

**National Survey of Mental Health and Wellbeing
Bulletin 2**

Costs of psychosis in urban Australia

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On behalf of the Low Prevalence Disorders Study Group

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COSTS OF PSYCHOSIS IN URBAN AUSTRALIA

A BULLETIN OF THE LOW PREVALENCE DISORDERS STUDY

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PREFACE

The Low Prevalence Disorders Study (LPDS) was a one-month census based survey of people with psychotic disorders in contact with mental health services. It was conducted in four metropolitan regions of Australia as part of the National Survey of Mental Health and Wellbeing. Its aims were to determine the prevalence of psychotic disorders, establish a demographic profile of individuals with these disorders, and estimate the extent of disability, service utilisation and unmet need associated with the psychoses.

The findings of this study revealed that people with psychotic disorders experienced much functional impairment and disability, poor quality of life, social isolation, substantial socio-economic disadvantage and numerous unmet needs. In spite of having high levels of service utilisation, relatively few were engaged in rehabilitation programs and there was a general lack of behavioural or psychosocial therapies.

In preparing this bulletin of the LPDS the information collected in the study was used to estimate the economic costs associated with psychotic disorders. We used a 'bottom-up' method for calculating these costs and this approach is described in detail in the following pages. It includes costs of the various components of treatment as well as non-treatment related costs associated with psychosis. For a group of conditions that are relatively uncommon compared to anxiety and depressive disorders, and drug or alcohol related disorders, the psychoses are extremely expensive, giving rise to a very large proportion of mental health care costs. They are also associated with very high non-treatment related costs.

The magnitude of these costs is partly a consequence of the severe levels of disability associated with the psychoses. However, it is also possible that some of what is being spent on treatment and related areas could be allocated differently and to better effect. In particular, simple cost modelling suggests that investment in evidence based therapeutic interventions that, according to the findings of the LPDS, are received by only a minority of people with psychoses, could not only improve clinical outcomes but also result in substantial cost savings.

To our knowledge this is the first time that the costs of psychosis in Australia have been calculated using the methods outlined in this bulletin. It is our hope that the bulletin will provoke lively discussion about resource allocation in relation to psychotic disorders.

Vaughan Carr

On behalf of the authors

1 Introduction

Cost-of-illness studies are an extension of the epidemiological concept of burden of illness. They aim to quantify and value the costs borne by individuals and organisations (including the government) arising from a particular disease. They can be useful in detailing the distribution of the economic burden, identifying the main components of current expenditure and resources foregone, and for indicating which illnesses have the higher economic burden. In turn, this information can alert policy makers to areas of potential need. Cost-of-illness (COI) studies do not, however, provide the information required to improve the efficiency of resource allocation. This is the domain of full economic evaluations such as cost-effectiveness and cost-benefit analyses.

The purpose of this Bulletin is to estimate the costs associated with the treatment and care of persons with psychosis in Australia based on data obtained from the Low Prevalence (Psychotic) Disorders Study (Jablensky et al. 1999). A secondary objective is to determine whether cost savings could be achieved if effective interventions were to be identified and more widely deployed. For example, is it likely that broader implementation of early detection and treatment programs (Frango & Bryne, 2000), evidence based psychosocial treatments (Nathan & Gorman, 1998) or rehabilitation programs (Crowther et al., 2001) would give rise to cost savings if such approaches were able to reduce the severity of illness or increase employment rates and other forms of participation?

The costs of an illness can be estimated using two methods, one based on the epidemiological concept of prevalence (Rice 1966) and the other on the concept of incidence (Hartunian et al. 1980). The prevalence-based method seeks to estimate the cost of treating all persons with the disease, both pre-existing and new cases during a specified period, usually a year. In comparison, the incidence-based method seeks to estimate how much it costs to treat new cases occurring during a specified period over the course of the illness.¹

Neither the prevalence- nor the incidence-based approach is, in all circumstances, the superior methodology for estimating COI. The method should be determined by the purpose of the analysis and whether an intervention is to be employed, and if so, whether it will impact on all cases or just new cases, such as in prevention. If an intervention is to be employed *and it will only affect new cases*, the incidence-based approach should be used; the cost of all cases other than the new cases will be unaffected by the intervention.

A prevalence-based approach has been adopted in the current analysis, reflecting the design of the Low Prevalence Disorders Study (LPDS) in which data covering a twelve-month period on both new and pre-existing cases were collected. Further, it is through an analysis

¹ When all episodes of the disease are diagnosed and successfully treated during the time period of concern, so that no costs are incurred in subsequent time periods, the two approaches will give rise to the same answer.

of the cross-sectional data for COI by severity of disability and employment status that the possibility of reducing costs by deploying certain interventions more widely will be examined.

1.1 Direct, Indirect and Intangible Costs

COI studies are based on the concept of opportunity cost. Opportunity cost is the value of the benefits foregone when resources are committed to one use over another, or the total amount of goods and services that may be consumed is reduced. Within this framework, COI has traditionally been seen as comprising direct and indirect costs, and intangible (ie, psychosocial) costs.

1.1.1 Direct Costs

Direct costs encompass the goods and services, medical and non-medical, used in relation to the illness or disease in question. Direct costs include, but are not limited to, the costs of: hospitalisation; services of general practitioners, specialists, psychologists and other health professionals; medications; supported housing; judicial costs; patient transportation; vocational, social and family counselling services, etc.

1.1.2 Indirect Costs

Indirect costs represent economic products – goods and services, including housekeeping services – that are *not* produced because of the effects of the person's illness (ie, the disease causes a 'loss' in productivity). Indirect costs can arise because of temporary or permanent disability, or death. Morbidity related indirect costs can be incurred by both the person affected by the disease and their carer(s).

Indirect costs are derived from the 'human capital approach' to valuing life. This approach assumes that an individual's value to society equates to his or her production potential, where earnings reflect productivity at the margin. However, within the COI paradigm the intent is not to value life but to obtain a measure of certain costs of disease – that is, resources lost and therefore unavailable for other purposes (Hodgson & Meiners 1982).

As indicated above, indirect costs can be incurred due to morbidity and mortality. Under the human capital approach, it is assumed that if a person did not become ill they would have earned the same amount as their age peers during the period in question. On this basis, morbidity costs encompass:

- mean earnings that would have accrued had the person not been affected by the disease, disaggregated by age and gender, and adjusted for labour force participation; and
- the number of days lost from performing their main daily activity (including work and housekeeping) while obtaining care.

Mortality costs encompass:

- the present value of the future stream of market earnings by age and gender, adjusted for labour force participation (Rice 1994), that would have accrued if the person had not died.

Excluded from these calculations are social security payments that, from the societal perspective, are considered transfer payments. The societal perspective is one in which all opportunity costs are estimated regardless of who bears the burden, while transfer payments, which represent neither a cost nor a gain to society, are excluded. However, transfer payments are relevant as a cost from the government's perspective.

Recently it has been argued that indirect costs should encompass 'actual' rather than 'potential' production losses (Koopmanschap & van Ivenveld 1992; Koopmanschap & Rutten 1994; Koopmanschap et al. 1995; Koopmanschap & Rutten 1996), and as applied to schizophrenia, at least in regard to mortality (Goeree et al. 1999a, 1999b). These losses, the time taken to fill vacancies or reorganise production processes, are defined as friction costs. It has been elsewhere held that friction costs do not represent the full costs of lost productivity, only the social cost of employment transition (Weinstein et al. 1997). This position is also held by the current authors. Thus, in the current study, indirect costs have been calculated on the basis of the traditional human capital approach.

There are obvious limitations to the human capital approach, not the least being that the technique yields very low values for the retired elderly and, depending on the discount rate, children. Further, the human capital values for men are higher than those for women, given men's higher wage rates and higher participation in the formal workforce. Participation in the informal sector, in particular women's child rearing and housekeeping activities, is excluded from the estimation. To address this situation within the current analysis, women and men have been assumed to have the same rates of employment as a proportion of total population. However, gender specific wage rates, estimated on the basis of average weekly earnings have been employed (see Appendix 1).

1.1.3 Intangible Costs

Another important category of costs is intangible or psychosocial costs. These are associated with reduction in quality of life (eg, pain and suffering), undesired changes in life plans such as being forced into economic dependence and social isolation, unwanted job changes, loss of opportunities for promotion and education, relocation of living quarters, and so on (Hodgson & Meiners 1982). Psychosocial costs are very difficult to quantify and place a value upon, and for these reasons they are generally excluded from COI studies. As reduced quality of life is such a serious consequence of schizophrenia and other psychoses, an overview of these issues based on the findings of the LPDS is provided.

1.2 Alternative Cost Categories

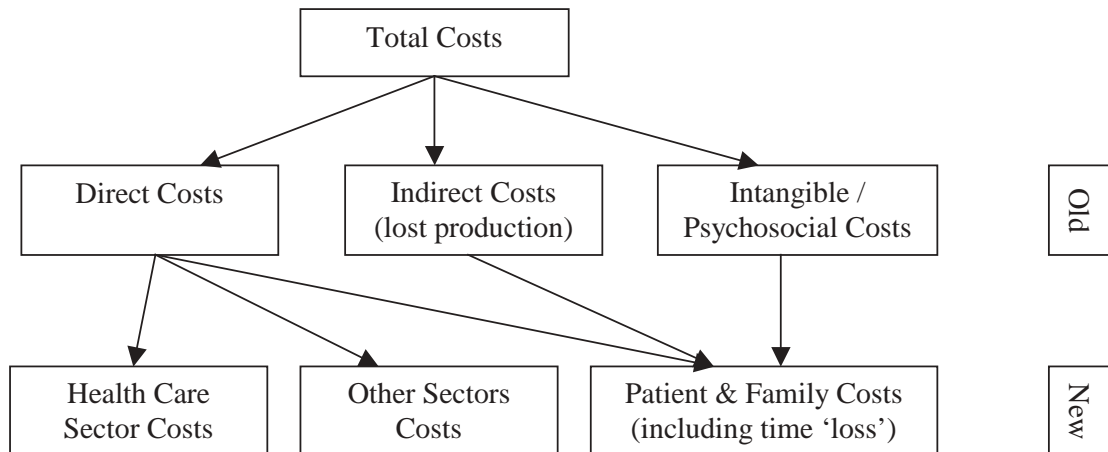
Recently, a revised terminology has been proposed for the categorisation of costs within the health economics literature (see Drummond et al. 1997:18-24). Under this revised terminology resources consumed are considered to fall within three sectors, namely –

- Health care sector,
- Patient and family, and
- Other sectors.

The health care sector encompasses resources used in providing initial and continuing care. The patient and family sector encompasses out-of-pocket expenses incurred in seeking and receiving care, time ‘lost’ by the patient and family during this process or arising from the death of the patient, and psychosocial costs. Resources used in other sectors depend on the nature of the program of care and could include home-care services and inputs provided by the voluntary sector.

There are obvious relationships between the two categorisations as illustrated in Figure 1. In particular there is a direct relationship between Direct Costs and Health Care Sector Costs and Other Sector Costs, while Direct Costs, Indirect Costs and Psychosocial Costs have together given rise to Patient and Family Costs.

Figure 1: Relationships between New and Old Costing Terminology



In the current analysis a disaggregated version of the newer sectoral approach has been employed in the first instance, allowing the ‘direct’ and ‘indirect’ costs to be estimated. The current analysis is also undertaken from two perspectives, government and societal. As noted previously, the societal perspective seeks to determine the total estimable opportunity costs associated with the illness. The analysis from the government perspective generates the financial costs of psychosis incurred by government, both State and Federal. Both estimates are conservative, as reflected in the methodology detailed in Appendix 1.

The categories employed within the societal and government cost perspectives are illustrated in Figures 2 and 3 respectively. The mathematical relationship for the societal perspective is also provided.

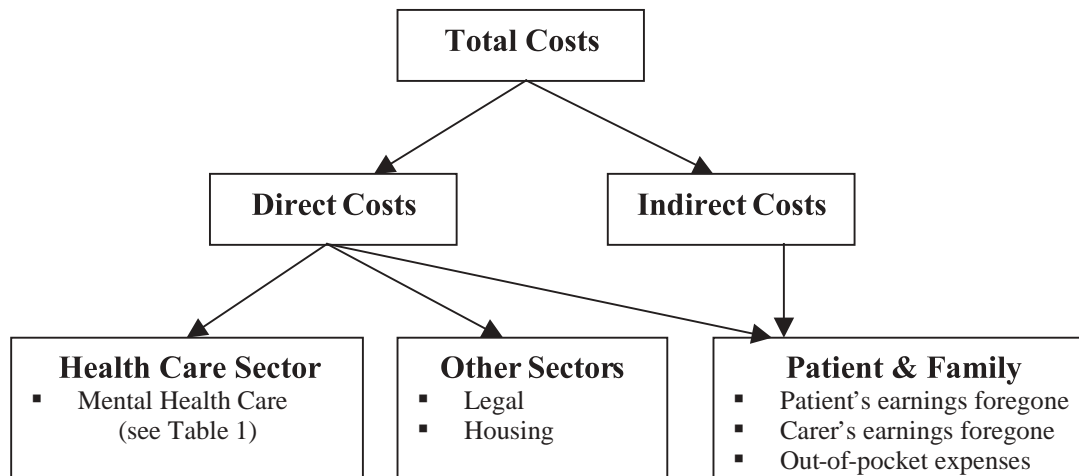
From Figures 2 and 3 it is observed that the major difference between the two perspectives is the resource items included within the Patient & Family cost groupings. There are also differences in the resource items included in the Mental Health Care Items as detailed in Table 1. In addition, differing valuations are employed for a number of items included from both perspectives, reflecting the inclusion of patient out-of-pocket expenses from the societal perspective. These items have been marked with an asterisk in Table 1.

