Attaching Unit Costs to Australia's National Survey of Mental Health and Wellbeing

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Abstract

Background: In mental health, policy-makers and planners are increasingly being asked to set priorities. This means that health economists, health services researchers and clinical investigators are being called upon to work together to define and measure costs. Typically, these researchers take available service utilisation data and convert them to costs, using a range of assumptions. There are inefficiencies, as individual groups of researchers frequently repeat essentially similar exercises in achieving this end. There are clearly areas where shared or common investment in the development of statistical software syntax, analytical frameworks and other resources could maximise the use of data.

Aims of the Study: This paper reports on an Australian project in which we calculated unit costs for mental health admissions and community encounters. In reporting on these calculations, our purpose is to make the data and the resources associated with them publicly available to researchers interested in conducting economic analyses, and allow them to copy, distribute and modify them, providing that all copies and modifications are available under the same terms and conditions (i.e., in accordance with the 'Copyleft' principle). Within this context, the objectives of the paper are to: (i) introduce the 'Copyleft' principle; (ii) provide an overview of the methodology we employed to derive the unit costs; (iii) present the unit costs themselves; and (iv) examine the total and mean costs for a range of single and comorbid conditions, as an example of the kind of question that the unit cost data can be used to address.

Method: We took relevant data from the Australian National Survey of Mental Health and Wellbeing (NSMHWB), and developed a set of unit costs for inpatient and community encounters. We then examined total and mean costs for a range of single and comorbid conditions.

Results: We present the unit costs for mental health admissions and mental health community contacts. Our example, which explored the association between comorbidity and total and mean costs,

suggested that comorbidly occurring conditions cost more than conditions which occur on their own.

Discussion: Our unit costs, and the materials associated with them, have been published in a freely available form governed by a provision termed 'Copyleft'. They provide a valuable resource for researchers wanting to explore economic questions in mental health.

Implications for Health Policies: Our unit costs provide an important resource to inform economic debate in mental health in Australia, particularly in the area of priority-setting. In the past, such debate has largely been based on opinion. Our unit costs provide the underpinning to strengthen the evidence-base of this debate.

Implications for Further Research: We would encourage other Australian researchers to make use of our unit costs in order to foster comparability across studies. We would also encourage Australian and international researchers to adopt the 'Copyleft' principle in equivalent circumstances. Furthermore, we suggest that the provision of 'Copyleft'-contingent funding to support the development of enabling resources for researchers should be considered in the planning of future large-scale collaborative survey work, both in Australia and overseas.

Introduction

Scope and Aim

This paper reports on a project in which we developed a set of unit costs for mental health admissions and community encounters, using data from the Australian National Survey of Mental Health and Wellbeing (NSMHWB).[1] Specifically, the paper provides an overview of the methodology we employed to derive the unit costs and presents the unit costs themselves. As an example of the kind of question that the unit cost data can be used to address, the paper then examines the association between comorbidity and costs. The work is presented both for its intrinsic interest and as an example of an innovative and generalisable approach to facilitating economic (and other) research through sharing resources.

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Increasing Need for Economic Analyses in Mental Health

In mental health, as in other areas of health where funding is finite, policy-makers and planners are increasingly being asked to set priorities. This requires them to examine the 'burden of disease' associated with specific disorders, and defend the effectiveness and efficiency of different services and interventions. This in turn means that health economists, health services researchers and clinical investigators are being called upon to work together to define and measure both outcomes and costs, since these key variables underpin economic evaluation and priority setting exercises.

Much has been written about the difficulties in assessing mental health outcomes,[2,3] and in particular the use of the utility measurement approach as an aid to priority-setting,[4] so we will not dwell further on this issue here. Of more concern for the current exercise are the many issues associated with defining and measuring costs, not the least of which are the availability of data sources and the assumptions underpinning given costing exercises. In Australia, three large-scale studies have provided direct costing information, or resource utilisation information that can be converted into costs. The first is the Mental Health Classification and Service Costs (MH-CASC) Project,[5] which collected bottom-up costing information for episodes of inpatient and community care (i.e., directly identifying all of the resources directly consumed in given episodes of care). These data, while of significant value, are not readily available to researchers at an individual level and are becoming somewhat dated. The second is the National Mental Health Survey (NMHS), which informs the regular National Mental Health Report;[6] this also collects bottom-up costing data, but at the service level, rather than the episode level. The third is the NSMHWB, which is described below in terms of its content and the way in which it has been used.

