

# **The Role of the Actuary in Healthcare: Where are we, and where are we going?**

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# **The Role of the Actuary in Healthcare: Where are we, and where are we going?**

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## **Abstract**

This is a discussion paper that examines the financing decisions that are made in healthcare, the roles that actuaries currently play in this area, and the possible roles that actuaries might play.

We examine who takes what funding decisions, and what analysis or modelling goes into them. In the public sector, we cover decisions made at Commonwealth, State and Local level; in the private sector, we look at decisions made by Private Health Insurers, Hospitals and Aged Care organizations.

The examination of the actuarial role covers:

- Who (other than actuaries) provides advice at present;
- The areas where actuaries currently provide advice;
- Other areas where we might be qualified to offer advice;
- Whether there is a realistic opportunity for our involvement in these areas, or whether this is purely speculative; and
- What actuaries need to do to become credible advisers in healthcare.

This paper aims to provide a structure for debate on the areas on which actuaries might focus in the future, how we can become involved, and what sort of strategic approach should be taken by the profession (if any).

*Keywords:* Healthcare, wider fields

## **1. Introduction**

In Australia, an estimated 9.0% of GDP (\$60.8bn) was spent on healthcare services in 2000-2001 (all sources). Healthcare spending has increased in real terms by 4.4% a year since 1990-91 (3.2% per person in real terms over the same period) [AIHW (2002a)].

Given the amount of money spent on health and aged care, the complexity and long-term nature of the decisions to be made, the link to demographics and the need for long-term financial planning, healthcare would seem to be an ideal area for actuarial involvement. In fact, actuaries have been involved in this area in Australia for more than thirty years. However, the number of actuaries involved has been small, and most of these actuaries have been involved with health insurance, either employed directly by funds, or consulting to them.

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## **The Role of the Actuary in Healthcare: Where are we, and where are we going?**

Despite restricted actuarial involvement to date, interest in the health sector by actuaries around the world has continued to grow. In Australia, this is exemplified by:

- the creation of the Institute of Actuaries of Australia's (IAAust's) predecessor to the Health Practice Committee over 20 years ago;
- IAAust's 'Actuarial Practice in Health Insurance' Course, first run in 1998; and
- the 'Health Financing In Australia' Course offered in 2002.

The UK profession's sixth annual Healthcare Conference posed the question as to whether the healthcare actuary was surviving or thriving: "are we treading water in the area of healthcare provision, or are we really making the most of the opportunities that exist?". As actuarial interest in the sector gains momentum, we thought it an opportune time to review the extent of current actuarial involvement in healthcare in Australia and examine the scope for future involvement, suggesting possible ways of increasing our involvement in this field. We hope that these suggestions will be debated at the convention.

This paper does not start from the position that 'Actuaries can do everything'. There are some areas where other professionals are better qualified to provide services; other areas where we are equally qualified, but others have already built a niche; and areas where some actuaries may feel is it not economic to get involved.

We are aiming to promote discussion and provide a structure for debate about a number of areas where actuaries might realistically become involved in health financing decisions. We recognise that there are other areas of health where actuaries may have a role that are not considered here. Additionally, our focus is mainly on the roles that groups of actuaries may play, as the paths that may be followed by individual actuaries in healthcare are impossible to predict.

This paper intentionally raises more questions than it answers, and it is hoped that these questions will lead to a healthy discussion at the convention. The areas detailed below, in which actuaries are currently or could potentially be involved, are based on our discussion with a number of actuaries and other professionals practising in health. The list is not exhaustive and we hope that other actuaries with views to add to this list will join the discussion at the convention and elsewhere. The paper is structured as follows:

- Introduction
- Overview of healthcare financing
- Summary of each healthcare sector, addressing: the decisions that are made; who carries out analysis in relation to these decisions; an indication of where actuaries are currently working in the sector; consideration of realistic opportunities for actuaries.
- A summary of the actuarial skill-set and how this applies to healthcare.
- Discussion of how we gain credibility in healthcare and move forward.

## 2. Overview of healthcare financing

Chapter 5 of Australia's Health 2002 [AIHW (2002b)] provides an overview of the financial contributions made up to 1999-00 and responsibilities of the various providers of health funding and services in Australia. Health Expenditure in Australia 2000-01 [AIHW (2002a)] includes updated information for 2000-01. These publications are available on-line. A few main points on funding from these sources are summarised below:

### 2.1. Healthcare spending

In Australia, spending on healthcare services over the 2000/01 financial year represented an estimated 9.0% of GDP (\$60.8bn), equating to an average of \$3,153 per capita. As noted above, this amount has consistently increased above the level of general inflation and these increases have been driven by both the number and cost of services utilised. Significant influences on these costs include advances in medical technology and prostheses, as well as increased use of pharmaceuticals. The impact of population ageing is cited by some as another factor contributing to cost increases; others believe its effect is to delay costs.