Table 1: Mental Health Care Resource Items Costed within Societal and Government Perspectives. Items marked with an Asterisk (*) indicate Differing Valuations Employed

Resource Items	Perspective	
	Societal	Government
GP Visits*	✓	✓
Private Psychiatrist Visits*	✓	✓
Private Psychologists	✓	
Ambulance Costs	✓	✓
Public Hospital Casualty Visits for Psychiatric Reasons	✓	✓
Public Psychiatric Inpatient Costs	✓	✓
Private Psychiatric Inpatient Costs*	✓	✓
Public Psychiatry Outpatient Costs	✓	✓
Private Psychiatry Outpatient Costs	✓	
Medication Costs*	✓	✓

The costs of providing health care (both societal and government perspectives) and the costs of transfer payments (government perspective only) which could *not* be regarded as psychosis-related have been separately estimated. These costs encompass all *non*-psychiatric inpatient and outpatient episodes of care (public and private), specialist consultations for *non*-psychiatric reasons, and the average number of GP consultations by gender for *non*-psychiatric reasons. Since these costs could not be regarded as attributable to psychotic illness they have been detailed separately within the report and are not included in the cost of psychosis calculations nor any of the sub-group analyses.

Figure 2: Societal Perspective – Opportunity Costs of Psychosis (Excluding Psychosocial Costs)



Mathematically;

$$TC_{\text{psychosis}} = TC_{\text{hc}} + TC_{\text{os}} + TC_{\text{p\&f}}$$

Where:

$TC_{\text{psychosis}}$ = total costs of psychosis

TC_{hc} = total costs incurred by the health care sector for the treatment of psychosis

TC_{os} = total costs incurred by other sectors through the provision of services/goods in relation to the person's psychosis

$TC_{\text{p\&f}}$ = total costs incurred by respondents & their families through seeking and receiving care for the patient's psychosis, and the time of the patient and family incurred during this process or arising from the death of the patient

Thus,

$$TC_{\text{p\&f}} = \text{time costs}_{\text{MB}} + \text{time costs}_{\text{MT}} + \text{out-of-pocket expenses}$$

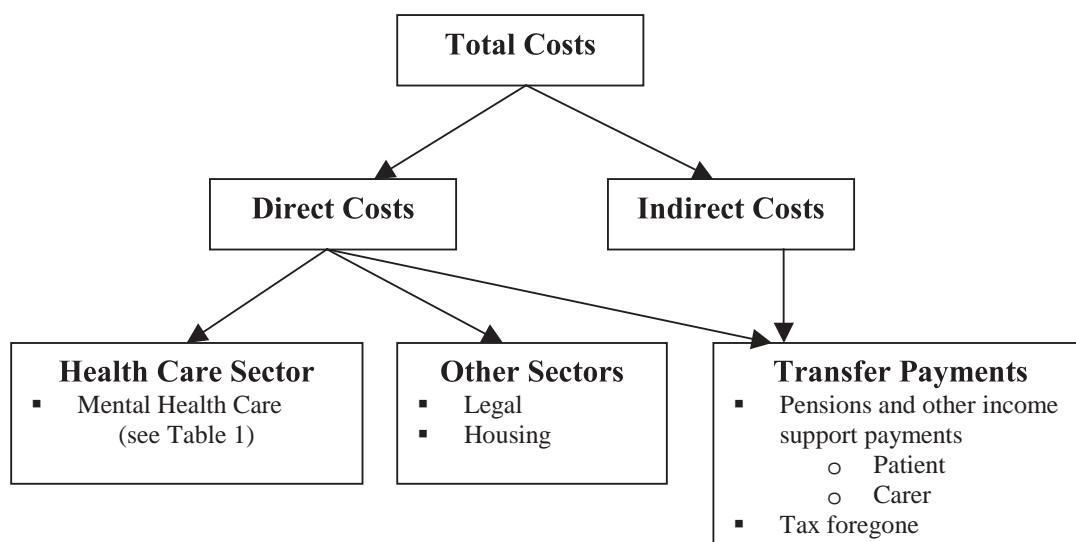
Where:

$\text{time costs}_{\text{MB}}$ = time-related costs associated with morbidity of persons during the year

$\text{time costs}_{\text{MT}}$ = present value of time-related costs associated with persons dying during the year (assumed to be zero)

out-of-pocket = travel + co-payments + home alterations, etc.

Figure 3: Government Perspective – Financial Costs of Psychosis



2 Data and Results

Mental health and service utilisation data were identified from the records of interviews conducted on 980 of 2002 randomly selected individuals in the LPDS,² a national study conducted in predominantly urban catchment areas of the Australian Capital Territory, Queensland, Victoria and Western Australia between 1997 and 1998 (Jablensky et al. 1999, 2000). The LPDS adopted a census-based approach to identify all people in the 18 to 64 year old age group located in those catchment areas who were likely to have psychotic disorders according to specified screening criteria. It encompassed a systematic one month census of key sites (eg, hospitals, community clinics) and the targeting of other relevant service providers and agencies (eg, general practitioners, private psychiatrists, hostels, boarding houses, rehabilitation sites, homeless and emergency shelters, church and community organisations) within each catchment area. A total of 3,797 patients were positively screened for psychosis across the four catchment areas.

The distribution of recruitment sources of all screen-positive persons (N=3,797) was:

- psychiatric inpatient services (N=663: 17.3%),
- community mental health or psychiatric outpatient services (N= 2,399: 62.6%),
- private general practice (N=250: 5.5%),
- private psychiatric practice (N=211: 6.5%), and
- hostels, shelters, refuges, charity services or other marginal accommodation (N=307: 8.0%).

² The remaining 1022 selected individuals were lost to interview.

In comparison, the random sample of LPDS participants (N=980) who agreed to be interviewed were drawn from:

- psychiatric inpatient services (N=262: 26.7%),
- community mental health or psychiatric outpatient services (N=425: 43.4%),
- private general practice (N=86: 8.8%),
- private psychiatric practice (N=87: 8.9%), and
- hostels, shelters, refuges, charity services or other marginal accommodation (N=120: 12.2%).

Samples were drawn from each recruitment source within each state.

Interviews were undertaken using a specially designed instrument (the Diagnostic Interview for Psychosis) covering living circumstances, symptoms, and the level of disablement in addition to service utilisation and needs. The service utilisation data encompassed, but were not limited to, care by mental health professionals, hospital and outpatient treatment, pharmaceuticals used, and rehabilitation services accessed and, in general, were obtained for the twelve months preceding the time of interview. Since these data were dependent on the recall of the participants they could be open to bias, although according to recent research this is not thought to be of sufficient magnitude to invalidate the findings (Voruganti et al. 1998; Herrman et al. 1999).

Given the richness of the available data, the current study has employed a ‘bottom-up’ approach to costing, in which the costs for each individual are estimated and then averaged.³ Individual costs have been estimated by multiplying the measured quantities of services and other resources utilised by their price. However, not all services and agencies, particularly community services involved in the supplementary care and support of people with psychosis, were recorded, or if recorded were not done so in a manner that enabled comprehensive costing. For example, information on incarceration was not recorded. Utilisation of services provided by non-government organisations such as mental health support groups, charities, religious organisations, and government social and welfare agencies were noted, but the number and types of services utilised were not recorded. In some instances, such as pharmaceutical use, where only the identity of resources used was captured, conservative assumptions have been made to obtain an estimate of resource use. Overall however, the omissions mean that the costs-of-psychosis calculated will tend to be under-estimated.

A set of standard (and conservative) unit prices have been employed to value resource consumption. To make the study as relevant as possible, and reflecting the limited availability of some unit price data, costs have been estimated for the year 2000. It has been assumed that resource usage/practice patterns would not have changed in the intervening

³ The other alternative is a top-down or cost-modelling approach in which the average cost is calculated on the basis of the aggregate cost data, ie the total cost of all respondents is divided by the total number of respondents.

period. The specific methodologies and assumptions employed in the calculation of costs are detailed for each cost category in the following section and in Appendices 1 and 2.

From the individual costs, the average cost per person with treated psychosis was calculated. As the distribution of the achieved samples across states and by recruitment source varied significantly ($\chi^2(19) = 488.4, p < .001$), weights have been applied to each individual to reflect their probability of selection within each state and the size of the catchment area. The derivation of the weights is shown in Appendix 3. Weights were used in the calculation of all aggregate 'representative' costs (ie, based on all 980 participants) but were not used in sub-group cost comparisons within the LPDS data set. Since a higher proportion of inpatients was sampled compared to patients from other sources, and since inpatient costs are considerably higher than other costs, a major effect of the weighting will be to reduce the estimated average cost per patient to below the unweighted average cost.

The weighted average cost per patient was then extrapolated to obtain a total estimate for the Australian urban population. This was based on the estimated one-month weighted prevalence of 4.7 per thousand within the 18 to 64 year old age group (Jablensky et al. 1999), and assuming 86% of the Australian population lives in urban areas (ABS 20 April, 2001).⁴ The one-month prevalence estimate has been used as it has been calculated on the basis of the sampling frame from which the interviewed sample was drawn.

To examine the potential impact of persons with psychosis who were not captured within the one-month census, a sensitivity analysis is undertaken in Section 2.6. For this analysis the number of persons not captured has been conservatively estimated at an additional 0.7 per thousand population, or 7,266 persons, based on the estimated 12-month prevalence of persons with non-affective psychosis accessing mainstream services. It has been assumed that the costs incurred by each person will be equivalent to the average cost of persons who had accessed mental health services, but who were hospitalised for less than 11 months, estimated at \$39,579 on average from the societal perspective.

The approach outlined above is believed to be more comprehensive than that employed by Andrews et al (2000), in which mental health care costs only were estimated, based on the aggregated and unweighted health sector resource utilisation data from the LPDS. This is at least in part reflected in a lower average mental health care cost being estimated within the current study, \$17,773 (see Figure 6) as compared with \$19,539 from Andrews et al (2000). However, the most important benefit of the current approach is that it enables detailed sub-group analyses to be undertaken and predictors of costs to be determined.

⁴ This equates to 48,784 persons given a population of 12,069,407 in the 18 to 64 year age-group (Table 6, ABS Cat. No. 3101.0, June Quarter 2000).

2.1 Mental Health Care

2.1.1 Health Professionals

2.1.1.1 General Practitioners

The number of general practitioner visits incurred by each participant in the LPDS was recorded. In all, 81% visited a general practitioner at least once in the previous twelve months, and the average number of attendances was 12 visits per year (Jablensky et al. 1999). However, one in five respondents (21%) saw a general practitioner 20 times a year or more, and 7% were averaging one visit a week. Based on the methodology detailed in Appendix 1, the average per patient cost of psychosis-related general practitioner visits has been estimated and extrapolated to an Australian total as detailed in Table 2.

Table 2: Annual Cost of Psychosis Related General Practitioners Visits*, Government and Societal Perspectives, per Patient and for Australia

	Government		Societal	
	Average Annual Cost per Patient (\$)	Total Annual Cost, Australia (\$)	Average Annual Cost per Patient (\$)	Total Annual Cost, Australia (\$)
Total	172.45	8,412,801	202.88	9,897,298

* Obtained as the difference between the number of visits recorded for the patient and the average number of visits per year by gender in the general population; namely, 5.5 for males and 7.5 for females (AIHW 2000a: 300).

Commonwealth expenditure on general practitioner services for mental health purposes has been estimated at \$144.4 million in 1997-98 (Table A-34, Commonwealth Department of Health and Aged Care 2000a). Adjusting for inflation of 9.2% in Items 23 and 36 between November 1997 and November 2000 (Commonwealth Department of Health and Family Services, 1997; Commonwealth Department of Health and Aged Care, 2000b),⁵ these data suggest that persons with psychosis incur 6.3% of public expenditure for mental health related services provided by general practitioners.

2.1.1.2 Private Psychiatrists

Some 24% of the LPDS participants visited a psychiatrist in private practice (Jablensky et al. 1999). Using the methodology detailed in Appendix 1, the estimated costs of private psychiatrist visits are given in Table 3.

⁵ It should also be noted that as 1997-98 was the year in which the LPDS was undertaken, potential changes in the patterns of service provision between 1997-98 and 1999-00 is not an issue.

