Designing a nationally acceptable system of hospital peer grouping

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Abstract

Little has been published on the design, use and evaluation of peer groupings of hospitals. This article explores the issue in the context of public hospitals in New South Wales. The process, established over the last two years by New South Wales Health, aims to meet six principles of peer grouping. Through a six-step procedure, the methodology focuses on the classification of hospitals by role, size and measure of acuity. Further research is needed to compare benchmarking across States and to identify which of the methodologies should be adopted nationally.

Background

Peer grouping is a process by which a cohort of facilities is divided into mutually exclusive and exhaustive subsets. It is performed in a logical manner that is chosen to meet a set of clearly defined principles. Hindle (1999), taking a more statistical definition, says that '…peer grouping means arranging observations according to some view about similarity'. The process of peer grouping is similar to that of stratification (used in sampling): just as strata should be formed on the basis of factors related to the characteristic under study, peer groups '…should be created in such a way that a significant degree of variation is explained by the attributes defining the groups' (Hindle 1999).

Peer groups are used as the basis for activity and cost comparisons presented in the *New South Wales Public Hospitals Comparison Data Book*. They are also used for cost benchmarking, service planning and selection of hospitals to participate in the New South Wales Hospital Cost Data Collection. Bridges and Hanson (1999) have also outlined a methodology for using peer groups to measure the financial risks faced by hospitals.

Benchmarking is a process in which groups of peer hospitals can be compared in terms of structure, output and/or costs. New South Wales Health has recently used cost benchmarking as a means of promoting efficient service delivery in the State's public hospitals – that is, hospitals are expected to achieve costs not exceeding the average for the peer group. Therefore it is important that hospitals within a particular peer group have similar cost structures. New South Wales Health has also incorporated a modified version of the Bridges and Hanson (1999) methodology into recent publications (New South Wales Department of Health 2000).

We believe there are six principles relevant to the formation of peer groups of hospitals:

- hospitals should be categorised using evidence on hospital activity such that each peer group has a sufficient number of hospitals in each group
- groupings should be based on relatively strong evidence
- the groupings should exhibit reliability and robustness
- hospitals in each peer group should also have relative casemix homogeneity
- they should exhibit relative resource homogeneity, and
- the hospitals should have similar organisational structures.

Development of the peer grouping methodology

The classification of hospitals into peer groups for 1997–98 has been derived using the methodology in the *New South Wales Public Hospitals Comparison Data Book 1996–97*. This classification methodology was established by the Peer Hospitals Group Working Party, which included representatives from Area Health Services.

The methodology for determining the peer groups is relatively simple and relies upon either:

- the specific roles of the facilities
- size
- casemix, and/or
- measure of acuity.

Aisbett (1998) has developed a clustering algorithm that uses iterated correlation binary-clustering to develop peer groups. He compared his results with the 1996–97 New South Wales peer groups and concluded that his clusters '…have a high level of

agreement with the input-defined peer groups devised by the New South Wales Health Department' (Aisbett 1988, p 84).

New South Wales Health conducts an annual benchmarking review based on the peer groups. Thus it was necessary to review the 1996–97 methodology before its application in the 1997–98 process. Rather than see further radical changes to the peer groups, this review aims to refine and better-explain existing methods. Some minor adjustments have been made to the methodology including extended adjustments to the data, clearer classification of the ungrouped acute (E) peer group (now referred to as A3) and internal reviews of the results to confirm that all facilities have been appropriately grouped.

The methodology adopted for 1997–98 comprises the six main steps depicted in Figure 1. Each step is summarised below.

Step 1: Adjustments to data

All New South Wales public hospitals with patients admitted during the 1997–98 financial year were included in the peer grouping database. The analysis for peer grouping is based on data provided by these hospitals to New South Wales Health through the Inpatient Statistics Collection.

Adjustments (carve-outs) were made to the data before the peer grouping analysis began. Unqualified babies, same-day chemotherapy and dialysis separations and error Diagnosis Related Groups (DRGs) were removed.

