Developing metrics for hospital medical workforce allocation

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Abstract

Public hospitals deliver a broad range of specialist treatments to patients, with public demand for hospital services almost always outstripping supply. Health department and hospital managers prioritise requests for additional resources, such as medical staffing, across the full spectrum of services delivered. Without a clear and equitable basis of workload comparison across medical specialties, this decision-making process can be controversial and internally divisive.

This paper outlines the development of a metric to guide the allocation of hospital medical staff. It suggests that a valid comparison of workload can be gained from the consideration of the number of inpatients (weighted for case complexity) and the number of outpatient presentations, as seen by each full-time hospital medical practitioner per annum. While this supports a "common sense" understanding of hospital medical activity, it also reflects limitations in the quality and quantity of data available. The replication and testing of this methodology in other jurisdictions is encouraged.

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What is known about the topic?

While some professional medical colleges have developed benchmarks to support "safe staffing" levels for their members, there has been no "universal" metric providing an equitable basis for comparing medical workload across different specialties.

What does this paper add?

This study brings together the collective knowledge of practitioners, managers and analysts to the problem of linking medical staffing to hospital activity. It provides statistical evidence of the importance of some, but not all, clinical activity data. It strengthens the arguments for the collection of teaching, research and quality assurance activity data.

What are the implications?

The ability to make and defend decisions about medical staffing numbers is enhanced by the ability to compare across clinical boundaries. Other jurisdictions can use this methodology to develop a metric based on local data. The information provided by these metrics supplements (but does not replace) practitioner advice to decision makers.

MANAGERIAL DECISION MAKING on hospital medical staffing is undertaken within a framework of political, clinical, technological and budgetary advice. In Australia, this framework has been developed in a series of key documents developed at a national level. (Australian Health Ministers have approved a National Health Workforce Strategic Framework and National Health Workforce Action Plan as well as overseeing numerous reports developed over the last decade through the National Health Workforce Committees. These are available at http://www.health.nsw.gov.au/amwac/reports.html) Within each state and territory, however, the local policy context has as much, if not more, influence over the allocation of resources.

The local context in Tasmania, for example, is that of a small hospital system managing within limited resources. As the smallest state in Australia, with less than half a million people, Tasmania has a public hospital network consisting of

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just three hospitals: the Royal Hobart Hospital, the Launceston General Hospital, and the North West Regional Hospital. (This does not count the 14 multi-purpose centres/rural hospitals/community health centres which may house a small number [from 3 to 23] of acute care beds in an integrated service environment.) There are just under 650 medical practitioners (senior and junior) practising in the public hospital system across the state.*

Tasmania faced a number of significant financial challenges in the 1980s, which came to a head at the turn of the decade.[1] During the 1990s this resulted in a series of public sector budget cuts and, in 1997, a health department restructure which resulted in a further loss of 10% of all positions.[2] Within the Tasmanian health and human services sector, there is a widespread perception among staff that services had been "run down" over a number of years, when the policy focus was primarily on cost containment.

More recently, however, the Labor Government has overseen the recovery of the Tasmanian economy. The flow on to the health sector has been palpable. The primary document guiding hospital policy in Tasmania was developed through public consultations in 2003–04 as part of a new commitment to sustainable services.[3] The Richardson Report emphasised the need to ensure safe staffing levels, and the delivery of a quality service, maintaining a critical mass of medical specialists in each site.[4]

Implementation of Richardson Report recommendations has been ongoing. In the 2005–06 Tasmanian Budget health and human services spending increased by 20%, to a record $1.2 billion.[5] Over the past 2 years, hospital funding, in particular, has increased with the announcement and implementation of capital, equipment and staff increases. This influx of funds into the system has provided a welcome opportunity to rebuild the health and human services sector.

The substitution of medical practitioner care with services provided by a multidisciplinary care team has been trialled in Tasmania, with mixed results.[6] More recently, the local policy context has focused on the distribution of an absolute increase in medical staffing numbers, rather than reform of the practice and productivity of medical specialists.

