COMMENTARY



Why a traditional health outcomes approach will fail in health care and a possible solution

LESIA GALE

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Abstract

This paper challenges the assumption that improved knowledge of health outcomes and their causation will lead to more rational decision-making, resulting in improved care at lower costs. The assumption implies that the health system completely controls all those functions, factors and initiatives that can affect the implementation of the standard. These include policies, procedures, applications of techniques, skill mix of staff, inter-team interaction, communication systems, education, and so on. Changes in policy do not automatically mean a change in practice.

Implementation is often approached in a manner that is perceived by staff as punitive, focusing on changing the individual rather than the system in which they work. Not only is this approach opposite to basic total quality management principles, but it also fails to acknowledge that most of the improvements arising from the health outcomes approach are a result of staff being prepared to continuously work harder, often ignoring the 'system', to maintain their high standard. However, continuing deterioration in the system in which they work sets the scene for an accident or incident to occur.

The answer lies in revisiting the traditional quality assurance cycle and acknowledging that health care has never been able to effectively 'close the feedback loop', that is, the health system is continuously increasing the sophistication of data collection techniques without giving equal consideration to what needs to be done to ensure effective implementation and evaluation.

This paper outlines how Campbelltown Health Service directly addressed this issue through its process of achieving international certification to ISO 9002:1994.

Introduction

The integrity of pursuing a health outcomes approach in health care cannot be questioned. Its definition is usually aligned to the health industry core business of achieving good health and well-being. The interest in the literature has been on clinical outcomes (Ellwood 1988; Tarlov 1989; Wennberg 1989), even though a health outcomes approach applies equally to health prevention and promotion.

The principal emphasis in health outcomes research has been to collect valid and reliable data on health outcomes indicators that will assist in understanding variation (Vayda 1973; Blumental 1994; Detsky 1995; Mulley 1995). This has been spearheaded by the numerous associations, colleges, institutions and societies within health care. The Australian Council on Healthcare Standards Care Evaluation Program collects clinical indicator data and reports results at sixmonthly intervals.

There are three principal reasons for the growth in health outcome research.

1. There is increasing evidence of wide variation in patient treatment and outcomes that cannot be accounted for by changes in patient severity. The variation has been identified in each stage of the continuum of care from admission to discharge.

The Quality in Australian Health Care Study (Wilson et al. 1995) found that 16.6 per cent of hospital admissions in 1992 were associated with adverse events resulting in appreciable disability and consuming more than 3 million bed-days. At least half of these adverse events were judged to be preventable. The design of this study was a retrospective audit of the medical records. This method identifies those adverse events that were actually recorded. The question remains as to how many adverse events actually occurred in the system that were not recorded on patient medical records.

- 2. The variation in patient treatment and the incidence of adverse occurrences are directly linked to the escalation of costs within the health system. The debate on costs is also a resource allocation issue best explained by Williams (1988): 'To ignore costs is to ignore the risk to others of premature mortality and avoidable suffering.'
- 3. There is an assumption that the improved knowledge of outcomes and their causation may lead to more rational decision-making. This would occur through the utilisation of best practice guidelines and a standardisation of practices, resulting in improved care at lower cost (Irvine 1986; Haines & Feder 1992; Sackett et al. 1996). The National Health and Medical Research Council has published methods for guidelines development in its publication, *Guidelines for the Development and Implementation of Clinical Practice Guidelines* (1995).

The problem lies in the assumption that improved knowledge of outcomes and their causation would lead to long-lasting improvement in health care delivery. This assumption implies that the health system completely controls all those functions, factors and initiatives that can affect implementation. Good clinical indicator measures, clinical practice guidelines and evidence-based practice do not translate into good health service or good health programs as they do not automatically mean a change in practice (Harvey & Kitson 1996; Solberg et al. 1996). At best, they suggest that quality needs improving (Smeltzer, Feltmann & Rajiki 1983; Lohr 1988). Improvements of processes and outcomes are invariably complex and include changes to policies, procedures, applications of techniques, skill mix of staff, inter-team interaction, communication systems, education, and so on. Often the changes required involve many parts of the health care system, located both inside and outside the hospital setting.

Grimshaw and Russell (1993) evaluated 59 published evaluations of clinical guidelines and found that the size of the improvements varied significantly, with most failures occurring during implementation of the guidelines and their evaluation. Another study highlighted the need for a classification of guidelines based on effective strategies (Russell & Grimshaw 1992).

Barriers to implementation

Barriers to health care implementation have been defined as cultural, economic and institutional (Geige & Jones 1990). Outlined below are a number of 'system' issues that are inhibiting effective implementation of standards and guidelines in health care. These need to be addressed if a health outcomes approach is to succeed in health care.

1. There is usually poor alignment of processes between departments. Often the approach to service delivery and quality management varies considerably between departments, reflecting the background of the individual taking the lead role. The result is the lack of compatible policies and procedures between teams. This reinforces their separateness and autonomy. The fragmented system is often based on professional or departmental lines. The Quality in Australian Health Care study showed that major groups of adverse events occurred between specific fields of practice, rather than within them (Wilson et al. 1995).

The importance of addressing the lack of alignment within the health system cannot be ignored, considering that health funding models are moving towards the maintenance of the health of catchment populations. These new models are based on integrated health care delivery models. There can be little debate over whether many traditional hospital services are being transferred to ambulatory care settings or other community-based settings. The traditional community-based programs themselves are becoming more complex as coordination is required between an increasing range of service providers, for example, general practitioners and inter-agency networks. These linkages will not succeed without addressing the issue of alignment of processes between services.

2. Given that much of the outcomes focus is based on the treatment of individuals and the detection of errors in the care delivery system, the resulting mechanism to address many of the issues arising also focuses on individuals. It is unfortunate that many of these mechanisms have adversarial overtones, despite the best intentions (Leape 1995; James 1997). The question is raised whether the reason for this is that it may be easier to lay blame and deal with the individual rather than to change the system in which they work (Marszalek, Gaucher & Coffee 1990; Leape, Bates & Cullen 1995).

It is very difficult to involve clinicians in a health outcomes approach or to comply with best practice guidelines when the punitive approach is continuously being reinforced by professional groups. An example is the current interest in the public reporting of data involving quality report cards. Discussion within the colleges on quality issues tends to concentrate on clinical competence of health professionals as a process of recertification. The Quality in Australian Health Care study identifies that 'the greatest overall quality improvement is likely to come from redesigning the health care system to make it easier for clinicians and other health care workers to deliver safe high quality care...this required approaches to error detection and error management which are not punitive and extend beyond rigid professional groups' (Wilson et al. 1995).

3. A barrier to the implementation of a health outcomes approach in many institutions arises from the way in which they were developed. Often hospital quality activities are isolated within one professional group or one hospital department. Isolation in developments often results in poorly constructed processes for implementation into mainstream delivery of clinical care. Too often lack of funds or lack of support from management is blamed for poor planning of the implementation process (Richmond 1990).

In one institution there may be an array of varying approaches to developing health outcomes practices, resulting in a multitude of ways of addressing implementation. The dilemma is made more complex by all parties insisting that their way is correct.

- 4. In the health system, the most common reaction to a problem is to change a policy. As health administrators, we know what is expected to happen with our policies and procedures but do we know what actually occurs? A change in policy does not always automatically result in a change in practice. Within my own organisation, a quality improvement review was conducted on the use of policy and procedure manuals throughout the organisation. The investigation revealed the following.
 - Many staff were not aware of what policies existed, and time constraints resulted in low use of policy and procedure manuals.
 - Many of our manuals were too long, repetitive and difficult to follow. Many policies were quite verbose and it was very time-consuming trying to find the one paragraph to answer your question.
 - Different manuals had conflicting information, outdated information or three or more revisions of the same policy located together.
 - If a new policy was introduced, there was no way of knowing if it was being implemented throughout the organisation. Many staff would say: 'I didn't get a copy', as a reason for non-implementation.

It was unfortunate that no article could be found in the health journals on this issue. This fact raises some interesting questions about the importance placed on this issue in health service delivery.

5. One of the principal barriers to implementation in most institutions is that it often relies heavily on a few persons to spearhead the process. These people take it upon themselves to educate others and ensure change is instigated. The difficulty is that much of their knowledge of what works in the system is lost when they leave.

When a new staff member joins a team, either on a temporary or permanent basis, they have to learn a lot of the procedures relating to that particular department by being shown by another staff member. This process is timeconsuming and often ineffective. Often new staff are embarrassed to ask questions, and existing staff are not trained to be 'educators', even if they had the time. The conclusions to the five points raised above are twofold. Firstly, if we cannot control variation in all those functions, factors and initiatives that can affect implementation, how can the health system establish the baseline to commence monitoring variation? Donabedian (1986), who is a leader in health care quality assurance, emphasised that evidence-based practice will succeed only if all decisions are based on fact. This involves identifying the gap between existing service delivery and the desired outcome. With the lack of data on system issues, for example, monitoring policy, adherence to procedure and communication linkages within the health sector, the task of establishing the baseline is almost impossible.

Secondly, it raises a more general issue, namely, the inability of the health system to accommodate change in general. There is agreement that changes within the health system are occurring at an exponential rate. Federal, State and area initiatives are juxtaposed with changes occurring with continuous improvement methods at the local level and coupled with demands from professional groups and consumers for evidence-based practice and advances in technology. There is a desperate need to ensure that the structure and processes within health organisations accommodate the change process.

Why is the delivery of health care improving?

The improvements in health care are often attributable to factors outside of institutions, for example, technology, improved funding and diagnostics. These factors do not result in system-wide improvements. That the delivery of health care is continuously improving is a credit to our staff who are prepared to continuously work harder, often ignoring the 'system' in which they work in order to maintain their high standard. However, staff within the health system are tired and feel unsupported in the pursuit of quality improvement. This is reinforced by poor communication and a bureaucracy that requires considerable rework. I challenge any health administrator to say with confidence that their system is working well. If these issues are not addressed, the corporate culture of the organisation will continue to deteriorate to the point where decision-making and organisational processes are affected. This sets the scene for an accident or an incident to occur.

Deming (1986) identifies that 85 per cent of problems are system problems and therefore it is not appropriate to blame the individual. The total quality management literature also stresses both the need to fix systems by reducing unwanted variation and the importance of leadership taking responsibility for correcting the system (Crosby 1979; Deming 1986; Juran 1988). In recent years

there is increasing emphasis in the total quality management literature on focusing on the internal customer and the need to develop intrinsic motivation of all staff as a key to success (Ishikawa 1985; Senge 1990). This unlocking of the potential within staff will occur only if staff feel supported within the organisation (Crosby 1979).

Towards a solution

The focus on outcomes, the selection and gathering of data and the development of best practice guidelines equates to the traditional quality assurance cycle. The quality assurance cycle historically applied in the health care industry has four stages.

- 1. Selecting data to be measured and gathering the data.
- 2. Assessing the information collected.
- 3. Modifying the process of care as a result of the assessment.
- 4. Evaluating the effect of the modification on the quality of care.

The health system needs to acknowledge that it is unable to close the feedback loop, that is, complete Stages 3 and 4 of the quality assurance cycle. The result is that many of the benefits of data collection are being lost. There is a paucity of evidence that previous quality assurance programs actually did anything to improve outcomes for patients (Chassin 1996). The question remains whether the cycle or its implementers are at fault.

One solution is for health administrators to emphasise the development of an integrated (quality) management system to coordinate processes, information flows and interfaces required to implement best practice guidelines. We need to manage the system to ensure quality; that is, the management of quality as well as the quality of management is important.

If an organisation has a quality management system, then the quality assurance cycle can be closed across the entire system. This allows disciplines, departments and specialties to be aligned and speak a common language, thus allowing the closure of the feedback loop. At this point the organisation can demonstrate an effective quality system. The ability to close the quality assurance cycle in one clinical outcome area, rather than in all areas, is not sufficient to demonstrate an effective quality management system.

Campbelltown Health Service (incorporating a 230-bed hospital, mental health service and the full range of community health services) chose international certification (ISO 9002) as a recognised methodology containing the structure

and processes which an organisation needs to be aligned in order to ensure that variation is controlled and closure of the feedback loop is guaranteed. International certification has a track record in over 200 countries. The service achieved certification in February 1997. Within the space available, it is impossible to describe the ISO 9002 system. The remainder of this article will emphasise the key components of the ISO 9002 system that have had the greatest impact on the development of a health outcomes approach to service delivery.

1. Internal audit program

An internal audit program is in place to review the quality management system (rather than individuals) and assess its effectiveness. For example, with the implementation of best practice guidelines into day-to-day practice, the audit process would demonstrate whether:

- operationalised procedures adequately describe the system activities
- procedures that are in place are being consistently applied by staff
- there is a need for an improvement or corrective action
- staff training needs are being adequately addressed
- standards are being maintained.

The audit process is carried out by 30 internally trained staff, in a non-punitive manner. The aim of the audit process is to improve the system to enable staff to deliver high quality care.

A further advantage of the audit program in the clinical area is that it has associated with it a coordinated system for ensuring that all issues identified during the audit are actioned and evaluated. This system of corrective action has assisted greatly in providing a non-threatening system to implement recommendations arising from other quality improvement initiatives, including adverse incident monitoring and any problem identified by staff or patients.

2. Document control

A challenge in the implementation of best practice guidelines is to gain interteam cooperation with systems thinking and commitment to change practices. This needs to occur both verbally and in writing by ensuring that all manuals 'communicate' with each other and can be easily updated.

In a quality management system, document control is imperative. What will happen in the implementation of best practice guidelines if each department:

- is left to 'interpret' the guidelines based on their own philosophy and practices of quality care?
- is given a copy of the best practice guidelines and instructed to change their practice?
- is territorial and/or too busy to cooperate?

The issues surrounding document control in an ISO 9002 system resulted in Campbelltown Health Service completely revising all policy and procedure manuals across all sites, commencing at a zero base hypothesis. Key elements of document control include the following.

- (i) There is no repetition anywhere in the system. This decision alone more than halved the size of most manuals. All manuals are compatible, complementary and presented in a standard format. Manuals 'communicate' with each other by each manual identifying its scope and purpose and by cross-referencing to other manuals.
- (ii) Operation manuals accommodate all procedures that are applicable across the system. The information is not available in departmental manuals. This further reduced the size of departmental manuals.
- (iii) All manuals have a custodian, an owner, who is responsible for revisions and distribution. The revision process is clearly identified to allow all staff to be involved; to allow quick identification of revised sections; to ensure the manual is kept up to date.
- (iv) There is no ambiguity or opportunity to interpret. All manuals are used as the basis of internal audits. The question often asked during an audit is whether staff are actually complying with what is actually stated in the manuals.

3. The development of work instructions

The health system has never before been exposed to 'work instructions'. This includes documenting how to implement work practices in sufficient detail to enable each staff member to understand their required actions, responsibilities and authorities. Guidelines for what has been written are 'where their absence would adversely affect the quality of service'. Work instructions at Campbelltown have been developed through team consensus and written by the staff themselves. The implementation of best practice guidelines can now be interpreted to individual staff responsibilities. The writing of work instructions has actually helped support existing staff and educate new and casual staff.

In the health area it is often taken for granted that the staff basically know their job. Why then are work instructions needed?

- (i) In the development of best practice guidelines, new processes often need to be introduced, particularly if the system has been re-engineered. Work instructions document these processes in detail. Previously a lot of the information that needed to be communicated to others had been carried around in people's heads. But what happens when the people who know the processes leave or are unavailable to assist?
- (ii) People do forget procedures, particularly if the tasks are carried out infrequently or if the staff are stressed, tired or rushed.
- (iii) Many adverse incidents and much rework is due to new or inexperienced staff members who have had insufficient training and lack access to easy to use written information to guide them, for example, agency staff, relief staff, casuals and new staff. These staff use work instructions as a guide when required.
- (iv) Not all staff understand the scope of their work, that is, required actions, responsibilities and authorities. The comment was made that 'they never realised before how many ways everyone had of doing the same job and all insisting they were correct'. The agreement was to investigate and document best practice.

Document control and work instructions together mean that changes in the system can occur rapidly and that the system is flexible enough to accommodate many changes simultaneously.

4. A platform for change

The advantage of having a quality management system is in having a platform to rectify problems in the system wherever and whenever they arise. The focus at Campbelltown in the clinical area is twofold. The first focus is improved documentation in the written medical record. This is occurring partly as a result of a cultural shift arising from increasing attention being given to documentation throughout the organisation. The bar for what is acceptable is rising. Anything documented is subject to internal audit. It is also occurring due to improved clinical documentation in other areas. For example, the implementation process for critical pathways is following the ISO 9002 format.

The second focus in the clinical quality area is in the advancement of adverse incident monitoring and the encouragement of all staff to raise current issues requiring corrective action. The visiting medical officers are cooperating as there is a quality management system for corrective action. The system of corrective action addresses any non-conformance that has been identified, actions that need to be implemented, a review date for evaluation and a person responsible for its completion. Monthly reports on corrective action in the clinical area are sent to the Clinical Review Committee, which considers the effectiveness and efficiency of the service delivery process. It is totally focused on the system, rather than on the individual, and therefore perceived as non-threatening.