Table 3: Annual Cost of Private Psychiatrist Visits, Government and Societal Perspectives, per Patient and for Australia

	Government		Societal	
	Average Annual Cost per Patient (\$)	Total Annual Cost, Australia (\$)	Average Annual Cost per Patient (\$)	Total Annual Cost, Australia (\$)
Total	399.36	19,482,378	474.42	23,144,105

Commonwealth expenditure on consultant psychiatric services has been estimated at \$190.5 million in 1997-98 (Table A-34, Commonwealth Department of Health and Aged Care 2000a). Adjusting for inflation of 4.2% in Items 304 and 306 between November 1997 and November 2000 (Commonwealth Department of Health and Family Services, 1997; Commonwealth Department of Health and Aged Care, 2000b),⁶ these data suggest that psychosis accounts for 11.7% of public expenditure on private psychiatrist services. Sections 2.1.1.1 and 2.1.1.2 together indicate a greater demand for private psychiatrist services, compared with general practitioner services amongst the population with psychosis, compared to the broader population with mental disorders.

2.1.1.3 Private Psychologists

Some 7% of respondents recorded that they had utilised the services of a private psychologist (Jablensky et al. 1999). The Government perspective is not applicable in this instance, as such care is not subsidised through Medicare. Based on the methodology detailed in Appendix 1, the costs of private psychologists visits are as detailed in Table 4.

Table 4: Annual Cost of Private Psychologists, Government and Societal Perspectives, per Patient and for Australia

	Government		Societal	
	Average Annual Cost per Patient (\$)	Total Annual Cost, Australia (\$)	Average Annual Cost per Patient (\$)	Total Annual Cost, Australia (\$)
Total	n.a.	n.a.	43.76	2,134,788

2.1.2 Hospitalisation

2.1.2.1 Ambulance

The number of ambulance services used was not recorded in the LPDS. However, within this population, ambulances are primarily employed in conveying involuntary psychotic patients to hospital. Some 23.7% of the LPDS sample (45.8% of those admitted to hospital) had at least one involuntary admission during the study period. It has been assumed that 20% of involuntary admissions would have been conveyed by ambulance and, as detailed in Appendix 1, the cost of these services were conservatively estimated to

⁶ Refer to Footnote 5.

be the minimum cost of a primary response transport in NSW, which is \$149. Based on these assumptions, the cost of ambulance services is given in Table 5.

Table 5: Annual Cost of Psychosis Related Ambulance Services, Government and Societal Perspectives, per Patient and for Australia

	Government		Societal	
	Average Annual Cost per Patient (\$)	Total Annual Cost, Australia (\$)	Average Annual Cost per Patient (\$)	Total Annual Cost, Australia (\$)
Total	9.67	471,741	9.67	471,741

2.1.2.2 Emergency and Crisis Intervention

Almost 44% of the respondents used emergency or crisis services during a 12-month period. Of this group 30.9% used both hospital- and community-based emergency teams, 46.0% used hospital emergency services only, and 23.0% used the services of community emergency teams only (Jablensky et al 1999). Overall, 37.0% of episodes were for psychiatric reasons, 37% for non-psychiatric reasons and 22.6% for drug overdose, other self-inflicted harm, or alcohol- and drug-related problems combined (Jablensky et al. 1999). In the current analysis only services used because of a psychiatric problem, drug overdose, deliberate self-harm or drug & alcohol problem have been assumed to be psychosis-related. The costs arising from emergency and crisis intervention are detailed in Table 6.

Table 6: Annual Cost of Psychosis Related Emergency and Crisis Intervention, Government and Societal Perspectives, per Patient and for Australia

	Government		Societal	
	Average Annual Cost per Patient (\$)	Total Annual Cost, Australia (\$)	Average Annual Cost per Patient (\$)	Total Annual Cost, Australia (\$)
Total	100.90	4,922,306	100.90	4,922,306

2.1.2.3 Inpatient Treatment

Information on the total number of admissions was obtained for each LPDS participant. Information on the duration of stay by type of hospital was also obtained. Given the aggregate nature of these data, the number of admissions per type of hospital, and the length of stay of each admission cannot always be ascertained.

Some 51.6% of the LPDS sample had at least one inpatient admission⁷ in the twelve-month period, with 23.8% reporting two or more admissions (Jablensky et al. 1999). The maximum number of admissions was 36. Some 29.8% of respondents spent two weeks or less in hospital over the course of the year. However, 10.1% of respondents had been in an inpatient facility for the entire year (Jablensky et al. 1999). The average period of hospitalisation was 13.7 weeks, with the median being six weeks.

⁷ Admission was defined as at least an overnight stay.

To ensure that inpatient costs have not been overinflated due to long-stay patients, the weighted average period of hospitalisation within public psychiatric hospitals for LPDS participants so hospitalised was compared with the average length of stay of all patients with psychoses in public psychiatric hospitals in Australia in 1997-98. The latter has been calculated on the basis of results reported in *Institutional mental health services in Australia 1997-98* (Table A4.2; Moore et al. 2000). Patients with psychosis were defined as those with a principal diagnosis of schizophrenia, other affective psychoses, paranoid states and other psychoses.⁸ The average length of stay for this group was 13.2 weeks. In comparison, the **weighted average period of hospitalisation** in public psychiatric hospitals for patients in public psychiatric hospitals within the LPDS sample was 11.6 weeks. Given that the average period of hospitalisation should exceed average length of stay, 23.8% of patients having multiple hospitalisations, the current data will yield conservative estimates of hospitalisation costs.

In the current analysis only hospitalisations in a public psychiatric hospital, public psychiatric unit in a general hospital, private psychiatric hospital unit, public drug and alcohol unit, and private drug and alcohol unit have been taken as psychosis-related. This is conservative as some general hospital admissions to non-psychiatric units will be due to injuries related to psychosis (eg, instances of self-harm, drug overdose, etc). Further, reliance on specialised versus general services differs by mental health diagnosis (Table 1.3.4; Moore et al. 2000), and this will impact on sub-group analyses by principal diagnoses.⁹ The cost estimates for inpatient services based on the methodology detailed in Appendix 1, are given in Table 7.

The national recurrent and depreciation costs for inpatients treated in specialised mental health units managed by State and Territory agencies has been estimated at \$751,074,000 in 1997-98 (Tables A-3 and A-9, Commonwealth Department of Health and Aged Care 2000a: 171). Given that the estimated costs of inpatient care within the current analysis are based on the second round of the National Hospital Cost Data Collection undertaken in 1997-98 (Commonwealth Department of Health and Aged Care 2000c) (see Section A-1.1.2.3),¹⁰ these data suggest that persons with psychosis incur 88.5% of public expenditure on specialised mental health inpatient services, excluding drug and alcohol services.

⁸ Affective disorders were excluded from this categorisation because the fifth digit specifier for psychosis in affective disorder was not identified in the tables contained in the report.

⁹ Specialised mental health services are defined as those in which:

- the primary function is specifically to provide treatment, rehabilitation or community support targeted towards people affected by a mental disorder or psychiatric disability, this criterion being applicable regardless of the source of funds; and
- such activities are delivered from a service or facility which is readily identifiable as both specialised and serving a mental health function (Commonwealth Department of Health and Aged Care 2000: 158).

¹⁰ Given the equivocal nature of the inflation data, no adjustment for inflation was made (see Section A-1.1.2.3).

Table 7: Annual Cost of Psychosis Related Hospitalisations, Government and Societal Perspectives, per Patient and for Australia

	Government		Societal	
	Average Annual Cost per Patient (\$)	Total Annual Cost, Australia (\$)	Average Annual Cost per Patient (\$)	Total Annual Cost, Australia (\$)
Public psychiatric hospitals	9,311.71	454,262,461	9,311.71	454,262,461
Public psychiatric units in general hospitals	3,673.79	179,222,171	3,673.79	179,222,171
Private psychiatric unit	n.a.	n.a.	264.14	12,885,806
Total psychiatric units	12,985.50	633,484,632	13,249.64	646,370,438
Public drug and alcohol units	450.34	21,969,387	450.34	21,969,387
Private drug and alcohol units	n.a.	n.a.	51.63	2,518,718
Total	13,435.84	655,454,019	13,751.61	670,858,543

2.1.3 Outpatient and Community Treatment

The majority of respondents (60.1%) used community and outpatient mental health services, with 42.1% of all respondents reporting frequent or regular visits. The mean number of attendances per year was 17 and the median 12. Community mental health centres and psychiatric outpatient departments in general hospitals were the major types of service used. Based on the methodology detailed in Appendix 1, the costs of outpatient visits are given in Table 8.

Table 8: Annual Cost of Psychosis Related Outpatient Visits*, Government and Societal Perspectives, per Patient and for Australia

	Government		Societal	
	Average Annual Cost per Patient (\$)	Total Annual Cost, Australia (\$)	Average Annual Cost per Patient (\$)	Total Annual Cost, Australia (\$)
Total	1508.61	73,596,030	1,520.00	74,151,680

2.1.4 Rehabilitation or Day Programs

Only a small proportion of the LPDS sample (19.1%) reported involvement in rehabilitation or day hospital programs. Approximately one-third of these had been involved for 6-12 months while almost 40% had only attended for 2 months or less. Just over 10% of participants were involved in programs that ran over 5 days per week, and most were attending rehabilitation programs for no more than 2 days per week (Jablensky et al. 1999). Based on the methodology detailed in Appendix 1, the costs of rehabilitation services are given in Table 9.

Table 9: Annual Cost of Psychosis Related Rehabilitation Services, Government and Societal Perspectives, per Patient and for Australia

	Government		Societal	
	Average Annual Cost per Patient (\$)	Total Annual Cost, Australia (\$)	Average Annual Cost per Patient (\$)	Total Annual Cost, Australia (\$)
Total	756.64	36,911,926	756.64	36,911,926

2.1.5 Medication

Participants in the LPDS reported the medications they had taken during the year. In the absence of information on the duration of use for each medication and given limited non-indicated polypharmacy, it has been assumed that each medication was taken for twelve months. Conservative estimates of typical dose schedules have been assumed as detailed in Appendix 2. It was further conservatively assumed that the compliance level would be 60% for oral medications and 80% for depot medications (Moayyard et al 2000; Chen et al 2000, *cf.* Olfson et al. 2000; Owen et al. 1996; Trauer et al. 1998). To avoid potential double-counting, pharmacy related costs were excluded from DRG estimates where possible. Based on the methodology and assumptions detailed in Appendices 1 and 2, the costs of medication use are given in Table 10.

Table 10: Annual Costs of Psychosis Related Medication, Government and Societal Perspectives, per Patient and for Australia

	Government		Societal	
	Average Annual Cost per Patient (\$)	Total Annual Cost, Australia (\$)	Average Annual Cost per Patient (\$)	Total Annual Cost, Australia (\$)
Total	860.23	41,965,460	913.20	44,549,549

Government incurred PBS expenditure on psychiatric drugs has been estimated at \$226,861,400 in 1997-98 (Table A-34, Commonwealth Department of Health and Aged Care 2000a). The best available evidence indicates limited if any inflation in pharmaceuticals during the period of interest (Table 7G, ABS Cat No. 6401.0). Conservatively assuming that inflation has been zero, the costs of psychosis-related medications amount to 19.6% of expenditure on psychiatric drugs.

2.1.6 Summary

A proportional breakdown of mental health care costs for the government and societal perspectives are presented in Figures 4 and 5 respectively. Clearly, the most expensive component of mental health care costs is hospitalisation. The provision of psychiatric inpatient care gives rise to 78% of mental health care costs from the government perspective and 77% of costs from the societal perspective. Otherwise, outpatient care contributes around 9% of mental health care costs and medication 5% of costs from both perspectives. Rehabilitation costs are a little less at 4% from both perspectives.