Limitations of existing methods

The Australian Medical Workforce Advisory Committee (AMWAC) specialist population ratios (SPR) is the methodology accepted at a national level as providing "prima facie evidence" of workforce shortages whenever a jurisdiction lies below the national average.[7] The AMWAC SPRs have limited utility in the allocation of public hospital medical positions due to the following characteristics:

- Some specialties have no SPRs calculated.
- Some of the AMWAC reports upon which the medical SPRs are based are up to 20 years old. These SPRs may no longer be accurate.
- Where there is a national shortage of medical specialists, a benchmark based on average numbers will simply reflect this shortage.
- The SPR is a head count only and does not take into consideration the full-time equivalent (FTE) activity of that medical specialist, counting specialists practising as little as one session a month.
- The SPR includes both public and private sectors in its consideration. In order for the SPR to be meaningful as a guide to public hospital staffing allocation, the proportion of specialists working in the public sector must match the proportion of patients seeking public treatment.
- Using the average national SPRs as a benchmark for Tasmania assumes that the epidemiology of the Tasmanian population is the same as the Australian average — that is, that the demand

* Every jurisdiction has a different nomenclature for the various grades of medical staff. In this paper, "senior medical staff" or "medical specialists" are medical practitioners with qualifications awarded by the relevant specialist professional college. They may be visiting specialists or staff specialists. The term "junior medical staff" includes both specialists-in-training (medical practitioners accepted by a specialist medical college into a training position supervised by a member of the college) or hospital non-specialists (this group includes resident medical officers and interns, as well as career and other salaried hospital practitioners).

1 Result of the clinical consultations: the "capability framework"

Level of inputs	Level of outputs
Medical workforce	Clinical services
Current number and mix of medical staff	Direct clinical service (inpatient contact)
Benchmarks and reviews	Clinical services (outpatients)
Leave management	Statewide service provision
Other human resources	Teaching
Nurses, allied health professionals	Undergraduate
Patient administration, other staff	Postgraduate/junior medical staff
Departmental administration (business manager, etc.)	Research/professional development
Teaching and research administration	Published papers
Accommodation	Research projects
Individual workspaces	Continuing medical education, conference attendance
Departmental meeting/gathering places	Quality assurance/clinical audit
Bed numbers, theatres, special units (eg, intensive care) and clinic space	Peer review activities
Equipment	Multidisciplinary patient conference meetings
Administrative needs (eg, computers)	Clinical audit, quality assurance activities
Clinical needs (eg, microscopes, telemetry)	Clinical indicators
Organisational/work practices	Governance/administration
University support for teaching and research	Interaction between Clinicians, Departmental Heads, Managers
Patient flow/clinical mix	Linkages across the state and nationally
Departmental structures	Policies, procedures and processes that support timely, efficient and effective administrative support for clinical practice (eg, hospital committee structure)

for services is the same and does not require more medical specialists in particular specialties.

In spite of these limitations, the AMWAC SPRs continue to be important as the medical specialist population as a whole represents the total pool from which public hospitals can draw their senior medical staff. At the same time, workforce allocation that meets the needs of public hospitals is clearly required.

Developing a framework: the first round of clinical consultations

The first step in developing a metric to guide the distribution of new hospital medical staff into the system was to gain a better picture of day-to-day activity. What kind of work was undertaken? What kind of resources were required for that work? In order to accomplish this, a series of 72 face-to-face interviews were held with public hospital heads of clinical departments across the state.

The interviews quickly identified broad agreement on what "inputs" supported medical staff in their work, and what "outputs", or range of activities, were undertaken by medical staff. From this analysis, a "capability framework" was developed, illustrated in Box 1.

A key point made across departments was that hospitals are complex systems made up of interlinking elements. An increase in the number of medical staff, for example, would require additional nursing, allied health and administrative support staff, as part of a functioning health care team. Additional staff require additional accommodation, equipment and organisational support. These inputs are interrelated and all elements must be considered during planning and funding exercises.