This paper has challenged the assumption that improved knowledge of outcomes and their causation will lead to more rational decision-making, resulting in improved care at lower costs. The assumption implies that the health system completely controls all those functions, factors and initiatives which can affect the implementation of the standard. There is evidence that changes in policy do not automatically mean a change in practice, and that health care has never systematically closed the feedback look on the quality assurance cycle. The cost is not only in the dollars spent on health care, but also in the stresses and strains placed on staff who are continuously working harder. The health system needs to emphasise structure and processes of implementation before it continues its exponential growth in improving the sophistication of data collection techniques. One system that needs strong consideration in the health system is international certification to the ISO 9000 series.

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REJOINDERS

Australian Health Review sought the following replies to the commentary 'Why a traditional health outcomes approach will fail in health care and a possible solution' by Lesia Gale.



And the winner is...'system'!

Тім Ѕмутн

Tim Smyth is Deputy Director-General, Policy, New South Wales Department of Health.

Gale's paper is an interesting one that challenges and frustrates. The assertions made are often right, but for the wrong reasons at times. I have more faith in the potential of approaches focused on improving health outcomes but share the concern that we do not have in place the structures and processes required to achieve them. Quality improvement is not a substitute for improved health outcomes; it is a key tool to achieve them. We need both.

Why things happen in Australian health care is still much of a mystery. Why is it that some developments, technologies or research findings rapidly diffuse into health care delivery policy and practice and yet others take years, if at all? Unfortunately, we do not yet spend enough time on research into changing behaviour in health care. What is it that influences changed behaviour? How can we facilitate positive change and discourage change that does not improve health outcomes? The point is well made that we spend a lot of time on the collection of data and the development of policies but precious little on how to effectively implement the results. More work needs to be done if Australian health care is to become a 'learning organisation'.

There are two key points that Gale's paper highlights: translating knowledge into practice and the importance of systems. The quality improvement pathway, whether ISO, AQA, EQUIP or whatever, is an essential tool to help translate knowledge into practice and to build a sense of system in Australian health care. Process improvement by itself is not enough. You need the right process and this is where a health outcomes approach comes in. Through the use of both you get synergy. While reading the paper a word kept recurring – 'system'. To achieve quality you need to focus on processes and system improvement. To achieve a better health outcome you need to build effective health care systems providing integrated high quality care. This is a key challenge facing Australian health care – how do we build a health care system?

Unfortunately, Australian undergraduate and postgraduate training does not place enough emphasis on system. Our health professionals are still trained in isolation from other professions. Many students get very little exposure to the many parts of the system. They do not have much opportunity to follow the path of chronic illness or the interaction of families, people with mental illness and the frail aged with the wider dimensions of our human services delivery 'systems'. The teaching and practice of the principles of quality improvement are also largely absent.

Another important tool that assists in creating a system is clear sense of direction. A good corporate plan, appropriate to the organisational level involved, provides the framework for the quality improvement and system building processes. Perhaps this is another factor behind the failure of both health outcomes and quality improvement projects?

Many Australians can recall the words of the International Olympic Committee President when announcing the winner of the right to host the 2000 Olympics. Hopefully, we might be able to also announce in due course that in Australian health care, 'the winner is...system'!

Are we ready for change?

CATHY O'HARA

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There is no doubt that improved knowledge of health outcomes and their causation will lead to improved care at a lower cost. The question is: How prepared are we to accept the challenge that ultimately demands change in an industry that until recently was steeped in tradition?

Gale's paper clearly identifies that the principles of total quality management still apply in health care, but that they are less easily implemented. The health system is changing at an ever-increasing rate and, to that effect, it is easier to go for the quick fixes, rather than using the more resource-intensive approach that underpins the principles of total quality management.

Although understanding variation will lead to a greater knowledge of key drivers within health care, the mass collection of data will only ever be as good as the systems that are in place to support and encourage the required improvements. The look-good approach is often easier, even if it is ineffective or, in fact, useless.

Changing the mindset of how care is delivered is not something that will happen overnight. In particular, it takes away the burden of examining how processes really work and the role that individuals play. Placing blame is often used as an outcome and this, though human nature, does lead to punitive action replacing process improvement. The development of health outcomes practices demands a collaborative approach that is robust and not merely a paper shuffling exercise. Getting individuals to work together requires commitment, removing barriers and introducing trust. Focusing on the process instead of the individual takes longer, is more complex and certainly more time-consuming. Gale's comments on policies and procedures are accurate and apply to most institutions, but are not ones often discussed.

Stating that staff within the health system are tired and unsupported is not absolute, and many administrators know that it is only through the development and support of their staff that change can be implemented and maintained. What is more difficult is the need to allow staff to be involved in decision-making and, in effect, that demands a shift in the balance of power. There is no doubt that in this they feel frustrated and unsupported. The first step towards a solution is in the hands of administrators, first to provide leadership and embrace change themselves. Regardless of what methodology is used, the basic elements of quality management still apply.

In summary, Gale's paper is thought-provoking and identifies a number of questions that we all struggle to find answers to...What is quality care and does it actually exist?

Patient outcomes paramount

TONY ADAMS

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I must admit to having been slightly taken aback initially by the title of Gale's paper until I realised that the author was not so much deprecating a health outcomes approach, but rather the 'traditional' approach with which she assumes we all can readily identify.

For someone like myself who does not work directly in the quality health care field, it is far from clear that there is an obvious 'traditional' versus 'contemporary' approach. Rather, the discipline seems to be still very much an evolving one, despite the writings of the ancient gurus such as Donabedian and others.

The subject is currently of high interest in Australia and will remain so for many a decade as health administrators do their darnedest to make hospital care, in particular, as safe as possible for patients.

The author rightly points to the need for existing quality assurance mechanisms to ensure that feedback loops are closed and that all players in the health care game, particularly clinicians, are intimately involved in the implementation and evaluation of such mechanisms. But surely patient outcomes must remain the paramount measure. The adoption of the type of quality management system exemplified by the ISO 9002 approach may well be the answer to many of our dreams for better health care and the Campbelltown Health Service deserves our thanks and congratulations for their initiative in giving the system a try.

We look forward to the sequel to this paper, which should tell us precisely the sorts of improved patient care outcomes achieved and at what cost, plus an idea of the long-term acceptability to all concerned.

If the current enthusiasm for this new approach is also translated into effective results over several years, then this will be progress indeed.

The hospital financing system in Germany

BEATE OSWALD

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Abstract

In common with other western countries, German health expenditure had been increasing at a rapid rate in recent years, especially in the hospital sector. This paper describes the reaction of the German legislator and summarises what has happened over the last few years following the introduction of the extensive Legal Reform Act. The paper puts the main emphasis on a new differentiated benefit system for hospitals, which is a requirement from 1996 onwards, after a transitional period. It shows the single components and the modalities of the new system and the possibilities of combining the new types of payment.

Introduction

In 1993, health insurance funds (gesetzliche Krankenkassen) in the former West Germany spent nearly DM60 587 million funding recurrent expenditure in the inpatient care sector. This compares to DM6251 million spent in 1970, an increase of 870 per cent in nominal terms. In real terms (using the German health price deflator for services of physicians, hospitals and other services in the health care sector, published by the Statistisches Bundesamt 1996, pp 108, 111) the increase was 208 per cent. The rest of the expenditure of the health insurance funds increased at a slower rate of 111 per cent in real terms.

The proportion of health expenditure of gross national product (in constant prices) increased from 6.5 per cent in 1970 to 9.5 per cent in 1993. See Table 1 for further data (also in constant prices).

The figures in this paper refer to the former West Germany. Current exchange rate, A\$1 = DM1.30 (approximately)

	1970 (DM)	1993 (DM)	increase (%)
Total expenditure in the health care sector per inhabitant in constant prices (1970 = 100)	1 149	2 273	97.8
Expenditure for inpatient treatment per patient in constant prices (1970 = 100)	1 519	2 302	51.5
Expenditure for inpatient treatment per nursing day in constant prices (1970 = 100)	64	151	135.9
Expenditure for inpatient treatment per hospital bed in constant prices (1970 = 100)	20 755	47 012	126.5

Table 1: Increase in West German health expenditure, 1970–1993

Source: Statistisches Bundesamt 1996; author's calculations

Between 1936 and 1972 Germany operated under a monistic financing system. The legal health insurance funds were the single source of funding. Under the dualistic financing system which currently operates, recurrent costs are paid by the health insurance funds and capital costs are paid by the Federal Government, the federal states and the municipal authorities. This is referred to in Table 2 as 'public budget'. Capital expenditure is one small part of the public budget. Capital expenditure only increased 2.45 times between 1973 and 1993, to bring capital expenditure in nominal terms from DM3589 million to DM8808 million in 1993. This means an increase of 9.3 per cent in real terms (Statistisches Bundesamt 1996, pp 61, 70, 108, 111; author's calculations). The reason for comparing capital expenditure figures of 1973, rather than those of 1970, is that the change in the financing system means figures, which are directly influenced by the system-change, for the years before 1973 are not comparable with later years. But generally all the other figures are comparable.

As Table 2 shows, there is no change in the proportion of total expenditure funded by the public budget. It is nearly constant at 14 per cent, despite the change in the financing system. The great losers are the legal health insurance funds.

Reasons for continuing increases in health expenditure

Possible reasons for continuing increases in health expenditure are:

- lack of control mechanisms in the health market, which leads to over capacity, inefficiency and an increase in unnecessary medical treatments
- increasing proportions of elderly persons

Source of funding:	1970 West Gei	rmany	1973 West Gei	rmany	1993 West Ge	ermany	Nominal increase	Real increase	
	DM (million)	%	DM (million)	%	DM (million)	%	1970–1993 (%)	1970– 1993 (%)	
Public budget	9 871	14.2	15 221	14.1	52 700	14.0	434	77	
Legal health insurance funds	24 712	35.5	42 559	39.3	172 398	45.8	598	111	
Pension insurance funds	6 561	9.4	9 107	8.4	25 137	6.7	283	27	
Legal accident insurance	2 520	3.6	3 373	3.1	13 960	3.7	454	83	
Private health insurance funds	3 616	5.2	4 739	4.4	22 102	5.9	511	102	
Employers	16 495	23.7	25 537	23.6	60 719	16.1	268	22	
Private budget	5 899	8.5	7 716	7.1	29 516	7.8	400	66	
Total	69 674	100	108 252	100	376 532	100	440	79	
Source: Statistisches Bundesamt 1	1996, pp 24, 27; aı	uthor's calc	ulations						

Table 2: Health expenditure by source of funding

- more emphasis on preventive medical check-ups
- improvements in medical treatments
- progress in pharmaceuticals
- innovations in highly expensive medical equipment
- the reduction of infectious diseases but with a simultaneous rise of chronic and degenerative diseases, which are more costly to treat.

The large increase in hospital expenditures resulted in a deficit for the health insurance funds of DM5590 million in 1991 and a deficit of nearly DM9100 million in 1992 (Bundesministerium für Gesundheit, German Federal Ministry of Health (228) 1997, GKV-Statistik).

The Legal Reform Act in Germany, the GSG (Gesundheitsstrukturgesetz) introduced in 1993, should help to control the increase in health expenditure and the increase in rates of subscription to the health insurance funds.

The objective of this reform Act was to control expenditure during the period 1993 to 1994–95 through immediate capping of the budget for the inpatient sector, increasing user charges for most patients, as well as some structural changes. One of the most important structural changes was the introduction of reinsurance arrangements between the health insurance funds (risk structure compensation).

With a change in the BPflV '95 (Bundespflegesatzverordnung 1995), which was already initiated by the GSG '93 (Gesundheitsstrukturgesetz 1993) and came into force in 1995, the legislator aims to carry the reform process further. After a transitional period for the implementation of the new benefit system (from 1993 to 1994–1995), the new system is a requirement from 1996 onwards. Additionally, a law exists for stabilisation of hospital expenditure for 1996 (Gesetz zur Stabilisierung der Krankenhausausgaben 1996) and a second one came into force on 1 January 1997 (Beitragsentlastungsgesetz), which effects a 1 per cent reduction in the budget of each hospital for every year from 1997 to 1999. Additionally, the law brought about a higher financial burden for insured people (for example, because of higher direct payments for medicine), on the one hand, and a decrease in contribution rates, by simultaneous decrease in medical aid, on the other.

Two further required steps of the Legal Reform Act came into force on 1 July 1997: the 1.NOG (Neuordnungsgesetz) and the 2.NOG. One of the important aims of this law should lead to more competition among the legal health insurance funds and to more efficiency in that area.

Since the BPflV came into force, the situation for the health care sector could be characterised as somewhat unstable and accompanied by continual adjustments of the legislation.

Instead of the previously used reimbursement system under which hospitals could claim reimbursement for all recurrent expenditure, a differentiated benefit system with medically fair benefits was introduced by the 1995 BPflV. One of the main aims was more control of the growth of hospital expenditure through increasing incentives for efficiency. The components of this new differentiated benefit system are outlined below.

Fallpauschalen (FP): These are single payments per patient, which should cover the whole cost from the day of admission to the day of discharge, including outsourced services (see also Figure 1 and the calculation in Table 3). The costs can be split into four groups of expenditure:

- ward services, standard care and intensive care unit
- surgical services
- investigation and treatment, for example, costs for laboratory and X-ray diagnosis, nuclear medicine and radiotherapy, electrocardiography, diagnosis of lung function, sonography and endoscopy. Some of these services may be obtained through outsourcing, for example, pathology or transportation of patients.
- support services; for further details, please see the Basispflegesätze (BP) below (legal basis is § 11 BPflV).
- Sonderentgelte (SE): This is part of the FP, and covers the costs of an operation, that is, it remunerates for 'surgical services'. For details, please see the calculation in Table 3. It also includes outsourced services. However, there is a difference in comparison to the corresponding part of the FP. The SE calculation does not include two kinds of costs: cost of upkeep for medicine technique and goods of medical needs. These costs will be remunerated by the AP and BP (legal basis is § 11 BPfIV).
- Abteilungspflegesätze (AP): This includes the benefits for medical and nursing work in the department which provides or arranges the service, and which are not already covered by the FP or the SE (legal basis is \$13 BPflV).
- Basispflegesätze (BP): This component is for non-medical and non-nursing work where the costs are not covered by any other components of the benefit system. The BP compensates for the costs of accommodation, catering, cleaning, administration and so on (legal basis is § 13 BPflV).

- Vorstationäre Behandlung (VB): Remuneration for medical services which happened before a hospital stay, for example, services which evaluate whether a hospital admission is necessary, or prepare the patient for the hospital stay. The VB is limited to a maximum of three treatment days during the five days before the hospital stay (legal basis is § 115a SGB V).
- Nachstationäre Behandlung (NB): This is remuneration for treatments after a hospital stay which are necessary to ensure the success of the hospital procedures. The NB is limited to a maximum of seven treatment days during the 14 days after the hospital stay (legal basis is § 115a SGB V).
- Ambulantes Operieren (AO): Remuneration for outpatient operations (legal basis is § 115b SGB V). It does not include outpatient services such as outpatient clinics for diabetics. But if a diabetic patient undergoes an outpatient operation, the clinic will get higher remuneration than for non-diabetic patients because the service for the diabetic is more costly.

Originally Germany had 40 FP and 105 SE. They are listed in the appendix of the BPfIV. After the 1. Änderungsverordnung from 14 June 1995 and the 2. Änderungsverordnung from 8 August 1995, the FP and SE lists were enlarged to include obstetrics, heart and thorax surgery. This increased the number to 73 for the FP and 147 for the SE. It is planned to enlarge the FP and SE catalogue in the future.

Figure 1 shows how the new benefit system works.

Below is an example of costs for one FP and the corresponding SE, calculated as the means of 15 German hospitals for 387 patients. The example was calculated as a basis for fixing the point system in Germany, required by the Bundesministerium für Gesundheit (German Federal Ministry of Health). Tables 4 and 5 show the derived results from these calculations for the new law (BPfIV).