Funding for healthcare comes from a number of sources, including: Commonwealth, State/Territory and local governments; health insurers; not for profit organisations; providers of motor third-party and workers' compensation insurance; and individuals. The breakdown of funding between sources (net of transfers), and an indication of how the burden has shifted in recent years, is illustrated in the following table. [As with many statistics, the split of total spending between the providers is not straightforward, and other presentations can show markedly different results. For example, the 30% rebate on insurance premiums paid by the Commonwealth Government could be classified as government spending, or as spending by Private Health Insurers, and it is important to ensure that this amount is not double-counted.]

Year	Government			Non-Government	Total
	Commonwealth	State & Local	Total		
1990-91	42.8%	25.5%	67.7%	32.3%	100.0%
1995-96	45.1%	22.0%	67.1%	32.9%	100.0%
2000-01	47.5%	22.5%	70.0%	30.0%	100.0%

[AIHW (2002a) Table 13 (extract)]

Recurrent expenditure on healthcare in 1999-00 was \$52.1bn (93.5% of total expenditure), with the remaining expenditure being focussed on one-off projects. This can be further segregated as follows. Note that to obtain data at this level of detail, the results relate to the 1999/2000 financial year, as opposed to the 2000/01 statistics mentioned above.

Category	Recurrent Expenditure 1999-00 (\$bn)				
	Commonwealth	State & Local	Insurers	Individuals & other	Total
Hospitals Public	6.9	6.8	0.2	1.0	14.9
Hospitals Private	1.3	-	1.9	1.0	4.2
High-level residential aged care	2.9	0.3	-	0.9	4.1
Ambulance services	0.1	0.9	0.1	0.0	1.1
Medical services	8.0	-	0.2	1.4	9.6
Pharmaceuticals	3.5	-	0.0	2.9	6.4
Dental services	0.2	0.4	0.5	1.7	2.8
Community and public health	0.7	1.9	-	-	2.6
Other recurrent health spending	2.1	0.3	0.9	3.1	6.4
Total	25.7	10.6	3.8	12.0	52.1

[AIHW (2002a) Table A.10 (extract)]

## The Role of the Actuary in Healthcare: Where are we, and where are we going?

### 2.2. Healthcare roles

Direct Commonwealth healthcare roles include: healthcare for veterans; pharmaceutical, and hospital benefits; medical and dental services; and quarantine. The Commonwealth funds Medicare and the Pharmaceutical Benefits Scheme (PBS) are administered by the Health Insurance Commission. The Commonwealth provides healthcare funding through Special Purpose Payments (SPPs) to States (set out in Australian Health Care Agreements (AHCAs)), and indirectly through payments to support private health insurance in the form of the 30% rebate.

State/Territory Governments' responsibilities include public hospital services; dental and mental health services; infant and community health centres; health promotion and prevention services; ambulance services, and public health facilities such as food regulation and water sanitation. Local Government provides some community- and home- based services and is responsible for environmental health issues such as food safety inspection and provision of immunisation programs.

Public hospitals are funded by the Commonwealth and State/Territory Governments, with the AHCAs providing the basis for determining the Commonwealth's contribution. Private hospitals are run both for-profit and not-for-profit and are funded by health insurers, individuals, Medicare (for in-hospital medical care), the Department of Veterans' Affairs (DVA) and other insurance arrangements.

Doctors operate in the both the private and public sectors. In the private sector, they either bill patients, who can recover a portion of the bill equal to 75% of the Medical Benefits Schedule (MBS) fee from Medicare, or bill the Health Insurance Commission (HIC) directly at MBS rates. In the public sector, doctors are either salaried or act as Visiting Medical Officers.

Services by allied health professionals, like dentists and physiotherapists, are funded through the public sector (for example community dental clinics and optometry services), private health insurance, or out of individuals' pockets.

### 2.3. Australia vs. the Rest of the World

The following table summarises total spending on healthcare as a proportion of GDP, and the growth in that spending, by certain OECD countries from 1980 to 2000:

Country	Health spending as a proportion of GDP (%)			Per capita growth rate (US\$ PPP comparison) (%)	
	1980	1990	2000	1980-1990	1990-2000
Australia	7.0	7.8	8.3	7.0	5.5
Canada	7.1	9.0	9.1	9.0	4.2
Germany	8.8	8.7	10.6	6.9	5.6
Japan	6.4	5.9	7.8	7.6	6.4
New Zealand	5.9	6.9	8.0	7.4	5.6
UK	5.6	6.0	7.3	8.2	6.1
US	8.7	11.9	13.0	10.0	5.4

[OECD (2002)]

### **3. Health Insurers**

This is the area of greatest actuarial involvement in health to date. Actuaries have been involved with health insurance for more than 30 years. There are now a number of actuaries either working for, or consulting to, private health insurance organisations. Actuaries in health insurance undertake a wide variety of tasks including:

- estimating outstanding claims
- pricing and designing products
- determining the fund's solvency and capital adequacy position
- projecting business indicators for a variety of purposes including budgeting, strategic planning and corporate mergers
- analysing utilisation and claims cost experience
- negotiating with hospital negotiations and calculating second tier benefit schedules

In November 2001, the Government increased the regulatory role of actuaries in health insurance. Organisations seeking to increase contribution rates from April 2002 were required to obtain actuarial sign off on their financial modelling. The requirements for the April 2003 rate increase notifications were modified, but still required actuarial review where the average rate increase sought was more than a benchmark percentage.