The National Survey of Mental Health and Wellbeing: Content and Use

Conducted in 1997 by the Australian Bureau of Statistics, the NSMHWB[1] presents a special opportunity to consider costs, because it collected service utilisation and other data that can be converted to costs. Over ten and a half thousand adult respondents were asked to consider the 12 months prior to the survey, and to report whether they had experienced symptoms associated with a range of mental disorders (anxiety, affective and substance use disorders were assessed with CIDI-Auto modules, others with a range of other instruments), and the degree of disability associated with mental disorders. For the 12 months preceding the survey, they were also asked to report their public and private admissions to psychiatric and general hospitals, as well as their community consultations with a range of health professionals. They also provided salient socio-demographic data, including age, sex and occupation. The NSMHWB has been described comprehensively elsewhere.[1]

The Australian Government and the psychiatric research community have both made substantial investment in secondary analysis of data from the NSMHWB. The survey's Confidentialised Unit Record File (CURF)[7] and associated documentation have been made available to all University researchers. These resources have been extremely valuable, and have resulted in scores of academic and policy-relevant publications.

There are inefficiencies, however. For example, each research team has to develop statistical software syntax necessary to manipulate and analyse the data in the CURF in a manner that allows them to explore their particular research questions. Typically, this will involve the elaboration of several hundred lines of code, many of which will be common across research teams. Some coding procedures have probably been written at least a dozen times around the country. There are clearly areas where shared or common investment in the development of syntax, analytical frameworks and other resources could maximise the use of data from the NSMHWB.

One such area is that of economic analyses. The NSMHWB was not originally designed to answer economic questions, but several research teams have begun to take advantage of the potential to extrapolate costing data from service utilisation and other data. In particular, some have started to use the NSMHWB as the basis for priority-setting exercises.[8,9] Essentially, they have all gone through the same exercise of assigning unit costs to various elements of the survey, but they have used a range of different, sometimes simplified and/or inexplicit, costing assumptions, which has had the effect of reducing comparability across studies. It would clearly be desirable for these (and other) researchers to use a common, or at least similarly declared, set of assumptions regarding how they have derived costs in association with the survey data. Better still, there would be benefits in the free provision of the syntax needed to assign the costs. At present, a culture of academic competition for intellectual property rights militates against this.

'Open Source' Software and 'Copyleft'

The situation described above bears some comparison with that prevailing in the computer software industry. Here too, independent entities have traditionally developed their own software solutions to common problems, and been generally reluctant to release them to outsiders. However, in recent years there has been a substantial growth in the 'Open Source' computer movement. Here, software products are made freely and widely available, governed by a radical modification of the copyright principle known as a General Public Licence, or 'Copyleft'. Rather than restricting access, releasing work in this way aims to promote the sharing of information and knowledge, and to facilitate the collective improvement of a product that remains freely available. Under such a provision, source code and accompanying documentation is placed into the public domain, with an accompanying and very specific type of copyright that allows them to be freely copied, distributed, modified and/or extended provided that all copies and modifications are also freely available, at no cost, and remain under the same terms and conditions.

Current Project

The funding application for the work described here was inspired by the 'Open Source' concept, and comprised a proposal to carry out the necessary research to attach unit costs to the NSMHWB, then to make these unit costs, and the assumptions underpinning them, freely available to other researchers. Accompanying the reported unit costs as a freely available publication would also be the SPSS syntax necessary to derive these costs from the survey CURF. This proposal received funding from Beyondblue, the National Depression Initiative, and has been completed and reported to that organisation. The full report, relevant syntax, and a set of supporting materials are all available from Beyondblue's website - http://www.beyondblue.org.au. All are subject to 'Copyleft' provision.