		Means of all hospitals for FP 17.02	Means of all hospitals for SE 17.06
Chara	acteristics:		
ave	erage age	80.56	
pro	portion of patients who are older than 65 years	93.65 %	
nur	sing days	24.60	
Ward	services, standard care:	DM	DM
1.	physician services	629.24	
2.	nursing services	2 891.96	
3.	material costs	604.40	
	Total costs of standard care	4 125.60	
Ward	services, intensive care unit:		
4.	intensive physician services	109.56	
5.	intensive nursing services	230.23	
6.	material costs	102.85	
	Total costs of intensive care unit	442.64	
Surgi	cal services:		
7.	physician services, surgical procedure	501.49	501.49
8.	other health personnel, surgical procedure	494.70	494.70
9.	physician services, anaesthesia	312.46	312.46
10.	other health personnel, anaesthesia	175.86	175.86
11.	medical equipment services*		
	Total personnel costs, surgical services	1 484.52	1 484.51
	material costs of surgical services**	2 409.20	2 353.28
	Total costs of the SE (nos 7 to 11) respectively,		
	total costs of surgical services (= part of FP)	3 893.71	3 837.79
Inves	tigation and treatment:		
11.	personnel costs	502.31	
12.	material costs	174.99	
	Total costs of investigation and treatment	677.30	
Supp	ort services:		
13.	personnel costs	1 624.76	
14.	material costs	1 553.72	
	Total costs of support services	3 178.48	
Total	costs, summary:		
15.	personnel costs	7 472.56	
16.	material costs	4 845.17	
	Total costs of this kind of case/patient	12 317.73	

Table 3: Example for calculating an FP and the corresponding SE

* This kind of cost will be calculated only for some particular FP or SE. One example is heart surgery. Normally a cardio-technical engineer is required for this kind of operation. For the FP 17.02 (which is calculated in the above example) a cardio-technical engineer is not required, so that there is no cost for the position 'no. 11: medical equipment services'.

** Two kinds of costs are not included in the SE calculation: cost of upkeep for medicine technique and goods of medical needs.

Source: Bundesministerium für Gesundheit 1995, Band 45, pp III 105, II 150.

Table 4: FP 17.02

FP-number	17.02	
Definition	*	
ICD-9	820.0,.9	
ICPM	5-820.3 and .4	
Points for FP		
Personnel	7 230	
Material	4 330	
Total	11 560	
Maximum allowed length of stay**	34	
Part of points for support service	S	
Personnel	1 270	
Material	1 290	
Total	2 560	
Length of stay***	20.91	

* Definition: fracture of the neck of femur, closed

** The maximum allowed length of stay in a hospital is derived from the length of stay (see the last row). The maximum allowed length of stay is calculated by the length of stay (last row) plus two standard deviations (calculated from the length of stay of the above-mentioned 387 patients), or plus seven days if two standard deviations are smaller than seven days. If a patient stays longer in hospital than the maximum allowed/permitted length of stay (in this case, for example, 36 days), the hospital can cash up the 34th day to the 36th day by an AP and a BP per day. The FP 17.02 covers all the costs including the 33rd day. For more details see the section on modalities of reimbursement below.

^{***} The last row shows the average length of stay of the above-mentioned 387 patients, which is reduced by 15 per cent because of the estimated or expected effect from the new system of reimbursement.

Table	5:	SE	17.	06
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SE number	17.06	
Definition	-	
ICD-9	820.0, .8	
ICPM	5-820.0 to .2	
Points for SE		
Personnel	1 530	
Material	2 470	
Total	4 000	

* Corresponds to FP 17.02.

German hospitals have been forced to use the new benefit system since 1 January 1996. There is an FP and an SE catalogue. Tables 4 and 5 show an excerpt of the catalogues, especially of the FP and SE explained above.

Because there is no maximum allowed length of stay in the intensive care unit for this FP and SE, it is not mentioned in these excerpts.

Scales of reimbursement

- An AP could range between DM180 and DM280 per day in 1996. It can differ from hospital to hospital and among each department of the hospitals.
- The BP was between DM100 and DM140 per day in 1996. It differs from hospital to hospital.
- The fictive lump sum (substitute for AP plus BP) was about DM260 per day in 1996.
- The value of one personnel point, for example in Bavaria, was DM1.0869 in 1996.
- The value of one material point, for example in Bavaria, was DM1.0837 in 1996.

In all the above-mentioned cases, deviations are possible in both directions, up or down.

Every FP/SE is remunerated by a special amount of points per case, in which the amount of points per case are fixed but the value of the point is variable. (Originally the value of one point was DM1 in 1993). The value of one point is negotiated between a group of representatives of the hospitals and of the health insurance providers in each federal state for the duration of one year. The values of the points for FPs and SEs as well as the remuneration for VB and NB apply for all hospitals in that federal state. So a Bavarian hospital cashes up 1.0869 x 7230 + 1.0837 x 4330 = DM12 550.71 per FP 17.02, in case the operation was in 1996. With this remuneration, all costs have to be covered from the day of admission until the day the patient is discharged.

There is a possibility for a hospital and the insurance funds to negotiate a special value of the points, that is, either a surcharge or a reduction of the FP/SE if there are special circumstances which warrant such changes.

In contrast to the FP, SE, VB, NB and the remuneration for outpatient treatment, the AP and BP have to be arranged between each hospital and the health insurance funds individually. The budget is bound for the calculations. From 1972 to 1995 the budget of every hospital was adjusted to the growth rates

in personnel and material costs every year. Additionally, until 1995 Germany had a system of flexible budgets, for example, if a hospital had more or less receipts because of more or less patients, there was a compensation to a certain degree (for details, see the old BPfIV, which was valid before 1995).

For the time being, Germany has a system of fixed budgets. For example, in 1996, on the whole, there was no need to adjust the budget. The only adjustment was a single payment of DM300 per employee (see also Stabilisierungsgesetz 1996). This amount was not sufficient to cover inflation in personnel costs. One of the effects of a system of fixed budgets is as follows.

For example, if a hospital in 1996 had more receipts (that is, DM18 million instead of the agreed DM15 million) because of more patients than planned and agreed in advance, it was forced to pay back exactly that amount it received for the extra number of patients at the end of the year (in this case DM3 million). That means the hospital treated these extra people for whom they did not correctly plan without any payment. Therefore, the closer it gets to the end of a year in Germany, hospitals which are close to their agreed limit will possibly send new patients on to other hospitals or try to do the operation in the next year, if no emergency treatment is required. In 1997 hospitals will have to pay back just 75 per cent of receipts which were not planned.

In the opposite case, if a hospital has treated less patients than planned, they are allowed to keep 50 per cent of the agreed budget for covering the fixed costs (see also § 12 IV and § 11 VIII BPflV '95 in connection with § 3 Stabilisier-ungsgesetz '96).

Modalities of reimbursement

Every main service for a patient in a hospital which is mentioned in the FP catalogue has to be reimbursed by an FP. Every service which is mentioned in the SE catalogue has to be cashed up as an SE. If there is a service mentioned in the FP catalogue as well as in the SE catalogue, it is not possible to choose between FP or SE. In this case, a hospital is forced to cash up an FP.

With one exception (this is FP 7.01, that is, 'Tonsillektomie', which could be ICD-9: 474.0; 474.1, .8, .9 and ICPM: 5-281.0, .4, .x, .y, 5-282), all FPs have to be cashed up for patients who have already finished their 14th year of life. This age limit is not valid for SE. If a patient is too young for an FP, the hospital will cash up an SE.

Normally an FP contains all necessary additional treatments of all typical attendant symptoms (for example, various diseases of elderly patients such as

diabetes or hypertension). In this case the consequences are that hospitals will not get more money for additional treatments. If the additional treatment is very difficult or very costly, hospitals will get the FP plus an additional reimbursement.

The above-mentioned rules are the general rules. There are more specific rules for heart surgery and obstetrics, which will not be discussed here.

Possibilities for combining the new types of payment

(Source: Bundesministerium für Gesundheit 1995, Band 44)

FP + SE

It is not usual to cash up an FP plus an SE, although there are two exceptions: if it is necessary to do an additional operation in another operation field or to treat an already treated disease again, the hospital will get an SE for these additional services. This second operation could either happen during the first operation or some days later. It is important that the patient does not leave the hospital in between the two different operations. One problem is to define 'another field of operation'.

Example

Assume that we have a patient who will receive a knee prosthesis (FP 17.09, ICPM could be: 5-822.1 to .7, .9) and simultaneously a hallux valgus operation (FP 17.12, ICPM could be: 5-788.3, .4). It is not possible to reimburse for two FPs because double payment would occur. But the hospital is reimbursed for the knee prosthesis with FP 17.09 and for the hallux valgus operation with SE 17.19. Because both operations happened in the same department, namely, the orthopaedic department, there is no possibility to cash up an AP for the orthopaedic department additional to the SE. But as we see later, the combination SE + AP + BP is very common.

FP + AP + BP

For every FP there is a maximum allowed length of stay in days. This is fixed in the FP catalogue. If a patient needs to stay longer than the permitted days, the hospital can cash up the AP and BP for every additional day. The day of discharge will not be reimbursed.

Example

FP 12.05:	Appendicitis, non perforata (ICPM could be: 5-470.0, .2; 5-479.1) maximum allowed length of stay: 15 days
1st day:	admission
2nd day:	operation
17th day:	discharge
	positions to cash up: one FP 12.05: it covers the costs up to and including the 14th day two (AP + BP): it covers the costs of the 15th and 16th day

FP + a fictive lump sum per day

It could happen that (first) a department of a hospital or (second) the whole hospital gets the reimbursement just by FPs. Therefore there exists neither an arrangement for an AP (in the first case) nor an AP and BP (in the second case). If a patient stays longer in the department than the maximum allowed length of stay, the hospital will cash up these additional days by a fictive lump sum per day as a substitute for BP and AP, independent of the first or second case.

FP + VB/NB

Normally, the FP contains the treatments which are carried out before a hospital stay starts (=VB) or carried out after a hospital stay (= NB). One exception is if the patient stays longer in the hospital than the maximum allowed length of stay and a VB is necessary, a hospital can cash up the AP plus BP per day and, additionally, the NB.

Example

FP 2.01:	Struma, one-sided (ICPM could be: 5-062.2) maximum allowed length of stay: 16 days
1st day:	admission
3rd day:	operation
17th day:	discharge
20th day:	NB (= treatment after a hospital stay)

positions to cash up:one FP 2.01:it covers the costs up to and including the
15th dayone (AP + BP):it covers the costs of the 16th dayone:NB

Calculation of 'length of stay or length of treatment' in the case of FP + VB/NB:

length of stay at the hospital

+ days of treatment before the hospital stay and after the hospital stay

An additional reimbursement is possible if the calculated length of stay/treatment exceeds the limit, that is, the maximum allowed length of stay.

Example

FP 2.01:	Struma, one-sided (ICPM could be: 5-062.2) maximum allowed length of stay: 16 days	
1st day:	VB (= treatment before a hospital stay)	
3rd day:	admission	
4th day:	operation	
16th day:	discharge	
19th day:	first NB (= treatment after a hospital stay)	
24th day:	second NB	
	<i>positions to cash up:</i> one FP 2.01: it covers the cost for 15 days one: NB	

Calculation of the length of stay/treatment of the example:

	length of stay at the hospital:	13 days (from the 3rd to the 15th day)
+	days of VB:	1 day (1st day VB)
+	days of NB:	2 days (19th and 24th day NB)
=	length of stay/treatment	16 days

SE + AP + BP

If we do not have the exception of cashing up an FP plus an SE (see the first case above), we have the normal situation of being reimbursed for the SE once, plus an AP and BP per day. It is important to realise that the department which has done the operation will get the BP plus 80 per cent of the AP per day. The reasoning for that is that an SE obtains the costs for surgical services and the corresponding material. The remaining costs for medical, nursing and therapeutic services will be covered by the AP. Because these costs are already partly covered by an SE, the operating department, which is reimbursed by an SE, will get only 80 per cent of the AP. In the case of an internal patient moving from the operating department to a non-operating department, the non-operating department will get the BP.

Example

SE 12.11:	Cholezystektomie (ICPM could be: 5-511.02, 5-511.22)		
1st day:	admission to the department of internal medicine		
4th day:	patient-moving to the department of surgery		
5th day:	operation in accordance with SE 12.11		
11th day:	discharge		
	<pre>positions to cash up: one SE 12.11 three : full AP (for the department of internal medicine) + BP seven : 80 per cent AP (for the department of surgery) + BP</pre>		

SE + AP + BP + VB/NB

In addition to an SE and the AP plus BP, there is a possibility to cash up every VB or NB which is carried out.

AP + BP + VB/NB

This combination is a possibility as well: For example, a hospital will cash up an AP and a BP for each day a patient stays in the hospital (if the patient has no operation) and a VB (or NB) for each treatment before (or after) the hospital stay.

Conclusion

Some of the expected consequences of the above-mentioned measures will cause greater incentives for efficiency, an increase in competition among hospitals and a reduction in the average length of stay. Germany's average length of stay for inpatient care institutions was 12.2 days in 1993. Until March 1995, the public health insurance funds often paid for nursing. Since 1 April 1995, Germany has introduced an extra nursing insurance. So the average length of stay might decrease. In addition, these reforms should lead to better information about the costs and types of procedures carried out by hospitals, enabling more valid comparison of different hospitals as well as more scientific management. One of the most important aims is a lasting reduction of health expenditure, which has not been realised yet. The Gesundheitsstrukturgesetz, which came into force in 1993, has brought an effective limitation of health expenditure in the short run. The deficit in 1995, for example, was mainly caused by an increasing number of patients (+ 2.6 per cent) and increasing costs per patient (+3.1 per cent) compared to 1994.

Balances (= contribution payments minus expenditure)	East Germany	West Germany
1991 (in million DM)	2770	-5590
1992 (in million DM)	-200	-9100
1993 (in million DM)	1350	9060
1994 (in million DM)	120	2090
1995 (in million DM)	-1840	-5110
1996 (in million DM)	-2140	-4640

Table 6: Ba	lances of	legal l	nealth	insurance	funds
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Note: From 1995 onwards, Berlin-East will be assigned to West Germany.

From the second quarter in 1995, expenditure for constant nursing care will be paid by nursing insurance. From 1994, the figures include payments from or to the risk structure compensation; from 1995, the figures also include payments from or to the risk structure compensation of pensioners.

Source: Bundesministerium für Gesundheit (228) 1997, GKV-Statistik

It is obvious that it will require additional expenditure, hard work and effort on the part of the hospitals to meet all the changes requested by law. Better cost systems and an improved support from electronic data processing are required to manage the new demands of the legislation. One of the problems in the future will be an additional, external quality management, which already has been legally fixed, and should have been introduced on 1 January 1997 to all hospitals. Because of the complexity in organisation and content of the external quality management, there was a delay. At the moment, pilot projects are on the verge of getting realised. The external quality management brings a new wave of bureaucracy into the hospitals because of the necessity to document the required data. A part of the documentation could be used for calculating FPs, SEs and so on, so hospitals can use some synergy-effects. In this context, one difficult task for the legislator is to set and implement quality standards. This is a difficult task, but necessary when remuneration is per patient, as a remuneration per patient system could lead to a reduction in quality.

Abbreviations

AP	Abteilungspflegesatz
AO	Ambulantes Operieren, outpatient operations
BMG	Bundesministerium für Gesundheit, German Federal Ministry of Health
BP	Basispflegesatz
BPflV	Bundespflegesatzverordnung
DM	Deutsche Mark, German Mark/s
EBM	Einheitlicher Bewertungsmaßstab für die ärztlichen Leistungen, standardised valuation scale
FP	Fallpauschale
GSG	Gesundheitsstrukturgesetz
KHG	Krankenhausfinanzierungsgesetz
KHNG	Gesetz zur Neuordnung der Krankenhausfinanzierung
NB	Nachstationäre Behandlung
NOG	Neuordnungsgesetz
SE	Sonderentgelt
SGB V	5. Sozialgesetzbuch - Gesetzliche Krankenversicherung
VB	Vorstationäre Behandlung

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Statistisches Bundesamt 1996, Gesundheitswesen, Fachserie 12, Reihe S.2, Ausgaben für Gesundheit, 1970 bis 1993, Wiesbaden.

For further information please see the following.

http://www.bmgesundheit.de/ (homepage of the German Federal Ministry of Health)

http://www.statistik-bund.de/zeitreih/def/definhg.htm (there are a lot of definitions, sorted alphabetically; to come to a new letter, change the bold letter "g" in the address)

http://www.statistik-bund.de/e_home.htm (homepage of the Statistisches Bundesamt)

http://www.oecd.org/els/health/hc97data.htm (to get OECD-data-series)

Problems in counting and paying for multidisciplinary outpatient clinics

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Abstract

Policy-makers have always found it problematic to formulate fair and consistent counting rules for public hospital outpatient activities. In the context of output-based funding, such rules have consequences which can affect patient care. This paper reviews the rationale for organising multidisciplinary clinics and reports on a series of focus groups convened in four Melbourne teaching hospitals to consider funding policy for such clinics. It discusses issues of targeting outpatient services, along with implications for payment policy. It evaluates counting rules in terms of intended and unintended consequences in the context of Victoria's introduction of output-based funding for outpatient services.

Introduction

Block funding for outpatient services, the current funding basis in Victoria and most other Australian States, provides few incentives (or disincentives) for hospitals to organise clinics on a multidisciplinary basis. Counting rules for occasions of service restrict multiple counting of such visits, the definition of an 'occasion of service' being a contact with a 'functional unit' of the hospital (Health and Community Services 1995) – although this definition could still be used to justify separate counting of, for example, a contact with medical practitioners in the endocrinology unit of the hospital and a contact with a nutritionist from the dietetics unit in the adjoining consultation room.