The Private Health Insurance Administration Council (PHIAC) also supports the increased involvement of actuaries in health insurers. PHIAC published a discussion paper in December 2002, outlining a proposed role of an "Appointed Actuary" in health insurance. (The proposal is the subject of a paper to be presented to the Biennial Convention by PHIAC CEO, Gayle Ginnane.) The PHIAC discussion paper and responses from industry are likely to lead to interesting debate regarding the involvement of actuaries in the industry.

Health insurance is an area where actuarial involvement is accepted, and the industry is likely to utilise our advice more extensively in the future.

### **4. Commonwealth Government**

Commonwealth health spending in 2000-01 was 16.1% of the Commonwealth actual expenditure. Government expenditure, by department was:

<b>2000-01</b>	<b>Defence</b>	<b>Education</b>	<b>Health</b>	<b>Social Security &amp; welfare</b>	<b>Other</b>	<b>Total</b>
Expenditure (\$bn)	11.4	11.0	25.2	66.9	42.4	156.8
As a % total	7.2%	7.0%	16.1%	42.7%	27.0%	100.0%

*[Reserve Bank of Australia website]*

(Figures differ from AIHW figures, but give an indication of the relative size of healthcare expenditure compared with other departments).

The financing decisions faced by the Commonwealth government include both short- and long-term decisions: how much money to allocate to health compared with other departments; how much to allocate between different areas of health; how to fund healthcare in the long term; and how to ensure that funding enables the healthcare system to meet the stated aim of broad, equitable, needs-based access for all.

Examples of decisions that involve modelling and analysis include the Pharmaceutical Benefits Schedule (PBS) listing of new drugs, assessment of specific programs, work force planning, policy

## **The Role of the Actuary in Healthcare: Where are we, and where are we going?**

evaluation in private health insurance and co-ordinated care trials. Other areas include the assessment of public health measures and the Medical Services Advisory Committee that considers new Medical Benefit Schedule (MBS) items. A number of these areas are examined below.

### **4.1. Strategic decisions**

The big-picture issues relating to the overall funding and direction of healthcare in Australia are classic actuarial problems; long-term projections, involving demographics and uncertainty. Much of the analysis and modelling that is undertaken in connection with the government's long-term strategic decision-making has been carried out internally. The IAAust has made a number of submissions to the Commonwealth Government, but to our knowledge, actuaries have not been engaged to produce reports or papers on healthcare funding.

In the UK, actuaries have been involved in financial planning for the National Health Service, but there is limited publicly available information regarding the work undertaken. However, Derek Wanless, a statistician, produced a report 'Securing our Future Health: Taking A Long-Term View' in April 2002, in conjunction with a team from the Treasury. This was an assessment of the long-term resource requirements for the National Health Service. It concluded that in order to meet people's expectations and to deliver the highest quality over the next 20 years, the UK will need to devote more resources to health care and that this must be matched by reform to ensure that these resources are used effectively [Wanless (2002)]. Derek Wanless was the keynote speaker at the UK Institute of Actuaries' 2002 Healthcare Conference, underlining the relevance of the issues to the profession and the profession's interest in this area.

The major analysts and advisors within the Australian Government are bureaucrats proposing and implementing public policy. The majority of the analyses required to support this work are carried out within government departments by health economists and analysts, or through external economic consultancies like Access Economics. The Department of Health and Ageing, which has the primary responsibility for healthcare, also seeks assistance from the Department of Finance on projections and budget estimates.

In addition, academics are frequently sponsored to carry out specific research projects. Doctors and other medical staff play a role in this area. They provide medical advice to the Government on various public health issues. They also sit on numerous government bodies and financing committees, including the Pharmaceutical Benefits Advisory Council (PBAC).

Lobbying bodies are also involved in the decision making process, like the Australian Medical Association, various economic think tanks (such as the Australia Institute), and the Australian Health Insurance Association. In fact, it has been suggested that there are now in excess of 600 industry and lobby groups in the health-financing arena [Australian Financial Review 18.02.03].

As funding pressures grow for the Government in Australia, are there realistic opportunities for actuaries in Australia to become involved in the review and possible restructuring of healthcare? If so, how do we overcome the political and economic barriers to our involvement – the 'displacement' of 'incumbent' internal advisors or health economists, and the perceived high relative cost of our services?

### **4.2. PBS listing of new drugs**

The Commonwealth Government subsidises the cost of pharmaceuticals through the Pharmaceutical Benefits Scheme (PBS). Once a drug is listed on the PBS, the Commonwealth will pay the cost of this drug, less any specified co-payment by the patient. To qualify for listing, a drug needs to be both clinically proven and cost effective.