Method

We took relevant data from the NSMHWB,[1] and developed a set of unit costs for inpatient and community encounters. All unit costs were represented in 1997 Australian dollars using the health price deflator published by the Australian Institute of Health and Welfare.[10]

As with any costing exercise, our unit costs were influenced by data availability (particularly in the case of community costs). For this reason, it was necessary to make various assumptions. These should not be regarded as any sort of gold standard, but we defend them as appropriate for the Australian context. The assumptions and calculations underlying our derivation of unit costs are described briefly below. More detail is available in the full report, but was beyond the scope of the current paper.

We used recommendations from The Manual of Resource Items and their Associated Costs (The Manual)[11] in our unit costing exercise. The Manual was developed by Australia's Commonwealth Department of Health and Ageing (CDHA) to provide direction on the source of unit costs to be used in submissions to the Pharmaceutical Benefits Advisory Committee (PBAC), and is an accepted source of unit cost information because of its transparency. It largely takes a 'gross' approach to costing, whereby individual services or interventions are valued using the best available national information (e.g., cost per Diagnosis Related Group (DRG) using the Australian National Cost Weights for inpatient admissions). The advantage of such an approach over a 'micro' costing approach which breaks the cost of a service or intervention down into resource categories, is that it promotes comparability across studies; the disadvantage is that it tends to limit the perspective taken for costing to the health sector, rather than being representative of true societal opportunity costs.

Estimating Costs of Mental Health Admissions

NSMHWB respondents were asked if they had had a same-day or longer admission to a hospital (public or private) for a mental health condition and/or for a non-mental health condition, although they were not asked the specific reason for the admission. In the case of mental health admissions, it was assumed that the admission was related to their stated mental health problem, and the average cost for the given DRG was attached (or the weighted average in the case of comorbidities, see below). This was preferred to utilising the stated length of stay as a data source for two reasons. Firstly, length of stay information in the survey is largely based on patient recall and prone to bias, and secondly, the Manual states that there are persistent concerns about whether cost estimates are verifiable when disaggregated beyond an episode of hospitalisation. In any case, the cost per bed day derived from the AR-DRG cost weights (determined by dividing the total cost by the average length of stay) are comparable to published bed day costs.

In Australia, published public and private hospital unit costs for mental health admissions differ because published DRG costs for the two types of hospital vary, and the latter do not include medical, pathology or imaging costs, which are charged to the Health Insurance Commission (HIC) according to the Medicare Benefits Schedule (MBS). We estimated these components using the published schedule fee for the medical, pathology and imaging costs, and added them to the published private hospital DRG unit costs.

Special consideration was given to comorbid conditions. Where respondents indicated that they had experienced more than one mental health problem, a weighted average cost for mental disorders was used. Where respondents indicated that they had experienced one or more mental health problem and physical comorbidities, but that the admission was for a mental disorder, the relevant unit cost for the mental disorder was used.

The relationships between DRG definitions, the ICD-10 diagnoses, and reasonable expectations for causes of admissions were not always clear-cut. For example, the definition of the DRG categories of Drug Intoxication and Withdrawal, and Other Drug Disorder and Dependence, included descriptions applicable to both the ICD-10 Harmful Use and Dependence diagnoses. Consequently, a weighted average of these two DRGs was used for people with a diagnosis of harmful use and/or dependence. In comparison, alcohol-related DRG categories appeared to closely match the ICD-10 categories. However it could reasonably be expected that a psychiatric hospital admissions due to alcohol would often be due to alcohol intoxication/overdose. As a result of this, for those people admitted to a drug and alcohol unit, the DRG Alcohol Use Disorder and Dependence category was used; for those admitted to a general or psychiatric hospital, the DRG Alcohol Intoxication and Withdrawal costing was used.

Estimating Costs of Mental Health Community Contacts

The NSMHWB asked respondents about whether they had contacted health professionals in the community, and, if so, the type and location of the professional and the number of occasions of services accessed for mental health problems. It

was not possible to determine the specific mental health diagnosis or diagnoses associated with these patterns of utilisation. Unit costs were estimated for each location, using recommendations from The Manual, and a weighted average was used for unspecified locations.

