
105 Northern Sydney	791,439	825	652,620	2,835	503	(6,650)	649,309	624,046
120 Western Sydney	669,003	994	664,989	13,017	590	(6,286)	672,310	646,152
125 Wentworth	305,948	977	298,972	7,239	643	(2,400)	304,454	292,608
130 South West Sydney	768,379	101.1	776,908	14,725	1,088	(6,522)	786,198	755,609
135 Central Coast	314,045	1029	323,058	5,781	388	(108)	329,118	316,313
140 Hunter	553,975	1032	571,702	14,465	1,258	(753)	586,672	563,846
145 Illawarra	362,133	1002	362,821	9,709	115	2,588	375,233	360,634
155 South Eastern Sydney	792,991	935	741,708	7,827	3,098	(2,356)	750,276	721,085
400 Northern Rivers	284,715	1038	295,534	10,960	275	41,624	348,393	334,838
410 Mid North Coast	285,813	1055	301,660	12,222	273	7,121	321,276	308,776
420 New England	176,112	1135	199,936	17,543	174	2,650	220,302	211,731
430 Murrumbidgee	105,631	1153	121,773	13,246	105	1,107	136,231	130,931
440 Mid Western	169,063	1108	187,384	8,667	169	62	196,282	188,645
450 Far West	47,164	167.7	79,103	11,051	47	695	90,896	87,359
460 Greater Murray	263,939	1086	286,748	10,015	260	4,516	301,539	289,807
470 Southern NSW	190,747	1073	204,748	5,749	189	6,219	216,905	208,466
Total	6,578,357		6,581,243	172,348	12,729	39,800	6,806,120	6,541,314

6.3 ACUTE INPATIENT SERVICES

The formula for acute inpatient services includes factors for:

- General Acute Services
 - Age/Sex weightings for General Services (excluding obstetrics and tertiary AN-DRGs)
 - Generic Need Index
- Tertiary Acute Services
 - Age/Sex weightings using HCCC AN-DRGs
- Obstetric Services
 - Age weightings using obstetrics AN-DRGs and actual births
 - Fertility rates for each Area
- Private hospital substitutable activity
- Public/private patient mix in public hospitals
- Health service ambulance costs (not NSW Ambulance Service costs)
- IPTAAS
- Patient Severity and Indirect Teaching & Research
- Specialist Paediatric Services
- Nationally Funded Centres
- Dispersion costs factor

Flows for acute inpatient services have to be taken into account when comparing the population share of funding with historical levels of funding which reflect where services are provided rather than where the population is located. Appendix C contains an assessment of acute inpatient flows and indicates flows to the New Children's Hospital and Interstate based on the most recent data.

Age/Sex Weights

The current Resource Distribution Formula applies an age/sex weighting derived from the 1996/7 hospital inpatient data collection. These are expressed in terms of a casemix weighted separation rates for age/sex groups and are calculated for General and Tertiary services. For Obstetric Services the need index is replaced by the age specific fertility rate, a measure of births per woman. This reflects that obstetric demand is more closely related to life cycle factors than chronological age. Fertility is higher in the outer metropolitan zones as people tend to change residence when they enter the family formation stage of the life cycle.

The age/sex weights for General and Tertiary services are based on:

- Casemix weighted separations of NSW residents treated in NSW public and private hospitals (excluding obstetric separations);
- Casemix weighted separations for NSW residents treated in interstate hospitals;
- Casemix weights applied utilising AN-DRG Version 3 and updated NSW cost weights. The age/sex weights for Tertiary services are based on casemix weighted separation rates for a defined list of High Cost Complex Casemix AN-DRGs. Age/sex weights for General services are derived from casemix weighted separation rates for all

other AN-DRGs (ie, excluding Tertiary and Obstetrics AN-DRGs). Separations occurring in freestanding day only private hospitals with a cost weight greater than 0.5 have been weighted at 0.5.

The age/sex weights are in Appendix D.

Generic Need Index

The Generic Need Index has been applied to general services (ie, non-Obstetric and non-Tertiary services). See section 5 for details of the Index.

Private Hospital Substitutable Activity

Acute inpatient services provided to patients treated in private hospitals provide a substitute for services provided in public hospitals. Therefore, since private hospitals are not funded from Area allocations, substitutable casemix weighted activity occurring in private hospitals is deducted from the total expected activity for the Area (the latter is derived from applying the age/sex utilisation rates and the Generic Need Index to the Area population). This deduction is needed because residents obtaining services from private hospitals save the Areas from having to meet the corresponding need in public hospitals. The definition of substitutable refers to the notion that a service performed in the private sector has substituted for activity which would otherwise be provided in the public sector.

In the previous RDF the deduction was not a full deduction as it has previously been estimated that around 20-30% of private hospital services are not substitutable for public hospitals services ie, they would not be undertaken in public hospitals and are therefore not regarded as a saving to Areas. The non-substitutable portion of private hospital activity relates to services like cosmetic surgery, some diagnostic testing which would normally be performed on an outpatient basis and purely elective procedures which are not performed in the public system which operates under fixed budgets and admits these patients on the basis of clinical need.

The previous approach assumed a rate of substitution of 70% for general activity whilst tertiary and obstetrics activity were assumed to be 100% substitutable. The overall level of substitution in the previous RDF was 75.6%. More recent refinements to this factor have involved the calculation of separate levels of substitution at the NSW individual AN-DRG level and removal of the 100% substitution assumption for tertiary and obstetrics services. The application of this results in a separate level of substitution across Areas depending on each Area's casemix and utilisation of private hospitals. A number of adjustments were made to the calculation to reduce the impact of the significant variation in admission policies and coding practices for specific AN-DRGs (such as renal dialysis, chemotherapy, certain endoscopies, aftercare and postpartum care) which are outside of the control of the Areas and affect some Areas more than others.

For a number of other DRGs the level of substitution calculated by the formula approach was considered too high given the estimated impact of supply effects and the fact that some cosmetic surgery is very rarely performed in public hospitals. The levels of substitution for these DRGs were also adjusted downwards.

Overall across NSW, the level of substitution has changed little in this version of the Formula (it is now 73.4%), however each Area has a different level of substitution of private hospital activity rather than the same level as shown in Appendix E.

Public/Private Patient Mix in Public Hospitals

For private patients in public hospitals, to date the Department has adopted an approach in the Resource Distribution Formula which assigns a cost weight to private patient separations equal to 88% of the cost weight applied to public patient separations. This difference is mainly due to medical costs associated with chargeable patients being met by the patient (or health insurance fund/other third party payer). A factor along these lines is included in the Resource Distribution Formula, although a more sophisticated approach will be investigated in 1999.

Health Service Ambulance Costs and IPTAAS

Relative funding for ambulance services by the Health Services varies with distance to services. Remote areas require fixed wing aircraft for rapid retrieval and long range land ambulance transport for less urgent cases. The consequence is that the proportion of budget required for transport rises with increasing distance from metropolitan centres. A similar argument exists for the Isolated Patient Transport and Accommodation Assistance Scheme (IPTAAS).

A factor has been incorporated relating to Health Service Ambulance Costs of \$28 million across Areas. The factor is distributed using the figures in the 1997/8 Agreements between the Areas and NSW Ambulance Service relating to inter-hospital transfers.

The factor relating to IPTAAS costs has been retained in this revision of the Resource Distribution Formula. The factor has been distributed to rural Areas on the basis of their share of the \$6.1 million spent within the health service on IPTAAS. A Review of IPTAAS is currently being finalised and it is considering reallocating historical funding levels for IPTAAS on a population basis to Rural Health Services and the Hunter Area Health Service.

Severity and Indirect Teaching and Research

The Resource Distribution Formula includes a Severity and Indirect Teaching and Research product component, which is related to:

- severity components which are not captured in casemix adjustments using DRGs. Severity recognises that if one hospital treats patients who are more severely ill but fall within the same DRG as a less severely ill patient in another hospital, average cost weighting will underestimate the true costs incurred. As casemix methodology improves the severity differentials will gradually diminish.
- indirect teaching and research costs associated with patient care. These indirect costs will remain even if severity is fully recognised. This refers to the higher cost due to the nature of the Teaching and Research function and the Principal Referral Function. For example: principal referral hospitals need to ensure clinical staff and ICUs are

available for major trauma; patient care and teaching (and some research) occurs at the same time making these costs hard to separate; the additional time required for patient care and additional diagnostic test that occur when staff are undergoing training involves higher cost for the equivalent level of patient care in non-teaching hospitals.