The key point in relation to identified outputs was the need for allocated time for each of the activities, time that could only be available where there were adequate staffing levels. Without adequate staffing, less urgent activities would be neglected. The capability framework applied to all the hospital specialties — across the clinical divisions of medicine, surgery, and women's and children's services — as well as across all three hospitals. Further, it was accepted as a reasonable proposition that linking hospital medical staffing numbers to a quantified level of activity would provide a basis for comparison across specialties and across hospitals. The ability to link staffing to activity, across specialties and across sites, meant that it was possible to develop an objective method to allocate new positions to the areas of greatest need.

Operationalising the framework: quantifying medical staffing

Having developed the capability framework, based on medical staff insights into the delivery of public hospital services, the second stage of the project involved developing measurable indicators for elements within that framework. Information on the current quantum of medical staff in each hospital clinical department (eg, general medicine, orthopaedics, paediatrics etc.) was available through the human resources information system. Data on the number of individuals (heads) and the FTE number of medical staff was gathered. Clinical heads of departments validated these data. Information on the medical "establishment" figures (current staff plus current vacancies) was validated by hospital administration.

Medical staffing in each hospital department was compared with what could be expected by the AMWAC SPRs. (All AMWAC reports are available at: http://amwac.health.nsw.gov.au/amwac/amwac/reports.html.) Because Tasmania has three distinct regions, with each region feeding into one of the three major public hospitals, the SPRs for each specialty were calculated at both statewide and regional levels.

Indirect indicators, such as leave balances and on-call rosters, were also examined to capture staffing supply or scarcity. Outstanding hours of recreation and long service leave were calculated, and hospital departments with leave balances in excess of the Department of Health and Human services manageable leave policy were noted.[8] After-hours on-call rosters of greater frequency than 1 : 3 were considered to be generally suboptimal to a sustainable work-life balance and were also noted.

Operationalising the framework: quantifying medical activity

Following the advice provided by the clinical consultations and an assessment of the robustness of the data, a wide range of quantitative indicators were considered in relation to the outputs identified in the capability framework. The delivery of clinical services was described by patient data extracted from the Tasmanian Hospitals Mortality and Morbidity Database. The casemix classification system allows for comparison of costs and activity across hospitals. Data elements extracted included inpatient numbers, inpatient bed-days, average length of stay, weighted inpatient separations, the average patient clinical complexity level (PCCL), and the number of outpatient clinic presentations.†

Patients were allocated to the hospital clinical department from which they were discharged (ie, the last department that treated them). The primary condition for which the patient was treated was identified through the diagnosis related groups (DRGs) and International Classification of Diseases (ICD) diagnosis codes, with these data

† All terms defined in the National Health Data Dictionary and contained within the National Hospital Morbidity Database. Definitions available on the Australian Institute of Health and Welfare website: http://www.aihw.gov.au/hospitals/datacubes/definitions.cfm.

‡ This paper does not address the debate over the accuracy of the diagnosis related groups clinical descriptions. Further information may be found in: Department of Health and Aged Care. Development of the Australian refined diagnosis related groups (AR-DRG) classification. Version 4. Volume 3. Canberra: Commonwealth of Australia, 2000.

2 Operationalising the capability framework

Staffing and activity data analysis by hospial clinical department

Medical workforce data
Senior medical staffing numbers (heads) and FTEs
AMWAC specialist population ratios (state and regional)
On-call rosters
Leave balances
Clinical services data
Inpatient data: number of inpatients, number of inpatient bed-days, number of inpatient "weighted separations", average inpatient clinical complexity level
Number of outpatient clinic presentations
Statewide or bi-regional service delivery
Teaching data
Junior medical staffing numbers (heads) and FTEs
Formulas
Ratio of medical staff (senior and junior) to weighted inpatient separations
Ratio of medical staff (senior and junior) to outpatient presentations
Average number of weighted inpatient separations per medical FTE
Average number of outpatient presentations per medical FTE
Ratio of junior to senior medical staff: heads and FTE

FTE = full-tme equivalent. AMWAC = Australian Medical Workforce Advisory Committee.

also linked to the attending doctor.[‡] As some clinical departments delivered a statewide or bi-regional service, this was also taken as an indirect measure of clinical workload.