Figure 4: Mental Health Care Costs Breakdown - Government Perspective

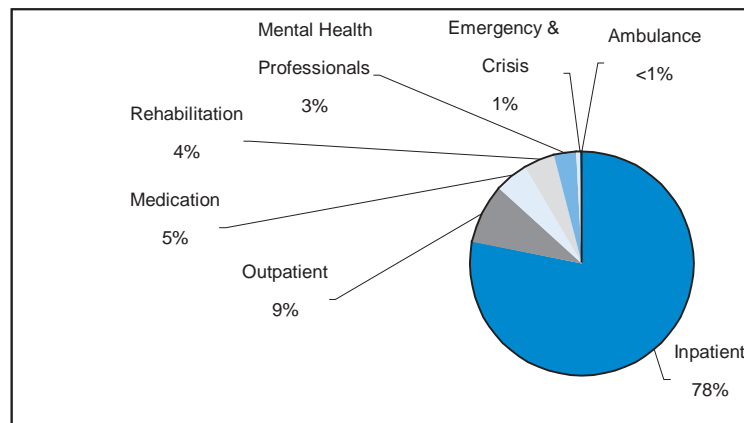
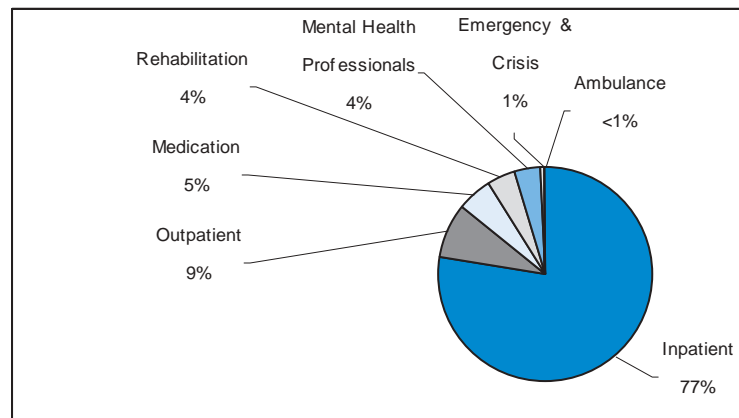


Figure 5: Mental Health Care Costs Breakdown - Societal Perspective



2.2 Other Sectors

2.2.1 Administration of Benefits

All participants in the LPDS indicated whether or not they were recipients of government benefits. More than 85% reported that they received government welfare benefits as their main source of income. For the limited sub-group defined as receiving psychosis related benefits, that is the Disability Support Pension, Sickness Allowance, or Special Benefit, administration costs have been estimated. These costs are not transfer payments, and as such should be included within both the government and societal perspectives. Based on the assumptions detailed in Appendix 1, the annual costs of administrating benefits for psychosis patients are detailed in Table 11.

Table 11: Annual Costs of the Administration of Benefits for Psychosis Patients, Government and Societal Perspectives, per Patient and for Australia

	Government		Societal	
	Average Annual Cost per Patient (\$)	Total Annual Cost, Australia (\$)	Average Annual Cost per Patient (\$)	Total Annual Cost, Australia (\$)
Total	201.24	9,817,292	201.24	9,817,292

2.2.2 Voluntary Sector

LPDS participants provided information about the social service, welfare and voluntary agencies from which they had sought services and assistance (hereafter referred to as services), and their level of satisfaction with those services. Information on the types of services sought, and the number of services obtained was not recorded. The services obtained could encompass counselling, accommodation assistance, meals and various other forms of social and material support.

Within the current analysis the costs of voluntary services have been limited to those incurred in respect of community organisations such as Lions, Red Cross, Salvation Army, Samaritans, St Vincent de Paul and Anglicare. As such, services provided by community counselling services, churches and mental health self-help and support organisations have *not* been costed. Their exclusion is based on the fact that very little is known about the costs of service provision within the voluntary sector, particularly given the importance of unpaid volunteer labour.

The costs of services provided by community organisations have been estimated on the basis of service provision within the Society of St Vincent de Paul using submissions by the Society to the Industry Commission for the 1995 report into Charitable Organisations in Australia (Industry Commission 1995). The data refer to operating costs only and thus exclude volunteer time. Given these limitations the cost calculations will necessarily be underestimates.

In view of the absence of data on the number of services provided, it has been assumed that LPDS participants who indicated that they had accessed such services in the past year will have had six occasions of service on average (see Appendix 1). Based on the average cost per service, as also detailed in Appendix 1, the cost estimates shown in Table 12 were obtained.

Table 12: Annual Costs of Service Provision by the Voluntary Sector for Psychosis Patients, Government and Societal Perspectives, per Patient and for Australia

	Government		Societal	
	Average Annual Cost per Patient (\$)	Total Annual Cost, Australia (\$)	Average Annual Cost per Patient (\$)	Total Annual Cost, Australia (\$)
Total	63.27	3,086,564	145.80	7,112,707

2.2.3 Accommodation

Persons with psychosis are heavily reliant on public assistance for accommodation. At the time of interview, some 17% were being housed in public rental accommodation in the past month, and 2.9% were being housed in a group home. Over the previous twelve months, the primary accommodation was institutional hospital care for 15.7% of participants, and public rental housing for 15.2%. Some 56.6% lived in rented accommodation, or their own or their family’s home.¹¹ Hostels and crisis shelters were the primary source of accommodation for 18.4% of respondents, as compared with 5.1% in group homes and supported housing.

The resources consumed in providing supported accommodation represents a societal opportunity cost of the illness, and therefore should be included within the analysis. From the government perspective, only the costs of Group Housing and Supported Housing have been included. Based on the methodology detailed in Appendix 1, the costs of accommodation are detailed in Table 14.

Table 14: Annual Accommodation Costs from a Government and Societal Perspective

	Government		Societal	
	Average per Patient (\$)	Total Australian (\$)	Average per Patient (\$)	Total Australian (\$)
Total	399.91	19,509,209	515.77	25,161,324

2.2.4 Legal Costs

2.2.4.1 Involuntary patients

The LPDS included no data on police involvement in conveying involuntary psychotic patients to hospital. Since no reliable estimates of the extent of police involvement could be obtained and no cost information was available from police services, it was not possible to calculate the costs incurred by police in relation to psychosis. In addition, Australian States vary in the extent to which their civil commitment laws involve magistrates (before which Legal Aid Services provide representation for patients) and in how their Mental Health Tribunals are administered. It has not been possible to obtain cost estimates for the administration and operations of the various State Mental Health Acts in relation to psychosis.

¹¹ Over half of people with schizophrenia in England live at home (Knapp 1997).

2.2.4.2 Criminal justice

Another significant category of costs is that related to the role of the law and the criminal justice system. This is reflected in the fact that 18% of the LPDS sample reported having been a victim of violence and 10% were arrested during the 12 months prior to interview. Legal costs have been estimated for LPDS participants who reported having been a victim of violence and /or charged with an offence in the previous year based on very conservative assumptions as detailed in Appendix 1. The cost estimates are provided in Table 15.

Table 15: Legal Costs from the Government and Societal Perspectives

	Government		Societal	
	Average per Patient (\$)	Total Australian (\$)	Average per Patient (\$)	Total Australian (\$)
Legal Costs	29.52	1,440,104	29.52	1,440,104

2.3 Patient and Family

2.3.1 Out-of-pocket Expenses (Societal Perspective)

Owing to a lack of information on out-of-pocket expenses, estimates of these costs have been limited to co-payments for medical care and pharmaceutical costs. These costs are not separately detailed here. Rather, they have been included in the calculation of health sector costs. They can be obtained as the difference between the government and societal perspectives shown below.¹²

¹² From the perspectives of Government, Patients and their Families, and Society the breakdown in costs are:

Perspective	Mental Health Care	Other Sectors	Patient & Family Time Loss/ Productivity Changes		Total Average Costs per patient
			OC	Financial	
Government	17,243.71	693.94	n.a.	11,692.18	29,629.84
Patient & Family	529.37	198.39	27,514.97	n.a.	28,242.73
Societal	17,773.08	892.33	27,514.97 ^a		46,180.37 ^b

Notes:

a Transfer payments are not relevant to the societal perspective.

b The Societal perspective is not the simple addition of the total costs from the Government and Patient & Family perspectives. This would result in double-counting in relation to patient & family time/productivity changes.

2.3.2 'Time-loss'/Indirect Costs (Societal Perspective)

In the current analysis 'time loss' costs incurred by the patients and their families have been formally calculated in respect of the morbidity of the patient only. While it is widely acknowledged that the mortality rate within this population is significantly higher than in the general population (see Knapp 1997; Goeree 1999a), given the design of the LPDS, the mortality rate within the sample must be regarded as zero. As such, mortality costs have been excluded from this analysis in the first instance. This will lead to a conservative estimate of indirect costs. However, the mortality within this population is in large part due to suicide. Therefore an estimate of the productivity losses arising from mortality has been calculated on the basis of a 10% lifetime risk of suicide in the LPDS sample as detailed in Appendix 1. The net present value of mortality costs, employing a 5% discount rate, is estimated to be \$74,648,082 for the Australian urban population, and \$1,530 when averaged across the urban population. These costs, while detailed in Table 16, are not included in the detailed discussion of total costs, nor subsequent analyses.

Table 16: Net Present Value of Annual Time-Loss Costs of Psychosis, Societal Perspective

	Societal	
	Average Annual Cost per Patient (\$)	Total Annual Cost, Australia (\$)
Morbidity		
Patient	26,460.13	1,290,830,982
Carer	1,054.84	51,459,315
Sub-total ^a	27,514.97	1,342,290,297
Mortality (NPV) ^b	1,530 ^c	74,648,082
Total	29,044.97	1,416,938,379

- These are the values that are included in subsequent calculations.
- NPV, or net present value, is the discounted value of the future time-losses. The discount rate employed is 5%.
- Calculated as the Total Annual Cost divided by the estimated number of persons with psychosis in the 18 to 64 age group in urban Australia annually (ie, 48,784 persons).

In relation to morbidity, only 14.5% of males and 17.0% of females were employed and receiving wages from an employer or income from their own business in the month prior to interview. Further, only 29.5% of males and 25.4% of female respondents had regular full-time or part-time work over the previous year. Such figures are comparable to the OPCS psychiatric morbidity survey from the United Kingdom in which 20% were found to be in paid employment (Foster et al. 1996 as cited in Knapp 1997). In contrast, as of December 1997, 67.8% of males and 49.9% of females in Australia aged 15 or over were employed, increasing to 68.5% of males and 52.2% of females in December 2000 (Table 18, ABS Cat No. 6203.0 1997 and 2000).

While productivity losses can be incurred in respect of employed persons, owing to time taken off work to seek care and treatment or reduced productivity while working, in the

current analysis only the costs associated with being unemployed have been estimated. This will result in an underestimation of costs, but the greater proportion of patient related morbidity costs should be captured. The costs of the potential losses have been calculated on the basis of a modified human capital approach detailed in Appendix 1. The major modification is that employment rates for females are considered to be the same as for males, in recognition of child-rearing and housekeeping activities that reduce female participation in the formal labour market. It is stressed that employment rates, rather than participation rates have been used.

Potential productivity losses also arise in respect of the carers of persons with psychosis, given their inability to work or their need to reduce the proportion of time spent working because of their caring commitments. Some 91 respondents indicated that they had a designated carer at home, and 25.8% of respondents were living in their own or the family home (ie, excluding rented accommodation). However, only 13 of the 91 respondents with a carer, corresponding to 1% of total respondents, had one who was receiving a carer's pension. The implications of these findings for the carers of persons with psychosis are worthy of further investigation.

2.3.3 Transfer Payments (Government Perspective)

2.3.3.1 Benefit Payments

The great majority of LPDS participants (85%) were found to be reliant on government welfare benefits as their main source of income. This represents a major opportunity cost to government, which should be assessed when adopting a government perspective. Of those receiving a benefit, the primary types of benefits paid were the Disability Support Pension received by 79%, Newstart or Unemployment Benefit received by 11.8%, and Sickness Allowance received by 5%. In the current study it has been conservatively assumed that only certain types of benefit are likely to be directly related to the person's psychotic illness, although the greater majority of beneficiaries are captured (84.8%).

Benefits held to be related to a person's psychosis are: the Disability Support Pension, Sickness Allowance, and Special Benefit. In contrast, benefits assumed *not* to be directly attributable to psychosis were the Age pension, Service pension, Widow Allowance, Carer Payment, Sole Parents Allowance, Newstart, Unemployment Benefit and 'Other'. The exclusion of the 'Unemployment benefit' is conservative given the problems in gaining and maintaining employment in this population.

Based on the assumptions detailed in Appendix 1, the estimated transfer payments per annum are \$8016.39 per patient and \$391,071,570 for Australia (see Table 17). In 1999-00 a total of \$6.23 billion was paid in assistance payments for sickness benefits and permanent disablement benefits (Table 29, ABS Cat No.5206.0, December Quarter 2000). Thus persons with psychosis account for around 6.3% of such payments based on the data collected in the LPDS.

Table 17: Annual Transfer Payments, Government Perspective

	Government	
	Average per Patient (\$)	Total Australian (\$)
Carer's Pension	89.15	4,349,094
Income Support Benefits	7452.63	363,569,102
Rent Assistance	369.82	18,041,299
Pharmaceutical Allowance	104.79	5,112,075
Total	8016.39	391,071,570

2.3.3.2 Tax Foregone

Another opportunity cost from the Government's perspective is the amount of tax that the government would have earned if people with psychosis were working as per their age and sex peer groups. Tax foregone has been estimated for unemployed respondents only, adjusted for the expected unemployment rate and participation rates by gender.

Based on the assumptions detailed in Appendix 1, the estimated tax foregone per annum is \$3,675.76 per person, including \$156.40 in respect of their carers, and \$179,319,739 in total for Australia.

Table 18 Annual Tax Foregone, Government Perspective

	Government	
	Average per Patient (\$)	Total Australian (\$)
Patient	3519.39	171,689,922
Carer	156.40	7,629,818
Total	3675.79	179,319,739

2.4 Psychosocial Costs

2.4.1 Patient

Psychosis is associated with a very large reduction in quality of life. Only a minority of people with psychosis attain a level of functioning and wellbeing that is commensurate with a good quality of life (Jablensky et al. 1999). In general, psychosis is associated with significant disablement in physical, social and occupational domains, and increased suicide risk.