When payment incentives are attached to activity measures, however, the definition must be more rigorous, and the rates of payment must be based on
an agreed common measure of resource use. Multidisciplinary clinics present problems on both these dimensions. In inpatient care, all activities undertaken on behalf of the patient are considered to be counted and covered in a single admission characterised by the diagnosis related group.

Outpatient care, precisely because patients are 'ambulatory', can be disaggregated into multiple visits, even when there is a high level of consensus about the appropriate constituents of patient care. In many areas of hospital outpatient activity, such a consensus about optimal care processes does not exist, making comparisons across hospitals (and measurement of resources used) difficult. In the face of new counting rules and differential payment relativities, hospitals face substantial incentives to change the way in which clinics are organised and/or reported.

This study was undertaken on behalf of the Victorian Department of Human Services to identify problems which arise from multidisciplinary clinics in the context of the department's proposal to fund hospital outpatient services on an output basis from July 1997, and the Metropolitan Hospitals Planning Board's endorsement of continuing public provision of multidisciplinary clinics (Metropolitan Hospitals Planning Board 1995; O'Connell & Sharwood 1996). It reviews the medical literature on the rationale for multidisciplinary approaches to outpatient services, and reports on discussions from a small series of focus groups convened in four Melbourne hospitals to consider issues of funding policy for multidisciplinary clinics. While the paper is Victorian in focus, the problems identified with regard to counting and classifying outpatient care are common to public hospital systems in all States, and issues of the complementarity or substitutability with services funded under the Commonwealth Medical Benefits Schedule are also shared by all States.

Study approach

Published articles indexed on Medline between 1991 and 1996 (inclusive) were reviewed using search criteria identifying outpatient or ambulatory services and the term 'multidisciplinary'. An overview of relevant papers is provided below.

In addition, meetings with staff of four metropolitan Melbourne teaching hospitals were arranged to discuss the issue of multidisciplinary clinics and alternative funding models. Two hospitals were selected which have deliberately organised their outpatient clinics to facilitate interdisciplinary and multidisciplinary consultation, both of which were involved in the 1996 Non-Admitted Patients Relative Resource Weights Study (NAPS) (Jackson & Sevil 1996). Two additional hospitals were selected, neither from the NAPS sample, which conduct a mixture of single and multidisciplinary clinics. Efforts were made to involve a range of medical specialists and allied health professionals, with wide representation being achieved in three of the four hospital focus groups.

Consulting four to ten key hospital staff at each hospital, we led a focused discussion on:

- the philosophy which underpins this form of clinic organisation
- the range of clinic types encompassed (that is, the different definitions of 'multidisciplinary' which may exist)
- the 'investment' which different professional groups or clinical specialties may have in single versus multidisciplinary clinic organisation
- the impact of the current block funding system and likely effects of alternatives, including casemix funding.

The purpose of the study was not to be able to report on a representative sample of hospitals or clinicians, but rather, to better understand the clinical and other reasons why hospitals might organise multidisciplinary clinics, to investigate the range of services currently provided with some claim to multidisciplinary status, and to involve clinicians and administrators in a discussion of the incentives inherent in alternative funding models. The theme sheet used in these discussions appears as an Appendix.

Literature review

A recent paper by Schipper and Dick (1995) in the *Lancet* makes a persuasive case for the multidisciplinary clinic in the care of patients with complex medical problems. They argue that 'compassion is often lacking in the traditional model of medical care ...when the patient is progressively fragmented while coursing from one specialist to another', yet, 'for complex problems, the knowledge base and treatment mix are too broad and labile for one person to encompass'. Stressing the importance of formulating a comprehensive plan amongst a range of specialists (medical, nursing, psychosocial and spiritual), they conclude that 'the multidisciplinary clinic provides a model wherein if one person cannot encompass all, one integrated team can'.

The international medical literature reveals two broad groupings of studies undertaken with a focus on multidisciplinary practice in outpatient settings. The first are studies which demonstrate (or hypothesise) patient-level clinical improvements attributable to a multidisciplinary model of patient care, and the second relate to indirect and/or organisational benefits of this form of outpatient service. It is notable that studies of multidisciplinary care reviewed here deal primarily with services for patients with chronic health problems, or complex psychosocial problems with a medical component. The largest number of papers were published in nursing journals, with a marked emphasis on nurse practitioner roles.

Multidisciplinary teams have been shown to improve clinical outcomes when compared with usual care in reducing low-density lipoprotein cholesterol levels (Schaffer & Wexler 1995); in dealing with nonorganic failure-to-thrive syndrome in children (Bithoney et al. 1991); in reducing the rate of lower limb amputations amongst renal transplant patients (Foster et al. 1995); in improving treatment outcomes for non-healing leg ulcers (Steed et al. 1993); and in treating chronic pain, especially non-surgically treated lower back pain (Tyre, Walworth & Tyre 1994). Sufficient clinical trials of multidisciplinary care in pain management were available for a meta-analytic review of the outcomes for this form of care (Flor, Fydrich & Turk 1992).

In addition, while no empirical evidence is presented, a case has been made for the clinical value of multidisciplinary treatment in the following areas: rheumatology (Ryan 1995); children on peritoneal dialysis (Harvey et al. 1996); HIV/AIDS (Satterwhite et al. 1991; Samet et al. 1995); chronic wound care (Ratliff & Rodeheaver 1995); myofascial pain syndrome (Auleciems 1995); breast care (August et al. 1993); cancer screening (Johnson et al. 1993); and saliva control/drooling (Reddihough, Johnson & Ferguson 1992).

Mechanisms by which improved patient outcomes are achieved are not always well delineated, but in general relate to better patient compliance, better coordination of care (usually attributable to better communication amongst providers of care and more consistency in communication with patients), more attention by providers to quality of life issues (emotional state, sleep patterns, family relationships), and best use of clinical expertise in areas of professional overlap (an example is in the treatment of non-healing wounds where vascular surgeons, dermatologists and plastic surgeons each provide care, but where *combined* expertise may be necessary for optimal recovery for at least some patients).

The papers reviewed also highlight patient benefits which are not directly related to clinical outcomes. These included increased patient convenience (Haig et al. 1994; Ratliff & Rodeheaver 1995); better rate of attendance at clinics (Banahan et al. 1994), and better training of resident medical officers in both clinical management (Schipper & Dick 1995; Harvey et al. 1996) and in communication skills (Weinsier et al. 1991; Nielsen, Kiley & Rosa 1993).

Organisational or system benefits claimed for multidisciplinary care included shorter post-operative inpatient stay (Banahan et al. 1994); greater flexibility in staffing (Hollenberg 1996); greater ability to respond to new health challenges (HIV/AIDS) (Satterwhite et al. 1991; Samet et al. 1995); more opportunities for formal quality improvement activities (Cornell & Kitsen 1995) and, in at least one study, financial savings to the institution (Hylka 1994). Schipper and Dick (1995) argue that while start-up costs for a multidisciplinary approach may be high, 'the end result is efficiency (fewer patient visits over the trajectory of an illness), patient satisfaction, and a culture of comprehensive management, inquiry, and progress'.

Structured discussions with hospital staff

In all but one of the four hospitals where meetings were held, background information was precirculated to participants. These included extracts from the 1995 NAP study, and a covering letter to the hospital outlining the proposed discussion areas. These were organised into the four broad headings noted above. Participants were given an undertaking that the meetings would last only one hour.

After introductions, the researchers briefly summarised the 1995 and 1996 studies of non-admitted patients undertaken by the Centre for Health Program Evaluation (Jackson & Sevil 1996; Jackson & Sevil 1997), and the use of the relative resource weights proposed for funding by the Victorian Department of Human Services in 1997. In one of the four meetings, participants chose to focus on broader payment policy questions, with relatively less time spent specifically on issues of multidisciplinary practice.

Philosophy

It was anticipated that participants in the structured discussions would focus on rationale for multidisciplinary clinics similar to those elucidated by Schipper and Dick in the *Lancet*. The discussions, however, revealed the ways in which the complex policy environment influences organisational innovation and development, including the nexus between general and specialist medical practitioners and between the public and private sectors.

The way in which clinic structures had developed in hospitals also influenced participants' thinking about the issue. The two hospitals which had deliberately embraced forms of multidisciplinary organisation could articulate more clearly their rationale for doing so. Participants from the other two informant hospitals stressed the more ad hoc basis on which multidisciplinary structures had developed. These included strong professional interests or specific training on the part of allied health staff in a particular medical discipline, relative availability of inpatient and outpatient allied health professionals, and/or identification of new interventions (for example, stomal therapy) which required both medical and allied health components to care.

All groups readily identified patients with complex chronic conditions as the key patient groups for whom multidisciplinary care had advantages, although shortterm rehabilitation following surgery and some forms of screening/diagnosis performed by allied health staff were also noted as requiring the involvement of multiple disciplines. The emphasis on chronic conditions was noted, both on grounds of patient convenience and on the greater need for coordination and care planning for these patients.

It became clear that the extent to which hospitals deliberately targeted their outpatient services to particular patient types was one component of the decision to increase the proportion of multidisciplinary clinics. Participants stressed that controversies about the proper role of outpatient clinics (as supplements or complements to private, fee-for-service medical consultations) as well as issues of optimal clinical organisation and patient convenience are important in considering the question.

Targeting

Prior to the introduction of Medicare, outpatient departments were provided using honorary medical officers who provided free specialist medical care for the poor in exchange for the right to admit private patients to the hospital. This was often the only access low income people with chronic or complex conditions had to costly private specialist care.

As allied health disciplines were accepted into the inpatient therapeutic environment, these disciplines were introduced into the outpatient department as well. The introduction of Medibank and, subsequently, Medicare, increased access to specialist medical care, but not to allied health services, and not to medical specialties where bulk-billing rates are low and large co-payments the norm.

Some hospitals have sought to target their services more specifically to complement availability of services through the private (Commonwealthsubsidised) sector. Targeting is done on at least two dimensions as illustrated in Figure 1. In this figure, the vertical dimension represents the balance between assessment and management (A, B) and the horizontal dimension represents whether or not a hospital selectively accepts referrals (C, D).

The first targeting strategy is to assume an assessment and consulting role in support of general practitioners (A). This entails a high proportion of once-only specialist assessments, with referral back to general practitioners for ongoing management. The second approach is to deflect most referrals to private specialists (C), in order to focus the effort of the outpatient department on providing care for complex patients whose care could not be managed in the private sector, and those who require supports not generally available in private consulting rooms, for example, interpreters (Cells AC and BC).

By contrast, hospitals which continue to offer outpatient services in the traditional (untargeted) way accept all patients referred for care (D), and continue to take responsibility for ongoing management of chronic conditions (B). Both targeting strategies, and particularly their interaction (Cell AC), have implications for funding policy which are considered below.

	Primarily assessment (high % new patients)	Assessment and management (high % review patients)
	A	В
Selected complex cases C	AC	BC
All referred cases D	AD	BD

Figure 1: Strategies for targeting outpatient services

Definitions of multidisciplinary care

Six models or variants of multidisciplinary care emerged from discussions in the four hospitals. The most common across all hospitals is a clinic providing specialist medical care, with one or more allied health professionals rostered to the clinic. Nutritionists, physiotherapists, occupational therapists, speech pathologists, social workers, orthoptists and nurse practitioners were specifically mentioned. The second model is closely related to the first, but with allied health professionals 'on call' from other duties rather than specifically rostered to the clinic.

A third model involves multiple medical specialists rostered to a single clinic, with ad hoc cross-referral of (or professional consultation regarding) complex cases. Such internal referrals are not structured around a treatment protocol, but are made when judged appropriate by the attending clinician. These multi-medical-disciplinary clinics might also have allied health professionals either rostered or on call as above, a fourth variant.

The fifth model described is organised around standard protocols which ensure that patients at a particular stage of the treatment process see a prescribed set of health professionals, *seriatim*. Thus new patients to a spina bifida clinic would be booked to see both the urologist and the physiotherapist.

The sixth and final model described is the most intensive, with patients (and sometimes family members) involved in a case-conference format consultation with a number of medical and allied health specialists meeting to discuss issues of clinical management. This model was noted as having developed particularly to provide outpatient care for children with multiple disabilities.

Each of these models implies different counting rules and other regulations if they were to be funded on a throughput basis, and could be predicted to stimulate different organisational responses to casemix funding. These are discussed below under 'Financial incentives'.

Professional 'investment' in multidisciplinary care

Participants in the four discussion groups generally dismissed the suggestion that support or opposition to multidisciplinary practice styles was related to professional training. Factors such as the nature of the clinical problems encountered were seen to be more influential with individual providers and with sponsoring hospitals in determining the mix of disciplines involved in patient care. For example, the complex needs of children with multiple disabilities were cited by paediatricians and allied health workers as the principal reasons for organising multidisciplinary clinics for this patient group.

Specific training or a strong interest on the part of an allied health provider in a particular condition were also cited as motivating factors for the involvement of professionals from a particular discipline. In a number of examples provided, this pattern of multidisciplinary care was acknowledged to be distinctive to a particular clinic or hospital.

Financial incentives

The final topic raised in discussions with administrators and clinicians was the effect of financial incentives of different payment mechanisms on the provision of multidisciplinary care. Participants were invited to discuss how block or historical funding might have shaped service provision, and how a throughput-based funding system might change current arrangements.

Because historical funding has been the norm for most of these professionals' working lives, they were not able to disentangle effects of the funding system from other issues of organisation and management. Most observations about block funding were made in contrast to private fee-for-service practice. Some participants remarked on funding shortfalls and on the current system's unpredictability in getting access to needed allied health staff. Unpredictability was associated with under-funding of specific disciplines (relative to perceived need), varying emphasis on inpatient and outpatient roles, and allied staff interest in particular clinical conditions and problems.

Other participants favourably compared hospital-based practice to private practice, noting that some patients 'could not be seen' in private practice because they required costly allied health intervention alongside medical management.

Participants' evaluation of casemix-based funding was linked to a number of the issues raised earlier in discussions. These included the impact of targeting on outpatient services; the counting of encounters when more than one professional group is involved; approaches to auditing of multiple professional encounters; and the types of allied health practitioners who might be separately counted and/ or funded.

The first of these issues was a concern raised by hospitals which target their outpatient services about the effect of a payment system which did not reward targeting. They were concerned that an average per case payment (estimated across hospitals which may or may not target outpatient services) would create incentives for their hospitals to return to provision of untargeted services. They argued that hospitals which target their services to minimise routine management and limit consultations to the assessment role are more costly per case because these cases require both longer consultation times and more associated diagnostic services. In their view, the more hospitals undertake routine management of uncomplicated patient care, the lower the proportion of these higher cost encounters in the hospital's casemix, and the more 'profit' available from an undifferentiated per case payment. The selection of referred patients is argued to be more costly, as one criterion for accepting a referral is a judgement that the patient would be 'too costly' to be adequately managed in private rooms under the Commonwealth Medical Benefits Schedule payment. When patients require multidisciplinary care, especially care involving allied health professionals not covered by the Commonwealth Medical Benefits Schedule, they have a higher average cost than unselected patients. Selection, per se, would not lead to higher costs, as it would also be feasible for hospitals to 'select' (or encourage) referrals which they predicted to be lower cost when compared with an 'all-comers' policy.

While it is unlikely that any hospital is a pure type, Figure 1 illustrates the interaction of these factors, with hospitals pursuing the strategy represented by Cell AC incurring the highest costs. Hospitals with a preponderance of Cell BC or Cell AD clinics would incur intermediate costs, and hospitals operating on the historical model of ongoing management of all referred cases (Cell BD) likely to have the lowest average costs.

Resolution of this issue lies beyond the scope of this more limited discussion of payment approaches for multidisciplinary clinics. Ultimately, policy must decide how the private fee-for-service and the public specialist outpatient clinics are to be harmonised. Arguments for targeting rest on a notion of the public hospital system as a residualist system, or 'safety net', for cases too complex or costly for the private system to easily accommodate. The alternative view is that the public system is universalist, and legitimately open to all who choose to use or provide this form of care. The issue is further complicated by debates about whether continuing management of chronic medical conditions is best coordinated by general or specialist practitioners.

Counting of multiple encounters

Payment policy for multidisciplinary clinics arises in relation to these issues when clinics deliberately attract the most complex patients and structure their services to provide access to the multiple professionals who may be necessary to their care. This raises the second issue of importance in discussions with the hospitals: How should multiple consultations be counted and reimbursed? Three approaches were identified.

The first approach is to 'bundle' such services, on the same basis that ancillary diagnostic services in Victorian hospitals are proposed to be bundled. All visits (diagnostic, medical and allied health) within a specified window of time might be bundled for a single payment, or only diagnostic and allied health visits, with a new medical consultative visit establishing a new encounter for payment purposes. This counting rule creates strong incentives for hospitals to designate case managers for each patient and/or organise utilisation review activities to monitor patterns of care for groups of patients. It encourages clinicians to periodically review the resource implications of different patterns of care against the set price offered for providing the bundled service.