## **The Role of the Actuary in Healthcare: Where are we, and where are we going?**

Since 1993, an economic evaluation has been required as part of a PBS submission for listing. Under the PBAC guidelines on submissions involving economic analysis, modelling can be used to support the submission if the data from a randomised trial is insufficient to judge the clinical and economic performance of the drug. Methods suggested include decision tree, Markov chain modelling and Monte Carlo simulation. The projection does not necessarily need to be dollar related, e.g., the transition between health states due to a particular drug over a period of time can have an impact on both the cost of treatment and the quality of life years (QALYs)/ life years saved measures experienced by the patient. This work requires the utilisation of strong statistical skills, but it is open to debate whether actuarial qualifications (and costs) would add anything further.

Actuaries have however been involved in a review of the methodology for calculating the Weighted Average Monthly Treatment Cost (WAMTC) for pharmaceutical products listed on the PBS. This review involved not only analytical work, but also a qualitative review of a number of factors. Further work followed, with the Department of Health and Ageing seeking actuarial assistance in projecting the financial impact of the introduction of new drugs. The results of such forecasts rely crucially upon the assumptions adopted, and as a profession, it remains vital that we ensure our clients realise the limitations of any such models.

There is obviously the possibility of actuaries finding employment in the pharmaceutical arena, however a number of questions are raised.

### *Questions for consideration:*

- Is this an area of health financing in which actuaries wish to work? (This question is equally applicable to other areas considered in this paper.)
- Do actuaries have anything unique to offer this industry? That is, can we add any value beyond that provided by academics and other health economists?

### **4.3. Assessment of specific programs**

The government may ask external parties to assess the likely economic performance of health programs. Examples include:

- The “Return on Investment in Needle and Syringe Program” report prepared by Health Outcomes Inc et al. for the Population Health Division estimated the return of investment in preventing the transmission of HIV/AIDS and hepatitis C through the program. Net Present Values (NPVs) were calculated at various discount rates to show the net benefit to the society from year 1991 to 2000 [Health (2002a)].
- In 1998, the government appointed Professor Len Gray to assess whether the reforms introduced in the Age Care Act 1997 met its objectives. The report - “Two year review of Aged Care Reforms”, mentioned that Oxley Corporate Finance Limited undertook a microeconomic review of the sector. This review pinpointed the factors that affect the return on residential facilities, and suggested that the residential care industry is viable and able to achieve a benchmark return of 12% [Gray (2001)]. Oxley has historically employed actuarial staff, however, the extent of actuarial involvement in this project is not known.
- The economic evaluation of pharmaceuticals and healthcare programs involves a significant amount of qualitative as well as quantitative assessment. A number of standardized quantitative measures (like QALYs) have been developed to include qualitative factors. The development and refinement of these measures is an area in which actuarial skills and judgement could add significant value.

## **The Role of the Actuary in Healthcare: Where are we, and where are we going?**

- A further current example is the Aged Care Pricing Review, under Professor Warren Hogan. The review will examine long-term financing options for the aged care sector and will take into account the improved care outcomes required from providers and the underlying cost pressures faced by the sector. The results of the review are due to be presented to the Minister of Ageing at the end of 2003.

### *Questions for consideration*

- It is worth considering how such work is likely to be allocated. How would an actuarial consultancy compete with Health Outcomes Inc?
- What skills do such organisations offer?
- If we are serious about trying to become involved in these areas, should we be forming alliances, as at least one actuarial consultancy has already done, with health-care professionals who speak the same language as some of these clients?

### **4.4. Medical Workforce Planning**

The long-term nature of doctors' training requires careful forward planning so the population has reasonable access to medical practitioners. It is a financing decision because government plays a large part in subsidising doctors' education (for example grants for study in rural areas and HECS). The Royal Australian College of Surgeons (RACS) provides specialist education services to doctors, and is also involved in the long-term workforce planning.

The Australian Medical Workforce Advisory Committee (AMWAC) has been established to ascertain the appropriate benchmark for the supply of medical practitioners. The current framework for workforce planning is usually "needs-based". The model evaluates the likely healthcare requirements of the population, as well as the incentives for parties to deliver services.

Projection of the medical workforce involves an understanding of the dynamics of the healthcare and labour markets, demographic changes and disease patterns. This, and the projection of demand for other medical professionals, such as nurses, is an area frequently suggested as an example of the type of work that healthcare actuaries would be suited for, but is this suggestion realistic? We know of only limited actuarial involvement in this type of work to date.

### **4.5. Policy Evaluation in Private Health Insurance**

The Department of Health and Ageing has initiated a number of policy changes in private health insurance in recent times. These include the introduction of the 30% rebate, lifetime health cover, deregulation of the prostheses market, reform of the second-tier default benefit arrangements and proposed changes to the benefit equalisation (reinsurance) scheme.