The approach adopted in the RDF in calculating the indirect Severity/Mixed Product pool has been based on an assumption that the gross efficiency of Principal Referral hospitals as a group is equivalent to that of the non-referral hospitals as a group. Any difference in overall costs between referral and non-referral hospitals relates to the indirect Severity/Mixed Product component. The RDF approach to determining the Severity/Mixed Product component can be divided into two steps:

- The total amount in the indirect Severity/Mixed Product pool;
- The proportions in which this amount is distributed among the various Areas.

This approach has been continued but with one significant difference being the inclusion of Gosford, Penrith/Nepean, Newcastle Mater Misericordiae Hospital, Sydney/Sydney Eye and Royal Hospital for Women to the calculation of the pool. Using data from the 1996/7 Hospital Cost Survey and 1996/7 NSW Public Hospitals Comparison Book an initial pool of \$191 million (cash) has been calculated as the difference in overall costs (equal to \$346 per casemix weighted separation) of these hospitals attributable to severity and indirect teaching and research. Added to this pool is a 14.4% percent loading (which is the same percentage loading derived from the acute inpatient component calculation) on reported non-admitted emergency and outpatient costs which brings the pool up to \$240 million. The higher cost for non-inpatient activity is already reflected in the Resource Distribution Formula through non-population adjustments of \$50m for radiotherapy, NFCs and MRI. After this \$50 million has been removed the residual pool for Severity and Indirect Teaching and Research is estimated to be \$190 million.

For this refinement of the RDF the distribution has continued to be based on shares of HCCC activity, but only allocated to Areas with hospitals included in the calculation of the pool. While complex treatments and teaching and research occurs in other hospitals, the cost structures due to the scale of referral work and teaching and research activity in these hospitals requires a non-population allowance on top of the Direct Teaching and Research component of the Resource Distribution Formula which is provided to all areas.

Adjustments to the HCCC activity for Gosford, Liverpool, Illawarra and Penrith/Nepean Hospitals have also been included to reflect their increased activity since 1996/7 due to their expanding teaching/research and referral role.

Appendix F illustrates the close relationship between HCCC activity, estimated teaching load and direct expenditure on teaching and research. Given this relationship the continued use of HCCC activity as an indicator of teaching and research activity is considered appropriate for the distribution of funds for this component.

The following further work will be undertaken on this component:

- identification of teaching and research outputs and performance measures will be examined with a view to incorporating them into a more sophisticated funding model for teaching and research
- identification of aspects of within DRG severity that could be funded directly on an output basis.

Nationally Funded Centres (including former NFCs)

Funding for these Centres has been provided to the host Areas and the patient flows to these centres have been removed from the calculation of overall flows to avoid double counting.

The Nationally Funded Centres and Recent NFCs are shown in Table 16.

Table 16: Current and Former Nationally Funded Centres

Hospital	Procedure
St Vincent's Hospital	Heart/Lung Transplants
Westmead Hospital	Pancreas Transplants
Royal Prince Alfred Hospital/Royal Alexandra Hospital for Children	Liver Transplants
Royal Prince Alfred Hospital/ Royal North Shore Hospital	Cerebrovascular Embolisation (CVE)

Specialist Paediatric Services

In the Resource Distribution Formula there is a need to ensure that a consistent set of principles is applied to the New Children’s Hospital (which is excluded from the Formula) and funding of Specialist Paediatric Services at Sydney Children’s Hospital (SCH) and John Hunter which are included in the Formula. The method for achieving this is to include an adjustment for the higher cost of these hospitals that cannot be explained by the average cost per casemix weighted separation for acute activity in other hospitals. This is the same approach used to identify the severity and indirect Teaching and Research cost of principal referral and major metropolitan referral hospitals.

For the SCH, the calculation uses the same State average costs used for the severity/indirect teaching and research pool and results in a loading of \$346 per casemix weighted separation (equal to 14.4% over the State average cost). This same percentage loading is added to non-inpatient costs to derive a total loading of approximately \$6.6 million for SCH.

John Hunter Hospital already receives a loading under the severity/indirect teaching and research factor of \$12.5 million relating to all activity (including paediatrics). As the loading is the same as that applied to the adult caseload, no additional paediatric loading is required for John Hunter as the paediatric caseload has been included in the calculation of John Hunter’s Severity/Indirect Teaching and Research factor (ie, the paediatric caseload is not reported separately to the Department whereas the SCH is a stand alone hospital with separately identifiable activity). The overall relative affect for each hospital is the same as the

only difference in their treatment is the presentation of the results under two separate RDF factors.

Note that the New Children's Hospital is excluded from the RDF and a factor for this hospital is not required.

In the future, cost data from interstate specialist paediatric services (eg possibly from the AAPTC) and costings of paediatric units in NSW public hospitals should inform the choice of benchmark cost for this factor.

Dispersion Costs Factor

It has been agreed by the HERC and RDF Committees that a population-based measure be used to calculate a factor for the additional costs of rural and remote regions rather than a small hospitals factor which basically reflects existing levels of provision. In particular, it was agreed that further work on the Commonwealth Grants Commission (CGC) approach to calculating dispersion factors would be undertaken. The key challenge is to disentangle the effects of dispersion on the need for additional facilities in Areas with rural populations (which should be legitimately acknowledged in the RDF) from historical patterns of service configuration which do not always align with the effects of dispersion.

The CGC approach estimates the relative extent to which each State's population is geographically dispersed and how that spatial distribution of population imposes costs on States in the delivery of services. In its most simple form the CGC approach attempts to standardise cost items affected by dispersion against population-weighted distances to regional centres and capital cities. These cost items relate to telephone calls over long distances, travel in connection with the provision of services (by motor vehicle and air), freighting goods or transferring staff and compensating staff for working in remote locations.

A NSW Area Health model has been developed based on the CGC approach and, for each CGC cost item, a set of distance-weighted population units have been calculated which have been converted to an index of relative dispersion for each Area. The raw populations of each SLA were weighted by the Generic Need Index to ensure that the distance-weighted population units reflected the estimated higher level of population need in rural Areas. This weighting was made to be consistent with research by the AIHW reported in *Australia's Health 1998* which found that age standardised hospitalisation rates in the remote areas are 23%/40% higher for males/females respectively than the rate in capital cities.

Two separate calculations were used to derive the relative dispersion index for each Area: one for the distance from major referral hospital (note: this is an adaptation of the distance from regional centres calculation of the pure CGC model) and another for the distance from nearest capital city.

Analysis of actual 1997/8 costs reported by Areas for each of the CGC cost items showed a relationship between relative dispersion and per capita service costs. The analysis showed that as the degree of relative dispersion increased, the per capita cost for the CGC cost items also increased. To calculate the per capita cost for each CGC cost item and Area, the estimated number of residents relating to patient flows was added/subtracted from inflow/outflow Areas populations to ensure that the per capita costs were related to the provision of services to the local population (ie, where the residents normally reside) rather than the costs of treating residents from other Areas.

Applying the relative dispersion index to the Statewide per capita cost for each of the CGC cost items (based on actual reported data for 1997/8) results in an estimate of total expected expenditure on these items for each Area. However, as we are only interested in the marginal additional costs of these components and not the total costs, only those costs of Areas with rural populations over and above the average per capita cost in metropolitan Areas for each cost item were included in this factor.

The Dispersion Costs Factor has been proportioned across the Acute Inpatient, Primary & Community Based Services and Rehabilitation & Extended Care components of the Formula according to the share of the total health expenditure of these programs. These programs are consistent with the programs assumed by the CGC in its model and reflects where the majority of the costs have been incurred. Also, given the very small numbers involved, the dispersion-related costs associated with outpatient and emergency departments have been included under Acute Inpatient Services whilst Aboriginal Health and Population Health have been included under the Primary & Community Based Services component.