It has the disadvantage, however, that it might discourage the provision of necessary care for complex cases, or encourage hospitals to organise complex care as a series of individual consultations spaced to maximise reimbursement (for example, just beyond the current 30-day payment window). It has the additional disadvantage that it would unfairly penalise hospitals when patients required multiple unrelated medical encounters.

The second approach is to separately count and reimburse each consultative/nondiagnostic encounter. This has the advantage that it does not encourage serial appointments with multiple specialists, and does not penalise hospitals providing multidisciplinary clinics. However, this rule is also vulnerable to gaming, with hospitals artificially organising clinics to provide opportunities for multiple, marginally necessary consultations with other specialists, and/or designating current staff (clinic nurses, for example) as separate consultants.

The third approach is the separate counting and reimbursement discussed above, but only for booked appointments. This approach has the advantage of providing documentation of activity which can be more easily audited and verified by funding authorities. It has the disadvantage that it may still be 'gameable' (if hospitals were prepared to distort their booking system to maximise payment). More seriously, it might discourage current 'on call' arrangements used in clinics which are intermittently multidisciplinary, that is, where the decision to refer for some forms of consultation (typically, allied health services) is made on the day of the specialist medical consultation, with on-call staff rearranging other duties to see clinic patients as required.

If the 'booked appointment' approach to counting of encounters were adopted, hospitals which use 'on-call' allied health staff for medical clinics would be likely to reconsider these arrangements. In some cases this would lead to formalised care protocols which specify in advance which types of patients require particular additional consultations. In less well-organised hospitals, the inflexibility of such a system might lead to the withdrawal of particular kinds of allied health care altogether, or additional patient inconvenience, with a return visit arranged in order to meet the requirement for a booked appointment.

In the longer term it may be possible to identify those patient conditions or clinical specialties where continuing management utilising a hospital-based

multidisciplinary team is both clinically and organisationally desirable. In these areas, an episode of care model (Jackson 1996) or continuing case management (such as forms of care developed through the Commonwealth's Coordinated Care Trials) may provide a better basis for funding policy.

Conclusion

Hospitals offer multidisciplinary clinics for a variety of reasons, and with a wide range of definitions of how the term translates into practical clinic organisation. The most frequent rationale for organising multidisciplinary care is to improve both convenience and clinical outcomes for patients with complex conditions requiring ongoing specialist medical care. This approach has considerable support from the published international literature.

Two important and unresolved policy issues complicate discussion of how hospital-based outpatient multidisciplinary care should best be reimbursed. The first is the relative roles of the public and private sectors, and the second is the respective roles of specialist and general practitioners. One key to both of these is the differential access to subsidised allied health care available through hospital outpatient departments.

Introduction of output-based funding for outpatient care creates some urgency in addressing the issue of multiple clinical transactions in the context of a single visit. Each of the three approaches canvassed here represents a different balance between the needs of funders and providers of outpatient care. A policy of counting multiple booked appointments may represent the best interim solution by rewarding the additional effort and resource use which multiple medical and/ or allied health consultations entail, while generating documentation of consultations to support rigorous audit by the funder. In the longer term, reduction of the discontinuities between Commonwealth and State responsibilities in ambulatory care may be necessary to ensure appropriate provision of multidisciplinary care.

Appendix

Theme sheet for seminars on multidisciplinary clinic (MC) payment policy

Introduction

- Description of current project
- Development of the Victorian Ambulatory Classification System (VACS)
- Payment window (medical, nursing, diagnostics and drugs)
- Problems in counting and paying for Multidisciplinary Clinics
 - Currently count as single encounter
 - Hospitals at a disadvantage when MCs are paid on this basis
 - Four topics for discussion: philosophy, definitions, professional 'investment' and financial incentives.

Philosophy

- What advantages does this kind of organisation have?
- Are there disadvantages?
- Why does your hospital organise clinics in this way?
 - History?
 - Concerns for patient welfare? (avoiding multiple visits,...)
 - Particular casemix?
 - Current philosophy?
- Should other hospitals place the same emphasis on MCs as yours?

Definitions

- What does the hospital mean by MC?
- What variations exist on MC?
 - Multi-doctor
 - Medical/Allied Health
 - Role of Nursing
 - Other
- How are they typically organised?

Professional 'investment' (perspectives of different professional groups)

- Do some professional groups favour or resist MCs more than others?
- Is it related to:
 - Particular aspects of training?
 - The casemix of patients?
 - 'Territorial' concerns?

Financial incentives (of different payment mechanisms)

- Does current block/historical funding help or hinder MCs?
- How do you see casemix-based outpatient funding affecting MCs?
- How would you prefer to see counting rules determined?

Any other issues

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Increasing general practitioner skills with patients with serious mental illness

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Abstract

This report describes a clinical training program designed to increase general practitioner involvement with a public mental health service. The program involved one half-day clinical session per week and one two-hour formal training seminar per month, over a six-month period. Prior to training, participants demonstrated major clinical and theoretical skill deficits when assessing patients with serious mental illnesses. While specific knowledge of psychiatry increased by the end of the training program, little change in clinical interview skills was evident. Current initiatives to enhance general practitioner involvement in mental health care may be hampered if these skill deficits are not directly addressed in relevant shared care programs.

Introduction

The need for more effective community-based mental health care is well recognised (National Health Strategy 1991, 1993). The National Mental Health Policy (Australian Health Ministers 1992) calls for reforms in service delivery, with increasing emphasis on primary and secondary prevention and development of innovative programs for treatment in primary care. A report to the Australian Health Ministers' Advisory Council (Medical Workforce Working Group on Hospital Training and Career Development 1993) noted, however, that the current role for general practitioners in public hospitals is limited. It suggested

that the organisational structure of hospitals be reorganised to provide more integrated hospital and community service enterprises. Mental health may provide an appropriate discipline for general practitioners to work within such integrated services as the majority of mental health problems are assessed and treated solely within the primary care sector (Whiteford 1992). Further, the relevant professional organisations acknowledge the need for a closer working relationship (Joint Consultative Committee in Psychiatry of the Royal Australian College of General Practitioners and the Royal Australian and New Zealand College of Psychiatrists 1997).

Unfortunately, there are a number of barriers to improved working relationships between mental health services and general practitioners. First, a large proportion of mental illness is not detected and/or treated by general practitioners (Ormel et al. 1990; Poynton & Higgins 1991; Goldberg et al. 1993; Harris et al. 1996). Such untreated morbidity continues to impose personal, social and financial costs on the community (Smith, Monson & Ray 1986; Pallak et al. 1993). The need for general practitioners to become more effective in assessing and managing mental illnesses is widely recognised (Dowrick 1992; Nazareth et al. 1993; Tippett 1994) and the key clinical competencies required are sophisticated interview and communication skills (Millar & Goldberg 1991; Goldberg et al. 1993; Goldberg & Gater 1996). Such skills are not simply acquired as a consequence of years of clinical experience, but need to be specifically learnt and developed (Gask et al. 1988; Bowman et al. 1992; Goldberg & Gater 1996). General practitioners in Australia rate the development of diagnostic and counselling skills as an educational priority (Phongsavan et al. 1995).

Second, patients with mental illnesses display a wide range of deficits in communication, social skills and cognitive function. Unless general practitioner education programs deal with these specific deficits, and target skill development in the engagement and treatment of patients with mental disorders, it is unlikely that the current initiatives to increase general practitioner involvement in mental health care will succeed (Goldberg & Gater 1996).

Third, the current highly structured nature of many general practice settings, with an emphasis on multiple brief consultations, creates an additional barrier to detection and adequate management.

Fourth, the current system of care in many public sector mental health services may exacerbate the difficulties faced by general practitioners. When patients do reach public mental health services, there has been a tendency to treat the patient independently. Thus the opportunity for sharing care and increasing the general practitioner's skill base is often lost. Research related to the involvement of general practitioners in mental health care has generally focused on identifying these barriers (Adeyemi & Jegede 1994; Phongsavan et al. 1995; Salokangas, Poutanen & Stengard 1995), and various interventions have been proposed. These include:

- (i) a liaison attachment model (Carr & Donovan 1992) whereby experienced mental health professionals work as consultants within designated general practices
- (ii) improved access to community-based mental health teams (Warner et al. 1993)
- (iii) the provision of needs-based education seminars (Phongsavan et al. 1995; Kerwick et al. 1997)
- (iv) the provision of regular consultant psychiatrist supervision to small groups of general practitioners (many of which are currently funded via the Commonwealth Divisions and Projects Grants Program.

While there has been recognition of perceived educational needs (Phongsavan et al. 1995; Kerwick et al. 1997), less attention has been paid to the ways in which relevant skills can be taught and assessed. Typical approaches have focused on the use of 'self-tests' of psychiatric knowledge (Kendrick, Burns & Freeling 1995) and audits of practice records (Joukamaa, Lehtinen & Karlsson 1995). While relevant, these approaches focus on improving confidence and knowledge and do not address specifically the acquisition of clinical interviewing skills. The notable exception has been the system developed by the University of Manchester which focuses on intense teaching of interview techniques and direct evaluation of clinical skills (Goldberg et al. 1993). This approach, however, is labour-intensive and requires a long-term commitment if it is to have any impact on a district mental health service.

Most service development programs do not openly differentiate the various types of mental health issues presenting in primary care. Most programs focus on general practitioners increasing their skill in the management of those patients with mild to moderate psychological morbidity and disability (Goldberg & Gater 1996). Such programs, however, are less likely to have an impact on the treatment of those with more severe, chronic and disabling disorders (Jackson et al. 1993). It is precisely this latter group which dominates the public mental health sector and which has the greatest need for close collaboration between mental health service providers and general practitioners. Such patients are in great need of primary medical care as a consequence of very high rates of untreated medical morbidity, but also have the greatest difficulty in establishing long-term treatment relationships with family practitioners.

A pilot training program

As a consequence of these barriers to care, the St George mental health service developed a training program which focused primarily on the acquisition of clinical skills relevant to patients with severe mental illness. Such patients typically have a psychosis, bipolar disorder or major depression, but their illnesses are also frequently complicated by concurrent substance abuse, social disadvantage and chronic and severe disability. The project was based within three community mental health centres belonging to the district mental health service. The program had three other practical objectives:

- to ensure that general practitioners would undertake more of the routine medical care of these patients – this would not only improve the medical health of these patients but also, potentially, create additional psychiatrist and psychiatry registrar time for the provision of specific mental health interventions
- (ii) to shift the focus of care in these patients from chronicity and disability towards health promotion and secondary prevention
- (iii) to increase the overall level of communication between the mental health sector and general practice, largely by exposing the two groups to each other in the community mental health environment (Warner et al. 1993).

Methods

Fourteen general practitioners in Southern Sydney were recruited to work three hours per week for six months. Their remuneration was consistent with other Division of General Practice programs (approximately \$91 per hour during the day and \$45 per hour for the evening tutorials). The participants comprised nine men and five women, largely in full-time general practice. They had responded to advertisements and information provided at mental health education seminars, and were from diverse language backgrounds. The group consisted of both Australian and overseas medical graduates, of whom only one had had any formal postgraduate training in mental health. During their weekly attendance, participants received a variety of experiences, including one-to-one tuition by a consultant psychiatrist, direct assessment of patients referred by the community health centre staff, participation in clinical review meetings, access to the psychiatric admission ward and attendance at emergency assessments in the community. Monthly evening tutorials for the whole group with a consultant psychiatrist concentrated on consolidating specific psychiatric knowledge. Topics included psychosocial assessment, interviewing style, mental state examination, diagnosis, and discussion of specific disorders.

The overall outcomes of the project were assessed in a variety of qualitative ways. Prior to commencement, and at the conclusion of each stage of the project, participants were interviewed regarding their views of the operation of the community mental health service. Similarly, the views of the community mental health staff with regard to the roles of the general practitioners were obtained.

Evaluation of clinical skills

The principal aim of the project, namely, to discover whether the program would improve actual clinical skills, was subjected to a more rigorous evaluation procedure. This evaluation took the form of a clinical viva and was based on the format used to assess the clinical psychiatry skills of fifth year undergraduate medical students of the University of New South Wales. Previous research has indicated that assessment of relevant clinical skills for the detection and management of psychological disorders requires some form of direct observation (Goldberg et al. 1993). Our clinical viva consisted of the participant conducting a 30-minute psychiatric interview in the presence of two consultant psychiatrists. At the conclusion of the interview, the participant presented the essential historical and mental state findings, suggested provisional and relevant differential diagnoses, and discussed key management issues. Two marks, each rated between 0 and 100, were given. The first mark was for general interviewing skills, while the second was for specific knowledge of psychiatry. The viva examination was repeated at the end of the six-month attachment. One examiner (IH), who had designed the initial evaluation schedule for medical students, participated in all pre- and post-training viva examinations. One general practitioner declined to participate in the post-training evaluation viva.

Results

Clinical skill and knowledge ratings

Prior to training, the rating of the general practitioners' interviewing skills (mean 48 per cent; SD 10.4; range 30–60 per cent) was below the pass mark for undergraduate medical students. Disappointingly, this value was only marginally improved by the training (mean 54 per cent; SD 8.0; range 30–65 per cent; t-value 1.33; NS, see Figure 1). For specific knowledge in psychiatry, the pre-training mark (mean 34 per cent; SD 11.1; range 20–50 per cent) indicated a serious deficiency in basic psychiatric knowledge. This factor was, however, improved significantly by the training (post-training mean 56 per cent; SD 6.1; range 50–65 per cent; paired t-test: t-value = 4.07; P < 0.01, see Figure 2).

Figure 3 shows the combined effects of these two scores. The examining psychiatrists noted that after the training the general practitioners showed an improved ability to elicit relevant medical, neurological and cognitive factors, were generally able to take an adequate history of longitudinal course, family history and treatment issues, and were more respectful and courteous towards the patients. However, too few opportunities were provided for patients to relate their own story. There remained an over-reliance on highly structured interviewing techniques and poor differentiation between history taking and mental state assessment tasks. General practitioners tended to accept many psychiatric symptoms at face value and, consequently, failed to explore adequately the actual nature and importance of key behavioural phenomena.

Attitudes of general practitioners to community mental health services

As a consequence of the training experience, the general practitioners indicated an increased awareness of the range of services offered by the public mental health system, reported greater confidence in referring patients as a result of the knowledge that they would be kept informed of their progress, and noted significantly less difficulty gaining access to the public psychiatry system. Additionally, they described improved working relationships with mental health case managers. Overall, they were satisfied with the training program and believed that it had increased both their skills and their knowledge in psychiatry.

Attitudes of community mental health staff to general practitioners

According to feedback from community mental health staff, the general practitioners who received the training were noticeably more specific in the information provided in referrals they subsequently made to the service and in the requests they made of the service. Furthermore, as a result of the exposure of the community mental health staff to the general practitioners in the program, relationships with general practitioners as a whole improved. This was reflected in greater interest from case managers in making referrals to primary care, and in positive comments about the service from other general practitioners at subsequent education seminars. It was also noted that the enthusiasm of the community mental health staff for involvement with the second intake of general practitioners was noticeably higher than it had been for the first intake, reflecting the beginnings of a change of culture in the public sector towards primary care. All of these attitudinal changes in community mental health staff were reinforced by policy changes which served to emphasise the importance of an active collaboration with general practitioners.



Figure 1: Interview skills



Figure 2: Psychiatric knowledge



Figure 3: Clinical viva result

Discussion

Current government policies designed to encourage general practitioners to care for people with mental illness have spawned many programs designed to provide essential knowledge for the task. Few have focused, however, on a discrete improvement in clinical skills or placed a specific emphasis on those severely disabled patients treated largely within the public mental health sector. This pilot program demonstrated that while theoretical knowledge relevant to these patients can be increased substantially, such knowledge gains are not necessarily matched by an increase in key clinical skills.

We had expected experienced general practitioners to demonstrate better interviewing skills than medical undergraduates. Given the pivotal role of general practitioners in the detection of mental illness (Whiteford 1992; Goldberg & Gater 1996), this lack of clinical skills is of great concern. More importantly, although an apprenticeship model of clinical training was provided, the program had only a small effect on these core skills. Since most of the current shared care initiatives in Australia do not assess clinical skills directly, the actual impact of such projects on national health policy objectives may be limited. In relation to the method of clinical skills evaluation, the participants did not express major concern about the process. Generally, they accepted the procedure as a common method in medical education for assessing actual clinical competencies. General practitioner managers and clinical academics did suggest that, in future, it would be more appropriate for a general practitioner to participate as a co-examiner.