Actuaries have been actively involved in the evaluation and implementation of such reforms. Examples include:

- Actuaries were heavily involved in the preparation of projections to the Private Health Insurance Administration Council (PHIAC) to ensure the sustainability of private health funds after the introduction of the 30% rebate;
- After significant consultation with the industry, actuaries developed the current risk-based Solvency and Capital Adequacy requirements for Private Health Insurers;
- An actuarial consulting firm was contracted to assess the impact of the proposed risk-based capitation reinsurance scheme;
- Actuaries were also engaged to evaluate the impact of lifetime healthcover;

## **The Role of the Actuary in Healthcare: Where are we, and where are we going?**

- The Private Health Insurance Medical Device Expert Committee was set up after the deregulation of the prostheses market. Its role is to advise the Department on the management of prostheses and human tissue items, and to establish a new list of items that do not fit the Department guidelines, but provide potential savings to the Commonwealth or health funds. An actuary was selected as a core member of that Committee by the Minister of Health and Aged Care; and
- Actuaries are involved in the preparation of Second-Tier Default Schedules for health funds.

The Government sees value in actuaries providing independent and professional advice on important policy evaluations. How can we build on our relationship with the Government and attract other wider health field opportunities?

### **4.6. Coordinated-care trials**

The coordinated care trials were established within different communities to examine the possibility of improving the funding and management of healthcare by adopting a different healthcare approach. As the name suggests, the concept involved adopting a co-ordinated approach to the provision of health care for the patient, and an analysis of both the financial and health benefits of such an approach.

The various trials undertaken in the late 1990s differed significantly according to the requirements of the target population. Samples of the projects undertaken included:

- Frail Aged (Illawarra)
- Multiple Care Needs (Hornsby)
- Aboriginal and Torres Strait Islanders (Tiwi Islands)

Actuaries have been involved with a number of the trials. The work has focussed on the financial analysis of the data and results. Following the actuarial involvement in the first round of trials, the Government sought actuarial assistance to modify and improve the reporting framework for the second round of trials.

There has been discussion about the cost of actuarial services. Despite the costs, and the typical trial aim of cost minimisation, many trials continue to utilise actuarial advisors.

*Questions for consideration:*

- Does this mean that the trials see real value in actuarial assistance?
- Have the actuaries involved been limited to certain roles, and has their involvement changed over time?
- What are the future possibilities for actuaries in this, or similar, areas?
- Will there continue to be scope for actuarial involvement if or when these trials cease and some of the programs become fully operational?

## **5. State/Territory and Local Government**

States receive funding from the Commonwealth in the form of Specific Purpose Payments (SPPs) under the Australian Health Care Agreements. In addition to this, there is funding from State sources, financed through taxation.

In 1999-00, around 66% (\$6.4bn) of State/Territory Government recurrent health expenditure (from its own resources) was on public hospitals. In addition to this, States were responsible for administering \$6.9bn of Commonwealth money on public hospitals. A further 18% of State expenditure was on community and public health campaigns and 8.5% on ambulance services [AIHW (2002a)].

### **5.1. The stakeholders**

The stakeholders at the State Government level are not dissimilar to the Commonwealth level, with more emphasis on microeconomic issues. Hospital managers, CEOs and Boards of Area Health Services (and similar entities), and medical professionals are more involved at the State level due to the greater focus on local healthcare issues.

### **5.2. Australian Health Care Agreements (AHCAs)**

The AHCAs are negotiated between State and Commonwealth and set out healthcare SPPs to States/Territories over 5-year periods. Four rounds of AHCAs have been negotiated so far, and the next round of AHCAs come into effect from July 2003.

The methods used to determine the amount of money that States receive from the Commonwealth, and how States/Territories then allocate this money to regions and hospitals within each jurisdiction, may differ. At the Commonwealth to State level (and for NSW Health to Area Health Services), the approach used is developed from a needs- or population-based resource allocation. Within some States and from NSW Area Health Services to hospitals within each Area, an activity-based approach using Diagnosis-Related Groups (DRGs) is employed (also referred to as casemix funding).

The population-based approach uses the current relationship between activity and population, and allocates resources based on the expected population. Differences between expected and actual activity are not reflected in changes in funding from one year to the next, but will cause funding targets to be adjusted over time.

In simplistic terms, the DRG is a measure to group episodes that are both clinically meaningful and resource homogeneous. Cost weights for each DRG denote the relative resources required. The casemix funding approach allocates resources using these cost weights. In addition to the funding formula utilised, political constraints may have an impact on the funding that States or hospitals receive.

The relative merits of population-based versus casemix funding have been researched and debated by health economists. Internal analysis is undertaken in the negotiation process for the AHCAs, and there has been limited actuarial involvement to date.

#### *Questions for consideration*

- Is there room for actuaries to provide further advice in these areas?
- The political and economic barriers to actuarial involvement that may exist at Commonwealth level are likely to be even higher at State level. However, if we work collaboratively with professionals from other backgrounds, do we have something to add?

## **6. Hospitals**

As discussed in the previous section, public hospitals are funded by the State and Commonwealth, with all funding directed through the States. In the case of private patients treated in public hospitals, the hospital receives a measure of reimbursement for treatment from health funds and individuals. Private hospitals, which may be run for-profit, or not-for-profit, receive funding from a combination of health insurers, individuals and other sources.

Funding for capital formation in public hospitals is largely from the States/Territories, and is the responsibility of the private hospital organisations in the private sector.

Although they may receive funding from different sources, public and private hospitals are faced with many of the same decisions on how to allocate capital, spend recurrent funds and control costs.