The supervision of postgraduate students/junior medical staff and the delivery of undergraduate teaching are important aspects of hospital medical activity. The human resources information system provided an indicator for postgraduate teaching in the number of junior medical staff for each department. Undergraduate teaching was based on data collected for the University of Tasmania Faculty of Health Science and used to calculate teaching time as a percentage of total senior medical staff time in each department.[9]

Research and professional development data were quantified by looking at the number of research projects and publications undertaken within the past year. Later questions about the accuracy of the undergraduate teaching, research and professional development data meant that these items were, unfortunately, withdrawn from consideration. The data issues surrounding teaching time encountered in Tasmania are not unique. The Productivity Commission recently noted a "lack of transparency" in relation to both direct and indirect funding of Australian medical training, and suggested that a "better information base" is required.[10]

The remaining two output elements, those relating to quality assurance and administrative activities, were also eventually excluded from the analysis. Even in a small system, each hospital had a distinctly different way of undertaking these activities, with different processes limiting comparisons across the board. This gap in the data limits the ability to quantify all outputs associated with the capability framework.

Formulas for linking staffing to activity

Having quantified staffing inputs and activity outputs, the next step was to find a way to form a relationship between these elements. A benchmark used in the United Kingdom's National Health Service — the FTE of medical staff (junior and senior) per 1000 patient admissions (FTE1000) — was identified as a way of linking medical staffing numbers to some (but not all) clinical service activity.[11] In order to increase the responsiveness of the formula, it was modified to account for patient case complexity, by using inpatient "weighted separations" rather than admissions.

The inpatient FTE1000 was calculated as the FTE of medical staff (junior and senior) per department, divided by the number of weighted

inpatient separations from that department in a 12-month period, multiplied by 1000. A similar ratio for outpatient presentations was also developed.

As a check to this rule, the average number of weighted inpatient separations per medical FTE in each hospital department was also calculated, as was the average number of outpatient presentations per medical FTE. As discussed above, an indicator of the amount of postgraduate teaching being delivered was the number of junior medical staff for each department. The ratio of junior to senior staffing in each department linked medical staffing to postgraduate teaching activity.

These formulas were applied to Tasmanian hospitals 2003–04 staffing and activity data. Box 2 lists the total data items considered for each hospital department.

Identifying limits: the second round of clinical consultations

The iterative nature of the project was such that qualitative and quantitative methods were used sequentially to test the conclusions at each stage of the work. Following the initial interviews with clinical heads of departments, and the data gathering discussed above, the results were brought back to the hospital medical staff for consideration.

This time clinical advice was sought from the Tasmanian Clinical Advisory Committee (CAC) and its subcommittees. The CAC provides advice to the Director of Hospitals and Ambulance Services in Tasmania on clinical strategic matters including service planning and coordination, policy development, quality and performance, professional issues, clinical teaching, and research matters. The CAC sub-committees reflect the clinical divisional structures within Tasmanian hospitals, consisting of medical services, surgical services, women's and children's services, pathology services, and imaging services. These committees are largely made up of hospital medical practitioners, some of whom contributed to the initial capability framework.

This second round of clinical consultations resulted in refinements to the metric through

