

Construction of the Australian Inpatient Export Database (AIED)

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Abstract

Objective: To establish a database of exports by Australian acute health care institutions for the period in which exports were first promoted.

Method: Hospital morbidity data for patients resident overseas (Group A) and Medicare ineligible patients resident in Australia (Group B) were sought for the period 1983–84 to 1995–96 from each state and territory health department. Private hospital permission was obtained for the release of identifiable private hospital data.

Results: Data were coalesced into a relational database covering the period 1987–88 to 1995–96. Coding variations between and within jurisdictions over time necessitated the development of a consistent coding mechanism. Group A and Group B patients gave rise to at least 77 568 separations over the period 1987–88 to 1995–96. Of these separations 58 418 (75.3%) should have generated export income and another 10 158 separations (13.1%) were likely to have generated export income. Definite export separations not for dialysis number 52 573, and these form the AIED.

Conclusion: An Australian database of inpatient exports, the AIED, encompassing public and private hospital data has been established for the period 1987–88 to 1995–96. The problems encountered in the course of this study emphasise the desirability of maintaining an adequately resourced national repository for health statistics.

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What is known about the topic?

To date there is little known about the extent and characteristics of health service exports and the institutions that undertake this activity, in Australia and internationally.

What does this paper add?

This paper describes the establishment of, and provides some initial data from, the Australian Inpatient Export Database (AIED). The AIED encompasses hospital morbidity separation data for overseas patients treated in acute care facilities, private and public hospitals and free-standing day surgeries for the period 1987–88 to 1995–96. The AIED is the only known longitudinal database of inpatient exports in the world.

What are the implications for practitioners?

This paper identifies the strengths and limitations of the AIED for use by health management and policy practitioners. From the database it has been ascertained that over the period 1987–88 to 1995–96 there were a minimum of 52 573 separations that should have generated export income.

BETWEEN 1980 and the early 1990s international trade in commercial services grew from around 15% to 20% of total international trade, a level which it currently maintains.^{1,2} During this period, and in line with the increasing realisation of the role of services exports in trade performance, the export potential of health services began to be acknowledged, explored and promoted in a number of countries including the United Kingdom,^{3,4} Cuba⁴ and Australia. More recently, consideration of the export potential of the health services sector has been enhanced by the introduction of the General Agreement on Trade in Services (GATS).⁵ The GATS, which came into effect in 1995, commits member governments to negotiate on specific issues on trade in services, including health services, and enter into successive rounds of negotiations to progressively liberalise trade.⁶ There are limited quantitative data on the nature

and extent of trade and investments in the health sector, the lack of which is problematic.^{7,8,9}

This article details the establishment of the Australian Inpatient Export Database (AIED), a national longitudinal database of non-dialysis separations for overseas patients treated in acute care facilities, hospitals and free-standing day surgeries in Australia during the period 1987–88 to 1995–96. The time period 1987–88 to 1995–96 was chosen given the availability of comprehensive data across the states and territories and the period's association with the tenure of the Hawke/Keating Labor Ministries (March 1983 to March 1996). It was during Labor's tenure in December 1986 that the export of medical services first became Australian Federal Government policy. This was a major reversal of the government's position; health service exports were previously discouraged through stringent visa requirements. The reversal in the government's position was particularly stimulated by the balance of payments crisis of the mid 1980s. This crisis led to the implementation of a 2-year export drive, primarily focused on those industries with immediate export potential. Two of these industries were education and medical services. The federal government and, subsequently, state and territory governments were to provide active encouragement of the health services sector's export performance through a range of policy tools.¹⁰

Given limited pre-existing information on acute inpatient service exports, the primary aim of the AIED was to establish extensive baseline data from when the export of health services first became government policy. This information in turn provides the basis for examining growth within the industry and the impact, if any, of government policies on health services export performance.

Methods

Data sources

The data required to construct a national database for the time period primarily resides in the unit

record data of the hospital morbidity collections retained by the Health Departments in Australia's eight jurisdictions (New South Wales, Victoria, Queensland, South Australia, Western Australia, Tasmania, the Australian Capital Territory and the Northern Territory). The Health Services Research Group (HSRG) at the University of Newcastle is also a repository for all New South Wales data from 1987–88, and for 1981, 1983 and 1986. The HSRG also holds a limited dataset for Queensland public hospitals and aggregated private hospital data.