Table 17 provides details of the formula under this component.

**Table 17a: Acute Inpatient Activity
Population Components**

	<i>GENERAL</i>					<i>TERTIARY</i>	<i>OBSTETRIC</i>	<i>Total Weighted Activity</i>
	<i>Age/Sex Weighted DRG Weighted Activity*</i>	<i>Transient Workers</i>	<i>Adjusted Weighted Activity</i>	<i>Generic Need Index</i>	<i>Total Weighted Activity</i>	<i>Age/Sex Weighted DRG Weighted Activity*</i>	<i>Age/Sex Weighted DRG Weighted Activity**</i>	
100 Central Sydney	90,569	-	90,569	102.9	93,177	21,195	7,701	122,073
105 Northern Sydney	152,925	-	152,925	82.5	126,102	34,568	10,101	170,770
120 Western Sydney	112,345	-	112,345	99.4	111,671	27,842	12,245	151,758
125 Wentworth	50,117	-	50,117	97.7	48,975	12,416	5,498	66,888
130 South West Sydney	127,437	-	127,437	101.1	128,851	31,780	14,195	174,826
135 Central Coast	63,131	-	63,131	102.9	64,942	14,693	4,313	83,949
140 Hunter	104,589	-	104,589	103.2	107,936	24,860	7,694	140,491
145 Illawarra	68,771	-	68,771	100.2	68,902	16,703	5,142	90,747
155 South Eastern Sydney	147,722	-	147,722	93.5	138,169	33,802	10,519	182,490
400 Northern Rivers	57,106	-	57,106	103.8	59,276	13,593	3,571	76,440
410 Mid North Coast	59,738	-	59,738	105.5	63,050	14,293	3,538	80,880
420 New England	33,349	800	34,149	113.5	38,769	8,023	2,548	49,339
430 Macquarie	19,520	-	19,520	115.3	22,503	4,854	1,820	29,177
440 Mid Western	31,181	-	31,181	110.8	34,560	7,614	2,690	44,864
450 Far West	8,962	300	9,262	167.7	15,534	2,206	673	18,412
460 Greater Murray	49,396	1,800	51,196	108.6	55,620	11,963	4,102	71,684
470 Southern NSW	37,400	-	37,400	107.3	40,145	9,141	2,313	51,599
Total	1,214,258	2,900	1,217,158		1,218,182	289,545	98,661	1,606,387

* Based on State casemix weighted utilisation rates for age/sex groups

** Based on AN-DRG cost weights for birth.

**Table 17b: Acute Inpatient Activity
Cost Components**

	<i>Public/ Private Mix \$'000</i>	<i>Health Service Ambulance \$'000</i>	<i>IPTAAS \$'000</i>	<i>Severity/ Mixed Product \$'000</i>	<i>Nationally Funded Centres \$'000</i>	<i>Specialist Paediatric \$'000</i>	<i>Dispersion -related Costs \$'000</i>	<i>New Children's Hospital Flows - Public \$'000</i>
100 Central Sydney	(1,848)	822	-	42,945	4,560	-	-	(3,963)
105 Northern Sydney	(3,119)	1,200	-	22,951	1,220	-	-	(3,478)
120 Western Sydney	913	900	-	25,435	1,000	-	-	(15,178)
125 Wentworth	580	515	-	7,293	-	-	252	(4,331)
130 South West Sydney	1,711	1,050	-	12,850	-	-	220	(8,726)
135 Central Coast	(53)	825	-	4,809	-	-	369	(2,190)
140 Hunter	550	2,000	-	17,519	-	-	543	(1,056)
145 Illawarra	644	1,250	-	6,344	-	-	578	(1,309)
155 South Eastern Sydney	(2,191)	1,000	-	49,855	4,500	6,600	-	(1,058)
400 Northern Rivers	954	2,870	1,685	-	-	-	1,402	(352)
410 Mid North Coast	705	2,250	-	-	-	-	2,105	(1,999)
420 New England	108	2,500	1,334	-	-	-	2,899	(690)
430 Macquarie	334	2,547	835	-	-	-	1,113	(888)
440 Mid Western	282	2,500	445	-	-	-	1,176	(1,539)
450 Far West	175	1,239	372	-	-	-	2,249	(115)
460 Greater Murray	105	4,153	1,187	-	-	-	2,602	(766)
470 Southern NSW	152	2,051	401	-	-	-	1,253	(957)
Total	(0)	29,672	6,259	190,000	11,280	6,600	16,760	(48,592)

6.4. REHABILITATION AND EXTENDED CARE SERVICES

The formula for rehabilitation and extended care for the previous Resource Distribution Formula was essentially that proposed in the 1995 discussion paper "A Resource Allocation Formula for Program 2.9". It included factors for:

- Palliative Care
 - age weights based on the age distribution of hospital bed days for oncology
 - a need index reflecting the 1989/91 Oncology Standardised Mortality Ratio for the Area
 - a private services flow factor based on utilisation of private hospices
- Community Nursing
 - age weights based on a cost survey of HACC services conducted in the Hunter Area
 - the blended need index for Aged and Rehabilitative Care (see below)
- Rehabilitation
 - age weights based on data held by the Central Coast and Illawarra Areas
 - the blended need index for Aged and Rehabilitative Care (see below)
- Program of Appliances for Disabled People (PADP)
 - age/sex weights for the RAF for program 2.3
 - A need index based on the ABS Education and Occupation Index
- Aged Care Assessment Program
 - age/sex utilisation rates based on ACAP data
 - the blended need index for Aged and Rehabilitative Care (see below)
- Statewide Services for Rehabilitation
- Nursing Home Type Patients in Public Hospitals
- Rehabilitation hospital flows based on bed days.

Recent Developments and Issues

The boundary between the Rehabilitation and Extended Care Program continues to be a significant problem for most Area health services. The key issue is that whereas the previous program 2.9 was largely a service based approach to defining boundaries, the new program 5.1 is more aligned to patient types. Key areas of problems include:

- absence of authoritative definitions of sub/non acute patient episodes
- costing of sub/non acute patients in general care settings
- appropriate assignment of various costs (eg pathology) to sub and non acute patients
- appropriate assignment of community health costs (eg community nursing) to the program

NSW Health is attempting to address some of these issues systematically over the next few years. A key initiative is that NSW Health sponsored a National Sub and Non Acute Care Study (SNAP) which was undertaken by the Centre for Health Service Development at the University of Wollongong. This study proposed that the Sub and Non Acute Episodes be classified in the following types:

- Rehabilitation
- Geriatric Evaluation and Management
- Palliative Care
- Psychogeriatric Care
- Maintenance Care.

The SNAP study has yielded a range of results which will be used in revising the Resource Distribution Formula, including age/sex specific costs for these services. The age/sex weights are at Table 18. The weights are based on the national cost data and combine overnight care with ambulatory care. As gender was not captured in the SNAP study, breakdowns into gender categories were based on other sources such as anecdotal reports from SNAP sites and NSW Cancer Council reports.