For example, some 73% of LPDS participants had experienced affective symptoms of pervasive depressed mood or loss of ability to enjoy life during the course of their illness, with a quarter experiencing those symptoms at the time of interview. Almost half (47%) of the people in the study were assessed as seriously impaired in their ability to function in everyday social and occupational domains, with 64.5% reporting that side-effects of their medication were of sufficient severity to impair them in their daily living. Some 18% were experiencing thoughts of suicide, with as many as 68% experiencing those thoughts at some time in the past. It was further concluded that the majority of people with psychotic disorders interviewed “had lost essential life roles that normally provide an individual with a sense of self-esteem and meaning” (Jablensky et al. 1999).

2.4.2 Carers

There was no information on the psychosocial burden of carers obtained through the LPDS. However, there is no denying that the burden placed upon carers and family members is a large and hidden cost of mental illness. In part the current burden on carers and family members has arisen from increasing deinstitutionalisation, a shift in care provision in which many people with psychotic illnesses are cared for in the community rather than through long-term hospitalisation (Bachrach 1990; Barnes and Toews 1983). Often with limited education regarding mental illness, and usually no formal training, family members and carers provide support in such wide-ranging areas as assisting with transport, advice, finding employment, attending appointments, and developing a positive lifestyle. This is a pervasive life role rather than a simple ‘job’. Given the sheer breadth and magnitude of emotional, social and personal resources expended by carers and family members for their ill relative, the psychosocial costs of carers and family members would be extremely difficult, if not impossible, to accurately estimate.

2.5 Non-Mental Health Care Costs

As noted previously, it has been assumed that all inpatient and outpatient, public and private hospital episodes and specialist consultations for non-psychiatric reasons have been incurred for reasons other than the person’s psychosis. Further, it was assumed that each person will have at least the average number of general practitioner consultations by gender (5.5 males; 7.5 females) for reasons other than their psychotic illness.

Based on the assumptions detailed in Appendix 1, non-mental health care costs have been estimated at \$1,004.53 per person per year from the perspective of the government, \$1,051.40 from the societal perspective and thus \$46.87 per person per year from the perspective of the patient and family. This corresponds to 5.3%, 5.4% and 8.7% of total health care costs incurred by persons with psychosis from each perspective respectively.

2.6 Total Costs

Aggregating the component costs of psychosis, the average total cost per treated patient is \$29,630 per annum from the government perspective, and \$46,180 per annum from the societal perspective (see Figures 6 and 7 and Table 19). Based on the one-month weighted prevalence of 4.7 per thousand in the 18 to 64-year old age group in urban Australia, psychosis costs the Australian Government at least \$1.45 billion per annum, while societal costs are at least \$2.25 billion per annum, even assuming ‘time-loss/indirect’ costs associated with mortality are zero. This increases to \$1.73 billion per annum from the government perspective and \$2.54 billion from the societal perspective for the twelve-month prevalence of 5.4 per thousand.¹³ Further, if mortality costs are included, the estimated cost from the societal perspective, is \$2.33 billion based on the one-month prevalence and \$2.62 billion based on the 12-month prevalence. The following discussion will refer to the lowest estimated costs of psychosis (ie, that based on the one-month prevalence estimates, and excluding mortality costs).

As calculated, the economic cost of psychosis from the government perspective is largely associated with the mental health care sector, which accounts for 58.2% of total costs (see Figure 8). On the other hand, ‘time-loss’ costs are the primary contributor to societal costs, at 59.6% of total costs (see Figure 9). Conversely, ‘time-loss’ costs are 39.5% of total costs from the government perspective, while mental health care costs are 38.5% of total costs from the societal perspective. In consequence other sector costs are 2.4% and 1.9% respectively from the government and societal perspectives. Given that only limited information could be employed in costing resources used in this sector, *ceteris paribus*, these costs will be underestimated.

¹³ This includes the additional 0.7 per thousand persons with non-affective psychosis who are estimated to access mainstream services in the other 11 months of the year. Their costs have been assumed to be the average cost of all patients who had accessed mainstream services within the census month but had been hospitalised for less than 48 weeks, estimated at \$39,579 on average from the societal perspective.

Figure 6: Breakdown of Annual Average Costs per Patient, Government Perspective

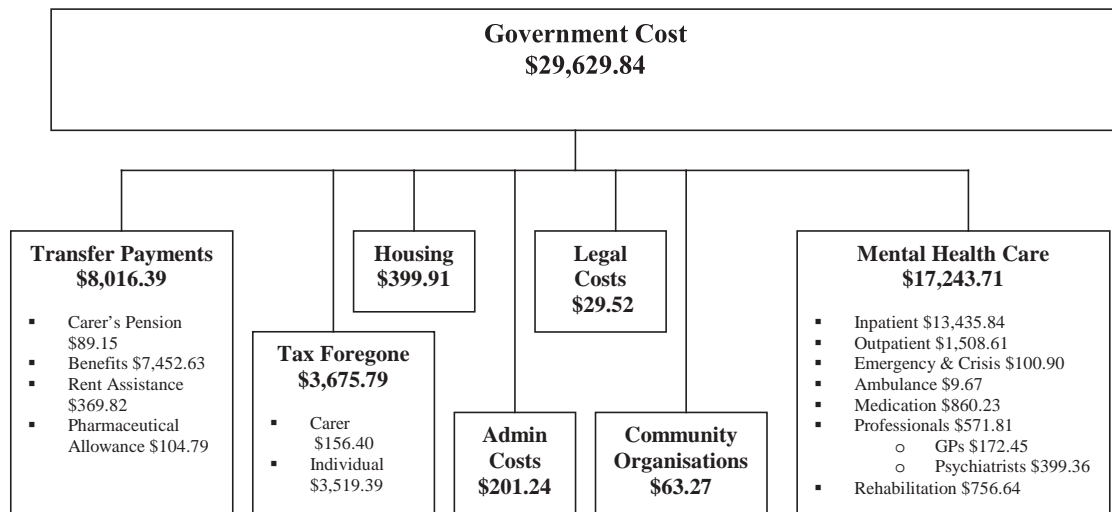


Figure 7: Breakdown of Annual Average Costs per Patient, Societal Perspective

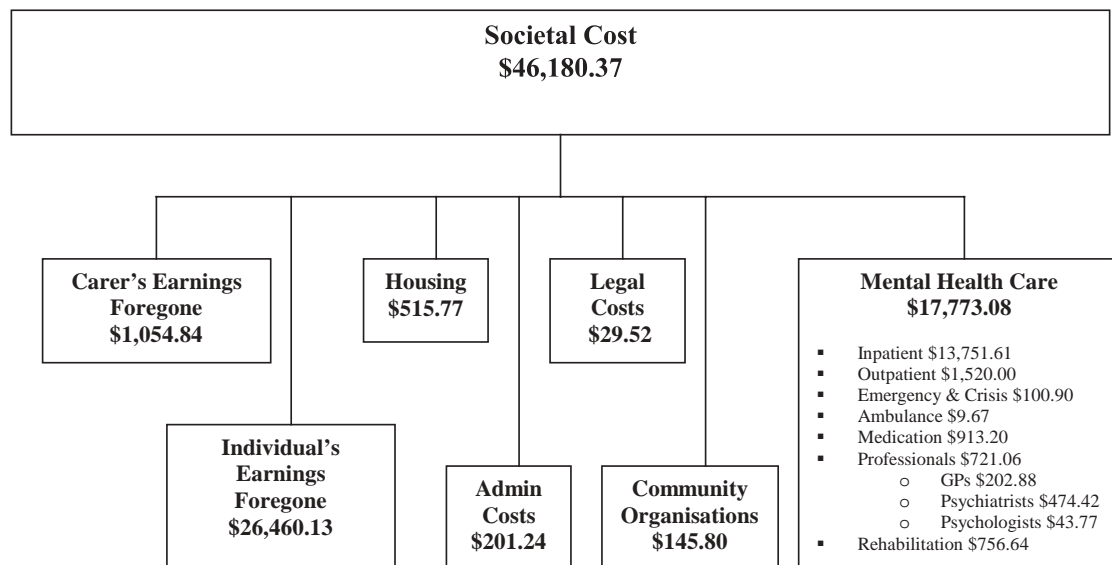


Figure 8: Breakdown of Costs of Psychosis, Government Perspective

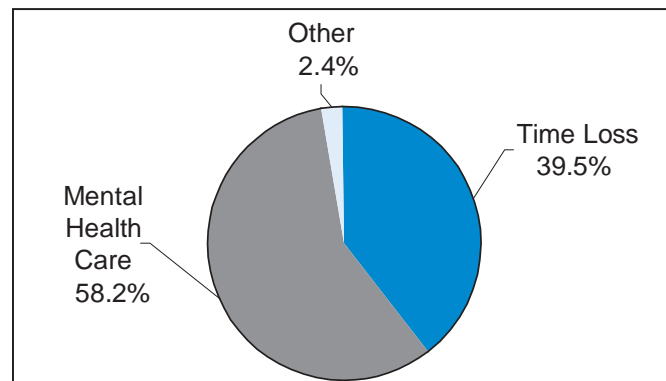
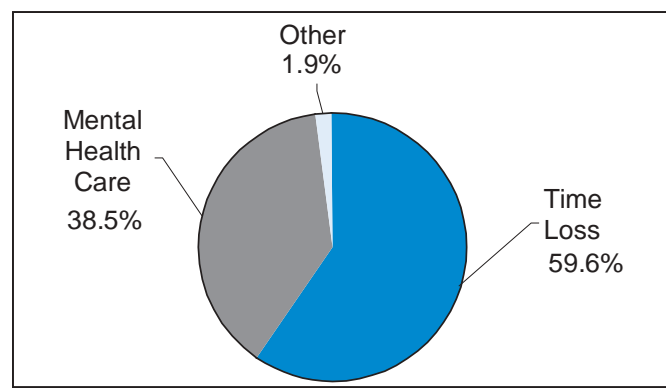


Figure 9: Breakdown of Costs of Psychosis, Societal Perspective



Considering only direct mental health care and other sector costs in Table 19, mental health care costs account for at least 95% of these costs from both government and societal perspectives. Inpatient costs are the largest single contributor, giving rise to 73.7% of direct mental health care and other sector costs from the societal perspective and 74.9% from the government perspective. This is higher than for Canada at 61.9% (Goeree 1999b).¹⁴ However, in Canada some 72.9% of direct mental health care and non health care costs were attributable to accommodation, including hospitalisation. Similarly, in the United Kingdom 73.9% of total direct health care and non health care costs have been estimated as being due to accommodation, including inpatient care, based on 1987 data (Davies and Drummond 1990). Aggregating the Australian supported accommodation and inpatient costs amounts to 76.4% of total direct mental health care and other sector costs from the societal perspective, and 77.1% from the government perspective. These data appear to indicate that greater reliance is placed on the mental health care sector within Australia for ‘housing’ persons with psychosis than in comparable countries, as illustrated in Figure 10.

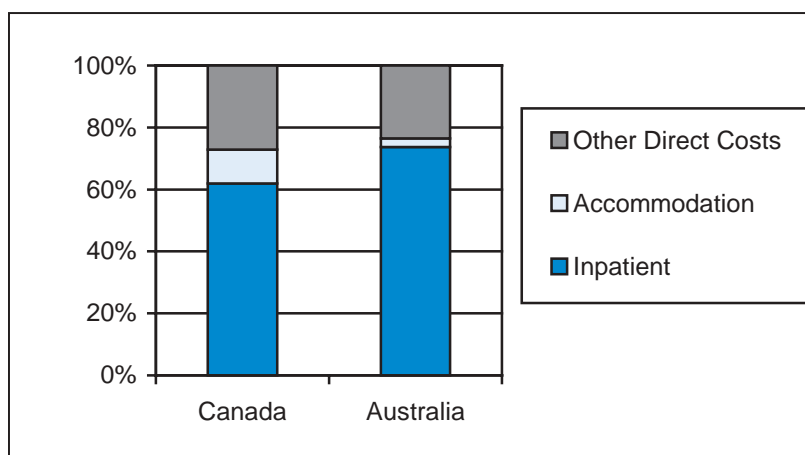
¹⁴ This figure excludes costs attributable to “seniors’ homes” and “incarceration.” It is acknowledged that there are a number of issues to consider in undertaking comparisons such as these, and that these comparisons should be taken as indicative only. Issues to consider include: differences in methodology, in particular differences in the resources costed; differences in relative resource prices between countries; and differences in service provision and resource prices over time.