General practitioner contacts were costed according to the full 1997/1998 MBS fee, with the assumption being made that most general practitioners are paid on a fee-for-service basis, rather than salaried, regardless of location. Home visits were differentiated from consultations in all other locations, which were treated equally and based on a weighted average cost of consultations of differing types and duration. Psychiatrist, physician or other medical specialist and surgical specialist or gynaecologist contacts were treated in the same way, with the exception that contacts occurring in hospital outpatient settings were assumed to be provided by salaried specialists, and were therefore costed according to the Australian Ambulatory Classification (AAC)[12] (psychiatrists) or the National Hospital Cost Data Collection (NHCD)[13] (physician or other medical specialist and surgical specialist or gynaecologist).

Unit costs for psychologist, social worker or welfare officer and nurse contacts were taken from those published in The Manual,[11] derived from sources such as the ACC and the Commonwealth Department of Veteran's Affairs. These sources assume that these service providers are predominantly salaried.

The Manual did not specify unit costs for drug counsellors and other counsellors (presumably because professionals from a range of disciplines take on these roles), so unit costs for drug counsellors were derived from a recent local economic evaluation of psychosocial interventions for drug users.[14] No equivalent data were available for other counsellors, so the unit costs pertaining to drug counsellors were applied to this group as well.

Unit costs for contact with a mental health team were not provided in The Manual, and were therefore taken from the Mental Health Classification and Service Costs (MH-CASC) project.[5]

Unit costs for chemist contacts were estimated as the average cost per prescription dispensed under the Pharmaceutical Benefits Scheme (PBS) in the period 1997/1998, on the rationale that it was considered unlikely that a chemist would be consulted without dispensing a pharmaceutical agent. To determine unit costs for contacts with ambulance officers, we contacted each state/territory and derived an average cost per ambulance transfer. Radiology and pathology services occurring in a hospital outpatient sector were costed using an average cost from the AAC.[12] Other radiology and pathology services were costed according to the relevant MBS fee, using a weighted average that took into account total cost and volumes for different classes of services. Unit costs for contacts with other professionals were excluded, as the general nature of this category made it difficult to attach a meaningful unit cost.

Data Analytic Procedures Used in Calculating the Mental Health Costs Associated with Single and Comorbid Conditions

To illustrate the potential of the unit cost data to inform key costing questions in mental health, we compared the mental health costs associated with single and comorbid conditions in a descriptive analysis. Specifically, we calculated the annual total and mean costs of mental health admissions, mental health community contacts and lost productivity due to mental health problems for specific conditions occurring in isolation and comorbidly. We chose to consider total and mean costs together, since the former sheds light on broad cost-of-illness questions, and the latter allows comparisons to be made independent of the prevalence of the condition. Following Thompson and Barber,[15] we specifically chose the mean, rather than the median, as our measure of central tendency. We did this on the grounds that the arithmetic mean is the most appropriate comparison to use in cost data, unless the data are extremely skewed or the sample sizes are very small. All analyses were conducted using SUDAAN,[16] which is specifically designed to deal with complex sampling strategies such as that employed in the NSMHWB.

Results

Unit Costs

Table 1 and **Table 2** show the unit costs (Australian $) that we used for inpatient admissions and community contacts.

Costs of Mental Health Care by Single and Comorbid Condition

Table 3 shows the total annual costs of mental health admissions and community contacts (alone and in combination). Substance use disorders were consistently associated with the lowest costs of care ($13,771,126 for admissions, $20,523,300 for community contacts, and $34,294,426 for total mental health care), and anxiety and affective disorders occurring comorbidly were consistently associated with the highest costs of care ($79,739,859 for admissions, $97,372,323 for community contacts and $177,112,182 for total mental health care).

Table 3 also shows the annual mean costs of mental health care by single and comorbid condition. Substance use disorders were again associated with the lowest costs for community contacts and total mental health care ($211 and $353, respectively), and the second lowest mean costs for admissions ($4,080). Anxiety, affective and substance use disorders occurring comorbidly were associated with the highest mean costs for community contacts and total mental health care ($610 and $980, respectively), but co-existing anxiety and substance use disorders (without affective disorders) were associated with the highest mean costs for admissions ($9,452).