Table 18: Age/Sex Weights for Rehabilitation & Extended Care

Combined Overnight/Ambulatory Weights					
Male	Palliative Care	Rehabilitation	Other**	Psychogeriatrics	PADP
0-4	-	0.020	-	-	0.564
5-9	-	0.020	-	-	0.564
10-14	-	0.020	-	-	0.564
15-19	-	0.146	-	-	0.258
20-24	0.037	0.335	0.178	-	0.258
25-29	0.047	0.221	0.206	-	0.272
30-34	0.121	0.294	0.228	-	0.272
35-39	0.209	0.345	0.241	-	0.272
40-44	0.267	0.519	0.278	-	0.272
45-49	0.622	0.372	0.355	-	0.825
50-54	0.819	0.582	0.571	0.299	0.825
55-59	1.748	0.783	0.627	0.615	0.825
60-64	2.614	1.609	1.072	1.849	0.825
65-69	4.522	2.579	1.925	3.282	3.257
70-74	6.640	4.199	3.354	4.983	3.257
75-79	6.947	6.333	6.375	6.927	6.634
80-84	9.955	9.907	10.855	8.929	6.634
85+	10.257	13.764	18.586	11.704	6.634

Female	Palliative Care	Rehabilitation	Other**	Psychogeriatrics	PADP
0-4	-	0.020	-	-	0.564
5-9	-	0.020	-	-	0.564
10-14	-	0.020	-	-	0.564
15-19	-	0.037	0.116	-	0.258
20-24	0.037	0.084	0.217	-	0.258
25-29	0.047	0.055	0.252	-	0.272
30-34	0.167	0.074	0.279	-	0.272
35-39	0.287	0.086	0.295	-	0.272
40-44	0.367	0.130	0.340	-	0.272
45-49	0.856	0.372	0.433	-	0.825
50-54	1.126	0.582	0.698	0.555	0.825
55-59	1.748	0.783	0.767	1.142	0.825
60-64	1.960	1.609	1.310	3.434	0.825
65-69	3.391	2.579	2.353	6.096	3.257
70-74	4.980	5.132	4.099	9.254	3.257
75-79	5.211	7.740	7.792	12.865	6.634
80-84	7.466	12.109	13.267	16.583	6.634
85+	7.692	16.822	22.717	21.736	6.634

***Includes GEM and Maintenance Care*

These weights have been adopted in the population-based components of this element of the Resource Distribution Formula detailed below. The weights to be applied in the Resource Distribution Formula also combine GEM and Maintenance Care into *Other*. The *Other* sub-category was further split into *Commonwealth Aged Care Assessment Program* to reflect the specific funding formula developed for this component.

A key difference in this new approach to that adopted in the previous Resource Distribution Formula is that community based services are part of the various episode types. In NSW and SA the SNAP study has collected data on community services along with inpatient care.

With the need to align the program expenditure data with the way in which the weights have been applied to the Rehabilitation & Extended Care component of the Resource Distribution Formula, a survey of Area 1996/7 expenditure on program 5.1 was undertaken which has resulted in the following revised weightings under this component:

Table 19: Sub-component Relative Shares

Sub-component	% Share
Rehabilitation	38
Palliative Care	18
Other (includes GEM, Maintenance Care, C/W ACAP)	26
PADP	3
Psychogeriatrics	6
Non-population-based factors	9
Total	100.0%

Rehabilitation

Previously, the population component of rehabilitation in the Resource Distribution Formula used age weightings based on data from the Central Coast and Illawarra Area Health Services. However with the availability of better data from SNAP, the age/sex weights for this component have been based on the SNAP data referred to above. The Blended Need Index has also been applied.

There is also an allowance for Statewide services for the all Brain Injury Units (particularly the three specialist brain injury units in Northern Sydney AHS, Western Sydney AHS and South Western Sydney AHS) and Specialist Spinal Injury Units in South Eastern Sydney AHS and Northern Sydney AHS.

Palliative Care

The age/sex weights for this component have been based on the SNAP data referred to above.

Data from 1990 to 1994 have also been used to update the Cancer Standardised Mortality Ratios used in the Palliative Care Need Index. The private hospital utilisation factor has also been recalculated using the most recent data on palliative care bed days by Area.

It should be noted that palliative care for AIDS is included in the total AIDS model which, for convenience, is a single entity in the outpatients funding component of the Resource Distribution Formula.

Other

This component includes Geriatric Evaluation & Management and Maintenance Care and Commonwealth Aged Care Assessment Program (ACAP) funding. The age/sex weights for the GEM and Maintenance Care component have been based on the SNAP data referred to above and have been further weighted by the Blended Need Index. The age/sex weights for the Commonwealth ACAP funding have been based on actual utilisation data from the *NSW Evaluation Unit* based at Westmead. The weighted ACAP populations have been further weighted by the Generic Need Index, the ATSI population aged > 45 years, and an index based on private/non-private dwelling living arrangements.

Psychogeriatrics

The current NSW Health program structure includes those services which are most closely aligned with aged care, such as CADE units, residential care for dementia patients and any community-based services in the Rehabilitation & Extended Care program. Acute psychogeriatric units are included in the Mental Health program. Given that the age/sex weights from the SNAP study are conveniently based on non-acute psychogeriatric patients, funding for these services has been allocated under the Rehabilitation & Extended Care component.

PADP

Utilisation data by age group have been obtained from a Survey of PADP in NSW and converted into age specific population weights. The need index is based on the ABS socio-economic index of Education and Occupation.

Community Services

With the adoption of age/sex weights derived from data from SNAP, the Community Services (largely community nursing) sub-component used previously in the Resource Distribution Formula has been absorbed into the other sub and non acute case types.

The Blended Need Index

The Blended Need index used for Rehabilitation and Community Services is a blend of factors including:

- age adjusted rates of people living alone (weighted by 3)
- the ABS socio-economic status index of Relative Disadvantage (weighted by 2); and
- a rurality variable (weighted by 1).

Table 20 details the Blended Need Index for Area Health Services. This Index has also been applied in this revision of the Resource Distribution Formula. Note that other specific Need Indices are used for PADP and Palliative care.

Table 20: Need Index for Rehabilitation and Extended Care

Need Indices for Rehabilitation and Extended Care					New Areas				
	Living Alone Age Adjusted Index*	Socio-Economic Status Index**	Rural/Urban Index***	Blended Index	Blended Index	PADP Need Index****	Palliative Care Need Index*****	Palliative Care Private Hospice Discount*****	
100 Central_Sydney	1.068	98.2	17.0	101.0	100 Central Sydney	101.0	0.982	106.8	99.7%
105 Northern_Sydney	1.044	110.2	16.6	94.4	105 Northern Sydney	94.4	0.863	89.0	95.2%
120 Western_Sydney	0.893	100.8	16.1	94.3	120 Western Sydney	94.3	0.953	103.8	99.5%
125 Wentworth	0.981	104.0	15.0	95.4	125 Wentworth	95.4	0.951	101.4	98.2%
130 South_West_Sydney	0.797	96.7	15.4	93.6	130 South West Sydney	93.6	0.997	102.6	99.2%
135 Central_Coast	1.025	98.4	13.6	99.7	135 Central Coast	99.7	1.002	104.1	97.9%
140 Hunter	1.033	99.1	14.2	99.5	140 Hunter	99.5	1.001	104.1	99.8%
145 Illawarra	0.933	98.0	14.8	97.0	145 Illawarra	97.0	1.013	103.2	93.0%
155 Eastern_Sydney	1.266	1.0	17.0	106.6	155 South Eastern Sydney	100.0	0.932	103.0	99.0%
155 Southern_Sydney	0.993	103.1	16.6	96.1	400 Northern Rivers	96.5	1.058	90.0	81.8%
400 Clarence	0.968	95.4	6.5	100.3	410 Mid North Coast	97.5	1.072	96.9	99.9%
400 Richmond	0.922	96.1	10.0	98.0	420 New England	102.0	1.054	100.0	100.0%
400 Tweed	0.771	94.8	10.0	94.2	430 Macquarie	102.3	1.069	99.8	100.0%
410 Lower_North_Coast	0.897	95.6	10.9	97.5	440 Mid Western	102.1	1.042	100.5	99.9%
410 Macleay-Hastings	0.870	94.8	10.7	97.2	450 Far West	112.4	1.090	101.8	100.0%
410 Mid_North_Coast	0.894	94.8	10.1	97.9	460 Greater Murray	101.8	1.050	99.7	100.0%
420 Barwon	1.046	97.5	3.9	102.2	470 Southern NSW	97.2	1.027	95.9	99.3%
420 New_England	1.139	99.2	7.2	103.2					
420 North_West	1.087	99.6	9.5	101.2					
430 Castlereagh	1.075	97.4	7.2	102.2					
430 Macquarie	1.085	97.2	8.3	102.5					
440 Central_West	1.068	99.4	9.7	100.7					
440 Evans	1.219	100.9	9.5	104.5					
440 Lachlan	1.086	97.8	4.2	103.2					
450 Far_West	1.284	94.2	2.8	112.2					
450 Orana	0.997	87.8	1.0	112.6					
460 Hume	1.090	100.5	9.7	100.8					
460 Murray	0.923	100.2	4.7	96.7					
460 Murrumbidgee	1.099	98.8	6.9	102.3					
460 Riverina	1.143	100.4	10.5	102.4					
470 Monaro	1.047	104.8	10.7	97.2					
470 South_Coast	0.735	97.8	8.0	91.6					
470 Southern_Tablelands	1.144	101.6	7.5	102.1					

* Living Alone Index from Census of Population and Housing Tabulations 1991

** Socio Economic Status Index of Relative Disadvantage, 1991

*** Rural/Urban Index from Eckstein and Gibberd 1994

**** Based on ABS Index Education and Occupation

*****Cancer SMRs for NSW 1990-94

*****Based on utilisation of private hospices

State Government Nursing Homes & Nursing Home Type Patients in Acute Care Facilities

The majority of SGNH expenditure has been excluded from the Resource Distribution Formula based on the estimate of the average cost per bed day (assumed to be \$145) currently used in the Department's SGNH strategy applied to the number of beds at August 1998. Additionally, there are five SGNHs which are NGO-managed and which are receiving a top up of \$8.93 per occupied bed day from the Area to cover costs. For these SGNHs, this lower figure has been used to exclude the Areas' costs related to these beds from the Formula. The occupancy rate used to calculate the total expenditure is 98%.