### **6.1. Cost analysis**

Hospitals in the public and private sectors must, to varying degrees, negotiate with governments and health funds to set the amount of funding they receive, and with suppliers to determine how much they have to pay for services.

In these negotiations, it is valuable to know the cost of procedures and activities performed. This information is also valuable in analysing whether a particular procedure is cost-effective and using this information in considering whether the hospital wishes to offer this service. It is important to realise however that public hospitals in particular are perceived to have a humanitarian obligation, and any decision regarding procedures to be offered must also involve value judgements. Imagine, for example, if it was not cost-efficient for a large public hospital to treat people having a heart attack, to have an accident and emergency service or to treat the elderly – the social backlash against the hospital could be significant.

Such analysis is not straightforward, as it relies on enormous amount of data being collected and analysed. Some of this data is difficult to collect accurately. For example, although the public and private sectors endeavour to collect information regarding the nursing time spent with each patient, there are inherent difficulties in measuring this precisely, particularly during emergency periods. In addition to this, hospitals also face standard cost allocation issues such as the apportionment of the CEO's salary, or general support staff expenses, to individual services. At present the consensus appears to be that although hospitals may endeavour to ascertain the costs of individual services (and this information is utilised in work such as determining the Diagnosis-Related Groups, or DRG, cost weights), many hospitals do not know with confidence which services cost or make them money. A cost accountant or management consultant could assist with this task, however an actuary could also assist in the future planning, modelling scenarios and optimising the solution for a given set of criteria.

### **6.2. Capital formation**

Funding for capital formation was \$2.5bn in 2000-01 for public hospitals, and \$1.1bn in the private sector. [AIHW (2002a)]

When building hospitals, decisions must be taken as to the location, type and size of hospital to be constructed. Currently, this is an area where health planners are involved in providing advice. Given the nature of the decisions being made, this is an area where actuaries could become involved. The main barriers to actuarial involvement include cost, lack of relationships with hospital decision-makers, and a perception that this type of analysis is not 'actuarial' work.

## **The Role of the Actuary in Healthcare: Where are we, and where are we going?**

### **6.2.1. Public Private Partnerships**

Decisions also have to be made about the structure of financing for the hospital, e.g. is a public hospital to be funded solely by the State/Territory, or constructed through a public/private partnership (PPP). Under the PPP route, a relationship exists between the private and public sectors with the aim of introducing private sector resources and/or expertise to provide public sector assets and services.

The PPP relationship may be anything from a loose strategic partnership to a design, build, finance and operate contract. Several aspects of this arrangement are attractive to the public sector:

- utilising the private sector's perceived greater efficiency, the public sector may get the hospital built at a lower cost (in net present value terms);
- injecting private sector capital that may not otherwise be available for infrastructure;
- transferring some of the risk to the private sector, which bears the cost overruns.

From the private sector's point of view, the contract is priced with the two main aims:

- constructing (and if applicable, operating) the hospital at a lower cost than the public sector, and
- ensuring acceptable return for investors.

In the UK, the PPP route is common when it comes to financing hospitals, schools, waste management facilities and other infrastructure. In Australia, the PPP funding route has also been tried in various sectors, with mixed success.

If there is the political will to finance hospitals in this manner in the future (and in NSW, the Carr government is keen to pursue this), this may be a potential area for actuarial advice to be provided to both sides in the negotiation process. Corporate financiers and investment banks have been involved in the analysis and modelling for the consortia submitting bids for the contracts, and have also been engaged by the public sector to determine feasibility and model costs.

Actuaries could be involved in this modelling, as they have been in the UK, working in conjunction with other advisors. It is an area more in line with the perception of the actuarial skill-set, and an environment in which actuarial fees, compared with the fees charged by corporate finance and investment bankers, are less of an issue.

PPP funding occurs in a number of sectors, so the question of how we build relationships with other advisors and enter this area may be more of a wider field issue than a consideration for healthcare actuaries in particular.

## **7. Aged Care**

The Commonwealth is the major provider of funding for residential Aged Care. Other aged care programs such as the Home and Community Care Program (HACC) are funded by both the Commonwealth and State Governments. It should be noted that low-level residential aged care and the HACC are not considered health spending, but are categorised as welfare. The Department of Veterans' Affairs also funds aged care through its Veterans' Care program. Contributions from patients and their family members (for example through caring for the elderly at home) also form an important source of funding in this sector.

The providers of residential Aged Care may operate for profit or not-for-profit. Providers range from small operations to sizeable organisations operating a chain of facilities. The necessity to comply with increasingly stringent standards of care, combined with the business imperative of operational efficiency, has resulted in a trend towards corporatisation in this sector. In the future, it is likely that operators of single, small homes may be less able to provide the quality of care required in an economical manner.

As aged care organisations increase in size and sophistication, long term planning decisions of a similar nature to those faced by private hospital organisations will need to be made:

- Is it economic to build facilities?
- Is the value of, and return on, existing facilities adequate?
- How can the construction of new homes be financed?