Step 2: Group facilities with a specialist function

Where available, definitions for the above roles were taken from the *National Health Data Dictionary Version 7.0* (Australian Institute of Health and Welfare 1998). The definitions, and the hospitals that are described by these, are listed below.

- *Psychiatric hospitals (peer group F1)*

  Establishments devoted primarily to the treatment and care of inpatients with psychiatric, mental or behavioural disorders. Private hospitals formally approved by the Commonwealth Department of Health under the *Health Insurance Act 1973* (now licensed/approved by each State health authority), catering primarily for patients with psychiatric or behavioural disorders, are included in this category (Australian Institute of Health and Welfare 1998, p 151).

- *Nursing homes (peer group F2)*

  Establishments which provide long-term care that involves regular, basic nursing care to chronically ill, frail, disabled or convalescent people or senile inpatients. They must be approved by the Commonwealth Department of Health and Family Services and/or licensed by the State, or controlled by government departments (Australian Institute of Health and Welfare 1998, p 152).

- *Multipurpose services (peer groups F3 and F4)*

  Multipurpose services provide a range of services that are negotiated with the community, service providers and relevant departments. There are currently four facilities operating as multipurpose services, whilst a number of other facilities have been scheduled to be commissioned as such in the near future. Thus, two multipurpose service groups were created: current and future. Whilst there is no change between the classification of future and current multipurpose services presented this year and last year, the categories have been confirmed in a New South Wales Health Circular (No 98/45) titled *Guideline for New South Wales Multipurpose Services,* dated 15 June 1998.

- *Hospices (peer group F5)*

  Establishments with the specific function of providing palliative care to terminally ill patients (Australian Institute of Health and Welfare 1998, p 152).

- *Rehabilitation hospitals (peer group F6*)

  Establishments with a primary role in providing services to people with an impairment, disability or handicap where the primary goal is improvement in functional status.

- *Mothercraft hospitals (Peer group F7)*

  Establishments where the primary role is to help mothers acquire mothercraft skills in an inpatient setting.

- *Specialist paediatric hospitals (peer group A2)*

  Establishments where the primary role is to provide specialist acute care services for children.

- *Major non-metropolitan hospitals (peer group B2)*

  Establishments located in rural areas providing acute specialist and referral services for the catchment population of a large geographical area.

- *Ungrouped non-acute facilities (peer group F8)*

  Establishments whose primary role is the provision of non-acute services, but for which there are insufficient peers to form additional peer groups. Limited comparisons can be made within this peer group and with other non-acute facilities.

- *Ungrouped acute facilities (peer group A3)*

  Establishments whose primary role is the provision of acute services of a specialised nature for which there are insufficient peers to form additional peer groups. Limited comparisons can be made with other hospitals in either A1 or A2.

Step 3: Classify peer groups A1, B1 and C1 by casemix-weighted separations

Using size as an initial split allows hospitals of similar capacity to be grouped together. The resulting group can then be examined to isolate indicators that may lead to more homogenous sub-groups. If size is not used as an initial split, the indicators may reflect the instability of the underlying data rather than the true scenario. For example, the average acute casemix weights of some small community hospitals are equivalent to those expected of teaching hospitals. It is unlikely that this is due to the complexity of cases that are treated at these hospitals. It is more likely a consequence of the small number of cases that are used to construct the indicator.

Acute casemix-weighted separations measure the size of a hospital by relating the number of separations to the workload (resources) associated with the care of those patients. Three peer groups result when hospitals are grouped in this way:

- A1 peer group: 25 000 or more acute casemix-weighted separations
- B1 peer group: more than 10 000 but less than 25 000 acute casemix-weighted separations
- C1 peer group: more than 5000 but less than 10 000 acute casemix-weighted separations.

Step 4: Classify peer group C2 by casemix-weighted separations and separations

The methodology chosen by the Working Group in the previous year uses acute-weighted and unweighted separations of hospitals to allocate to the District Group 2 (peer group C2) facilities. Hospitals are considered part of the C2 peer group if their total acute casemix-weighted separations are less than 5000 but greater than or equal to 2000, or if their total acute (unweighted) separations are greater than 2000.