An allowance recognising the additional burden on Areas of NHTPs in public hospitals as a result of insufficient aged care residential places has been continued in this revision of the Resource Distribution Formula for equity reasons. However, a refined approach has been adopted. The allowance has been provided under two components: (1) a base population component which would be already captured under the *Geriatric Evaluation & Monitoring and Maintenance Care* age/sex weights and (2) an additional component reflecting the estimated additional burden of NHTP bed days in rural Areas (over and above a given base level of NHTP bed days per 1000 population aged over 65) where there are typically an under-supply of aged care residential places such as nursing homes, hostels and community aged care packages for home-based care. The estimated number of additional NHTP bed days in an Area is then multiplied by \$142 which is the average cost per maintenance care bed day from the SNAP study.

Patient Flows Across Areas

An adjustment has been made for flows of patients to non-acute facilities for rehabilitation. The flows are based on all Rehabilitation episodes and uses the average core cost per bed day of \$265 from the SNAP study. Ultimately these flows should be dealt with under funding arrangements for patient flows.

It is considered that Palliative Care services should be provided in the local community and therefore no specific adjustments have been made for flows of these services. Similarly no adjustments should be made for Psychogeriatrics, PADP or Other Services (relating to Geriatric Evaluation & Management and Maintenance Care).

Dispersion Costs Factor

A dispersion costs factor has been included in this component of the Formula. This factor captures the higher costs of providing services in rural and remote areas of NSW. For convenience, discussion of this factor has been included under section 6.3 *Acute Inpatient Services*.

Table 21 provides details of the formula under this component.

**Table 21a: Rehabilitation and Extended Care
Population Components**

	<i>Palliative Care</i>						<i>Rehabilitation</i>	
	<i>Age/Sex Weighted Population</i>	<i>Palliative Care Need Index</i>	<i>Private Discount</i>	<i>Total Need Adjusted Population</i>	<i>Normalised Population</i>	<i>Percentage Share</i>	<i>Age/Sex Weighted Population</i>	<i>Rehab & Ext. Care Need Index</i>
100 Central Sydney	540,476	106.8	99.7%	575,510	518,672	7.9%	543,184	101.0
105 Northern Sydney	958,614	89.0	95.2%	811,814	731,638	11.2%	1,009,766	94.4
120 Western Sydney	626,629	103.8	99.5%	646,991	583,093	8.9%	604,308	94.3
125 Wentworth	272,025	101.4	98.2%	270,732	243,994	3.7%	260,848	95.4
130 South West Sydney	707,158	102.6	99.2%	719,903	648,805	9.9%	680,234	93.6
135 Central Coast	417,642	104.1	97.9%	425,816	383,762	5.9%	432,497	99.7
140 Hunter	655,215	104.1	99.8%	681,028	613,769	9.4%	658,810	99.5
145 Illawarra	434,955	103.2	93.0%	417,515	376,281	5.8%	423,220	97.0
155 South Eastern Sydney	902,530	103.0	99.0%	920,134	829,260	12.7%	930,952	100.0
400 Northern Rivers	376,882	90.0	81.8%	277,468	250,065	3.8%	376,018	96.5
410 Mid North Coast	406,807	96.9	99.9%	393,636	354,760	5.4%	400,901	97.5
420 New England	209,420	100.0	100.0%	209,420	188,738	2.9%	209,011	102.0
430 Macquarie	120,520	99.8	100.0%	120,279	108,400	1.7%	117,220	102.3
440 Mid Western	192,364	100.5	99.9%	193,063	173,996	2.7%	189,158	102.1
450 Far West	56,481	101.8	100.0%	57,498	51,819	0.8%	55,114	112.4
460 Greater Murray	308,789	99.7	100.0%	307,813	277,413	4.2%	307,285	101.8
470 Southern NSW	241,089	95.9	99.3%	229,517	206,850	3.2%	231,789	97.2
Total	7,427,594			7,258,138	6,541,314	100.0%	7,430,314	

	<i>Other (GEM & Maintenance Care)</i>						<i>PADP</i>	
	<i>Age/Sex Weighted Population</i>	<i>Rehab & Ext. Care Need Index</i>	<i>Total Need Adjusted Population</i>	<i>Normalised Population</i>	<i>Percentage Share</i>	<i>Commonwealth ACAT \$'000</i>	<i>Age/Sex Weighted Population</i>	<i>PADP Need Index</i>
100 Central Sydney	567,790	101.0	573,467	497,895	7.6%	900	492,643	0.982
105 Northern Sydney	1,077,454	94.4	1,017,117	883,080	13.5%	1,458	862,458	0.863
120 Western Sydney	618,984	94.3	583,702	506,781	7.7%	1,168	606,657	0.953
125 Wentworth	268,244	95.4	255,905	222,182	3.4%	351	270,278	0.951
130 South West Sydney	693,355	93.6	648,980	563,457	8.6%	903	695,596	0.997
135 Central Coast	451,846	99.7	450,490	391,124	6.0%	690	373,969	1.002
140 Hunter	681,024	99.5	677,619	588,321	9.0%	1,055	598,294	1.001
145 Illawarra	429,699	97.0	416,808	361,881	5.5%	619	392,279	1.013
155 South Eastern Sydney	979,346	100.0	979,452	850,379	13.0%	1,349	820,925	0.932
400 Northern Rivers	387,958	96.5	374,194	324,883	5.0%	586	334,582	1.058
410 Mid North Coast	411,075	97.5	400,605	347,813	5.3%	628	352,259	1.072
420 New England	216,492	102.0	220,747	191,657	2.9%	360	189,758	1.054
430 Macquarie	119,841	102.3	122,615	106,457	1.6%	210	110,472	1.069
440 Mid Western	193,676	102.1	197,809	171,741	2.6%	315	176,534	1.042
450 Far West	56,541	112.4	63,576	55,198	0.8%	139	50,417	1.090
460 Greater Murray	316,771	101.8	322,467	279,972	4.3%	513	281,865	1.050
470 Southern NSW	235,321	97.2	228,621	198,493	3.0%	360	213,454	1.027
Total	7,705,418		7,534,176	6,541,314	100.0%	11,603	6,822,439	