Table 19: Costs of Psychosis from Government and Societal Perspectives

	Government		Societal	
	Average per Patient (\$)	Total Australian (\$)	Average per Patient (\$)	Total Australian (\$)
Professionals				
GPs	172.45	8,413,000	202.88	9,897,000
Psychiatrists*	399.36	19,482,000	474.42	23,144,000
Psychologists	n.a.	n.a.	43.77	2,135,000
Sub-total	571.81	27,895,000	721.06	35,176,000
Hospital				
Ambulance	9.67	472,000	9.67	472,000
Emergency/Crisis	100.90	4,922,000	100.90	4,922,000
Inpatient	13,435.84	655,454,000	13,751.61	670,859,000
Outpatient	1,508.61	73,596,000	1,520.00	74,152,000
Sub-total	15,055.02	734,444,000	15,382.18	750,405,000
Rehabilitation	756.64	36,912,000	756.64	36,912,000
Pharmaceuticals	860.23	41,965,000	913.20	44,550,000
Mental Health Care	17,243.71	841,216,000	17,773.08	867,043,000
Legal Costs	29.52	1,440,000	29.52	1,440,000
Accommodation	399.91	19,509,000	515.77	25,161,000
Administration	201.24	9,817,000	201.24	9,817,000
Voluntary	63.27	3,087,000	145.80	7,113,000
Other Sectors	693.94	33,853,000	892.33	43,531,000
Time-loss costs	n.a.	n.a.	27,514.97	1,342,290,000
Transfer Payments	8,016.39	391,072,000	n.a.	n.a.
Tax foregone	3,675.79	179,320,000	n.a.	n.a.
Time Loss Costs	11,692.18	570,392,000	27,514.97	1,342,290,000
TOTAL	29,629.84	1,445,461,000	46,180.37	2,252,864,000

* Includes imputed psychiatrist visits for private hospital inpatients.

Figure 10: Distribution of Direct Costs (Health Care Sector and Other) for Australia (2000) and Canada (1999)*



Source: Goeree 1999b.

* Please refer to Footnote 14

This is expensive but not necessarily cost-effective, and is worthy of further investigation. For example, does inadequate supported housing place excessive demands on the mental health care sector, leading to inefficient use of resources? Does inadequate supported housing compromise the mental health status of patients and lead to increased need to access inpatient care?

Second in importance to inpatient costs as a contributor to direct costs are outpatient costs, followed by pharmaceutical costs. From a societal perspective, the proportion of total direct costs (mental health care and other sectors) incurred by drug therapy is 4.9% from the societal perspective and 4.8% from the government perspective. In comparison, drug therapy as a proportion of the total direct costs of schizophrenia is 4.0% from a societal perspective in the United Kingdom, 5.6% in France, 1.1% in the Netherlands and 4.3% in Canada (Knapp 1997, Goerre 1999b).

In 1999-00, the Gross Domestic Product (GDP) of Australia was \$621,186 million, of which \$32,875 million (5.29%) was attributable to health and community services (Table 33, ABS Cat No.5206.0 Dec 2000). Thus the total direct (Mental Health Care and Other Sector) costs of psychosis as a proportion of GDP are 0.14% and 0.15% respectively from the government and societal perspectives, while total costs of psychosis as a proportion of GDP are 0.23% from the government perspective and 0.36% from the societal perspective. As a proportion of health and community services expenditure, the total direct costs of psychosis are responsible for 2.7% of such expenditure from the government perspective and 2.8% from the societal perspective. In turn, Mental Health Care costs alone give rise to 2.6% of health and community services expenditure from both the government and societal perspectives. In contrast, expenditure on psychosis is around 2% of total health service expenditure in Europe (see Knapp 1997). Given the above discussion, this difference may, at least in part, be due to higher reliance on inpatient care in Australia.

Considering expenditure on all mental disorders, the latest data indicate that \$3.0 billion or 9.6% of total health expenditure was spent on mental disorders in 1993-94 (AIHW 2000a, 246). Assuming that the proportion of total health care expenditure on mental health has remained constant at 9.6%, given total health *and* community welfare expenditure of \$32,875 million, mental health care costs of psychosis would be of the order of 29.8% of total mental health care costs.

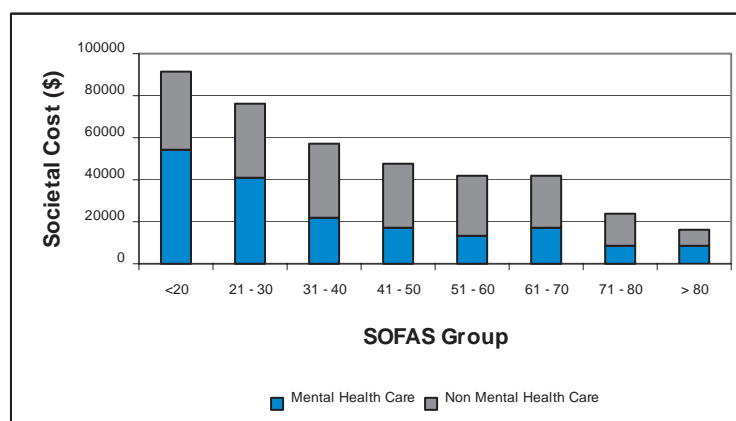
2.7 Simple Modelling

Because a 'bottom up' approach was adopted, a wide range of analysis is possible. For example, information can be categorised according to demographic classifications, such as age and gender or by illness related categories such as diagnosis. This type of information should assist in decision-making regarding allocation of resources in the care and treatment of psychosis. In the following sections more detailed examinations of cost by disability level and workforce participation are examined. Only data from the societal perspective are displayed since there was very little difference in the results for these analyses between government and societal perspectives.

2.7.1 Costs and Level of Disability

The societal and government cost information outlined earlier in this bulletin allows for a comprehensive review of the relationship between costs and level of disability. [Figure 11](#) provides an overview of (unweighted) societal costs by level of disability using the Social and Occupational Functioning Assessment Scale (SOFAS). This figure indicates that costs increase as the level of disability increases (low SOFAS scores indicating high disability; high SOFAS scores indicating low disability).

Figure 11: Average Cost per Patient per Annum by Level of Disability, Societal Perspective (unweighted data)



Disability in people with psychotic disorders can be reduced using a variety of evidence-based psychosocial treatments and rehabilitation interventions such as social skills training, coping skills enhancement, and certain behavioural and cognitive-behavioural interventions (eg, Nathan & Gorman 1998). There is little evidence from the LPDS that these

interventions are being widely used in Australian mental health care (Jablensky et al. 1999, 2000). It is also possible that early detection and intervention programs can contribute significantly to disability reduction through early and more effective control of symptoms, reducing relapse rates, and improving social adjustment and occupational functioning (Birchwood et al 1997; Birchwood 2000; Falloon 1992; Larsen et al 2000; McGlashen 1996; McGlashen & Johannessen 1996, McGorry 2000). Early psychosis programs in Australia are about to be reviewed and it will be of particular interest to discover to what extent these programs are being implemented and what effect they are having on outcomes.

The following cost modelling evaluates the extent to which the achievement of an improvement of 10 SOFAS points for 10%, 20% and 30% of persons in each SOFAS category from 10 to 90 (ie, excluding those in SOFAS category 100) impacts upon the costs of psychosis. That is, the stated percentages of people in each SOFAS group were moved to the next highest SOFAS group and costs recalculated. The results of this analysis are given in Table 20. This shows that there could be approximately \$49 million saved per annum for every 10 SOFAS point improvement in level of disability achieved by 10% of people with a psychotic illness, or \$1,005 per person with psychosis per annum, assuming no deterioration in disability level. That is, the benefits (\$49 million in cost savings at the population level) can be expected to accrue each year, assuming no deterioration in disability level and no change in the age- and sex-profile of the sample. If the age- and sex-profile changes then benefits can still be expected to accrue, but the level of those benefits may change, either increasing or decreasing.

Table 20: Societal cost projections based on reduced disability within a proportion of each SOFAS grouping (Unweighted data)

Proportion of people within a given SOFAS grouping experiencing a 10-point improvement (%)	Average Mental Health Cost per Patient (\$)	Average Total Cost per Patient (\$)	Total Population Cost (\$)	Savings Across Population (\$)
0	19,443	48,085	2,345,778,640	n.a.
10	18,941	47,080	2,296,705,720	49,072,920
20	18,448	46,079	2,247,917,936	97,860,704
30	17,982	45,105	2,200,402,320	145,376,320

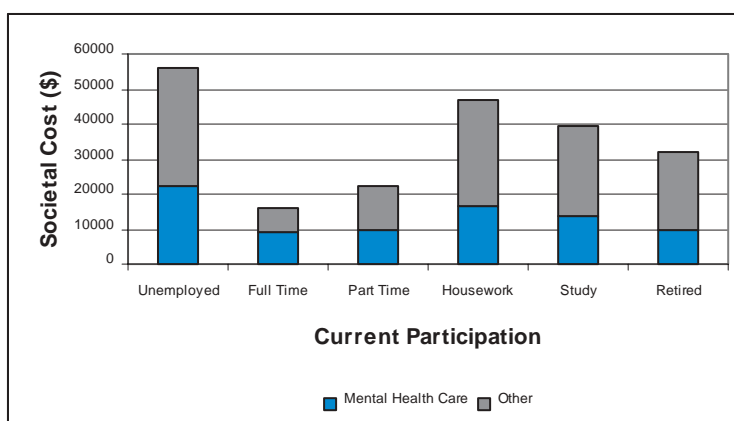
However, such changes are not likely to occur without further investment in psychosocial treatment and rehabilitation programs or reorientation of existing services. Thus if \$49 million was spent (ie, just over \$1,000 per person with psychosis) and 10% of the population were to gain a 10-point SOFAS improvement, the program would be cost neutral within the first year, and with cost savings accruing into the future.

2.7.2 Costs and Meaningful Participation

The current study has found a strong association between participation rates, including employment, and reduced cost burden. Those individuals with psychosis engaged in meaningful activities (including part- or full-time employment, housework or study) incur less expense than those (72%) who do not have productive employment as illustrated in Figure 12.

Is it possible to increase the rates with which people with psychotic disorders participate in meaningful activities in the community, including paid employment? There is good evidence that certain rehabilitation interventions and supported employment programs can increase rates of employment (eg, Crowther et al. 2001) and many rehabilitation programs include greater community participation of people with psychotic disorders among their goals. However, in Australia these programs are not reaching the people that need them to a sufficient extent. For example, in the LPDS less than 20% of the sample were involved in rehabilitation programs in the previous twelve months and only 7% were in such programs for six months or more.

Figure 12: Average Cost per Patient per Annum by Employment Status, Societal Perspective (Unweighted data)



To investigate the impact of increasing the proportion of people with psychosis engaged in meaningful participation, 10%, 20% and 30% of unemployed persons in the LPDS sample were redistributed to the other occupational categories in the same proportions as had been identified in the LPDS sample. These were: full-time employment, 24%; part-time employment, 53%; household duties, 13%; and formal study, 10% (the retired group was excluded from the analysis). The results of this exercise are provided in Table 21.

Based on the analysis described above, increased participation in meaningful activities by 10% of unemployed people with a psychotic disorder (ie, movement into full- or part-time employment, study or household duties) would result in potential savings at the population level of \$147 million per annum. If 30% were able to undertake meaningful activity the potential savings would be of the order of \$441 million dollars per year. However, such changes are not likely to occur without further investment in rehabilitation programs or reorientation of existing rehabilitation services.

Table 21: Societal cost projections based on progressively increased meaningful participation of unemployed persons (Unweighted data)

Level of increased meaningful participation (%)	Average Mental Health Cost per Patient (\$)	Average Total Cost per Patient (\$)	Total Population Cost (\$)	Savings Across Population (\$)
0	19,172	47,779	2,330,850,736	n.a.
10	18,017	44,763	2,183,718,192	147,132,544
20	16,862	41,747	2,036,585,648	294,265,088
30	15,707	38,731	1,889,453,104	441,397,632

How much would such investment be likely to cost? Assuming that a six-month rehabilitation program equates to 78 days of care (26 weeks at 3 days per week), and that the costs are \$106 per day (see Appendix 1), the total cost per person is \$8,268. Given that the estimated population with psychosis within urban Australia is some 48,784 persons, the estimated cost of providing 6 months rehabilitation to each and every one of those persons is \$403,346,112. If a 30% improvement in participation rates could be achieved (ie, if one in three were to gain and maintain part- or full-time employment or other form of meaningful participation), this would lead to net cost savings of the order of \$38 million within the first year, and \$441 million per annum thereafter (undiscounted). In contrast, it would take less than 3 years to break even if there was a 10% improvement in participation rates, with savings of the order of \$147 million per annum thereafter (undiscounted).

Thus a modest 10% improvement in meaningful participation rates will result in cost-savings from the societal perspective, assuming that the cost of rehabilitation services is \$106 per day. Such improvement is certainly indicated by the above results, there being an 11% difference in unemployment levels between sub-groups having experienced no rehabilitation and at least six months of rehabilitation. Further, the quality of life of those having undergone rehabilitation leading to greater levels of participation in meaningful activities would be superior to those whose levels of participation remained low. Thus the available data indicate that further investment in rehabilitation programs is potentially cost saving, and would also give rise to improved quality of life – a win-win or ‘dominant’ situation.