Scope

Three states (NSW, WA and Qld) have long-term data collections, extending back to 1979 or earlier, that encompass both public and private hospital data.¹¹ The WA database, the Hospital Morbidity Data System (HMDS), extends back to 1970 and contains 100% of public and private hospital separations.^{12,13} The Queensland database starts in 1968,¹⁴ and contains 100% of public and private hospital separations since 1979.¹² The NSW data are contained within the Inpatient Statistics Collection (ISC). The NSW data are not complete, with rotational sampling employed for some public hospitals until 30 June 1991 and for some private hospitals until 30 June 1993.^{15,16} Further, data are not available at the state level for 1982 or the first half of 1987, and the data for 1985 are considered atypical due to a doctors' dispute concerning public hospital appointments.¹²

The current SA collection, the Integrated South Australian Activity Collection (ISAAC) extends back to July 1985, with private hospital data complete from July 1988. The Victorian collection is contained in the Victorian Inpatient Minimum Database (VIMD) introduced in 1987–88. Initially this collection was limited to public hospitals only. Private hospitals began submitting data in 1992–93, with complete private hospital data available since 1995–96. The Tasmanian collection was established in 1988 and became fully operational in 1991. The current ACT morbidity collection was commenced in 1991–92, although data are available from 1992–93. Private

I Data items identified for inclusion and included in the national database

Identified		
NHDD item	Definition	AIED minimum dataset
P1	Establishment identifier (1)	Yes*
P4	Sex	Yes
P5	Date of birth/age group	Yes
P6	Country of birth	Yes
P11	Preferred language	No
P16	Patient accommodation status	Medicare eligibility status, third party status and chargeable status
P18	Compensable status	Yes
P19	Insurance status	Yes
P23	Problem status	No
P24	Admission date/admission quarter	Length of stay
P26	Discharge date	Length of stay
P27a	Total leave days	Length of stay
P29	Source of referral	No
P30	Location immediately prior	No
P32	Referral to further care	Yes
P33	Legal status on admission	No
P35	Principal diagnosis	Yes
P36	Additional diagnoses (4)	Yes
P37	Principal procedure	Yes
P38	Additional procedures (3)	Yes
P39	External cause	Yes
P40	Place of occurrence	Yes
P41	Diagnosis related group	Yes

AIED = Australian Inpatient Export Database. NHDD = *National health data dictionary*.^{22,23} * The establishment identifier remained confidential in Queensland, although some additional information was provided on general characteristics including sector, region of location, and size.

hospitals are not required to submit data, and free-standing day hospital facilities do not submit any data to this collection. The NT morbidity collection also does not include private hospital

data, and its public hospital data is considered to be complete and reliable from 1991–92.

Coverage

In addition to variations in scope, the coverage of the morbidity collections varies between (and within) states over time. For example, the majority of jurisdictions began to employ the *Clinical modification of the ninth revision of the international classification of diseases* (ICD-9-CM) in 1987–88,¹⁷ but this was as early as 1985 in SA¹⁸ and as late as 1993–94 in Queensland. Other areas of difference include the definition of principal diagnosis,^{15,16} the classification of inpatients (admitted patients), particularly dialysis patients;^{15,17} and the coding of leave days.^{17,18}

Another issue is that a number of individual data items have lower reliability, including:

- clinical data items, particularly for rare diseases and diseases or procedures with new ICD codes;¹⁵
- data relating to sensitive social or legal issues;¹⁵
- admitted patient episodes for NSW in 1993–94;¹⁹ and
- “area of usual residence”.

Due to the incomplete nature of “area of usual residence”, this item was not included in the National Hospital Morbidity (Casemix) Database for 1993–94 and 1994–95.²⁰ However, on the basis of available information, the problems arising with respect to this item appear to be concerned with the comprehensiveness of data at the inter-state level only.²¹ Coding of overseas patients is not an issue.

Timeframe

The preferred timeframe for the construction of the AIED was 1983 to 1996, in line with the tenure of the Labor government that reversed the policy on health service exports. However, as detailed above, half of the current hospital morbidity collections do not extend back before 1987–88. Further, the NSW data are not considered reliable before 1987–88. Given that the collections of the two largest jurisdictions, Victoria and NSW, effectively began in 1987–88, it was decided to commence the database from 1987–88.