	<i>Psychogenics</i>					<i>Other Costs Components</i>			
	<i>Age/Sex Weighted Population</i>	<i>Risk & Est. Care Needs</i>	<i>Total Natl Adjusted Population</i>	<i>Nominal Population</i>	<i>Percentage Share</i>	<i>NHP \$00</i>	<i>Dispositional Cos \$00</i>	<i>Service \$00</i>	<i>Rehabilitation Flow \$00</i>
100 Central Sydney	682358	1010	688881	484409	74%	-	-	-	(693)
105 North Sydney	1237263	944	1167977	888605	131%	-	-	4500	1680
120 Western Sydney	717526	943	676627	497455	76%	-	-	3000	186
125 Werris Valley	302108	954	288211	211892	32%	-	35	-	(207)
130 South West Sydney	806676	986	750049	555111	85%	-	31	3000	(90)
135 Central Coast	549981	997	544343	400000	61%	-	52	-	(59)
140 Hunter	816137	995	810056	597023	91%	-	76	1000	(55)
145 Illawarra	500032	970	514131	377988	58%	-	81	442	(85)
155 South East Sydney	1131114	1000	1131236	831683	127%	-	-	2500	278
400 North Riverina	471800	965	459081	334575	51%	802	196	294	85
410 Mid North Coast	500738	975	496755	365214	56%	-	294	314	(332)
420 New England	292269	1020	264365	194361	30%	3762	405	372	(78)
430 Macquarie	145665	1023	140057	100572	17%	3667	156	198	218
440 Mid Western	234007	1021	230205	175863	27%	9997	164	429	(231)
450 Far West	67617	1124	70000	55897	09%	365	314	-	(272)
460 Greater Murray	380724	1018	387569	284940	44%	5457	364	499	(225)
470 Southern NSW	280018	972	280789	206436	32%	706	175	553	(75)
Total	9097251		8897342	654334	100%	24817	2344	17100	(1)

6.5 MENTAL HEALTH SERVICES

A draft Mental Health RDF has been prepared and requires further refinement over 1998/9. In the interim the mental health component of the RDF has been based on historical expenditures of Areas. Table 22 provides details of the historical costs-based formula under this component.

Table 22: Mental Health

	<i>Percentage Share</i>
100 Central Sydney	15.9%
105 Northern Sydney	15.6%
120 Western Sydney	14.0%
125 Wentworth	2.3%
130 South West Sydney	5.5%
135 Central Coast	2.5%
140 Hunter	10.6%
145 Illawarra	3.7%
155 South Eastern Sydney	11.0%
400 Northern Rivers	2.2%
410 Mid North Coast	2.1%
420 New England	2.1%
430 Macquarie	0.7%
440 Mid Western	5.2%
450 Far West	0.5%
460 Greater Murray	1.7%
470 Southern NSW	4.5%
<i>Total</i>	<i>100%</i>

6.6 DIRECT COSTS OF TEACHING AND RESEARCH

Certain costs can be directly identified by Areas as expenditures on teaching and research activities. In 1995/6 the Department sponsored research on guidelines for identifying these elements of direct costs. Three elements of direct costs have been identified:

- *Special Purpose and Trust Funds:* These trust funds have been excluded from the Resource Distribution Formula pool of funds.
- *Expenditures funded through Local Revenue:* These expenditures are relatively small but have been excluded from the effect of the distribution approach recommended in this report.
- *Department funded Expenditures including overheads:* Of the remaining direct teaching and research costs, these have been distributed according to the direct costs reported by Areas in the unaudited 1996/7 program expenditure reports.

The 1996 Resource Distribution Formula included a direct teaching and research component that was based on a survey of Teaching and Research Program expenditure of Areas for 1994/95. For this refinement of the Resource Distribution Formula the relative shares of direct teaching and research expenditure reported in the detailed 1994/95 survey have been applied since the survey was considered to be the most accurate assessment of expenditure available.

An adjustment was made to the total pool of funds for the Teaching and Research component as the 1996/7 program expenditure reports have highlighted varying levels of compliance in reporting across Areas under the Teaching and Research Program (eg, some Areas have reported zero costs whilst others have reported increases in expenditure of over 300% since 1995/6). Given these changes impact directly on the RDF pool for Teaching and Research (which is a non-population based component), the pool of funds for Teaching and Research has been based instead on the 1995/6 average percentage share of total Area expenditure (1.4%) rather than the 1996/7 share of 2%. The dollar difference has been allocated to the Acute Inpatient component of the RDF to ensure the total expenditure of Areas remains consistent with that reported in 1996/7.

The Teaching and Research Sub-Committee of HERC recommended that in the future funding be linked to measures of teaching outputs and research performance and to strategic considerations in developing an appropriate teaching and research infrastructure across NSW. This will be progressed by the Department in 1998/9 through the Teaching Advisory Committee and Research & Development Advisory Committee.

For indirect teaching, research and patient severity costs, funding has been allocated as explained in the Acute Care component.

Table 23 provides details of the formula under this component.

Table 22: Teaching and Research (direct costs)

	<i>Share</i>
100 Central Sydney	13.1%
105 Northern Sydney	12.2%
120 Western Sydney	17.3%
125 Wentworth	4.7%
130 South West Sydney	6.8%
135 Central Coast	3.4%
140 Hunter	7.8%
145 Illawarra	5.4%
155 South Eastern Sydney	19.1%
400 Northern Rivers	1.2%
410 Mid North Coast	2.0%
420 New England	2.9%
430 Macquarie	0.6%
440 Mid Western	0.4%
450 Far West	0.4%
460 Greater Murray	2.0%
470 Southern NSW	0.7%
<i>Total</i>	<i>100.0%</i>

7. FUTURE REFINEMENTS AND RESEARCH PRIORITIES

A number of priorities for research over the next twelve months have been identified. The key issues to be dealt with are as follows:

- Reviewing the Health Need Index
- Refining the Mental Health component
- Refining the Oral Health component
- Updating the population projections based on the PPG LGA-level projections when released
- Refining the age/sex weights for Primary & Community
- Refining the non-population based factors for Acute Services, particularly treatment of statewide services
- Refining the Program Budgets
- Refining the adjustment to non-inpatient flows
- Reviewing public/private mix
- Investigating output and performance measures for funding Teaching and Research
- Reviewing the treatment of revenue.

8. SUMMARY

Table 24 summarises the RDF-implied shares of resources of Areas in December 2001 after adjusting for patient flows and based on Areas' historical expenditure on mental health.

Table 24: Area Shares of RDF Components 2001/02

	<i>Population Health</i>	<i>Non-Inpatient</i>	<i>Acute Inpatient</i>	<i>Mental Health</i>	<i>Rehab & Extended Care</i>	<i>Direct Teaching & Research</i>	<i>Total RDF Target Share 2001/02</i>
100 Central Sydney	7.7%	11.0%	12.0%	15.9%	6.8%	13.1%	11.5%
105 Northern Sydney	9.6%	9.4%	9.5%	15.6%	12.9%	12.2%	10.3%
120 Western Sydney	10.4%	11.3%	9.7%	14.0%	8.0%	17.3%	10.4%
125 Wentworth	4.7%	3.8%	3.6%	2.3%	3.1%	4.7%	3.5%
130 South West Sydney	12.1%	10.4%	9.3%	5.5%	8.8%	6.8%	9.2%
135 Central Coast	4.7%	4.1%	4.0%	2.5%	5.4%	3.4%	4.1%
140 Hunter	8.6%	8.6%	9.1%	10.6%	8.5%	7.8%	9.0%
145 Illawarra	5.4%	4.9%	4.6%	3.7%	5.2%	5.4%	4.7%
155 South Eastern Sydney	11.0%	14.3%	16.0%	11.0%	12.1%	19.1%	14.9%
400 Northern Rivers	4.4%	4.3%	4.5%	2.2%	4.6%	1.2%	4.3%
410 Mid North Coast	4.5%	4.0%	3.9%	2.1%	5.0%	2.0%	3.8%
420 New England	3.2%	2.7%	2.9%	2.1%	3.6%	2.9%	2.8%
430 Macquarie	2.0%	1.7%	1.7%	0.7%	2.4%	0.6%	1.7%
440 Mid Western	2.9%	2.4%	2.4%	5.2%	4.6%	0.4%	2.8%
450 Far West	1.3%	1.0%	0.9%	0.5%	0.9%	0.4%	0.9%
460 Greater Murray	4.4%	3.6%	3.7%	1.7%	5.2%	2.0%	3.7%
470 Southern NSW	3.1%	2.4%	2.2%	4.5%	3.1%	0.7%	2.5%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Note: The percentage shares presented here reflect population, statewide services and other cost factors

Considerable progress has been made in moving Areas towards their RDF target. In 1994/5 the distribution of resources meant Areas were on average 9.6% away from their 2001/02 RDF target. In 1998/9, through the distribution of increased funds in the Health Budget to Areas of greatest need, Areas are now on average 4.4% away from their 2001/02 RDF target. This progress is shown in Table 25.