In mental illness, the interaction between the patient and the doctor has enormous impact on diagnostic reasoning and treatment planning. Patients with mental illness frequently deny or minimise the nature of their distress. This fact provides some of the explanation for the reduced rates of detection (approximately 20-50 per cent of possible cases) described in the literature (Ormel et al. 1990; Poynton & Higgins 1991; Goldberg et al. 1993; Goldberg & Gater 1996; Harris et al. 1996). Practitioners, however, must have interviewing techniques which encourage patients to tell their own stories and, thereby, provide an entry point to their private world. Highly structured interviews, especially those with a limited medical focus, do not encourage the exploration of relevant psychological symptoms (Goldberg et al. 1993). If general practitioners are not sensitive interviewers, valuable opportunities for early and cost-effective interventions may be lost. This program attempted to increase clinical skills largely via exposure to experienced clinical psychiatrists. The failure to achieve significant gains via the 'apprenticeship' training model emphasises the need for more intensive and/or more prolonged educational experiences which require the acquisition of relevant interviewing techniques (Goldberg et al. 1993). Although such programs may be costly and labour-intensive, their long-term impact may be considerable (Bowman et al. 1992).

When the results of the study were discussed with the participants, a number of relevant factors were highlighted. Participants noted their widely different undergraduate experiences in psychiatry and the general lack of attention paid to the formal teaching of interviewing skills in medical schools. A particularly relevant issue was the present fee-for-service payment system in Australia which, in the view of the participants, simply reinforces poor interviewing behaviour by encouraging closed, goal-directed approaches to clinical history taking.

It was of concern to the mental health service managers that the combination of poor interviewing skills and limited psychiatric knowledge at the commencement of the program meant that the general practitioners were not able to enter the service as equal partners with other mental health personnel. Consequently, only small numbers of selected patients with severe mental illness were eventually transferred to primary care settings. As a result, there was less ability to offset the large cost of the training through more cost-effective patient care. Whether the improved relationships between the mental health service and general practitioners justified the expense of the program is questionable.

Conclusion

Many mental health training programs currently being offered to general practitioners focus simply on increasing specific areas of knowledge. Whether such programs succeed in improving actual clinical skills is rarely directly measured. The program described here attempted to address this issue, but highlighted simply the need for more intense, prolonged and targeted interventions. This program indicated that our expectations of greater general practitioner involvement in the public mental health sector were unrealistic within the time frame of the project. The study raises important questions about the ongoing training of the medical workforce and what other measures will be needed if national policy objectives are to be met. We suggest that evaluation of current shared care programs should focus on the assessment of actual clinical skills and the impact of such skills on later health outcomes.

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Evaluating health information systems: An assessment of frameworks

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Abstract

The rapid increase in investments for computerised systems is a major concern for all health organisations. Questions about these investments arise as information technology is only one of the areas that are competing for a finite amount of resources. There is also some concern that some of the failures of information technology would have been detected if proper evaluation of information systems were conducted. The state of the art of evaluating information systems shows changes from a very positivist approach to more comprehensive approaches that would incorporate multiple methods. This paper presents an assessment of the techniques and methods for information systems evaluation, followed by an application to a case study in community health to illustrate the value of the contextualist approach to evaluation. The paper argues for the use of longitudinal, contextualist approaches to information systems evaluation if decision-makers seek to improve the situation of information systems in the health industry.

Introduction

Information technology (IT) has had a wide impact on the work of organisations worldwide. Its impact has also been considerable on the health sector and is related to the following.

1. The increasing use of IT to support the core business of the organisation. This is typified by the use of IT in hospitals for laboratory systems, systems to manage admission and discharge and inventory. Currently these systems depend heavily on IT as most systems of information are now fully computerised.

- 2. *The transformation of the way clinical work is done.* The use of computerised care planning and computerised medical records is increasingly changing the manner in which professionals in the health sector carry out their day-to-day work.
- 3. The increasing complexity of information systems as health organisations link with the external environment using IT to make the communication links. This also results in data standards and database design becoming increasingly important, as well as complex.

In this paper, information systems are used as a wider concept than IT to refer to how designed information collections and flows meet the defined information requirements of the organisation (Willcocks & Lester 1993).

In the wider environment of business, it has been identified that the evaluation of costs and benefits of information systems is currently a major concern for senior general managers and that many organisations report that they are uncertain of methods to measure the impact of their IT investments (Farbey, Land & Targett 1992).

Evaluation services a number of objectives in the information system field. Howgood and Land (1988) identified the following objectives.

- 1. *To establish the feasibility of a new project.* The emphasis of these studies is to test economic, technical and organisational feasibility.
- 2. To make organisational investment decisions. There is competition for resources in all organisations and information systems also need to be subject to the same process. The problem in this case is whether the usual methods of evaluation used for investment decisions which are based mostly on accounting methods are sufficient. Farbey, Land & Targett (1993, p 9) state that due to the experience of using return on investment in judging investment decisions for IT projects, there is a quest for a 'one best' method. This has led to frustration as the characteristics of an information system project and its organisational environment affect these decisions.
- 3. *To review progress of information system projects.* Here the evaluation plays the role of project control. Typically, the planned changes in information systems are only part of the changes in the organisation and therefore major problems of information system implementation have been identified.
- 4. To assess the impact of an information system on the organisation. This is an area where much effort has been taken to identify common tools that could be used to compare information system projects in various environments. This may be the reason why there is insufficient consensus, as, for instance, the impact on a clinician will be quite different from that on a nurse unit manager.

5. To assess value added by the information system function as a service providing *department*. This is another area that is increasingly being given attention, especially with moves in organisations to have charge back systems, cost centre budgeting and outsourcing of the IT function.

However, in the United Kingdom it has been found that, in some cases, the greater the expense and strategic importance of an information system, the less likely it is to be evaluated using a formal methodology. This apparent paradox is attributed to the conceptual and operational problems of evaluating (Symons 1990).

Dowling (1980) found in a survey of hospitals that 45 per cent of information systems failed because of user resistance and staff interference, not system issues. Lyytinen (1987) reports similar failure rates in information systems in general. Often systems fail because developers concentrate on the technological aspects and neglect the social and political aspects (Lyytinen 1987; Kling & Scacchi 1982).

In a review of hospital information systems evaluation, Glandon and Shapiro (1988) identified a number of barriers to evaluation. They state that the first barrier is the acceptance of technology for technology sake and that some hospitals introduced systems just to keep up with the Joneses, the cost being no object. The second barrier is the constraints in methodology of cost-benefit and cost-effectiveness analysis where information systems contain many impacts that are difficult to measure and even more difficult to value monetarily. The other barrier they identified pertains to the issue that initial cost-benefit analysis projections are lost in the flurry of activity that accompanies systems implementation and managers consider this 'water under the bridge' when they need to evaluate it.

The question may be posed: Why do information systems need to be evaluated? There are many reasons. In the context of health information systems these are as follows.

1. *Economic efficiency*, where there are a number of recent trends that are disturbing.

Firstly, the investment in information systems is high in the health sector and is increasing. New South Wales Health has an \$800 million strategy for IT over 10 years (Crawford 1992). The Queensland Health Department has invested \$100 million for a new hospital information system (Fitzpatrick 1992). Questions about these investments arise as IT is only one of the areas competing for a finite amount of resources. There has been some concern that some of the failures of IT would have been detected if proper evaluations were conducted. 2. *Clinical effectiveness.* The use of IT in the diagnosis and management of patient care is increasing. In some areas the increases in effectiveness are not known. The investments of time and resources for clinicians to adapt to the new IT technology are a cause for concern. When changes in the use of these patient management systems take place, clinicians and managers need information to decide whether the change improves the health outcomes of the patients.

As the needs of information systems in the health sector grow, but resources are less freely available, it is only rational that managers will require assessments of effectiveness in order to fund new systems (Zviran 1992). In the current climate of cost consciousness in health care in Australia and worldwide, it is only a matter of time until organisations will be required to not only justify expenditure on information systems but demonstrate its impact on clinical effectiveness and health outcomes.

This paper will review the evolution of the art of information system evaluation, with a focus on identifying the major conceptual and operational frameworks. It will use a case study from the health sector to illustrate key issues faced in reality and assess the relevance of frameworks for evaluation of information systems in the health sector.

Evolution of the art of information systems evaluation

In the early 1980s, most of the work in information systems related to evaluating management information was treated as an integral part of the management control process (Hamilton & Chervany 1981). The main thrust of evaluation was to assess the effectiveness of the management information system. Two general approaches to measure IT were a goal-centred view and a systems resource-view. The former focused on the costs and benefits of the IT function and the latter on the process or functional aspects of the system. The distinction between the two has been described as being similar to the difference between summative and formative evaluation from the program evaluation literature (Hamilton & Chervany 1981). Management information system evaluation approaches identified by Hamilton and Chervany (1981) were broadly divided into efficiency-oriented and effectiveness-oriented and are presented in Table 1.

Information systems can be looked at from two perspectives: the computer systems domain and the user domain (Chandler 1982). Multiple perspectives dominated information system evaluation research in the 1980s. In approaching information systems with a view to their impact on organisational change, Eason

(1989) identified four dimensions of evaluation (see Table 1). The first, a technical systems performance which pertains to reliability and efficiency of the system. Typically, this is measured by system response time, downtime, recovery time, and so on. A second dimension was based on the functionality and useability of computer systems. This was measured by components such as task match, ease of use and ease of learning. A third dimension captured user performance and satisfaction. Many technical systems are designed to improve the task performance. Therefore, its evaluation must measure its impact on overall task performance. The final dimension he suggests is the need for evaluating the socio-technical systems performance and its ramifications as the introduction of new technology leads to changes in the socio-technical system.

Much of the development of measurement tools for information system evaluation in the late 1980s was related to the use of user satisfaction as a surrogate of the impact of the information system. Remenyi, Money & Twite (1993) review the extensive literature on this topic. These techniques incorporate user perceptions as a means of measuring the intangible benefits of information systems. By including user perceptions of the system performance, quality of service, quality of documentation, management involvement and user participation, instruments have been developed and tested for their psychometric properties to represent an holistic framework that can be used to measure effectiveness.

Often a system's life cycle has been used to identify the stages for evaluating an information system project during its development and implementation. Farbey, Land & Targett (1993) identify the following main stages.

- 1. Information system strategy development stage, where it is assessed against the business strategy.
- 2. Cost justification of the project.
- 3. In the development stage, to ensure that external changes have not affected it.
- 4. Point of 'sign off', when the system is transferred from the IT department to the user department.
- 5. Project implementation, to ensure that it is working as planned.
- 6. When it has been operational for some time, to assess its impact and to find out whether the actual costs and benefits are similar to planned costs and benefits.
- 7. End of life of the system, to assess for replacement options.

However, a survey of United Kingdom firms found that very few had conducted an ex ante or ex post evaluation. About half had used 'back stairs' methods to

Management information system evaluation approaches	Dimensions of evaluation	Evaluation methods and approaches
Hamilton & Chervany 1981	Eason 1989	Farbey, Land & Targett 1993
Efficiency-oriented		Quantification methods
Quality assurance review	Technical systems performance	Cost/revenue analysis
Compliance audit review		Return on investment
Budget performance review	User evaluation of technical system	Cost-benefit analysis
Management information system personnel		Return on management
productivity measurement		Boundary values
Computer performance evaluation	User performance and satisfaction	Information economics
Post installation review		
		Exploratory and experimental techniques
Effectiveness-oriented		Multi-objective, multi-criteria methods
Service level monitoring	Socio-technical systems performance	Value analysis
User attitude survey		Critical success factors
Cost-benefit analysis		Experimental methods

Table 1: Frameworks for evaluating information systems

affect decisions (Farbey, Land & Targett 1992). A common stage at which evaluation is conducted is the post-implementation review, typically done after the system has been implemented for some time. In a study of postimplementation evaluation of computer-based information systems in business organisations, the picture that emerged was much different to that espoused in the normative literature. The post-implementation review was used mostly as a 'close-out' device before or just after the system was handed over to the users. It was typically done by the system's development team and used as a major tactic for project disengagement. The study identified that superficial importance was given to the agreements on evaluation criteria and methods and the most frequently used criteria were related to information quality (accuracy, timeliness, adequacy and appropriateness). Systems impact was less frequently evaluated. They also highlighted their concern that 'it is unlikely that an evaluation managed and performed by the development team will discover any basic flaws in the process or the product design' (Kumar 1990, p 210).

An approach to match evaluation methods with that of IT investment was carried out by Farbey, Land & Targett (1993, p 142). They list a number of evaluation techniques available (see Table 1). A survey of 16 IT projects in the United Kingdom found that only nine were justified and that an ad hoc method was most commonly used (stating that the present system was obsolete and needed to be improved). Of the identified methods used, return on investment was used in three projects and cost-benefit in one. The authors state that an 'organisation wishing to sharpen its IT investments decision-making must first recognise that there are evaluation techniques other than return on investment' (Farbey, Land & Targett 1992, p 116).

These positivist approaches to information system evaluation have been challenged on the grounds that information systems cannot be treated as objective and rational (Hirscheim & Smithson 1988) and that the difficulty in using a positivist approach is the multidimensionality of cause and effect and the multiple and often different perspectives depending on the evaluators (Symons & Walsham 1988). The arguments have been based on the complexity of the connections to the context as expounded in the 'web model' (Kling & Scacchi 1982) and the contingency approach to evaluation (Legge 1984). The basic tenet of the web model is that a computer system is best conceptualised as an ensemble of equipment, application and techniques rather than as discrete entities. The model also incorporates the social and economic context by identifying that the infrastructure is embedded in a larger matrix of relations ('macrostructures'). According to the web model, the macrostructures and infrastructure direct the kind of computer-based services available, and themselves evolve over time. Thus
the web models are described as complex social objects constrained by their context, infrastructure and history (Kling & Sacchi 1982). Hirscheim and Smithson (1988) also state that the use of analytic frameworks are not suitable as information systems cannot be viewed in isolation from the complex social and political environments in which they are embedded. Symons and Walsham (1988, p 122) believe that 'positivist designs which seek to shield the causal process of a study...render unreal any inferences drawn from their evaluation'.

These interpretivist views consider the overt and covert functions of an evaluation and recognise that the evaluation cannot be separate from the study. They state that in an evaluation design the questions and data collected are selected on assumptions that are value-laden (Symons & Walsham 1988). Evaluation of information systems has been identified as a political process depending on the interests of the stakeholders (Avgerou 1995). Others have emphasised the political issues related to evaluation to explain the social actions of players (Sauer 1993). These social scientists have emphasised that evaluation is a social process and that they 'view evaluation not as an approach of a set of tools and techniques, but as a process to be understood' (Symons & Walsham 1988, p 123).

Over the years, information system evaluation has been informed and has imbibed principles and concepts from both the evaluation research and organisational change literature. The relationship between evaluation of information systems and organisational change has been emphasised (Avgerou 1995). Based on the contextualist approach to research that was used to study organisational change, the content of evaluation is considered as separate from the context and process. Contextualists consider two levels of analysis (the outer and inner context) and require time series, processual data to understand the factors through any particular sequence of events and action (Pettigrew 1985). Five problem areas in evaluation research have been identified in social program evaluation (Rossi & Williams 1972). Farbey, Land & Targett (1993) have taken concepts from these fields to develop a framework for issues in IT evaluation. They added the concept of 'organisational learning' in the process dimension to show that the evaluation itself presents an opportunity for organisational learning and communication. Figure 1 shows a simple adaptation of their framework.

Contextualist approach	Problems in social evaluation
1. Content	Conceptual problems
	Methodological problems
2. Process	Organisational Learning
3. Context	Bureaucratic problems
	Political problems
	Organisational problems

Source: Adapted from Farbey, Land & Targett 1993

Figure 1: Issues in information system evaluation

Avgerou (1995) suggests an alternative approach to information system evaluation, based on the work of Guba and Lincoln (1989) from the general evaluation literature. The emphasis in this case is on the need for the criteria for evaluation to emerge from the concerns and consensus achieved with stakeholders. This fits with the concepts of organisational learning that occurs in the process of evaluation. At a practical and operational level, it is suggested that the evaluation process provides tools to encourage communication between stakeholders and promote organisational learning (Serafeimidis & Smithson 1996).

In summary, the review of the evolution of information system evaluation shows a trend to expand the dimensions to incorporate concepts and methods from the organisational change and general evaluation literature. The value of this approach will be illustrated by using a case study in the health sector.

Case study: Evaluation of a computerised information system for community health

This system was designed in-house by a health professional on a micro-computer platform over three years (1992–1994) in an area health service in New South Wales. The objective of the system was to capture information about the use of community health resources. The impetus for the development was a review of the community health services which recognised inadequacies in the manual system of information such as:

- data were not comparable between services
- no data were available on current clients

- staff lacked commitment to any data system
- an over emphasis on numbers rather than outcomes
- collected data not being used by community health staff generally.