Data requested

Data were sought from each state and territory health department, and through the HSRG for the NSW data. The population of interest is overseas residents (herewith referred to as Group A) and overseas-born persons giving an Australian residence but not classified as an Australian resident for the purposes of Medicare (referred to as Group B) attending public and private hospitals. Twenty-three fields, as specified and defined in the Versions 2.0 and 4.0 of the *National health data dictionary*^{22,23} (as listed in Box 1), were identified for inclusion in the AIED. As is most common in health services research, the statistics were requested on the basis of patients separating during the year, rather than being admitted or treated.¹⁵

To obtain release of the data, individual private hospital permission was required to satisfy commercial-in-confidence agreements between the states and private hospitals. Queensland unit record data also required substantial processing before release to satisfy the provisions of the *Health Services Act 1991* (Qld), s 63 and the requirements of the project. Ethics approval, while not required from the University of Newcastle at the time this research commenced, was required to obtain the release of public hospital data from the NT and WA.

Private hospital permission

The process of gaining individual private hospital permission was supported by the Australian Private Hospitals Association (APHA). The APHA prepared and forwarded to their members and non-affiliated private hospitals and day surgery establishments a letter introducing the research project and requesting the organisation to allow the respective state/territory health departments to release their data for the purposes of this research. Four hundred and forty-four establishments (306 hospitals and 138 day surgeries), were approached either individually (154 hospitals, 136 day surgeries) or through a National Hospital Group (ie, operators of two or more hospitals [152 hospitals, 2 day surgeries]). Follow-up was undertaken over a 4-month period,

2 Accommodation status categorisations

Non-chargeable (all except Qld): Patients treated under Medicare and whose care and treatment is supervised by doctors nominated by the hospital and in respect of whom no charges for medical care can be raised against the patient by or on behalf of the doctor. Includes public contract patients in Victoria and Medicare ineligible patients exempted from fees by the Secretary of their respective state health departments (although such information is only available for Victoria from 1991–92).

Compensable (all): Patients entitled to the payment of, or who has been paid compensation for, damages or other benefits (including a payment in settlement of a claim for compensation, damages or other benefits) in respect of the injury, illness or disease for which he or she is receiving care and treatment. This will include persons treated under Workcover, motor vehicle third party insurance, public liability insurance and so forth.

Veterans' Affairs (all): Patients in respect of whom responsibility for care and treatment provided has been accepted by the Department of Veterans' Affairs.

Defence Force (NSW, Vic, WA): Patients in respect of whom responsibility for care and treatment provided has been accepted by the Department of Defence.

Public contract (NSW): A patient of a private hospital or private day procedure centre who is covered by a contractual arrangement with a public hospital for the provision of accommodation, care and/or treatment. For the purposes of this study it will be assumed that persons treated under a public contract within a private hospital will be Medicare eligible, and as such will not constitute exports.

Eligible other (Tas, ACT, NT): An eligible public patient with Defence Force personnel entitlements and common law cases.

Chargeable (all): Encompasses both Medicare eligible patients that elect to be treated as private patients and Medicare ineligible patients. This distinction, however, is not always clear. Given inconsistent coding practices between states and within states over time, for the purposes of this study it is considered preferable to combine the "ineligible" and "private patient" categories into the one "chargeable" category only. It is thought this will allow more robust comparisons to be made. However, it is not fully comprehensive.

Not stated: By definition, these records only pertain to patients resident overseas, ie Group A.

with each organisation approached a maximum of five times before being classified a negative responder.

Identification of export separations

Accommodation status has been employed to determine the export status of separations. To be defined as “exports” it is required that “domestic factors receive income from non-residents in exchange for their services”.²⁴ Thus, patients treated through Australian compensation schemes, for example automobile third party insurance, patients treated under reciprocal health care agreements or under the auspices of the Department of Veterans’ Affairs will not give rise to exports given that payment will not be received from the non-resident *per se* for the services provided. However, assuming that “residents” only encompasses legal and permanent Australian residents, the provision of paid services to non-permanent residents who are Medicare ineligible, for example overseas students, will constitute exports. In these cases it is assumed that payment will be received from the patient *per se*.