Table 25: Progress towards RDF Targets (%)

	<i>1994/95 Share of Resources</i>	<i>1998/99 Share of Resources</i>	<i>2001/2 RDF Target Share</i>
100 Central Sydney	12.8%	11.9%	11.5%
105 Northern Sydney	10.9%	10.1%	10.3%
120 Western Sydney	10.7%	10.4%	10.4%
125 Wentworth	3.1%	3.7%	3.5%
130 South Western Sydney	7.8%	8.9%	9.2%
135 Central Coast	3.5%	3.7%	4.1%
140 Hunter	8.7%	8.8%	9.0%
145 Illawarra	4.1%	4.5%	4.7%
155 South Eastern Sydney	15.9%	15.4%	14.9%
400 Northern Rivers	3.8%	3.9%	4.3%
410 Mid North Coast	2.9%	3.3%	3.8%
420 New England	3.0%	2.9%	2.8%
430 Macquarie	1.9%	1.8%	1.7%
440 Mid Western	3.2%	3.1%	2.8%
450 Far West	1.0%	1.0%	0.9%
460 Greater Murray	4.1%	3.9%	3.7%
470 Southern	2.7%	2.5%	2.5%
Total	100.0%	100.0%	100.0%

The RDF Target and current share are based on:

- 1996/7 flows
- 1996/7 share of Mental Health expenditure
- 1998/99 Area budget allocations excluding once-off funding

APPENDIX A

List of Excluded Funding

- Head Office functions, Health Care Complaints Commission, Corrective Health Services, Ambulance Service, New Children's Hospital
- Special Purpose and Trust Funds
- Patient Access Scheme and one-off Area Funding Relief/Rural Funding Assistance
- Managed Fund Insurance benchmark premiums
- Non-Government Organisations
- Aboriginal Health Promotion
- Alternative Birthing
- Bone Marrow Registry
- BTS AIDS Screening
- Cervical Cancer Screening
- Breast Cancer Screening
- Commonwealth Casemix Development Grants
- State Casemix Development Grants
- Youth Health
- External Research Grants
- Health Outcomes
- HIB
- Female Genital Mutilation
- Artificial Limbs
- National Mental Health
- National Womens' Health
- Ambulatory Care Reform
- Special Health Promotion
- Special Public Health
- State Government Nursing Homes
- National Drug Strategy

APPENDIX B

Services currently funded on a Statewide Basis in Resource Distribution Formula

Acute Care

NFCs and former NFCs (eg, Heart/lung/pancreas/liver transplantations and CVE)

Primary & Community Based Care

Dental Hospitals

Outpatients

Neonatal & Paediatric Retrieval Service

Adult Retrieval Service

Home Dialysis Fluids/Equipment managed by Sydney Dialysis Centre

Service for Treatment and Rehabilitation of Torture & Trauma Survivors

Centre for Education & Information on Drugs & Alcohol/Healthquest

Statewide Genetics

MRI

Radiotherapy

APS/ICP&MR State Reference Laboratory

Centre for Education & Information on Drugs & Alcohol/Healthquest

Rehabilitation & Extended Care

Specialist spinal injury units

Brain Injury Units

APPENDIX C

ACUTE INPATIENT CROSS BOUNDARY FLOWS

A related funding policy foreshadowed in the Economic Statement for Health is the introduction of funding arrangements for the flows of patients between Areas. In 1998/9, an accounting adjustment will be made to each Area's budget to reflect the true value of flows based on established patterns of flows and funded service enhancements. Fully devolved Area responsibility for patient flows will be introduced after this transitional phase. Financial responsibility for Inter-State flows has already been devolved to Areas from 1 July 1997.

Intrastate Patient Flows

Separations are casemix weighted with private separations further weighted by 88%. For this refinement of the Resource Distribution Formula flows are priced at \$2300 per casemix weighted separation. This is based on 1996/7 data in the Hospital Comparison Data Book and is a cash cost that excludes the cost of superannuation and depreciation and adjustments for the fixed allocation to Nationally Funded Centres, Specialist Paediatric Hospitals and Principal Referral Hospitals in the Resource Distribution Formula. The cost of private patients treated in public hospitals is lower hence the 88% of the public patient cost in the Resource Distribution Formula. To avoid double counting, flows to Nationally Funded Centres (NFCs) have been excluded from the calculation of acute flows as the funding for these patients is allocated separately in the RDF to those Areas which host the NFCs.

Interstate Acute Patient Flows

For interstate patient flows, from July 1997 Areas now have financial responsibility for these patients. This arrangement encourages Areas to actively manage and influence the direction of patient flows to other States and Territories. However, in the interim the Resource Distribution Formula will continue to include an adjustment for Areas which will provide funding based on the national casemix weighted price (public separations \$2454 and private separations \$1123. National rather than NSW AN-DRG cost weights have used to weight the separations.

Data on the number of casemix weighted separations for residents of NSW treated in other States have been obtained from those States through specific arrangements. These outflow data are netted off against the inflow data held by the Department on interstate residents treated in NSW for the relevant period. This approach will be reviewed in future refinements of the Resource Distribution Formula.

Flows to the New Children's Hospital (NCH)

Flows to the NCH have been deducted from each Area as this hospital is outside of the Resource Distribution Formula.

Table 26 details the value of cross boundary flows of acute patients in public hospitals.

Table 26: 1996/7 Casemix Weighted Separations: Net Cross Boundary Flows

	Interstate Flows - Public	Interstate Flows - Private	Intrastate Flows - Public	Intrastate Flows - Private	New Children's Hospital - Public	New Children's Hospital - Private
100 Central Sydney	422	168	19,795	13,051	(1,723)	(485)
105 Northern Sydney	166	25	6,737	(757)	(1,512)	(1,309)
120 Western Sydney	167	31	1,767	(224)	(6,599)	(1,450)
125 Wentworth	(52)	(5)	(5,984)	(2,089)	(1,883)	(440)
130 South West Sydney	(125)	(6)	(15,393)	(5,747)	(3,794)	(966)
135 Central Coast	(96)	(7)	(7,412)	(2,224)	(952)	(210)
140 Hunter	(125)	(12)	2,574	21	(459)	(119)
145 Illawarra	(208)	1	(9,070)	(2,903)	(569)	(226)
155 South Eastern Sydney	1,366	256	34,742	9,121	(460)	(873)
400 Northern Rivers	(1,622)	(300)	(970)	(329)	(153)	(16)
410 Mid North Coast	(372)	(23)	(7,785)	(2,553)	(869)	(57)
420 New England	(1,289)	(141)	(3,823)	(835)	(300)	(25)
430 Macquarie	(40)	(8)	(2,371)	(927)	(386)	(57)
440 Mid Western	(224)	(17)	(4,761)	(1,436)	(669)	(141)
450 Far West	(3,021)	(191)	(2,141)	(387)	(50)	(12)
460 Greater Murray	(6,640)	(367)	(1,930)	(671)	(333)	(63)
470 Southern NSW	(10,019)	(625)	(3,975)	(1,111)	(416)	(32)
Total	(21,712)	(1,221)	-	-	(21,127)	(6,481)

APPENDIX D

Acute Care Age/Sex Utilisation Rates

General	Male				Female			
	DRG Weighted Activity	Population	Rate	Calibrated to Male/Female Total	DRG Weighted Activity	Population	Rate	Calibrated to Male/Female Total
Age								
0	97	3,761			142	3,571		
1	26,241	221,747			18,070	210,599		
0-4	26,338	225,508	0.117	0.65	18,212	214,170	0.085	0.48
5	11,305	224,303	0.050	0.28	8,068	213,903	0.038	0.21
10	10,473	222,339	0.047	0.26	7,692	211,968	0.036	0.20
15	13,041	216,342	0.060	0.34	13,645	206,321	0.066	0.37
20	16,168	234,363	0.069	0.39	21,021	228,501	0.092	0.52
25	17,574	235,748	0.075	0.42	26,586	236,514	0.112	0.63
30	19,446	246,561	0.079	0.44	28,012	245,023	0.114	0.64
35	22,032	246,441	0.089	0.50	29,581	246,550	0.120	0.67
40	23,317	226,728	0.103	0.58	29,781	227,123	0.131	0.74
45	26,688	219,613	0.122	0.68	31,806	213,579	0.149	0.83
50	31,139	176,248	0.177	0.99	32,102	169,606	0.189	1.06
55	34,864	144,448	0.241	1.35	32,277	140,814	0.229	1.29
60	41,482	123,508	0.336	1.88	35,019	125,412	0.279	1.57
65	57,019	119,026	0.479	2.69	47,555	126,464	0.376	2.11
70	63,241	98,097	0.645	3.61	57,864	117,233	0.494	2.77
75	53,758	64,080	0.839	4.70	57,985	87,562	0.662	3.71
80	38,261	37,072	1.032	5.79	51,775	62,685	0.826	4.63
85	23,580	20,233	1.165	6.53	47,767	49,808	0.959	5.38
All	529,726	3,080,658	0.172	0.96	576,748	3,123,236	0.185	1.04
Total:					1,106,474	6,203,894	0.178	