3 Generality of application by division

Formula applicable	Relative value units required
Medicine	
Cardiology	Critical care medicine
Dermatology	Emergency medicine
Gastroenterology	
General medicine	
Geriatric medicine	
Infectious diseases	
Neurology	
Psychiatry	
Rehabilitation medicine	
Renal medicine	
Respiratory medicine	
Rheumatology	
Surgery	
Cardiothoracic surgery	Anaesthetics
Ear, nose and throat	
Faciomaxillary	
General surgery	
Hyperbaric medicine	
Neurosurgery	
Ophthalmology	
Orthopaedics	
Plastic surgery/burns unit	
Urology	
Vascular surgery	
Women's and children's services	
Neonatology	
Obstetrics and gynaecology	
Paediatric surgery	
Paediatrics	
Oncology	
	Medical oncology
	Radiation oncology
Pathology	
	Anatomical pathology
	Chemical pathology
	General pathology
	Haematology
	Microbiology
Radiology and medical imaging	
	Radiology and medical imaging

alterations to the data sources and methodology. The most important set of decisions to emerge from this process was a consideration of which hospital departments could be considered by using the formulas developed and which could not. For the majority of public hospital departments, the link between staffing and inpatient/outpatient activity provided insights into the capacity of that department to meet current demands. Where this was inappropriate, relative value units were developed and applied to those specialties. Box 3 lists both sets of departments/specialties.

A good example of a specialty where a metric based on inpatient and outpatient activity data is inappropriate is that of anaesthetics. The responsibility of the anaesthetist is to provide care for the patient prior to, during, and after the anaesthetic. Patients do not generally present at a hospital for the purposes of getting an anaesthetic — they are given an anaesthetic as part of the process of having surgery. The patients are defined as patients of their treating physician's department (eg, cardiology, plastic surgery, or obstetrics). The relative value unit used to consider pressure on the anaesthetic workforce is the formula developed by the Australian and New Zealand College of Anaesthetists.[12]

To the CAC, the presentation of staffing and activity data at clinical department level across all three public hospitals gave rise to many questions. There was no evidence to prove the salience of the capability framework — were these the right "outputs" to examine in order to understand the relationship between activity and staffing? Even if they were the right outputs, were they all equally important, or were some more important than others? The amount of work involved in this kind of data gathering and analysis exercise also underlined the importance of streamlining the process by reducing the number of data sources. Statistical analysis was used to answer these questions.

Developing a metric: correlation analysis of staffing and activity data

For the statistical stage of the project, 2004–05 data from 65 hospital departments were gathered and analysed. These consisted of 31 departments from the Royal Hobart Hospital, 18 from the Launceston General Hospital and 16 from the North West Regional Hospital.

Several exploratory analyses using correlation analysis (Pearson's *r*) were conducted to examine the strength and direction of associations between variables. The results of the correlation analysis (Pearson's *r*) are shown in Box 4.

The Pearson correlations showed that there tended to be more senior medical staff in departments where weighted separations, bed-days and outpatient presentations were high. Senior medical staff are correlated moderately and positively with outpatient presentations (*r,* 0.46) and bed-days (*r,* 0.50) but more strongly with weighted separations (*r,* 0.60).

The data for junior medical staff showed a similar pattern, with stronger associations. In particular, junior medical staff correlated strongly with weighted separations (*r,* 0.82), bed-days (*r,* 0.75) and outpatient presentations (*r,* 0.50).

The fact that the correlation analysis suggests that weighted inpatient separations, bed-days and outpatient presentations are closely associated with hospital medical staff is not surprising, confirming the "common sense" understanding of the work of hospital doctors. The higher correlation of junior medical staff to these data reflect the high correlation of junior to senior staffing (*r,* 0.69) as well as the concentration of junior medical staff in larger departments and larger hospitals where the quantity and diversity of patients are available for teaching experience. At the same time, the lower correlation of senior medical staff to these data could also reflect the research/professional development, quality assurance/clinical audit and governance/administration activities were included in the capability framework but not captured by the data available to this analysis.