Eight categories of patient accommodation status were utilised in determining export status based on the coding mechanisms (Box 2). Of these categories the “chargeable” category will definitely give rise to export separations while the “not stated” category is likely to give rise to export separations.

Results

Private hospital permission

During the process of obtaining private hospital permission it was revealed that 18 of the 444 establishments initially identified did not meet study criteria. These criteria were that the establishment had to be a hospital or day surgery in operation during the study timeframe, and for which data were collected at the jurisdictional level. Subsequent to follow-up, the overall and positive response rates for all private establishments were 91.8% and 72.5% respectively, up from initial rates of 31.9% and 40.9%. The final results were primarily driven by the NSW and Victorian response, particularly with regard to hospitals and day surgeries (see Box 3).

In all jurisdictions except Queensland, but particularly Tasmania and WA, larger hospitals have been the primary responders (see Box 3). The largest response in terms of bed number was achieved by NSW. This result is not unexpected given the high response rate for NSW hospitals. Again in line with the Australian trend, a better response rate was obtained for hospitals than for day surgeries in all jurisdictions except Victoria.

Data received

Over 1 100 000 records were received from the jurisdictions, with varying coverage and in vary-

3 Final positive response rates for each state and territory by institutional type and bed numbers

State/territory	All	Hospitals	Day	Beds
New South Wales	78.1% (118/151)	91.7% (77/84)	61.2% (41/67)	94.3% (6333/6716)
Victoria	73.1% (87/119)	72.2% (70/97)	77.3% (17/22)	77.9% (5199/6676)
Queensland	70.8% (46/65)	74.0% (37/50)	60.0% (9/15)	71.0% (3750/5284)
Western Australia	64.3% (18/28)	68.4% (13/19)	55.6% (5/9)	81.5% (1934/2374)
South Australia	64.6% (31/48)	66.7% (26/39)	55.6% (5/9)	71.6% (1575/2200)
Tasmania	66.7% (8/12)	70.0% (7/10)	50.0% (1/2)	89.3% (749/839)
Northern Territory	Access to the one private hospital was refused at a National Hospital Group level			
Australian Capital Territory	60.0% (3/5)	50.0% (1/2)	66.7%* (2/3)	31.5% (80/254)

* Day surgery data are not maintained within the ACT Morbidity Database, therefore data pertaining to these institutions could not be accessed despite positive responses.

4 Initial and final number of records by state, and numbers excluded during the data cleaning process

Number of records	NSW	VIC	QLD	WA	SA	TAS	ACT	NT	Australia
Initial	36 007	38 630	23 593	9 026	930 137*	479	1 407	66 094	1 105 373
Overseas-born, Australian residents, not ineligible, [†] and availability of a Medicare number is not known					925 258				925 258
Overseas-born, Australian residents, no Medicare number, eligibility unknown								39 589 [‡]	39 589
Eligible, [§] overseas-born, Australian residents, no Medicare number provided		25 163 [¶]						6 035	31 198
Without fields									
Area of usual residence	2 861							18 881	21 742
Establishment identifier						94			94
Date of birth/age group				1	2		2	9	14
Principal diagnosis		26**			6			142	174
Separation date or length of stay		3							3
Data, outside timeframe		2 234	4 428	1 452	779	61	437	342	9 733
Final	33 146	11 204	19 165	7 573	4 092	324	968	1 096	77 568

* Three groups of data were provided. Group 1 — patients born overseas with a local government area (LGA) of “overseas”. Group 2 — all patients born overseas regardless of LGA. Group 3 — patients born in Australia with an LGA of “overseas”. Group 1 (1 499 records) is therefore a subset of Group 2. The figure reported thus only pertains to Groups 2 and 3. † Eligibility was defined as at separation, based on the assumption that there was greater (financial) incentive to ensure these data were correct. Compensable patients were also excluded, except if status on admission was ineligible. This occurred in two instances. ‡ This consists of all 1991–92 records and records for which P16 is blank from 1992–93 on. § Eligibility was defined as at separation. ¶ While excluded on the basis of Medicare eligibility, this figure includes 191 separations for which no principal diagnosis was given, including 59 from 1993–94 and 124 from 1996–97. ** Includes four records for which the principal diagnosis given was “0000”. NSW = New South Wales. VIC = Victoria. QLD = Queensland. WA = Western Australia. SA = South Australia. TAS = Tasmania. ACT = Australian Capital Territory. NT = Northern Territory.