However, even if there is a net cost associated with increased investment in rehabilitation, it can still be cost-effective. Specifically, as long as the additional benefits, including improved quality-of-life arising from rehabilitation, are considered to be worth the additional cost, the program would be cost-effective.

3 Conclusion

Psychosis represents a considerable economic burden to society. Based on the one-month prevalence of 4.7 per thousand in the 18 to 64-year old age group, psychosis costs the Australian Government at least \$1.45 billion per annum, while societal costs are at least \$2.25 billion per annum. This corresponds to 0.23% of GDP and 0.36% of GDP respectively in 1999-00. Similarly, the mental health care costs of psychosis as a proportion of health and community services expenditure are 2.6% from the government and societal perspectives. Adopting a conservative estimate of 12-month prevalence, societal costs are estimated to be as high as \$2.54 billion, increasing to \$2.62 billion when 'time-loss' costs due to mortality are included.

The high costs of psychosis are largely associated with inpatient care and the reduced productivity of persons with psychosis and their carers, even assuming 'time-loss/indirect' costs associated with mortality are zero. The burden associated with inpatient care in Australia appears to be high relative to other countries, while the costs associated with supported accommodation are lower. This situation is worthy of further investigation, not least because inpatient care may not be cost-effective, and improved patient outcomes and reduced costs may potentially be achieved by providing psychotic persons with adequate supported housing.

The cost burden of psychosis is positively associated with the level of disability and unemployment. The analyses indicate that there may be potential cost-benefits if early intervention and evidence-based methods for reducing disability are pursued, and rates of participation in meaningful activity by the unemployed are increased through appropriate rehabilitation programs.

Finally the burden on carers is worthy of further investigation, particularly in view of the evidence that only 14% of designated carers received a carer's pension. Since family support can positively contribute to better outcomes for people with psychotic disorders, improved access to the carer's pension may not only give due recompense for the burden shouldered by carers, but help in achieving better clinical outcomes.

The main findings:

- The average costs of psychosis are extremely high, even on the basis of conservative assumptions.
- The main driver of mental health care costs is inpatient care.
- We appear to be spending disproportionate amounts on 'housing' people in hospitals and not investing sufficiently in supported community accommodation.
- If we invested more on certain evidence based psychosocial interventions we could achieve better outcomes and save money.

APPENDIX 1: COSTING METHODOLOGY

A-1.1 Mental Health Care

A-1.1.1 Health Professionals

A-1.1.1.1 General Practitioner

For each individual, only visits exceeding the average number of GP consultations by gender – 5.5 males; 7.5 females (AIHW 2000a: 300) – have been costed. In valuing these services it was assumed that one visit would be of greater than 20 minutes duration but less than 40 minutes, corresponding to Item 36 in the Medicare Benefits Schedule (Commonwealth Department of Health and Aged Care, 2000b). It was otherwise assumed that visits would be of less than 20 minutes duration, corresponding to Item 23 of the Schedule. The services were valued at the Scheduled Fee from the societal perspective and the Scheduled Benefit, 85% of the Scheduled Fee, from the government perspective.

A-1.1.1.2 Private Psychiatrist

In valuing private psychiatric services it was assumed that one visit would be between 45 and 70 minutes duration, corresponding to Item 306 in the Medicare Benefits Schedule (Commonwealth Department of Health and Aged Care, 2000b). It was otherwise assumed that visits would be between 30 and 45 minutes duration, corresponding to Item 304 of the Schedule. The services were valued at the Scheduled Fee from the societal perspective and the Scheduled Benefit, 85% of the Scheduled Fee, from the government perspective. This approach is supported by evidence presented in the National Mental Health Report 2000, in which total fees charged by psychiatrists are equivalent to 98.5% of total Scheduled Fees (Table A-35, Commonwealth Department of Health and Aged Care 2000a: 201).

A-1.1.1.3 Private Psychologist

In valuing these services a fee of \$70.00 per visit has been assumed. This is the amount believed to be typically charged by psychologists for a one hour consultation. This compares with the 1 hour scheduled fee of \$158.00 set by the Australian Psychological Society.

A-1.1.2 Hospitalisation

A-1.1.2.1 Ambulance

The number of ambulance services required was not specifically recorded. However, based on the experience of one of the authors (VC), approximately 20% of *involuntary* admissions were believed to present to hospital via ambulance. This proportion has been assumed for the current study.

Ambulance services have been costed at \$149, the minimum cost of a primary response transport for the first 16km or part thereof. (NSW Health Department, 14 September

2000). In comparison, urgent ambulance transportation costs \$355 in Western Australia (St John Ambulance Australia. Western Australia. 2000), the emergency transport fee is \$565.80 for non-WorkCover situations in Victoria (Metropolitan Ambulance Service 1999), and in Queensland the fee for emergency transport is \$676 (Queensland Ambulance Service 2000).

A-1.1.2.2 Emergency and Crisis Intervention

In the absence of more specific costing information, Emergency Department and Crisis intervention services have been costed at \$106 per episode based on the average cost per non-admitted mental health service episode in New South Wales in 1998-99 (derived from Table 1b, NSW Health Department 2000).

A-1.1.2.3 Inpatient Treatment

In the current analysis only hospitalisations in a public psychiatric hospital, public psychiatric unit in a general hospital, private psychiatric hospital unit, public drug and alcohol unit and private drug and alcohol unit have been assumed related to the patients' psychoses. All respondents admitted to public hospitals have been assumed to be public patients.

For patients admitted to public psychiatric hospitals or public psychiatric units in general hospitals AR-DRG's have not been employed as unit costs, consistent with the approach recommended by the Casemix Policy Unit, NSW Health Department (September 1999: 11). Rather, two national per diem rates reported in National Mental Health Report 2000 have been employed. The rates are \$376 per day for acute stay patients and \$335 per day for non-acute (extended care) patients (Table A-22, Commonwealth Department of Health and Aged Care 2000a). Within the current study patients with a cumulative length of stay of less than 2 months within a given type of institution are defined as acute patients, while patients with a cumulative length of stay greater than 2 months have been defined as non-acute patients.

The rates obtained from the National Mental Health Report were calculated in respect of 1997-98. However, no adjustment for inflation has been made, given the unequivocal nature of the prices index data. In adjusting for inflation, the Final Consumption Expenditure by Government - Hospital and nursing home care implicit price deflator, is considered the preferred index to apply to mental health expenditure for mental health services in States and Territories (Commonwealth Department of Health and Aged Care 2000a: 168), but is only available until 1998-99. The index evidences a 2.4% increase in prices between 1997-98 and 1998-99 (Table A17, AIHW 2000b). In contrast the Health Group of the CPI is available to 1999-00, and shows deflation for each year between 1997-98 and 1999-2000, the index reducing from 165.4 to 158.7 over the period (1989-90 = 100.0) (Table 3, ABS Cat No. 6401.0, December Quarter 2000), reflecting deflation in the hospital and medical services subgroup.

No adjustment for pharmaceutical costs supplied during the hospital have been made, thus leading to the potential for double-counting. As pharmaceutical costs account for 4.7% of total health care costs, the effect, if any, is considered to be minimal.

For patients admitted to private psychiatric hospital units, their stay has been costed at the average daily cost of AR-DRG Version 4.0 1997/98, U61B: Schizophrenia Disorders W/O Mental Health Legal Status for private hospitals, net of pharmaceutical costs (Commonwealth Department of Health and Aged Care 2000c). The pharmaceutical component has been excluded to avoid potential double-counting. There has been no adjustment for inflation for the reasons cited above.

AR-DRG U61B was chosen in preference to U61A: Schizophrenia Disorders W Mental Health Legal Status, as it is not necessarily possible to identify which admissions have been involuntary, nor the length of stay of those admissions, given the design of the instrument used in the LPDS. Further, the latter DRG is not actually available for the private sector.

In private hospitals it has also been assumed that a private psychiatrist would visit the respondents twice a week. In valuing these services it was assumed that the first visit would be between 45 and 70 minutes duration, corresponding to Item 306 in the Medicare Benefits Schedule (Commonwealth Department of Health and Aged Care 2000b). Otherwise it was assumed that visits would be between 30 and 45 minutes duration, corresponding to Item 304 of the Schedule. The services were valued at the Scheduled Fee from the societal perspective and the Scheduled Benefit, 75% of the Scheduled Fee, from the government perspective.

For patients admitted to public drug and alcohol units and private drug and alcohol units, their stay has been costed at the average daily cost of AR-DRG Version 4.0 1997/98 V61A: Drug Intoxication & Withdrawal with complicating co-morbidities (Commonwealth Department of Health and Aged Care 2000c). The pharmaceutical component has been excluded to avoid potential double-counting. Again there is no adjustment for inflation.

A-1.1.2.4 Outpatient

In the absence of more specific costing information, Outpatient services have been costed at \$106 per episode based on the average cost per non-admitted mental health service episode in New South Wales in 1998/99 (derived from Table 1b, NSW Health Department 2000).

A-1.1.2.5 Rehabilitation or day programme

Rehabilitation or day program services have been costed at \$106 per episode based on the average cost per non-admitted mental health service episode in New South Wales in 1998/99 (derived from Table 1b, NSW Health Department 2000). This would appear to be conservative. A same-day cost of \$353 was reported in Casemix Standards for NSW 1999/2000 for patients classified as receiving ambulatory care occasions of service (Casemix Policy Unit, NSW Health Department September 1999:12).

A-1.1.3 Medication

Unit prices were obtained, where possible, from the list prices reported in The Pharmaceutical Benefits Schedule (Commonwealth Department of Health and Aged Care 2000d), and otherwise from MIMS (MIMS. Australia 2000). It was assumed that the lowest cost medication and the lowest cost combination of tablets required to make up a particular dosage would be dispensed. Patient co-payments of \$3.30 for relevant social security beneficiaries (some 85% of the respondent population) and \$20.60 for all other respondents were excluded from the Government perspective (Health Care Access and Financing, Commonwealth Department of Health and Aged Care as at December 2000).

Also, as noted above, pharmacy related costs were excluded from the DRG estimates used in costing inpatient services to avoid potential double-counting.

A-1.2 Patient and Family

A-1.2.1 Out-of-pocket (Societal Perspective)

Owing to a lack of information, out-of-pocket expenses have been limited to co-payments for medical care and pharmaceutical costs. It has been assumed that the Scheduled Fee only is charged, with respondents paying the difference between the Scheduled Fee and the appropriate rebate. As previously noted, some justification for this approach is provided by the National Mental Health Report 2000, in which total fees charged by psychiatrists are equivalent to 98.5% of total Scheduled Fees (Table A-35, Commonwealth Department of Health and Aged Care 2000a). In relation to pharmaceutical costs, it has been assumed that persons on benefits, and therefore presumably health care cards will pay \$3.30 per script while persons not on benefits will pay up to the maximum contributory rate of \$20.60 (Health Care Access and Financing, Commonwealth Department of Health and Aged Care as at December 2000).

A-1.2.2 'Time-loss'/Indirect Costs (Societal Perspective)

'Time-loss' costs incurred by the patients and their families have been calculated employing a modified human capital approach. The major modification is that females are considered to have the same employment rates as a proportion of total population as for males. This approach has been adopted given that highly productive activities such as child-rearing and housekeeping activities reduce female participation in the formal labour market. In Andrews et al (1985) 90 per cent of women were costed as employed either in the marketplace or in the home. The current analysis is therefore more conservative.

A-1.2.2.1 Morbidity Costs

Morbidity-related costs have been estimated for respondents who had been unemployed during the previous year, for the proportion of time they were unemployed. For each week they were unemployed, 'time-loss' costs were estimated as the product of age- and gender-specific weekly earnings foregone, and the age-specific male employment ratio. Adjusting earnings by the employment ratio reflects the fact that even if all respondents were perfectly healthy, not all would be expected to be in employment.

For carers known to be on carer pensions, 'time-loss' costs have been estimated, where gender is known, as the product of the gender-specific average weekly earnings and the male employment ratio. Where the gender of the carer was unknown, it has been conservatively assumed that they were female.

A-1.2.2.2 Mortality Costs

Mortality costs have been estimated from the societal perspective only, assuming that 10% of all suicides in persons aged 15 to 64 are attributable to schizophrenia, as per the assumption employed in Goerre et al (1999). The costs have been calculated as the discounted sum of the product of age- and gender-specific earnings and age-specific male employment ratio from their current age until retirement at 65. A discount rate of 5% was employed. As deaths were available either in only 5- or 10-year age groups, the age corresponding to the mid-point of the category was employed for 5-year age-groups, eg 17 for the age-category 15-19, and to bias the results downwards, the age corresponding to rounded up average for 10-year age groups (eg, 40 for the age-category 35-44). To prevent potential double-counting of morbidity and mortality, the first-year has only been calculated in respect of the proportion of males and females in paid employment in the past month. Employment ratios were obtained from Table 18, ABS Cat No. 6203.0, December 2000 and age- and gender-specific weekly wage rates were obtained from Table 4, ABS Cat No. 6310.0, August 1999, the latest available version of this publication.