Table 1. Attachment of Unit Costs ($AUD) for Mental Health Inpatient Admissions for NSMHWB Respondents

Attachment of Unit Costs	Definition	Public sector	Private sector
Used for all respondents who had a mental health admission lasting 1 night only (except for alcohol use)	U40Z, U60Z: Weighted average cost for same day admissions	$577	$778
Used for all respondents who had a mental health admission and met ICD-10 criteria for a major affective disorder	U63A, U63B: Weighted average cost for major affective disorder	$5,521	$5,212
Used for all respondents who had a mental health admission and met ICD-10 criteria for an anxiety disorder	U65Z: Average cost for anxiety disorder	$2,274	$2,660
Used for all respondents who had a mental health admission and scored positive on the personality disorder screener but did not meet ICD-10 criteria for any other mental disorder	U67Z: Average cost for personality disorder and acute reaction	$2,746	$5,269
Used for all respondents who had a mental health admission and met ICD-10 criteria for alcohol harmful use or dependence	V60Z: Average cost for alcohol intoxication and withdrawal	$1,490	$3,097
Used for all respondents who had a mental health admission and met ICD-10 criteria or harmful drug use or dependence (except for alcohol and opioid use/dependence)	V61A, V61B, V64Z: Weighted average cost for drug intoxication and other drug use disorder and dependence	$2,532	$2,532
Used for all respondents who had a mental health admission lasting more than one night and met ICD-10 criteria for alcohol use or dependence	V62A: Average cost for alcohol use disorder and dependence	$2,399	$6,039
Used for all respondents who had a mental health admission lasting only one night and met criteria for ICD-10 alcohol use or dependence	V62B: Average cost for alcohol use disorder and dependence	$551	$425
Used for all respondents who had a mental health admission and met ICD-10 criteria for opioid harmful use or dependence	V63Z: Average cost for opioid use disorder and dependence	$1,837	$3,417
Used for all respondents who had a mental health admission and screened positive on the psychosis screener but did not meet ICD-10 criteria for any other mental disorder	U61A, U61B, U62A: Weighted average cost for psychotic disorders	$$6,013	$5,515
Used for respondents who had a mental health admission and had comorbid mental health conditions or did not meet any of the above criteria	Weighted average cost	$3,290	$4,218

Table 2. Attachment of Unit Costs ($AUD) for Mental Health Community Contacts for NSMHWB Respondents[a]

Attachment of Unit Costs	Home	Rooms	Community health centre	Clinic	Drug/alcohol service	Hospital outpatient	Not specified
Used for all GP contacts specified to have occurred at given location	$56	$27	$27	$27	$27	$27	$27
Used for all psychiatrist contacts specified to have occurred at given location	$105	$116	$116		$116	$41	$103
Used for all physician or other medical specialist contacts specified to have occurred at given location		$71	$103			$159	$83
Used for all surgical specialist or gynaecologist contacts specified to have occurred at given location		$147				$56	$137
Used for all psychologist contacts specified to have occurred at given location	$65	$88[b] $62[c]	$65	$65	$65	$62	$66
Used for all social worker or welfare officer contacts specified to have occurred at given location	$38	$42[b] $20[c]	$38	$38	$38	$38	$33
Used for all nurse contacts specified to have occurred at given location	$26	$26	$26		$23	$23	$26
Used for all drug counsellor and other counsellor contacts specified to have occurred at given location	$36	$36	$36	$36	$36	$14	$34
Used for all mental health team contacts specified to have occurred at given location				$94			
Used for all chemist contacts specified to have occurred at given location				$20			
Used for all ambulance officer contacts specified to have occurred at given location	$464					$184	$341

[a] Blank cells indicate that no NSMHWB respondents used this service in the given location;
[b] First contact;
[c] Subsequent contacts.