ing formats (see Box 4). Group A and B data were provided by all jurisdictions except Tasmania, which provided Group A data only, with additional records being provided by Victoria, the NT and SA. Data were supplied as a single dataset by Queensland, Tasmania and the NT. NSW and Victoria provided data by year. WA and the ACT supplied data according to year and groups. SA provided data by public and private sector, for the periods 1987–88 to 1990–91 and 1991–92 to 1996–97, for three groupings.

- Not all data items were available or supplied by each state, and the coding mechanisms employed often varied between and within states over time. Only three jurisdictions,

Tasmania, the ACT and the NT, consistently provided data according to the *National health data dictionary*. Major differences in coding practices were observed with respect to “country of birth” (with Queensland and NSW each employing their own coding mechanism), “age group”, “length of stay”, and “diagnosis”, “procedural”, “external cause” and “place of occurrence” codes, in regard to both morphology and utilisation of the ICD-9-CM. In general, however, most jurisdictions recorded and provided equivalent core information.

The construction of a national database necessitated:

5 Accommodation status by Medicare eligibility status for all records within the cleaned database

	Medicare eligibility status			Total
	Eligible	Ineligible	Unknown	
Non-chargeable	6 358	76*	0	6 434
Group A	6 358	14	0	6 372
Group B	0	62	0	62
Compensable	317	183	1 919	2 419
Group A	317	28	1 919	2 264
Group B	0	155	0	155
Veterans' Affairs	2	2	8	12
Group A	2	0	8	10
Group B	0	2	0	2
Defence Force	0	3	49	52
Group A	0	0	49	49
Group B	0	3	0	3
Public contract	0	0	68	68
Group A	0	0	68	68
Group B	0	0	0	0
Eligible other [†]	7	0	0	7
Group A	7	0	0	7
Group B	0	0	0	0
Chargeable [‡]	2 502	45 235	10 681	58 418
Group A	2 502	9 246	10 681	22 429
Group B	0	35 989	0	35 989
Not stated	0	0	10 158	10 158
Group A	0	0	10 158	10 158
Group B	0	0	0	0
Total	9 186	45 499	22 883	77 568
Group A	9 186	9 288	22 883	41 357
Group B	0	36 211	0	36 211

* Ineligible non-chargeable patients represent ineligible non-Australian residents specifically referred to Australia for hospital services not available in the patient's own country and for whom the relevant signatory has determined that no fee be charged. This information was only available for Victoria from 1991–92. † Includes patients with entitlements under common law or through the Defence Force. ‡ Includes private patients.

- the specification of a set of fields for use across all jurisdictions (see Box 1), for which there was a common and consistent coding mechanism.

Coding of core items was based on the *National health data dictionary Version 6*,²⁵ where possible, with information at separation preferred to that at admission. This preference was based on the assumption that there was greater incentive to ensure the correctness of information, particularly for financial items, at separation;

- the generation of a single longitudinal dataset for each jurisdiction encompassing Group A and B records only (ie, excluding the additional records provided by SA, Victoria and the NT);
- the exclusion of records for which there were missing or inconsistent values in key fields, defined as:
 - Area of usual residence (or other field indicating whether the patient is resident in Australia or overseas);
 - Establishment identifier;
 - Date of birth/age group and date of admission (where available);
 - Principal diagnosis;
 - Country of birth; and
 - Separation date and admission date, or length of stay (LOS); and
 - the establishment of an Access© relational database to access the finer detail of the original source data.

Cleaning of the database led to the exclusion of 1 027 805 records (Box 4).

Export separations

Of the 77 568 patient separation records included within the cleaned database, 58 418 (75.3%) are “chargeable”, and therefore represent definite exports (Box 5). The great majority of these records (45 235; 77.4%) are for persons who were Medicare ineligible, with a further 10 681 records (18.3%) for persons of unknown Medicare eligibility status. In turn, the great majority of Medicare ineligible separations 35 989 (79.6%) are Group B separations, that is, separations for which the patient is classified as overseas-born but resident in Australia and who is Medicare ineligible, for example tourists on a working holiday and overseas students.