The plan was to establish an appropriate data set and then develop a software package (which for the purposes of the case study will be called COMIS) to manage it. The developer spent time consulting both clinical and administrative staff to decide on the data items, its collection and processing methods. As the users lacked computer experience, the developer spent much time developing prototypes that were tested at a pilot site. Each of the health centres was to have standalone PCs for this system and eventually a data link was to be established to a central computer through modems. Along with developing systems, the developer had to negotiate for resources (hardware) for the centres and staff to maintain the system. A formal feasibility study had not been undertaken at the commencement of the project and it was not clear who was responsible for the project. The system took longer than scheduled to be operational for many of these reasons and there were questions about its efficacy and its future.

The evaluation was conceived as an 'action research' project in the stage when the early prototypes were being developed. The evaluator therefore was able to participate in the development phase and, as he was external to the organisation, continue to have an independent opinion. The methodology used for the evaluation followed a formal-rational perspective and was based on the framework of Eason(1989) and concentrated on user evaluation of system performance and user performance and satisfaction (Jayasuriya, Foulstone & Little 1993). The following techniques were used.

- 1. Measurement of user satisfaction. An instrument was developed by adapting Doll and Torkzadeh's (1988) end-user satisfaction instrument, following a focus group to identify user perceptions of attributes of an effective information system.
- 2. A measure of information system problem resolution by the new computerised information system using a gap analysis approach (Remenyi, Money & Twite 1993).

The use of quantitative measurement of user satisfaction showed that the content was satisfactory for most but did not give a real picture of their work for 57 per cent of the respondents. The format of the information was found to be meaningful and clear for 61 per cent and 81 per cent respectively. Of those who accessed the system, all found it easy to use. However, 71 per cent said that the system was slow in operation. The main findings of these assessments were that

the content of information and format were satisfactory. The system was userfriendly and easy to use. However, the training was insufficient and the system was slow in operation.

A positivist approach to evaluation is illustrated in the above case where the concentration was on the content areas such as the measurement of user satisfaction (as a proxy for system success) and user evaluation of system performance. Some interviews were also conducted to ascertain the success of project management.

However, using the framework of the contextualist approach requires that the evaluation also covers the process and context components. The context can be analysed at two levels: the inner context which refers to the intra-organisational issues and the outer context that covers the extra-organisational and environmental issues (Pettigrew 1985).

The methods used to carry out the contextualist analysis of retrospective change were based on a variety of data sources. Archival documentation of the system was carried out. One of the evaluators participated in steering committee meetings to get a feel for the issues and to become sensitised to the 'real' issues. The evaluators also conducted some in-depth interviews with two managers to collect qualitative data on the impact of the system. A focus group with seven users was conducted to obtain their views of 'success' of the system. In all, the evaluators participated in the work in the field over a period of about one year. These investigations, together with interviews with the developer, were then content analysed to provide material on the context of the case. Based on the model of Figure 1, the classification of bureaucratic, political and organisational issues will be used to present the relevant findings from the contextualist analysis.

Bureaucratic

The project did not go through a formal feasibility study and approval. Therefore, there was no ownership by the users (community health centre staff) nor the IT services of the organisation. The developer was from another unit in the organisation which had been given the responsibility to proceed. This created problems as the developer was not from the IT services and bureaucracy demanded that all software and hardware acquisitions be made through the IT services. As an approved budget was not available, hardware was acquired on an ad hoc basis. When computers were given to the units, there was pressure to use them for other clerical work rather than for the COMIS system. The project developer did not have formal authority on these issues, which led to many conflicts and delays in implementation.

At the start, the State Department of Health mandated the use of one particular type of software for PCs that was later not supported. The developer therefore ended up having to find support from the vendors by himself. If a choice was available at the start for the developer, this may not have occurred.

Political

A steering committee was formed to coordinate the development. This committee was disbanded subsequently as the developer found that it created obstacles to development rather than facilitating development. This arose partly from the disagreement between the developer and the chairperson. An underlying factor was that the managerial staff who comprised the steering committee saw the system as a tool to manage (more explicitly 'control') staff. This was very obvious in the qualitative findings.

... as a manager, I need to know something about the services that we are providing.

I need to know in a general sense, what proportion of time of a drug and alcohol worker's time is taken for drug and alcohol work as opposed to other work.

...I suppose, eventually...to link our activities through our staffing levels and our budget information.

...to make sense of it, we have to get more details on non-client-related activities.

This made sense from the perspective of a manager. However, the developer disagreed because past experience had proved that clinicians would deliberately enter false information if they were aware that the data collection was to oversee how they utilised their time. There was also resistance on the part of the specialist consultants who felt that the system could not capture the complex activities they performed as the system reduced their activities into a few codes. This simplified coding system made them feel that they lost their technical power.

Organisational

In organisational terms, the development occurred during a transition period where the area health service was undergoing an organisational overhaul. The resultant insecurity of office and threats of mergers of managerial sectors and so on did not create a positive environment for new developments. The impact of the system was also sought in the more qualitative data gathering exercises. The findings show that the perspective of the impact related to the position of the respondent. Respondents at a level close to the field staff showed some enthusiasm for its benefits.

... they are quite happy and quite willing to implement a new process as long as it proves beneficial to them in the long run...

...since the computer has come in...a computer has a memory, so if you saw someone 3 or 4 years ago...you can recall it.

I think it is a lot quicker for clients to be registered on the computer than it was to do it manually.

I think that the computer is like an extra telex...I think it is just an extra additive.

For respondents (managers) at a distance it meant:

... but generally, clinically oriented staff aren't keen on data collection systems, half of them despise computers.

I am not as convinced as X (the developer) that people are actually going to use it as often as he would like.

...there are a few people down there on those levels that have some interest but mostly we see data systems of any sort as just a imposition, something we have to do but only if we can't avoid it.

The main concern of staff related to the change involved.

In the past 17 years we have probably had about 15 or 20 different methods of collecting information...people do get quite stressed at having the changes.

... the frustration of changing from one system, collecting information and another, and another...

I think we have to be prepared to change it when we have tried it out and not just stick with something because it is internally consistent, or it looks nice, or it works well with the computer.

Epilogue to the case study

The community health information system was implemented over the next year in all the sites and most of the data collection mechanisms were put into place. Following a resurgence of interest in community health issues by the State health department, funding was identified to develop a statewide system. Further investments at the local level (area health service) were stopped in view of these developments. There is still some concern about the use of the information but the developments allowed the community health services to undergo a 'learning' phase. This experience has enabled the managers to have a positive attitude towards future developments. However, many of the clinical staff did not use the system except for some administrative tasks and this provided the feedback on the necessity to have systems that provide value to clinical staff if the systems are to be used.

Due to the turbulent nature of the environment and the non-involvement of the IT services in the original development, significant 'learning' of the process of IT development did not occur. As there was no 'champion' or 'business sponsor', an organisational commitment was not seen and the development died when a new community health manager was appointed. The promise of a statewide system also influenced the decision of the new manager as well as the stringent budget for the services.

Discussion

The above case study illustrates the gains that can be made in using multiple methods of evaluation and the conduct of longitudinal studies. Unfortunately, most often information system evaluations are contracted out as one-off studies. The framework of Farbey, Land and Targett (1993) is a useful tool to identify the issues that have to be incorporated in an evaluation of information systems in organisations. This case study illustrates that the assessment based on a contextualist approach provides a richer picture of the information system, its outputs and impact on the organisation. It provides an explanation for the intended (planned) and the unintended (unplanned) effects that occurred. As Pettigrew (1985) argues, the context examines the organisational background in terms of who is involved and why.

Positivist approaches and the use of techniques that seek to ascertain an objective measure of success only address the content area of the framework. If only the assessment of content was used, the quantitative findings showed that the content was satisfactory and the format was meaningful and clear for the majority of respondents. The issues of the relative lack of use by clinicians and why the developments ceased cannot be explained without the contextual information. The case study also shows that there is a need to value the evaluation process as an 'organisational learning' process. In the normative literature of program evaluation, this is termed 'formative evaluation' (Rossi & Freeman 1985). The participating organisations need to be visited for observations regularly, with the view to reflecting on the decision-making activities that take place in the lifetime of an information system.

Another aspect that is important in information system evaluation is the need to maintain the independence from the development to be able to make an unbiased assessment. However, most post-implementation reviews are carried out by 'insiders'. Sometimes they are used as mechanisms to obtain support of decision-makers to address recommendations that pertain mostly to implementation issues (Kelly 1996). The limitation of the one-time postimplementation review approach is that it concentrates on efforts to produce a 'close-out' report (Kumar 1990). The systems impact is therefore not given the consideration it deserves. Information systems are a unique combination of technically complex components embedded in human interaction. Practitioners are able to identify the extent to which impacts are not achieved due to nontechnical or political reasons. To elicit such information, qualitative approaches to evaluation need to be used. Borrowing from the organisational change literature, the contextualist approach therefore provides a framework for this to be carried out (Serafeimidis & Smithson 1996). In moving from a systems approach to change, this perspective allows one to explain the dynamic processes that happen with change. The content, context and process of change are central to this approach and longitudinal qualitative methods are needed to capture the data (Pettigrew 1985).

The health industry is an environment with increasing pressure for accountability of investments in IT and frequent failure of large IT projects. This trend will require multiple evaluations for information system projects. Evaluation can also play a central role in the process of organisational change in introducing information systems if the evaluation is carried out as a longitudinal process that facilitates communication and consultation to obtain the commitment of the interest groups. This paper has assessed frameworks that have been proposed by various authors and, based on the experience of a case study, argues for the value of using a longitudinal, contextualist approach to evaluation if decision-makers seek to improve information systems in the health industry.

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Corporate information systems in health organisations

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Abstract

This paper presents an overview of the nature of corporate information systems and their applications in health organisations. It emphasises the importance of financial and human resource information in the creation of a corporate data model. The paper summarises the main features of finance and human resource systems as they are used in health organisations. It looks at a series of case studies carried out in health organisations, which were selected on the basis of their representation of different aspects of service delivery. It also discusses the theoretical and practical perspectives of the systems themselves, their roles in information management, executive and decision support, and in planning and forecasting.

Introduction

The term 'corporate information system' primarily refers to finance and human resources. A broader definition might well include physical facilities management and networked administrative systems such as word processing. In order to confine the present study within reasonable limits, consideration is limited to the two major aspects, finance and human resource management. The transactional nature of corporate information systems, as defined, is sometimes a barrier to health service managers wishing to use them in more complex ways. Financial and human resource databases are crucial to the development of middle and higher level applications of corporate systems to strategic planning, problemsolving, decision support, and executive information systems with which health service managers are deeply involved.

Financial and human resource issues assume a very high profile in the management of health organisations. Financial matters have become increasingly dominant during the last 15 years or more as shrinking budgets have compelled health organisations to adopt stringent accountability measures, particularly in the area of financial accountability and management decisions (Horowitz, Straley & Kelly 1992). By far the largest segment of health service expenditure is taken up in the human resource area, directly contributing to the costs of health services. Given the magnitude of the issue and problems which surround corporate – sometimes referred to as business – systems and their place in health service management, it is surprising that so little is documented in academic literature: Di Mauro (1987) and Segall (1991) are rare examples, but from different contexts. This paper takes a first step towards filling a large gap in knowledge about corporate information systems in health organisations.

The purposes of the present study are to:

- provide an overview of the functions of corporate information systems in health organisations from a conceptual and theoretical perspective
- draw some simple comparisons by presenting a series of short case studies of their utilisation in different types of health organisations
- identify some of the major issues and problems which might warrant further investigation.

Although this is a preliminary investigation, there is considerable scope for further study in such a significant area of activity in health management. This study attempts to draw a primitive map of territory which is still largely unexplored, and focuses on the basics rather than high-level applications.

Financial management information systems

The financial management of health organisations has long been regarded as a topic of interest. The nature and scope of financial management in hospitals has received extensive treatment (Henderson & Tate 1991; Levy 1992). Financial management is also of major concern to the Commonwealth Government (Commonwealth Department of Finance 1993), which has carried out an extensive evaluation of commercially available management information products. As a first step towards coming to terms with devolved structures, middle and senior managers in health are often found to need explanations at a more basic level (Gill 1990; Dickey 1992). Corporate systems in health organisations, it has to be borne in mind, are basically no different from those in other kinds of organisation in that they carry out similar functions, irrespective of the type of business or service conducted.

Finance departments were one of the first users of system hardware and software in the health service. Historically, the first computer systems were only capable of transactional functions which could be ideally applied in the financial environment of health organisations. There were significant savings in clerical time, which was a determining factor in these being the first computer systems in health organisations. Acquisition of financial systems tended to take place independently of developments in clinical and activity based systems where 'people' savings could not be made. The requirement was for financial systems which were primarily designed for statutory reporting purposes, and to provide statements for budget holders. The emphasis was on finance, with little regard for activity and workload levels other than full-time staff equivalents. The problems inherited from financial management information systems (FMIS) centre around limited linkages between systems, outputs which are limited to operational requirements (for example, pay slips) and inflexible management reporting tools (Institute of Health Services Management 1994, p B7).

The basis of financial management is the accounting system. Computerised systems retain elements of the traditional manual accounting structure. The accounting process as a manual activity deals with several steps:

- recording transactions in journals
- posting journal entries to ledgers
- balancing ledger accounts and closing them off at the end of the period
- creating statements from the balanced amounts (income and expenditure, balance sheet and cash flows).

Computerised financial information systems record, classify, summarise and generate reports on financial transactions and events (Livingstone 1991). Their principal characteristics are as follows.

- The central module of a financial information system is the general ledger, organised around the chart of accounts. Six categories comprise the chart of accounts: assets, liabilities, equity, revenues, costs and operating expenses. A double entry format (debit and credit) is normally used to enter transactions into the general ledger.
- Accounts receivable and payable are also integral components of a financial information system. The accounts receivable module is organised around the customer and deals with sales orders, billing statements and customer statement reports. Accounts receivable is organised around the vendor and deals with purchase orders, payments to vendors, discrepancy reports, ageing reports and cash requirements forecasts.

- The payroll module processes employee time sheets. It generates payroll cheques and statements to employees and tax authorities. Information in the payroll module is based on pay rate, overtime, income tax and other deductions information.
- Inventory and fixed assets modules are also characteristic features of financial information systems. An inventory module calculates the costs of goods sold for the income statement, and the inventory level for the balance sheet. It generates inventory status reports and usage reports. It can calculate economic order quantities and produces inventory reconciliation reports. A fixed asset module accounts for depreciation of capital assets and purchase of new ones, job costing and profitability.

A government survey (Commonwealth Department of Finance 1994) identified 43 commercial suppliers of financial information systems, 39 of which satisfactorily met a series of evaluation criteria for public sector organisations. It was observed that a large portion of FMIS software is available across a variety of hardware platforms. The report noted a declining reliance on systems developed in-house, with a corresponding increase in the use of off-the-shelf software. As management reporting needs have become more demanding, there are increasing requests for financial information systems that can be integrated with executive information systems, decision support systems, and human resource management information systems. In this regard, it is anticipated that the complexity of user needs is likely to grow over the coming years as more insight is gained into their potential.

Financial management information systems differ from one organisation to another, as the organisations themselves vary. Differences are attributable to the nature of the organisation, the type of transactions, the sophistication of hardware and software, linkages between finance and other databases, and the history of development of the system. Large organisations generally need substantial computing power in order to integrate finance with operations management. In some large organisations home-grown software can still be found, together with a staff of programmers for maintaining and modifying the product. Large organisations employ systems analysts to deal with system and other organisational change. In this way they can respond to their changing information requirements and carry our evaluations of the cost, availability and characteristics of new technology. System security is a major consideration in large organisations, especially for access to confidential data. In large organisations there tended to be significant modification of packages, but today it is a costly exercise and subject to questioning by management. Smaller organisations, on the other hand, tend to use microcomputers (networked where possible) and packaged software. It is common for a user to adopt a standard chart of accounts and report formats. Niche market items can be found for particular brands of accounting software. Small organisations often lack in-house accounting specialists and need simple, easy-to-master designs. The need for detailed budget information may be limited so that there is a demand for no-frills hardware and software. Integrated hardware and software financial systems, known as turnkey systems, are sometimes used, so that the purchaser needs to deal with only one vendor.

Human resource management information systems

Human resource management information systems (HRMS) exist in order to support decision-making, evaluate policies and programs, and to support the operational side of the organisation. In doing so, HRMS store, retrieve, analyse and distribute information on an organisation's human resources (Kavenagh, Guetal & Tannenbaum 1990). A growing number of organisations (17 per cent in 1985) reported that fully integrated systems were in operation (Stone 1991). Typical HRMS contain information on employees, jobs and work conditions, and activities such as recruitment, training, cessations and performance appraisals (Nankervis, Compton & McCarthy, 1992). Well-designed HRMS provide the organisation with an active role in strategic planning, bring together in one location diverse sets of records, speed cost-benefit analyses, and facilitate storage of and access to personnel records (Schuler et al. 1996). A major difference between FMIS and HRMS is that the origins of the former lie in transactional processing whilst the latter has its roots in database technology. There are major implications in this basic fact of life for future generations of software. HRMS databases are important to organisations in processes such as tracking, recruitment, recording results of performance appraisals and evaluating enterprise bargaining packages. Until relatively recently, such activities were possible only in larger organisations which had mainframe computers, and even then it was common for processing time to be shared with financial functions.