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Table 3. Costs ($AUD) of Mental Health Admissions and Community Contacts, by Single and Comorbid Condition

	Sample size	Weighted size	Mean	S.E. Mean	Lo95%	Hi95%	Sum
Cost of Mental Health Admissions							
Anxiety only	5	7,270	$3,122.14	$869.77	$1,417.39	$4,826.89	$22,697,942.00
Affective only	6	6,569	$6,485.84	$1,924.62	$2,713.58	$10,258.10	$42,605,503.00
Substance use disorders only	2	3,375	$4,080.33	$2,211.80	-$254.80	$8,415.46	$13,771,126.00
Anxiety and affective disorders	15	14,544	$5,482.66	$1,341.15	$2,854.01	$8,111.31	$79,739,859.00
Anxiety and substance use disorders	3	17,38	$9,451.94	$3,995.80	$1,620.17	$17,283.71	$16,427,480.00
Affective and substance use disorders	3	2,784	$7,772.39	$2,408.80	$3,051.14	$12,493.64	$21,638,330.00
Anxiety, affective and substance use disorders	7	4,918	$6,303.89	$3,357.70	-$277.20	$12,884.98	$31,002,544.00
Costs of Mental Health Community Contacts							
Anxiety only	197	227,748	$274.21	$23.52	$228.11	$320.31	$62,449,878.00
Affective only	148	167,858	$294.48	$35.15	$225.59	$363.37	$49,430,919.00
Substance use disorders only	72	97,055	$211.46	$55.47	$102.74	$320.18	$20,523,300.00
Anxiety and affective disorders	203	199,300	$488.57	$35.79	$418.42	$558.72	$97,372,323.00
Anxiety and substance use disorders	60	70,659	$388.27	$67.16	$256.64	$519.90	$27,434,507.00
Affective and substance use disorders	36	36,685	$363.06	$91.08	$184.54	$541.58	$13,318,863.00
Anxiety, affective and substance use disorders	89	83,690	$609.78	$73.39	$465.94	$753.62	$51,032,349.00
Cost of Total Mental Health Care							
Anxiety only	197	227,748	$373.87	$62.17	$252.02	$495.72	$85,147,820.00
Affective only	149	168,465	$546.32	$152.38	$247.66	$844.98	$92,036,422.00
Substance use disorders only	72	97,055	$353.35	$132.91	$92.85	$613.85	$34,294,426.00
Anxiety and affective disorders	204	199,986	$885.62	$141.91	$607.48	$1,163.76	$177,112,182.00
Anxiety and substance use disorders	60	70,659	$620.76	$166.77	$293.89	$947.63	$43,861,987.00
Affective and substance use disorders	36	36,685	$952.90	$472.59	$26.62	$1,879.18	$34,957,193.00
Anxiety, affective and substance use disorders	89	83,690	$980.22	$230.05	$529.32	$1,431.12	$82,034,893.00

Discussion

A New and Freely Available Resource for Researchers

By attaching unit costs to the NSMHWB, we have created a potentially valuable resource for use in priority setting and economic evaluations in mental health in Australia. This resource is freely available to all interested researchers, and the intent behind the application of the 'Copyleft' principle is to promote the widest possible dissemination and sharing of this work and whatever further developments others may make of it. There are precedents for this sort of work overseas, such as the inventory of the unit costs of health and social care,[17] developed by the Personal Social Services Research Unit in the United Kingdom, but this is the first attempt at such an endeavour in mental health care in Australia.

We advocate the use of these unit costs because they are based on an explicit set of assumptions, many of which go further than earlier work to represent the complexities of mental health service delivery in Australia. As an example, many of our unit costs for mental health community consultations are based on weighted averages, recognising that people who present to GPs with mental health problems may have sessions of varying durations. Although we believe these unit costs to be an excellent set of estimates for a wide range of health economic analyses, others may be able to improve on our work. If they make developments that enhance the costs and supporting resources that have been made available through Beyondblue, then they are bound by the conditions of license that they accept when they use the code, to place such improvements in the public domain.

Our unit costs draw heavily on The Manual, which has the advantage of presenting a transparent source of national unit costs. This increases the comparability of studies that ask economic questions about different mental health problems. Equally as importantly, it provides the potential for making economic comparisons between mental disorders and physical health problems.