The next most frequent category is for separations of unknown accommodation status and

6 Breakdown of exclusions by jurisdiction: non-export, export and dialysis separations

	NSW	VIC	QLD	WA	SA	TAS	ACT	NT	Total
Cleaned data	33 146	11 204	19 165	7 573	4 092	324	968	1 096	77 568
Non-export separations	3 932	1 079	157	2 542	632	175	67	408	8 992
Dialysis separations	3 126	1 668	754	ns	ns	ns	ns	ns	6 225
Accommodation status not stated	164	505	9 062	ns	ns	ns	ns	ns	9 778
AIED	25 924	7 952	9 192	4 592	3 281	146	841	645	52 573

ns = not specified to ensure confidentiality. NSW = New South Wales. VIC = Victoria. QLD = Queensland. WA = Western Australia. SA = South Australia. TAS = Tasmania. ACT = Australian Capital Territory. NT = Northern Territory.

Medicare eligibility, of which there are 10 158 records (13.1% of total). These records pertain to patients resident overseas, that is, Group A. Queensland is the primary source, giving rise to 9336 (92%) of these records. Although coding for Medicare eligibility commenced in Queensland in 1993–94, this information was not provided for Group A patients. Attempts to derive Medicare status on the basis of whether the patient was treated in a private hospital or treated as a “hospital” patient within the public sector were not successful. However it is likely that these separations generated export income.

There are an additional 52 separations recorded for Defence personnel, of which the vast majority, 45, are for WA. As there is a separate code for foreign defence personnel within the Hospital Morbidity Data System in WA, this result was queried. It was noted that miscoding seemed likely in a number of cases, given that most had the same country of birth and country of residence. However, it is possible that these separations were for persons in Australia on defence exchange with the Australian military. It is unlikely that these separations would have provided export income.

The remaining 8940 separations within the cleaned database definitely do not constitute exports, and include 76 separations for which the patients are Medicare ineligible, but are “non-chargeable”. Each of the “non-chargeable”, Medicare ineligible separations occurred in Victoria, which was the only jurisdiction in which this information was recorded. In each instance the patient was specifically referred to Australia for

hospital services not available in the patient’s own country, and the Secretary of the Victorian Department of Human Services determined that no fee be charged.

Of the 9186 separations within the cleaned database for which the person was Medicare eligible (Group A only, by definition), 47.0% could be attributed to persons born in countries with which Australia had a reciprocal health care agreement. This compares with 6.1% of “ineligible” separations and 26.9% of separations for which Medicare eligibility was unknown, a significant difference ($\chi^2 = 11\,220.82$; $df = 2$; $P < 0.0001$).

Refining the AIED

Of the 58 418 “chargeable” separations, 5 845 are dialysis related, while 380 separations of the 10 158 for which accommodation status is unknown are also dialysis related. Coding of dialysis separations has been inconsistent among the jurisdictions over time and makes interstate and longitudinal comparisons problematic. Dialysis separations have therefore been excluded from the AIED. Because of the uncertainty surrounding the records for which “accommodation status” was not stated or could not be ascertained, the remaining 9778 records within this category were also excluded from the AIED, although they could represent exports. Thus the AIED comprises 52 573 separation records that represent definite non-dialysis-related export separations. For a breakdown of exclusions by jurisdiction subject to confidentiality provisions, see Box 6.

The number of separations identified as definite export separations (52 573) does not represent the number of individual patients, which would appear to be around 50 000. There were 1208 separations identified where a patient was transferred from another inpatient facility; 805 separations giving rise to a statistical admission due to a type change and 84 separations giving rise to a statistical admission as the patient came back from leave. There were also another 4344 separations where the source of referral was unknown.

Discussion

The AIED database covers the period 1987–88 to 1995–96, its comprehensiveness largely dependent on the breadth of the state and territory databases from which it is derived. This is the only known longitudinal database of inpatient exports in Australia or elsewhere. From the database it has been ascertained that over the period 1987–88 to 1995–96 there were a minimum of 52 573 separations that should have generated “export” income, and that this figure is a likely underestimate as detailed below.