Tertiary	Male				Female			
	DRG Weighted Activity	Population	Rate	Calibrated to Male/Female Total	DRG Weighted Activity	Population	Rate	Calibrated to Male/Female Total
Age								
0	13,259	3,761			11,937	3,571		
1	7,417	221,747			5,464	210,599		
0-4	20,676	225,508	0.092	2.12	17,401	214,170	0.081	1.88
5	2,378	224,303	0.011	0.25	1,620	213,903	0.008	0.18
10	2,283	222,339	0.010	0.24	1,756	211,968	0.008	0.19
15	3,725	216,342	0.017	0.40	2,003	206,321	0.010	0.22
20	3,457	234,363	0.015	0.34	2,104	228,501	0.009	0.21
25	3,583	235,748	0.015	0.35	2,141	236,514	0.009	0.21
30	4,041	246,561	0.016	0.38	2,633	245,023	0.011	0.25
35	5,286	246,441	0.021	0.50	3,386	246,550	0.014	0.32
40	6,419	226,728	0.028	0.66	4,519	227,123	0.020	0.46
45	9,306	219,613	0.042	0.98	5,303	213,579	0.025	0.58
50	11,586	176,248	0.066	1.52	6,087	169,606	0.036	0.83
55	13,251	144,448	0.092	2.12	7,005	140,814	0.050	1.15
60	15,074	123,508	0.122	2.83	7,764	125,412	0.062	1.43
65	20,024	119,026	0.168	3.90	10,560	126,464	0.084	1.93
70	20,122	98,097	0.205	4.75	11,518	117,233	0.098	2.28
75	14,067	64,080	0.220	5.08	9,899	87,562	0.113	2.62
80	6,602	37,072	0.178	4.12	5,349	62,685	0.085	1.98
85	2,218	20,233	0.110	2.54	2,699	49,808	0.054	1.26
All	164,098	3,080,658	0.053	1.23	103,747	3,123,236	0.033	0.77
Total:					267,845	6,203,894	0.043	

Obstets/perinatal	Male				Female				
	Age	DRG Weighted Activity	Births	Cost W/Birth	Calibrated to Male/Female Total	DRG Weighted Activity	Births	Cost W/Birth	Calibrated to Male/Female Total
0	0	0	0		0				
1	0	0	0						
0-4	0	0	0	0	0				
5	0	0	0	0	0				
10	0	0	0	0	0	21	27	0.778	0.789
20	0	0	0	0	0	14,138	15,842	0.892	0.905
25	0	0	0	0	0	26,436	26,815	0.986	1.000
30	0	0	0	0	0	24,788	25,058	0.989	1.003
35	0	0	0	0	0	11,625	10,198	1.140	1.156
40	0	0	0	0	0	1,975	1,757	1.124	1.140
45	0	0	0	0	0	59	48	1.229	1.247
50	0	0	0	0	0	4	2	2.000	2.029
55	0	0	0	0	0				
60	0	0	0	0	0				
65	0	0	0	0	0				
70	0	0	0	0	0				
75	0	0	0	0	0				
80	0	0	0	0	0				
85	0	0	0	0	0				
All	0	0	0	0	0	82,877	84,067	0.986	1.000

APPENDIX E

Percent of total private hospital activity that is regarded as substitutable by Area Health Service of Residence

		General	Tertiary/ Obstetrics	Total
100	Central Sydney	67.8%	89.4%	71.8%
105	Northern Sydney	70.8%	89.6%	74.7%
120	Western Sydney	68.6%	89.8%	73.2%
125	Wentworth	69.7%	89.2%	73.8%
130	South Western Sydney	67.1%	86.6%	70.4%
135	Central Coast	72.4%	88.5%	76.0%
140	Hunter	70.2%	88.5%	74.1%
145	Illawarra	70.6%	86.6%	73.2%
155	South Eastern Sydney	69.0%	89.3%	73.1%
400	Northern Rivers	65.1%	88.1%	67.2%
410	Mid North Coast	73.9%	89.0%	76.0%
420	New England	70.8%	86.5%	74.3%
430	Macquarie	67.3%	84.2%	69.7%
440	Mid Western	69.8%	83.8%	72.2%
450	Far West	70.2%	78.5%	71.6%
460	Greater Murray	71.8%	90.6%	75.1%
470	Southern	63.6%	84.5%	68.4%
	Total	69.8%	88.7%	73.4%

APPENDIX F

Comparison of Area Shares of HCCC Activity, Estimated Teaching Load and Direct Costs of Teaching & Research

Area	HCCC 1996/7 Casemix		Direct T&R \$'000		Trainee EN	Nurse Educators	Allied Health Yr 1	Interns	RMO 1	RMO 2	Registrar and RMO 3/4	Total	%
	Wtd Seps	%	%	%									
Central Sydney	38,374	19.3%	9,132	13.1%	90	27	45	58	60	34	287	601	15.8%
Northern Sydney	24,155	12.1%	8,519	12.2%	71	38	40	46	52	34	196	477	12.6%
Western Sydney	25,749	12.9%	12,061	17.3%	47	31	32	51	63	41	155	420	11.1%
Wentworth	5,897	3.0%	3,257	4.7%	24	8	9	29	16	8	2	96	2.5%
South Western Sydney	11,462	5.8%	4,777	6.8%	16	32	36	52	46	11	108	301	7.9%
Central Coast	4,457	2.2%	2,400	3.4%	21	19	3	32	42	15	50	182	4.8%
Hunter	16,135	8.1%	5,427	7.8%	39	15	45	56	39	13	134	340	9.0%
Illawarra	5,748	2.9%	3,756	5.4%	33	5	17	25	16	3	28	127	3.3%
South Eastern Sydney	52,700	26.5%	13,337	19.1%	110	49	58	96	112	67	382	874	23.0%
Northern Rivers	3,102	1.6%	807	1.2%	3	3	18	4	2	9	11	50	1.3%
Mid North Coast	1,890	0.9%	1,412	2.0%	1	1	12	6	10	10	8	48	1.3%
New England	1,915	1.0%	2,053	2.9%	13	3	20	9	11	3	2	61	1.6%
Macquarie	1,262	0.6%	431	0.6%	6	2	11	-	6	-	9	34	0.9%
Mid Western	1,771	0.9%	259	0.4%	19	5	16	5	12	2	8	67	1.8%
Far West	186	0.1%	297	0.4%	4	1	3	-	-	3	2	13	0.3%
Greater Murray	3,555	1.8%	1,419	2.0%	18	6	7	11	7	2	23	73	1.9%
Southern NSW	688	0.3%	501	0.7%	8	5	14	2	-	2	1	32	0.8%
Total	199,046	100.0%	69,843	100%	523	250	383	482	494	257	1,406	3,795	100.0%

Sources:

1996/97 Inpatient data

Shares of T&R from a 1994/95 Survey of Area expenditure on Teaching and Research applied to 1996/7 expenditure reported under this Program

Medical Staff Monitor and Registrar Staffing Surveys

HOSPAY reports and a survey of non-HOSPAY sites

An inaugural data collection for Allied Health Professionals was undertaken in April 1997

**Severity/Indirect Costs of Teaching & Research Factor
Alternative Distribution Methods**