It should be noted that we have not presented all of the unit costs here for reasons of brevity. Specifically, we calculated other health sector unit costs, such as those for non-mental health related problems (e.g., admissions for physical health problems), and societal costs, such as costs associated with lost time. Depending on the research question, it would be possible to use these costs to explore wider economic implications of particular mental disorders, and to do so from a broader perspective. The additional detail regarding these other health sector unit costs can be found in the project report[18] on the Beyondblue website.

Utility of the Developed Report and Associated Software

We acknowledge that the resource will be of most use to mental health economists and mental health services researchers in Australia. However, we believe that elements of our approach are generalisable to other countries, both in terms of some of the technical and conceptual issues we have dealt with in developing our unit costs, and in terms of the tenets of information-sharing involved in presenting the work. We would encourage other Australian researchers to make use of our unit costs in order to foster comparability across studies. We would also encourage Australian and international researchers to adopt the 'Copyleft' principle in equivalent circumstances.

Questions that May be Informed by the Resource

Our presented example, which used the unit costs as the basis for calculating total and mean annual costs for single and comorbid disorders, showed that as a general rule, conditions that occur comorbidly cost more than conditions which occur on their own. Although the primary purpose of this analysis was to show the way in which our unit costs could be applied to inform key questions in mental health economics, it is worth considering this finding in more detail. It is an intuitive result, and one that has been observed elsewhere in the international literature when the economic costs of specific disorders have been considered.[19-21] However, costing exercises do not always take this into account. Some under-estimate costs because they consider only single diagnoses or the disorder regarded as the principal complaint, which focuses on milder, less complex cases. Others over-estimate costs by double-counting resource use for people with more than one condition. The importance of taking comorbidities into account in economic analyses has been discussed elsewhere,[22] and cannot be emphasised enough in the context of using our unit costs.

Our example is just one of the many questions that can be addressed by using our unit costing data. Some questions can be answered solely with reference to data from the NSMHWB, such as 'Do mental health sector (and other health sector) costs vary according to perceived needs for care and the extent to which these perceived needs are met?' Others require data from the NSMHWB to be combined with supplementary data sources (e.g., systematic reviews of randomised controlled trials assessing the efficacy of different interventions), such as 'What are Australia's ''best bets'' in terms of the most cost-effective interventions for specific disorders?'

Limitations

The process of attaching unit costs to a survey not developed with such an intention in mind, created some difficulties in the development and application of costing units. As a result, a number of assumptions that had to be made in both developing and applying the unit costs to the information collected in the NSMHWB. For example, comorbidity was common which created issues in assigning costs. Respondents who indicated that they had experienced more than one mental health problem were asked to indicate the one that troubled them the most. We considered using this

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'primary' problem to assign costs, but felt this was inappropriate as the most troublesome problem may have been so because it received least intervention. Instead, we favoured the application of weighted averages when conditions occurred comorbidly, but acknowledge that this means that the majority of admissions were assigned a general weighted average costing because comorbidity was very common among those reporting hospital admissions (52.3% had a comorbid condition). Other researchers who favour alternative approaches would be free to use and modify the code, providing they honour the 'Copyleft' obligation to publish their modification.

Potential recall inaccuracies introduced by the self-report format of the NSMHWB must also be recognised. The survey relied on self-reporting of the number of hospital admissions, and the number of consultations with various health professionals over the previous twelve months.

Clearly, conclusions should only be drawn from these results with careful consideration of the limitations inherent in the dataset. With this caveat in mind, we believe that our work provides a unique and valuable opportunity to explore a range of important mental health questions from an economic perspective.

Conclusion

We believe that these unit costs provide an important resource that has the potential to inform debate about funding choices and other key economic questions in Australia. In the past, such debate has largely been based on opinion, rather than evidence. Our unit costs provide the underpinning to strengthen the quality of this debate.

Furthermore, we suggest that the provision of 'Copyleft'-contingent grant funding to support the development of enabling resources for researchers should be considered in the planning of future large-scale collaborative survey work, both in Australia and overseas. Had the NSMHWB data collection and file preparation been followed by calls for tenders to develop publicly-available resources and syntax, then the widest range of potentially useful research outputs from the survey might have been more rapidly and fully realised.

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