On this basis the net present value of mortality costs, employing a 5% discount rate, is estimated to be \$86,800,095 for the Australian population in total. Assuming that 86% of suicides within the population with psychosis occurs in persons resident in urban areas, as per the population distribution, the net present value of mortality costs within the urban population are estimated at \$74,648,082, and \$1,530 on average (see Table A-1.1).

Table A-1.1: Estimation of the NPV of Mortality Due to Suicide

Age group	Deaths from suicide 1998, all causes ^a		Death from suicide attributable to schizophrenia ^b		Present value of future production lost per death (\$)		
	Male	Females	Males	Females	Males	Females	Total
15-19	116	35	11	3	483,163	337,556	6,327,456
20-24	248	47	24	4	544,882	371,742	14,564,129
25-34	591	109	59	10	530,501	339,191	34,691,456
35-44	479	135	47	13	416,230	254,595	22,872,561
45-54	314	72	31	7	215,423	131,940	7,601,682
55-59	88	30	8	3	63,799	39,342	628,416
60-64	75	23	7	2	13,763	9,027	114,395
65 and over	233	80	23	8	-	-	
TOTAL	2144	531	210	50			86,800,095

a. Source: Table 5, Suicides 1921-1998, ABS. Cat. No. 3309.0

b. Assumes 10 percent of all suicides are attributable to schizophrenia, rounded down to the nearest whole number. Based on approach employed in Goerre et al (1999).

A-1.2.3 Transfer Payments (Government Perspective)

A-1.2.3.1 Benefit Payments

A-1.2.3.1.1 The Patient

In the current study it has been conservatively assumed that only certain types of benefit are likely to be directly related to the illness of the patient. Benefits assumed to have been incurred due to the illness of the patient are: the Disability Support Pension, Sickness Allowance, and Special Benefit. In contrast, benefits assumed not to be directly attributable to the illness include the Age pension, Service pension, Widow Allowance, Carer Payment, Sole Parents Allowance, Newstart, Unemployment Benefit and 'Other'. The exclusion of the 'Unemployment benefit' is a conservative option given the problems in gaining and maintaining employment in this population.

The Benefit Rates employed in this study were obtained from the Centrelink website as at October 2000. The Pharmaceutical Allowance and Rental Assistance were also calculated where applicable.

A-1.2.3.1.2 The Carer

In calculating the benefit payments for carers, it has been conservatively assumed that all carers were single. For those respondents who were unaware whether their carer was on a pension or not, six of 91, it was assumed that 50 percent would receive the carer's pension.

The Benefit Rates employed in this study were obtained from the Centrelink website as at October 2000.

A-1.2.3.2 Tax Foregone

Tax forgone has been estimated for unemployed respondents only. It was calculated based on average weekly earnings figures for males and females, adjusted for the expected unemployment rate and participation rates by gender (ABS Catalogue No. 6302.0 February 2000) and the Individual Resident Income Tax Rates were obtained from the Australian Tax Office website as at October 2000. (see <http://www.ato.gov.au>) (see Table A-1.2).

Table A-1.2: Tax Foregone by Employment Status

Description (Current Employment Status)	Tax Foregone (NOTAX\$)
Male, Full Time Employed	\$0.00
Male, Part Time Employed	\$0.00
Male, Not Employed	\$8,092.18
Female, Full Time Employed	\$0.00
Female, Part Time Employed	\$0.00
Female, Not Employed	\$4,095.46

A-1.3 Psychosocial Costs

No attempt has been made to explicitly value the psychosocial costs of psychosis.

A-1.4 Other Sectors

A-1.4.1 Administration of Benefits

The average cost of administering benefits provided by the Federal Government has been estimated on the basis of information contained on Centrelink's website as at February 2001. The average administration costs per beneficiary is estimated at \$262.30 given a recurrent budget of \$1.6 billion and 6.1 million customers.

A-1.4.2 Voluntary Sector

In the Industry Commission inquiry into charitable organisations, the St Vincent de Paul society provided information to the Commission that they serviced 1,260,000 visits during 1992-93 given a total income of \$114.6 million (Table 1.2, Box C.1, IC 1995). As such it is estimated that each visit cost a minimum of \$79 on average. Inflating this figure to 1999-00 based on the CPI (ABS Cat No. 6401.0), the average cost is estimated to be \$91 per visit. This is considered to be an underestimate given that volunteer time has not been included.

A-1.4.3 Accommodation

The cost of providing Group Homes and Supported Housing is estimated at \$77.00 per day or \$539.00 per week (Personal Communication, Casemix Unit, NSW Department of

Health). However, between \$80.00 and \$150.00 is recovered from residents per fortnight. The current study conservatively assumed that \$150.00 was recovered, thereby estimating the overall cost as \$464.00 per week.

In the Industry Commission Report on charitable organisations it was noted that client fees and charges fees amounted to 14% of total revenue in the largest 50 community social welfare organisations (IC 1995: 258). This is almost double the proportion that Baptist Community Services say they recovered in the provision of homeless accommodation. It has therefore been conservatively assumed that client fees represent 14% of the total cost of service provision. Given that the fees charged per resident at the Salvation Army hostel and the Matthew Talbot hostel in Newcastle are a little over \$12.00 per day, it has been estimated that the cost of crisis shelter accommodation is just over \$85 per day or \$600 per week.

Nursing home costs have been valued at \$71 per day, based on the average cost per day per utilised residential place given that the average national cost per utilised place in 1999-00 was \$25,961 (Commonwealth Department of Health and Aged Care 2000e).

Hostel accommodation has been costed at \$41.97 per day, the aggregate value of the national subsidy rate for Resident Classification Level 5 (\$34.77), the highest level of low level care and the concessional resident subsidy (\$7.20) as at July 1999 (Aged and Community Care Division, Commonwealth Department of Health and Aged Care, 30 October 1998). The pensioner subsidy was excluded as rental assistance has been included in the calculation of entitlements for all persons on a benefit.

A-1.4.4 Legal Costs

Owing to the lack of information regarding the exact nature of these assaults and charges, it was necessary to obtain an estimate of the costs involved in such situations. The Australian Institute of Criminology estimates that in 1999, the average expenditure per criminal case lodgment was \$127 at a Magistrate's court; \$3191 at an Intermediate court; and \$8224 at a Supreme court (Australian Institute of Criminology 1999).

The Magistrate's court cost (\$127) has been employed in the current study based on the following reasoning. Firstly, it was assumed that most criminal activity reported in the study was relatively minor, since the interviewee had not been jailed for the offence. Secondly, it was assumed a large proportion of criminal activity would be related to substance use (eg, theft to buy substances) and therefore be crimes against property rather than the person. These crimes would typically be addressed in a Magistrate's court in the first instance. Finally, the Magistrate's court cost was the most conservative option.

A-1.5 Non-Mental Health Care Costs

All inpatient episodes have been costed assuming a cost weight of 1.0 based on public and private hospital AR-DRG Version 4.0 (Commonwealth Department of Health and Aged Care 2000c). Further, for episodes in private hospitals it has been assumed that a specialist will visit the patient twice a week. The first visit has been costed as Medicare Benefits

Schedule Item Number 104 with all subsequent visits costed as Item Number 105 (Commonwealth Department of Health and Aged Care 2000b). The Scheduled Fee has been employed from the societal perspective, and the Scheduled Benefit from the government perspective.

APPENDIX 2: ASSUMED MEDICATION DOSAGES AND COSTS

Medication	Dose (mg) / Day	Cost / Day (\$)	Cost / Year (\$)
Chlorpromazine	350	0.57	208.05
Clozapine	400	10.80	4148.40
	Includes monthly blood tests at \$17.20 each		
Flupenthixol	20 / Fortnight	3.41 / Fortnight	88.66
Fluphenazine	5	0.88	321.58
Haloperidol	15	0.51	185.49
Olanzapine	15	11.58	4225.97
Perphenazine	<i>Not listed in PBS or MIMS. Only 1 respondent was taking this medication. Arbitrarily given the figure of \$135.12 per annum (as Pericyazine below).</i>		
Pericyazine	30	0.37	135.12
Pimozide ^a	4	1.16	423.59
Risperidone	5	5.75	2097.90
Quetiapine	<i>No respondents were taking quetiapine.</i>		
Sulpiride	<i>No respondents were taking sulpiride.</i>		
Thioridazine	350	0.48	174.80
Thiothixine ^a	24	1.45	530.64
Trifluoperazine	15	0.25	92.75
Flupenthixol Decanoate	20 / Fortnight	3.41 / Fortnight	88.66
Fluphenazine Decanoate	25 / Fortnight	4.54 / Fortnight	118.09
Haloperidol Decanoate	100 / Fortnight	9.60 / Fortnight	249.60
Zucloperthixol Decanoate	200 / Fortnight	4.62 / Fortnight	120.12
Amitryptiline	150	0.43	157.24
Carbamazepine	1000	0.84	307.07
Clomipramine	150	2.23	812.93
Desipramine	150	0.90	327.62
Dothiepin	150	0.49	179.58
Doxepin	150	0.46	169.07
Fluoxetine	20	1.21	440.61
Lithium Carbonate	1150	0.32	186.29
	<i>Includes quarterly blood tests at \$17.20 each.</i>		
Imipramine	150	0.80	293.02
Mianserin	120	3.01	1098.94
Moclobemide	600	1.91	698.73
Nefazadone	600	2.11	771.71
Nortriptyline	150	1.06	385.15
Paroxetine	20	1.27	463.55

Medication	Dose (mg) / Day	Cost / Day (\$)	Cost / Year (\$)
Sertraline	100	1.31	477.24
Tranlycypromine	30	0.80	291.49
Trimipramine ^a	150	2.06	752.05
Valproate	1600	1.17	427.23
Venlafaxine	200	3.70	1350.50
Alprazolam	2000	0.46	167.24
Buspirone	30	2.65	965.57
Clorazepate	<i>Not listed in PBS or MIMS. Only 1 respondent was taking this medication. Arbitrarily given the figure of \$98.40 per annum (as Diazepam below).</i>		
Diazepam	10	0.27	98.40
Lorazepam	5	0.97	535.54
Oxazepam	45	0.47	169.94

All quoted costs were obtained from Commonwealth Department of Health and Aged Care (2000d) except those marked ^a, which were obtained from MIMS Australia (2000).

APPENDIX 3: SAMPLING WEIGHTS

Assume that the costs to patient b who is from state j and recruited from service i is X_{bij} . The weight which is given to this cost, W_{ij} , reflects the probability that a patient from state j who screened ‘positive’ in service i was interviewed, weighted by the proportion of the total interviewed sample from state j . This can be shown to be equal to:

$$W_{ij} = Q_{ij}/S_{ij} * N_j/S_j$$

Where:

Q_{ij} = proportion of (screened-positive) patients from state j recruited from service i ;

S_{ij} = proportion of patients in interviewed sample from state j recruited from service i ;

N_j = proportion of total persons in catchment area in state j ;

S_j = proportion of patients in interviewed sample in state j .

The proportions employed for Q_{ij} , S_{ij} , N_j and S_j are detailed in Tables A-3.1 to A-3.5 respectively.

Thus the weighted costs associated with individual b , from state j and recruited from service i , X_{bij} are given by:

$$X_{bij} * W_{ij} = X_{bij} * Q_{ij}/S_{ij} * N_j/S_j$$

Table A-3.1: Q_{ij} = proportion of patients from state j recruited from service i

	ACT	QLD	VIC	WA
Inpatient	14.42	23.1	10.97	14.63
Outpatient	65.88	58.23	60.48	69.57
Private Psychiatrist	13.73	4.29	3.8	6.74
GP	4.16	6.51	7.45	3.25
Marginal	1.8	7.87	17.3	5.81

Table A-3.2: S_{ij} = proportion of patients in interviewed sample from state j recruited from service i

	ACT	QLD	VIC	WA
Inpatient	25.5	36.4	14.52	31.93
Outpatient	51.68	24.03	52.26	49.58
Private Psychiatrist	12.08	12.72	6.13	5.88
GP	6.04	12.72	8.06	6.72
Marginal	4.7	14.13	19.03	5.88

Table A-3.3: N_j = proportion of total persons in catchment area in state j

	ACT	QLD	VIC	WA
	0.189726	0.535801	0.137157	0.137316

Table A-3.4: S_j = proportion of patients in interviewed sample in state j

	ACT	QLD	VIC	WA
	0.152041	0.288776	0.316327	0.242857

Table A-3.5: Aggregate Weights: $Q_{ij}/S_{ij} * N_j/S_j$

	ACT	QLD	VIC	WA
Inpatient	0.705655	1.17748	0.327583	0.259069
Outpatient	1.590738	4.4961	0.501792	0.793389
Private Psychiatrist	1.41831	0.625768	0.268785	0.648117
GP	0.859457	0.949591	0.400777	0.273454
Marginal	0.477906	1.033417	0.394175	0.558688

Weights were used in the calculation of all aggregate ‘representative’ costs (ie, based on all 980 participants) but were not used in sub-group cost comparisons within the LPDS data set.

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