FTE1000 inpatient separations and FTE1000 outpatient presentation results were weak and non-significant at the 95% level for both senior and junior medical staff. In addition, average patient clinical complexity level was very weakly and not statistically associated at the 95% level

4 Results of the statistical analysis: correlation analysis, 2004–05

	Pearson's correlation coefficient (2-tailed significance)	
	Senior medical staff	**Junior medical staff**
Medical workforce		
Senior medical staff	1	0.687 (0.000)
Recreation leave	0.512 (0.000)	0.484 (0.000)
Excess leave	0.325 (0.008)	0.395 (0.001)
Long service leave	0.317 (0.010)	0.330 (0.007)
On-call roster (proportion of time after hours on call)	–0.115 (0.362)	–0.198 (0.114)
SPR for Tasmania	–0.085 (0.503)	0.033 (0.796)
Clinical services		
Weighted inpatient separations	0.599 (0.000)	0.816 (0.000)
Inpatient bed-days	0.500 (0.000)	0.752 (0.000)
Outpatient numbers	0.464 (0.000)	0.501 (0.000)
Inpatient numbers	0.299 (0.015)	0.390 (0.001)
Outpatient FTE1000 current	0.136 (0.282)	0.216 (0.083)
Offer services state-wide	0.110 (0.385)	–0.010 (0.940)
Average patient clinical complexity level	0.059 (0.640)	0.071 (0.574)
Inpatient FTE1000 current	0.038 (0.762)	–0.012 (0.924)
Teaching		
Junior medical staff	0.687 (0.000)	1

SPR = specialist population ratio. FTE1000 = full-time equivalent of medical staff (junior and senior) per 1000 patient admissions.

with senior (*r*, 0.06) and junior (*r*, 0.07) medical staff numbers. This suggests that both ratios were poor stand-alone indicators.

The correlations for recreation leave were moderate for senior (*r*, 0.51) and junior medical staff (*r*, 0.48), while long service leave was also positively associated with both senior (*r*, 0.32) and junior staff (*r*, 0.33). The on-call roster was negatively, though again not significantly, associated ($P < 0.05$) with medical staffing numbers. Excess leave had a positive and significant association with staff numbers, but the correlations are weaker than for recreation leave. These correlations are also unsurprising.

On the other hand, the SPRs were only weakly correlated with senior and junior medical staff, which is an unexpected result in a small state such as Tasmania where public hospitals employ many medical specialists. This raises questions for future investigation.

Developing a metric: regression analysis of staffing and activity data

Ordinary least squares (OLS) regression analyses were used to explore the net associations between the independent and dependent variables, controlling for inter-relationships between the independent variables. Given the small size of the population, the complexity of the regression models was constrained to only two independent variables. Box 5 shows regressed weighted separations (divided by 1000) and outpatient numbers (divided by 1000) upon senior medical staff, while the same variables are utilised in Box 6 for junior medical staff.

The R^2 statistics suggest that the models containing weighted inpatient and outpatient numbers explained a far greater amount of the variation for junior medical staff than for senior staff. Almost 70% of the variation in the dependent variable is accounted for by these two variables (R^2, 0.69) in

5 Regression estimates for senior medical staff (ordinary least squares analysis)

	B	SE	β	T	Significance
Intercept	0.840	0.157		5.333	0.000
Weighted inpatient separations/1000	0.414	0.092	0.489	4.520	0.000
Outpatient presentations/1000	0.102	0.044	0.252	2.330	0.023

R^2, 0.41; $n = 65$

6 Regression estimates for junior medical staff (ordinary least squares analysis)

	B	SE	β	T	Significance
Intercept	–0.043	0.341		–0.125	0.901
Weighted inpatient separations/1000	1.865	0.198	0.737	9.418	0.000
Outpatient presentations/1000	0.219	0.094	0.181	2.319	0.024

R^2, 0.69; $n = 65$

the junior staffing model but only 40% of the variation for senior medical staff (R^2, 0.41).

The explained variance for the regression model was increased with the addition of variables measuring time spent delivering undergraduate teaching, research projects, and numbers of publications per department. The explanatory power of the regression formula rose by 16% for senior medical staff (R^2, 0.57) and by 8% for junior staff (R^2, 0.77). However, data for these variables were not considered to be of adequate quality to utilise in this study.