Step 5: Allocate peer groups D1 and D2 to hospitals by acuity

For the remaining ungrouped hospitals (those with less than 2000 acute-weighted separations or 2000 acute separations) peer grouping is determined by level of acuity. The methodology chosen by the Working Group last year uses non-acute and outlier bed days as a percentage of total bed days. Last year 40% was considered as naturally dividing the data. Hospitals with less than 40% of the total bed days being non-acute and outlier were classified as being in the community acute (D1) peer group. Those facilities for which the percentage exceeded 40% were classified in the community non-acute (D2) peer group.

Step 6: Verification of classification (hospitals close to boundaries and changes)

This step has been introduced into the methodology this year to examine any changes in classification and peer groups that are close to a boundary of definition. The review of the 1997–98 peer grouping was completed in the first instance by staff within the New South Wales Department of Health. In this review a number of Area Health

Services were contacted to see if there had been any planned change in role for the hospitals where changes in activity were evident. Once the internal draft of the reclassification was completed, a draft document was circulated to the Area Health Services for formal comment.

Results of the 1997–98 peer grouping analyses are summarised in Table 1. Note that total acute separations exclude:

- error DRGs
- same-day dialysis and chemotherapy DRGs
- rehabilitation DRG separations
- unqualified babies, and
- separations in designated psychiatric units.

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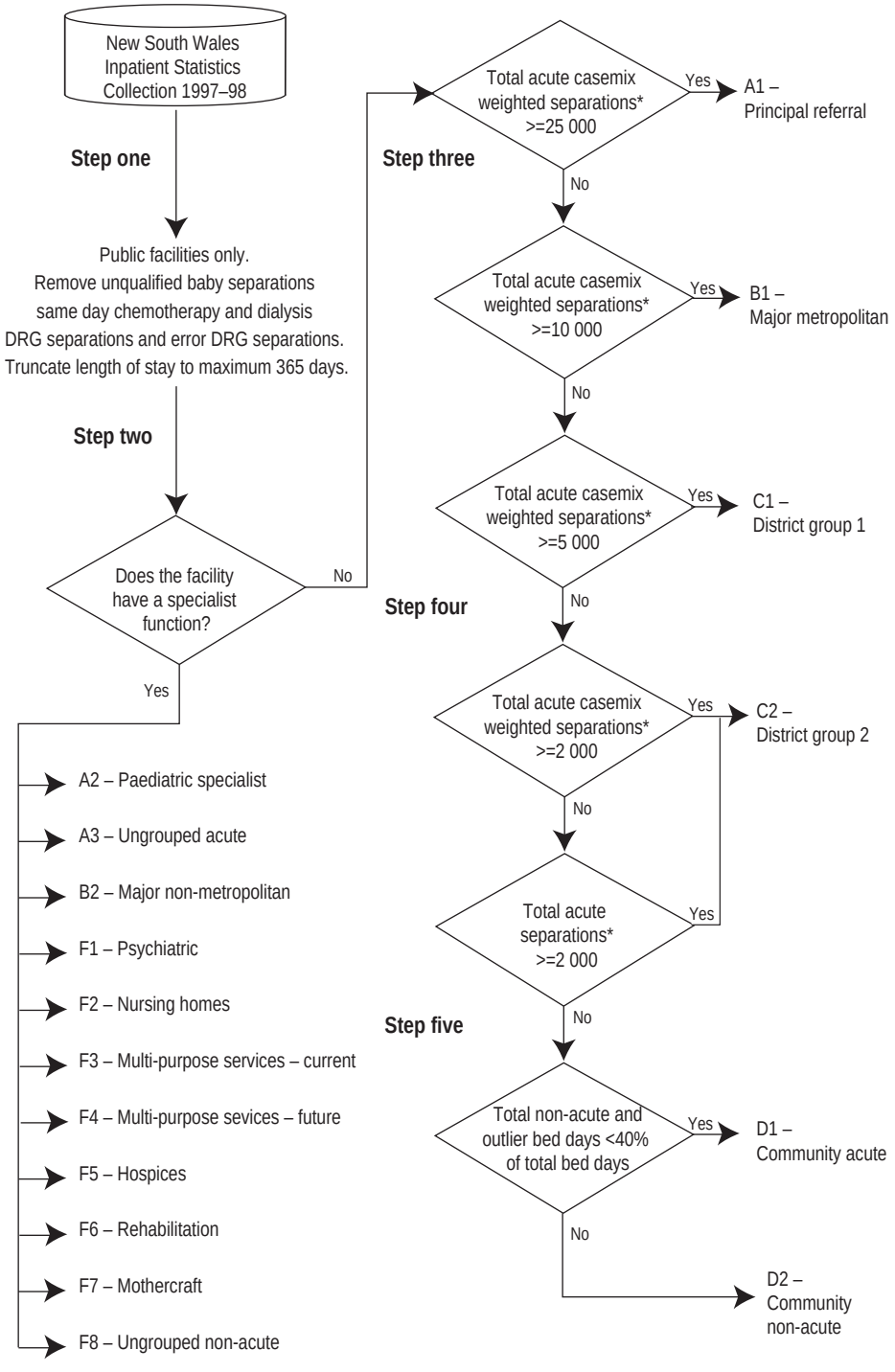
- unqualified babies.