When it comes to capital formation, similar opportunities may exist in aged care as in the hospital sector, i.e., advising on what structure the funding should take, and assessing the relative merits of each option.

Cost analysis and recurrent expenditure decisions are undertaken using internal analysis, with the assistance of small specialist consultancies. As with private hospitals, there may be scope to provide actuarial advice.

## **8. Actuaries in Healthcare: Relevant Skills**

As a profession, actuaries use judgement and a combination of mathematical, statistical, demographic, economic, financial, analytical and modelling skills. Most of the technical skills possessed by actuaries are not unique, for example, econometricians and statisticians review historical data and develop forecasting models, but the combination of actuarial skills with the rigour of the control cycle means that we may have something additional to offer in health financing.

The concept of the control cycle – not only doing projections, but utilising actuarial judgement when following through, examining the results, analysing the differences and modifying the approach going forward - is a cornerstone of the actuarial approach. The control cycle frequently makes the actuarial approach to data and analysis more rigorous than others, as it involves the identification of risk factors and the interaction between them, rather than looking at aggregate effects.

The comments above, on how we compare with other professions, and our need to show some concrete “actuarial advantages”, may reveal something about the actuarial mindset (or maybe just that of the authors...). As actuaries in the traditional areas of superannuation, general and life insurance (and increasingly in health insurance), we do not have to compete against professionals with other qualifications; for most of the tasks we carry out in these areas, the involvement of an actuary is a statutory requirement.

## **The Role of the Actuary in Healthcare: Where are we, and where are we going?**

By contrast, in much of healthcare, other professions such as health planners, economists and statisticians are undertaking analysis to which we feel we could make a valid contribution. Is there anything to be gained by attempting to increase actuarial involvement by displacing other professionals? The presence of a large number of non-actuarial healthcare professionals at the 'Health Financing in Australia' course underlined the broad interest in this topic, and many group activities emphasised the value to be gained by working collaboratively with these professionals. Perhaps this is a more practical route to increasing actuarial involvement in providing credible health financing advice.

### **9. Getting involved**

Having the technical skills required to make a useful contribution in healthcare (whether alone, or in conjunction with other health professionals) is worthless without relevant knowledge, experience and credibility in this area. This is one of several barriers for the profession (and individual actuaries) to surmount. Other barriers include the perception of actuarial advice being expensive, only applicable in an insurance setting, and of actuaries only performing limited functions.

#### **9.1. Education and Training**

Our general training gives us some of the skills required to approach healthcare financing problems. Specific healthcare training makes these skills more useful. So far, the IAAust has run two health-related courses:

- 'Actuarial Practice in Health Insurance', first run in 1998, then in 2000 and scheduled to be offered again in August 2003; and
- 'Health Financing in Australia' in September 2002.

Courses of this nature both improve the knowledge of individual actuaries and display the profession's commitment to healthcare as a practice area.

#### *Questions for consideration*

- With the proposed revision of the Part III examination process in Australia, it is possible that more actuaries will consider undertaking further study in health-related areas. What, if anything, should we be doing to support these students?
- Would it be valuable for actuaries who undertake further, personal study in the health arena to evaluate and provide details of the courses so that these could be distributed to interested parties?
- How should such studies be counted towards CPD for IAAust members?

#### **9.2. Commitment from the IAAust and Members**

The commitment of the IAAust to the area of health financing is important to the success of actuaries working in the wider health field. The IAAust and a number of members have supported other actuaries in the health arena through a variety of means including:

- Submissions to the government on health policy issues, including the solvency and capital adequacy standard for health funds and draft health privacy guidelines; and
- Publication of two guidance notes for actuaries working in private health insurance.

So far the IAAust and the members of the Health Practice Committee have contributed primarily on private health insurance related issues. What else can or should we do as a professional body to further promote actuaries in the health arena?

## **The Role of the Actuary in Healthcare: Where are we, and where are we going?**

### **9.3. Research**

Occasional papers on health are published in the Australian Actuarial Journal and Actuary Australia magazine. The volume of papers on health is small compared to the more traditional practice areas. This is understandable given the small size of the profession working in the health industry. As more actuaries work in health, it is important that we promote actuarial research in this area.

Careful selection of research projects would have the potential to raise the profile of the profession. These papers could also form the building blocks for further development in the health education program.

*Questions to be considered:*

- How should the research be funded, and by whom?
- How should we select the research topic, or will this be left to the individual researchers?
- Have we got enough resources to do the research?
- Should we collaborate with other health bodies on the research project?

### **9.4. Actuarial Salaries and Fees**

One of the main barriers to increased actuarial involvement in healthcare would seem to be cost of advice both in absolute terms, and relative to other professionals in the field. This cost barrier is equally applicable to actuaries seeking direct employment in wider health roles and consultants advising the industry.

*Questions for consideration:*

- How do we aim to get over this cost barrier (or the perception of this barrier)?
- Can we convince others that the additional value created by employing actuaries is worth it?
- Alternatively, will we be forced to (or choose to) reduce our costs to enter these markets? Will this change the perception of actuaries within, and outside, the healthcare arena?
- How will the decisions made by individual actuaries impact on other actuaries wishing to become involved in this field?