While the explanatory power of the regression model is moderately strong for junior medical staff, it is less powerful for senior medical staff. It is likely that the reasons are the same as in the correlation analysis: that there is a concentration of junior medical staff in larger departments and larger hospitals and that the work of junior staff is more closely related to clinical care. The reduction in explanatory power in relation to senior medical staff is due to a wider distribution of senior staff and a broader range of activities undertaken. In addition to delivering clinical services, senior medical staff undertake research and professional development, quality assurance and clinical audit activities, as well as clinical governance and administration activities.

The regression formula, when applied to each hospital department, provided guidance on where that department stood in relation to the average staffing : activity (clinical services) ratio.[§] By placing all departments on a level playing field the relative under- or over-staffing of particular areas — in relation to the delivery of clinical services only — became clear. As a great deal of senior medical staff activity was not captured by the data, this relative measure could only be indicative of some workload pressure. These data did provide a new source of information for decision makers. These results are useful in themselves as a step toward improving the equity of hospital medical staff distribution across Tasmania, as the metric aligns workforce more closely with patient service provision.

A future agenda for Tasmania: the third round of clinical consultations

A report outlining the results of the 2004–05 staffing and activity data analysis, plus the results

§ Based on the ordinary least squares regression formula $Y = a + b_1X_1 + b_2X_2 + e$ where Y is the estimated dependent variable, a is the intercept, X_1 and X_2 are the independent variables and b_1 and b_2 are the regression coefficients for each independent variable.

of the statistical analysis, was presented to a second round of CAC and subcommittee meetings. Based on this work (including the current limitations to the data) the committees were asked to consider the following proposal:

- To determine relative priorities a metric consisting of the number of weighted inpatient separations *and* the number of outpatient presentations should be used as the measure of comparative workload.
- Where this is inappropriate, the relevant specialist college formula should be used, or comparisons made with equivalent hospital departments.

The committees suggested a number of caveats:

- It is recognised that this method only provides one source of information for the decision-making process, and that the CAC and subcommittees will continue to provide a source of clinical judgment and advice.
- It is recognised that this method is limited in application to areas where we already provide services — it does not indicate areas of new service need.
- It would be desirable to develop a process by which both public *and* private practice could be considered. This is particularly significant where there is a high proportion of visiting medical practitioners employed by the hospital.

In March 2006, the CAC concluded that, with the caveats, the project methodology was a useful tool to be applied to staffing and activity data on an annual basis. The CAC also recommended that Tasmanian private hospitals be invited to participate in the next round of analysis, expected to commence in the second half of this year, using 2005–06 data.[13]

In Tasmania, the next steps in the development of a metric for hospital medical workforce allocation involve addressing the comments provided by the CAC through the following actions:

- Improving the quality and collection of data on activities such as undergraduate teaching, research and quality assurance, in order to factor these into future assessments.¶
- Working with the existing clinical services planning and acute inpatient demand modelling project groups to inform the development of new services.
- Developing a process to collect data on the hospital medical workforce spanning both the public and private sectors.

Even in its current form, the salience of the regression formula will only hold true for as long as there is no dramatic change in the staffing or activity data.

An invitation for interested parties

These metrics have been developed through an iterative consultative-analytical process that brings together perspectives from across the Tasmanian hospital system. An opportunity also exists for other jurisdictions to test and refine the Tasmanian methods and results. It is not possible to apply the Tasmanian regression formula to other jurisdictions but it is possible for other jurisdictions to develop their own, following (or improving on) the Tasmanian example.

The development of a supplementary source of information for hospital and health department managers means that practitioner advice can be complemented by objective data, reducing the likelihood that the decision-making processes around the allocation of hospital medical practitioners will be controversial and internally divisive, and strengthening the linkage between clinical staffing and clinical activity in Australia's hospital system.

Competing interests

Bruce Tranter was paid a consultancy fee for conducting quantitative research for the Department of Health and Human Services. The quantitative findings in this paper are based on the consultancy project.

¶ Nationally, the same point was made just on a decade ago in the KPMG consultancy report on costing and funding of teaching and training activities in Australian public hospitals, October 1996.

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