Firstly, dialysis separations are not included in the AIED given inconsistent coding between the jurisdictions. Secondly, there were another 9778 non-dialysis separations within the overseas patient database for which accommodation status was not stated or could not be ascertained that could represent exports. Thirdly, complete private hospital data for the states only became available from 1995–96, although all states and the ACT began submitting some private hospital data from 1992–93. The majority of states have only collected, at least some, private hospital data since 1991. Fourthly, 92% of Tasmanian records are reported as having been coded in 1989–90,¹⁵ and it has been reported that 3.3% of 1991–92 records were not coded.¹⁶ It has also been reported that the data available for the NT public sector represent about 60% of the total for 1991–92.²⁶ Further, of five hospitals contributing to the NT's 1992–93 dataset, the records from two were incomplete (10 months in one case and 7 months

in the other).²⁶ The number of NSW export separations may also be underestimated. Within the current database, 16 of 136 NSW hospitals that gave rise to at least one separation were subject to rotational sampling for at least one year, with 275 of the 25 924 NSW separations (1.06%) included in the AIED as the result of sampling. Finally, not all jurisdictions provided Group B data, and a complete dataset only became available, subject to the above limitations, from 1993–94.

While the AIED provides the most comprehensive statistics available, there are omissions, particularly regarding Group B and private hospital data. Because the omissions are concentrated in earlier years, this will bias the results towards improved growth rates, which must be taken into consideration in any analysis. Further, given variations in scope and coverage between the morbidity collections, limitations arise in undertaking analyses at a national level and caution must be exercised. This is particularly the case for longitudinal comparisons in the light of changes in data coverage over time. However, as noted in the inaugural Hospital Utilisation and Costs Study (HUCS), such shortcomings are an argument for improving the quality of the data, not an argument for refusing to perform the analyses.¹⁸ That study considered that by and large the information presented was sufficiently accurate and consistent for the analyses of broad trends and differentials.¹⁸ This position was reiterated in subsequent HUCS.^{17,27,28}

The process of constructing the AIED has generated policy-relevant information. For example, of the 11 204 Victorian separations within the cleaned overseas-patient database, 10 191 (91.0%) are shown as having a Medicare number recorded. Of these, 2444 are Group A separations, of which only 37.5% are for persons who are also coded as being Medicare eligible. By definition, no Group B separation is for a person who is Medicare eligible. Thus the great majority of Group B patients and a substantial proportion of Group A patients within Victoria presented with a Medicare card, even if they were not subsequently treated as a Medicare patient (as for

all Group B patients). If this result is not a coding artifact, the fact that people are erroneously seeking treatment under Medicare is arguably reflecting the importance of the benefits afforded by Medicare. This is a finding worthy of further investigation. For example, is this finding the impact of changes in Medicare eligibility status over time? Medicare eligibility was initially liberally defined and included all long-term visitors — those entitled to remain in Australia for more than 6 months. However, from August 1986 Medicare eligibility has undergone a series of restrictions. In turn, if people value the benefits afforded by Medicare, is there a “black market” for Medicare cards that requires that cards be reissued regularly, or that additional identification be provided to prevent abuse of the system?

Constructing a dataset such as the AIED is time consuming and requires considerable tenacity. The multitude of data sources, with often differing confidentiality requirements, means that data are not always easy to access. Restricted resources at state departmental level compound the inherent difficulties. The time involved in the process can also lead to administrative problems, including those associated with the turnover of the personnel identified as data sources within organisations.

This study has also highlighted conceptual problems associated with ensuring comparable data collection in the various states and territories. However, there has been considerable progress in this regard over recent years. Similarly, ethical issues associated with the release of data for research have been brought to the fore, as has the desirability of developing nationally accepted protocols. The problems encountered in the course of this study emphasise the desirability of maintaining an adequately resourced national data repository for health statistics. A national dataset does however have its limitations, particularly if only a restricted number of items are recorded, thereby limiting the analyses that can be undertaken.

Despite the difficulties involved and the limitations of the AIED, the potential which it offers for the analysis of health trends and policy impacts

justifies the effort. The AIED, now constructed, will support a comprehensive research program on Australia's health service export performance, and inform future policy development on the provision and funding of health services to non-Australian residents.

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Competing interests

The authors declare that they have no competing interests.

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