### **9.5. Culture**

When deciding to work in a foreign environment, a number of major considerations are often cultural:

- How do I communicate effectively?
- What is the best way of approaching these people?
- Are there any unspoken rules I should be aware of?

Being technically or commercially brilliant will not help if you offend or cannot communicate with the people you are trying to work with. For actuaries, health is a foreign environment, and as such, similar considerations apply.

The wider health field encompasses people from a wide range of backgrounds, with different skills, business language and expectations. The number of female decision makers is typically higher than in life or general insurance companies, and the mode of doing business can be radically different to that encountered in the typical actuarial domain.

## **The Role of the Actuary in Healthcare: Where are we, and where are we going?**

The way in which data is collated and utilised may also differ significantly from that found in more traditional actuarial environments. In order for actuaries to add value to some of the parties detailed above, it may be necessary to spend considerable time understanding or improving the data collection and analysis. This is not an “easy win”, but has the potential to add longer-term value to the clients or employers.

*Questions for consideration:*

- Are we as a profession prepared to invest the time and effort to understand this different environment?
- Will we be able to earn our place in this industry?

### **9.6. Perception**

Actuaries are typically perceived as the professionals responsible for premium setting and reserving. Although the contribution of actuaries has rapidly expanded beyond the traditional areas, there is still a lack of understanding of how actuaries can add value to business processes. This phenomenon is especially evident in the healthcare area. Many healthcare professionals believe actuaries are “insurance gurus” and should not get involved in wider health financing decisions. It is going to take time and effort in educating the market about our skills and experience.

### **9.7. Why Health?**

The discussions around actuarial involvement in the health arena have historically focussed on what actuaries could or should be doing in the field. Perhaps it is also worth considering why health rather than other non-traditional areas such as natural resource planning, utilities or telecommunications?

It has been suggested that health has a natural appeal. It is certainly something that is important to us all as individuals and as a society, and it has a high profile on the political agenda. Health also involves people, scarce resources and uncertainty. It is an area where, through private health insurance, we have a foot in the door.

### **9.8. Healthcare market**

Most actuaries involved in healthcare came to this area through the insurance route. This was a logical extension of the work undertaken in other insurance fields. Despite various forays into wider health financing areas, some of them high-profile, actuaries have yet to establish a major meaningful presence in health beyond insurance.

An increasing number of actuaries are working for “non-traditional” employers, who may be involved in a diverse range of activities, including health-financing advice. As individuals, these actuaries may or may not be inclined to participate in IAAust activities or to share information regarding their involvement in specific projects. In an environment of increasing corporate competition, there is also the possibility that such projects have been undertaken beneath the covenants of confidentiality agreements. It is likely to remain difficult to assess the full involvement of actuaries in these areas and to understand the work performed by our professional peers.

While there seems to be a broad consensus amongst the profession that it is an area worthy of our attention, there does not appear to be a coordinated approach to expanding actuarial involvement in healthcare. Should there be, given that there is no strategic approach in other areas of actuarial practice?

## The Role of the Actuary in Healthcare: Where are we, and where are we going?

In the past, the onus has been on individual “healthcare pioneers” to perform much of the groundwork for later actuarial involvement in health financing. It may be that this model for extending actuarial involvement in healthcare continues in the future.

### *Questions to consider*

- How big is the healthcare financing market?
- Is there room for a large number of actuarial players, or will a select few continue to compete against each other for each job?
- Are we close to exhausting the opportunities that exist?

## 10. Further Discussion

There are opportunities to expand the actuarial role beyond the area of health insurance, the area in which healthcare actuaries are mainly working at present. However, the opportunities may not be as wide as currently speculated and several hurdles may need to be overcome to increase our healthcare presence, including political, cost, culture and perception barriers.

We are interested to know what others think about these issues. The following questions will form the basis of the discussion to be held at the convention.

1. Do actuaries have a role to play in health financing decisions?
  - If so, at what level?
  - Which parties are we best suited to assist? How do we target these groups?
  - How do we determine the most appropriate jobs to focus on?
2. Do we need any additional skills?
  - What are they?
  - How should we obtain them?
    - From other actuaries, the Institute?
    - Working with other professionals?
    - Structured training?
3. What about the perceived cost of actuaries versus other advisors?
  - Should initial work be subsidised?
    - If so, by whom? Consultancies? The Institute?
    - What are the wider costs of such subsidies?
  - How do we measure value delivered?
4. How do we gain credibility in this field?
  - As individuals, companies / consultancies?
  - As a profession?
  - Should we be concerned about this?
5. Are we ready to compete in an arena where we are not the only specialist service providers?
  - Are we physically in the best locations to be able to provide assistance as and when required?
  - Are we prepared to understand and accommodate the cultural differences in this field?

## **11. Acknowledgements**

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Certain views expressed in this paper are those of the authors; other points are included to stimulate debate, and should not be directly attributed to any individual associated with this paper. The authors' employers do not necessarily hold the opinions expressed in this paper.

## The Role of the Actuary in Healthcare: Where are we, and where are we going?

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