Table 1: Summary of 1997–98 peer grouping analyses

Peer 1997–98	Number of facilities	Total acute separations	Total separations	% total acute separations	% total separations
A1 – Principal referral	12	398 958	431 904	38.3	38.4
A2 – Paediatric specialist	2	37 920	37 926	3.6	3.4
A3 – Ungrouped acute	4	35 734	36 482	3.4	3.2
B1 – Major metropolitan	13	197 571	205 958	18.9	18.3
B2 – Major non-metropolitan	8	96 740	100 492	9.3	8.9
C1 – District group 1	13	98 010	103 142	9.4	9.2
C2 – District group 2	28	94 576	96 678	9.1	8.6
D1 – Community acute	34	44 306	45 266	4.2	4.0
D2 – Community non-acute	54	20 792	23 094	2.0	2.1
F1 – Psychiatric	9	1 868	11 483	0.2	1.0
F2 – Nursing homes	15	140	2 118	0.0	0.2
F3 – Multipurpose services – current	4	563	645	0.1	0.1
F4 – Multipurpose services – future	11	4 053	4 314	0.4	0.4
F5 – Hospices	4	4	4 532	0.0	0.4
F6 – Rehabilitation	3	1	1 794	0.0	0.2
F7 – Mothercraft	3	5 754	5 766	0.6	0.5
F8 – Ungrouped non-acute	19	6 015	13 350	0.6	1.2
Total	236	1 043 005	1 124 944	100.0	100.0



* Count of acute separations occuring in designated psychiatric units and rehabilitation DRG separations coded as acute. Weighting based on policy specified in the Casemix Standards for New South Wales 1998–99, except adjustment for long-stay outliers and private episodes.

Figure 1: The peer grouping methodology (excluding step six)

Conclusions

The process of peer grouping and benchmarking in the hospital setting has previously lacked a rigorous method of determination. All State and Territory health authorities have tailored the peer grouping method to meet the problem at hand. However, this lack of consistency across time and setting does not lead to an optimal outcome. If peer hospitals are going to be involved in the necessary sharing of data and practices – which would lead to efficiency gains – then they must be assigned a stable set of peers.

South Australia, Queensland and Victoria have often used peer grouping in conjunction with their various funding models. However, these models have often been based on rurality or role-delineation (South Australian Health Commission 1994; Queensland Health 1998; Commonwealth Department of Health and Family Services 1997). If a national methodology is to be established then it has to be applicable to most settings and research questions.

The New South Wales peer grouping process can be considered as an axiomatic clustering and can thus be applied to a vast number of settings; however, further research needs to be done regarding some steps (especially step 5). The primary benefit of this methodology, especially over statistical clustering, is that it is easily applied to other States. Thus, it would serve as an ideal national peer grouping methodology.

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