Early versions of HRMS experienced severe limitations on software flexibility. They were used as report generators rather than as management tools. Other limitations of early mainframe HRMS included high operational costs, lack of flexibility, and lack of suitability to the health environment, particularly in accommodating the wide range of special awards and conditions that exist in the health service. The introduction of relational databases as the source of many HRMS has enabled easier use. It is now possible to answer in seconds what were hitherto regarded as difficult and time-consuming questions. Since the mid-1980s the widespread adoption of electronic spreadsheets in both FMIS and HRMS has facilitated the downloading of data from mainframes to microcomputers. Analysis of human resource data can be carried out effectively by both mainframes and personal computers. It is now possible to test prospective organisational decisions and policies on bottom-line measures of performance and conditions.

Possibilities for human resource information management by means of mainframe databases have existed for a considerable time (Bartholomew 1982; Smith 1982) and the topic continues to be treated extensively in more recent texts (Strike 1995). Based on the notion of human resource management as a function of supply of, and demand for, various categories of skilled and unskilled labour, HRMS have to deliver a series of essential analytical reports. Central to this notion is the concept of stocks, the current number of staff employed expressed as headcounts or full-time equivalents, and flows expressed as recruitment and wastage rates. Many examples of policy matters which depend on HRMS are to be found in the planned reduction of the workforce by means of redundancy, redeployment, and early retirement. Similarly, indicators of the state of the current workforce are reflected in staff absence rates, turnover, stability ratios, overtime levels and vacancy levels, all of which depend on HRMS.

The basic requirement for this form of HRMS is an integrated database which holds subsets of information on both people and positions. Health organisations with a publicly funded establishment need to keep track not only of the positions themselves, but also of their nominal and actual occupants. An individual employees' database will typically contain information on recruitment and termination, leave, skills and qualifications, staff development and training. Estimation of workforce needs utilises both data sets to identify trends in staff numbers and their relationship to other relevant variables such as recruitment, wastage and promotion.

In their more advanced form, mainframe HRMS have the potential to develop planning models. A human resource planning model systematically provides speedy, accurate and repeatable results. There are two main forms taken by planning models. A deterministic model projects into the future based on the expected value for flows without provision for random variation. A stochastic model, by comparison, takes account of the influence of probability over time and tends to be used with relatively small groups. Other statistically and computing-based planning models in common use are based on fractional flows, and on Monte Carlo simulation techniques. The sophistication offered by these models is available to larger health organisations such as health departments and bigger acute care institutions which have the capacity to make provision for modelling activities.

The PC revolution has also made HRMS more accessible to medium- and smaller-sized health organisations (Beutell 1996). Downloading of data into microcomputers for use in analysis and planning is a prominent feature of many postgraduate training programs. The design of spreadsheets, built around a grid of rows and columns, makes them well suited to 'what if' analyses. The possibilities for even the smallest health organisational unit to engage in HRMS activities have increased dramatically as a consequence of the accessibility of data that can be managed by PCs.

As tools for human resource management policy issues, spreadsheet applications to 'what if' models can be supplemented by database applications and automated questionnaires. Prominent among the activities generated by PC applications is the issue of workforce planning, underpinned by the necessity to understand the nature and process of staff turnover. Human resource activities such as recruitment, equal employment opportunities considerations, interpretation of performance data, staff development and training, collective bargaining, attitude surveys and more general issues such as work stress can be analysed and reported on by means of PC applications. The range of PC activities adds depth to the ways in which human resource issues can be utilised in management, and promises to make a significant contribution to small- and medium-sized health organisations. A new generation of business intelligence tools will further extend the capacity of human resource managers to conduct sophisticated analyses.

Summary

The foregoing overview of FMIS and HRMS demonstrates the framework they bring to health service management. A theoretical perspective is necessary to a full understanding of the relationship between two of the principal operational information systems at work in health organisations. Bringing together two diverse fields of management and focusing them on health organisations is only part of the problem to be addressed. The view from the ground is equally important to make possible comparisons and contrasts between theory and reality. Since so little research has been carried out in this area, the appropriate means for this project was to carry out a series of case studies in a sample of health organisations. Selection of the organisations was based on representation of different aspects of health care delivery. Studies were conducted in a State department of health and community services, an acute care facility, a large community health centre, and a small privately owned and operated nursing home. There were two purposes to the case studies: to develop a profile of information management in a cross-section of organisations; and to generate issues for discussion which might be of interest and significance to researchers, managers and professional groups in health.

The case studies

A department of health and community services

A State government department is perhaps the largest and most complex organisational entity engaged in health service management. It could be expected that the corporate information systems in use would be the most powerful and substantial in terms not only of the hardware, software and data communications in use but also in the level of sophistication of the analysis of the information they contain. During the last few years a series of amalgamations between government departments has added a new dimension to the development and rationalisation of corporate information systems. At the time of the study, the department employed between 11 000 and 12 000 staff in total, excluding service providers belonging to non-government organisations. The department's total annual budget is in the region of \$4 billion (Department of Health and Community Services 1995, p 213). Finance and human resource management systems exist in an environment of devolved financial management, with the consequence that well-defined reporting mechanisms are essential to effective functioning.

The financial departmental system in use is an application developed in-house, known as Renaissance (RFMS), which collects data and generates reports, running on a VAX platform. Base data is captured by RFMS, fed into the general ledger, and from there the full range of financial reports derive. In-house systems do not seem to be found so commonly, as previously stated. It was not surprising to learn that the department thought that their financial system was nearing the end of its useful life, and that tenders were being evaluated for a replacement.

Payroll is a batch-oriented operation outsourced to a private company (Health Computing Services). Payroll processing is performed by an application called NEWPAY, on UNISYS hardware. A related application, PERSPAY, gives on-line access to about 300 users on a statewide basis, and from which human resource management standard reports are generated. Data are transferred from PERSPAY via an interface to NEWPAY, which performs payroll processing. Under this arrangement, both finance and human resource transactional requirements are met by the same system.

Information can be downloaded from PERSPAY and NEWPAY into personal computer software for further analysis. In particular, SAS is extensively used for workforce planning and reporting. More recently, an executive information system has been implemented. Key performance indicators are identified for each departmental division, financial performance being prominent. Managers are able to view a series of tables in summary form at the highest level and then 'drill down' in highlighted areas to examine information in greater detail. Extensive use is being made of the decision support tool in identifying finance for the capital works program. It is an example of the use of one of the new generation of business intelligence tools.

A public acute care organisation

The organisation is a public facility which provides a comprehensive range of health services. The services include acute care, aged care, rehabilitation, psychiatric care and residential care and are targeted at a regional population of some 200 000 people. The facility operates from three main sites and eight smaller sites. It employs about 2000 staff in total, which represent 1500 full-time equivalents. The total budget is around \$90 million. The creation of the comprehensive health organisation in 1995 had the effect of increasing the demand for services, so that patients are less likely to travel to the State capital for health care needs than previously.

At the time of the study there were two accounting systems in operation, MacDonnell Douglas and IBA, both running on Unix platforms. By mid-1996 it was anticipated that there would be a single stores system, creditor, payroll, general ledger and reporting systems. The organisation has autonomy of choice in acquiring the system which is best tailored to defined organisational needs, although it was noted that there seems to be a movement away from healthspecific products and towards standard commercial packages. In moving towards a single unified financial system, it is believed that minimisation of financial risks will be achieved. Reporting to State and Commonwealth departments is in standard format. Reports of this nature are seen to be a by-product of the financial information system, rather than its main focus. Reporting to the Commonwealth Government is a routine matter. Care Aggregated Module/ Standard Aggregated Module (CAM/SAM) data, for example, is sent to the State government for coordination. Internally, the organisation perceives some difficulties in comparability between organisations which have been subsumed into the comprehensive facility.

Within the last three years the whole human resource function has been reorganised and is now a recognised specialist function. Previously, it had been a control rather than a service function, which reflects on the changing management role played by human resource management in general. It led to much duplication of effort, and with hidden costs that are probably of high magnitude. Centralisation of the human resource function had empowered unit managers. Everyone in the organisation had been affected by the big effort which had been made in performance development.

The information system in use (HCS 1992) is a database system running off the payroll. The potential of the system is not fully realised. In part, this is attributable to the fact that the system itself is not easily understood and needs to be more fully resourced. Recognition of the changing needs in management, brought about by the introduction of devolved budgets, suggests that, whilst the necessary information was in existence, it needs a clearer focus. Perhaps this might be brought about by disaggregation of data from a central bureau and posted to unit managers. Whilst the need to maintain an establishment database has diminished in recent years, organisation caps on staffing levels have been retained. It was suggested that there was no real ownership of human resource information, and that reports are often not related to perceived needs. The cause of the problem seems to be that defining and retrieving information is difficult, particularly for clinicians, because the system has been designed from a human resource management perspective, with little regard for health professionals.

The organisation has a clinical costing decision support system in operation (Shapleigh 1994) which was thought to be effective in a static environment. Experience in using the decision support system had highlighted several issues which would in due course influence the development of corporate systems. The speed of delivery of information from the systems in use is inadequate. Even in the decision support system, the information utilised is five weeks old. There is also a problem in the design of the systems in use. Technical specifications are perceived to be arrived at without sufficient regard to enduser needs. An example of this can be seen in the fact that the systems in use are still input-oriented rather than output-oriented. The problems raised seem to indicate that there is a requirement for corporate systems to have predictive power. Financial and human resource information should be capable of being modelled to show forecasts for the future against actual performance. Clinical data, in the form of diagnosis related groups, as well as that from corporate systems should be more outcome-oriented. A link back into performance could be achieved by showing the data as relative values, which would for the first time make it possible to benchmark performance.

A community health centre

A multi-sited, community-based and managed community health centre is a complex organisation to manage. A management review in 1991 recognised the fact by recommending the introduction of a flat management structure. In the centre studied, there are 108 salaried employees and another 132 caregivers (wage-earning and voluntary). The centre delivers a comprehensive range of programs, both medical and in-depth community services such as consumer advice, tenancy, problem-focused counselling (for example, gambling), gender-specific focus groups, health promotion, stress management, diabetes, home and community care, youth homelessness and STD/AIDS services. The different sites are based on the client types to whom the programs are delivered. The total gross budget is in the region of \$5.5 million.

The financial system was centralised as part of the 1991 review in order to keep accountability at a high level. The computerised accounting system in existence at the largest site (Pacific Databases 1989) was extended to all other sites. The basis of the reorganisation was to create a chart of accounts which would serve the whole organisation. Reflecting on the experience, it was observed that a needs analysis should have been carried out and the new system introduced at the beginning of a new year, rather than retrospectively. However, the initiative had been successful in that the whole organisation had brought in a profit for the last three years for the first time. A full-time accountant and accounts payable and receivable clerk are employed reporting to the finance and personnel coordinator. The management committee is now better informed on financial matters than previously, there is a higher level of financial awareness, and financial reports are closely questioned.

Functions of the basic accounting information system are as described in the section on FMIS above. Cost centres and codes are used to distinguish between employees whose salaries and wages are derived from State, Commonwealth or other sources. The board of management carries the legal responsibility for ensuring that appropriate distribution of funds is made for service provision (through service agreements), regardless of the source of the funds.

The introduction of the Employee Relations Act in 1992 brought contractual arrangements into community health. An outcome has not only been more enterprise and collective bargaining, but also more productivity and profit-sharing. Employees are now on one-year contracts, which are evaluated by a panel before re-appointment. Job descriptions and contracts are stored on a word processing package, and other human resource data on electronic spreadsheets. Salary packaging is the issue which brings together FMIS and HRMS. The issue

is still some way from resolution because access to salary packaging for all employees is still being developed. The review system is carried out manually. It is anticipated that it will continue to do so as a means of maintaining personal communication

The FMIS issue identified in community health is consequent on the introduction of unit-based funding. Reporting requirements have changed as a consequence of linking unit-based funding with the health service agreement, which details and specifies the services to be delivered. A unit-based funding approach was introduced before the development of adequate software. Data has to be collected manually and extra staff will have to be appointed to input data. The discrepancy between State- and Commonwealth-funded programs also causes problems in community health. An example is provided by home and community care, which is not integrated with other forms of service delivery. The top level of financial and human resource software is not yet in sight for the organisation. The range of products presently available is thought to be beyond the expectations of the organisation which, in any case, does not have the purchasing power to acquire it. An unresolved problem is that the linkage between budgeting and output-based funding has to be defined and established. Presently, the two processes are carried out independently.

A private nursing home

Although the 20-bed organisation has 38 staff in total, only one, the proprietor and the director of nursing, is full-time, with the remainder being part time. The part-time staff comprise 25 nurses and 12 ancillary staff (therapy, cooks, cleaners gardeners, and so on). The total budget is in the region of \$750 000, comprising CAM/SAM and OCRE (Cost Reimbursed Expenditure) combined. Income is generated by a resident contribution of 87.5 per cent of the combined single pension and rent allowance. The balance is made up by a Commonwealth Government subsidy paid directly to the nursing home each month.

A manual accounting package, the Kalamazoo System, was used until mid- 1995. It was found to be inadequate because it depended on one person, and could not generate enough information for reporting needs. The requirement for improved accessibility of financial information to a wider range of employees led to the introduction of a standard financial package marketed at small nursing homes (Australian Nursing Home Management Pty Ltd 1995). Features of the package include general ledger, accounts payable and receivable, resident records and payroll. The distinctive feature is the inclusion of a Resident Classification Instrument, the basis of CAM/SAM funding. Trust accounting and full reporting of resident transactions are possible through this facility. Payroll and rostering

are interrelated in order to produce cheques and pay slips automatically. Three staff are involved in using the system and all have required essential training. Despite the effort, external technical support is necessary, especially in the area of communications.

Human resource management, in the form of storage of employee records, is included in the package recently implemented. The main characteristics are work classifications, CAM/SAM allowances, deductions and entitlements, long service leave accrual, award tables and electronic transfer of salaries to bank accounts. Since all information is stored in the same system, Commonwealth reporting requirements can be met with relatively little effort. Possibilities for analysis of human resource issues such as wastage and job analysis exist within the package, but the size of the organisation is seen to impose more severe limitations in this regard.

The needs for capacity such as decision support and executive information summaries for the organisation are thought to be adequately met by the system. It may be that full realisation of the potential of the selected system may not be realised because alternative software for the Resident Classification Instrument (for example, Microsoft 1992) may better meet the needs, allowing for alteration and modification of information to model Resident Classification Instrument changes and their impact on the organisation. The package in use does not give the opportunity to model the information to any great extent.

Discussion

Information management provides the key to gains in efficient resource use in the health services (Abel Smith 1994, p 203). The World Health Organization Regional Committee for the Americas estimated that 30 per cent of total resources available to the health sector were lost through inadequate technology and deficiencies in management (World Health Organization 1985, p 13, quoted in Abel Smith 1994, p 204). There is little doubt of the importance of the place occupied by corporate systems in health organisations, and of the likelihood that they will continue to maintain their pre-eminence in a climate of continuing change. Since there has been very little systematic study of their form and use in health organisations, there is considerable scope for further investigation. From a brief review of the literature, and preliminary study of a small sample of health organisations, it would be inappropriate to attempt to reach definitive conclusions. Enough can be learned, however, to highlight some issues which might warrant comprehensive study in a wider range of health organisations. Discussion of the present investigation arises from the nature of FMIS and HRMS themselves, and from their place in the totality of information available to health service managers, and will consequently centre on these main themes.

Financial management information systems

Developments in FMIS are having the effect of coordinating clinical, financial and management aspects of health. Health organisations are looking to financial information systems to supply them with the tools to bring into reality an integrated approach to management. Some features of the movement observable in the case studies, particularly in acute care, can be seen in:

- sharing and common ownership of financial information
- interfacing between financial and other systems, as in casemix
- local control and management of systems
- improvements in the reporting functionality of systems so that information is available to all managers, as well as the financial director
- better presentation of information to improve understanding by non-financial systems users
- improved capacity for forecasting and planning.

It is noteworthy that the tendency for health organisations to develop their own systems is changing, as seen in the State department studied. Solutions developed by private sector software suppliers appear to keep better pace with changes in technology and with increasing user expectations, evidenced in their uptake by relatively small, as well as large, health organisations. Many health organisations are beginning to adopt clinical costing packages such as TRENDSTAR, which are closely linked to financial systems and the widespread introduction of casemix.

Human resource management systems

HRMS have the capacity to quantify resources to compare with patient-based activity and resource use throughout the whole health system, particularly in comparing costs and performance. As budgetary control is devolved, the tools which allow skill-mix analysis are being introduced. Examples of the process are afforded by the fostering systems utilised in nursing homes where CAM/SAM is a powerful vehicle for local responsibility in effective deployment and financial management.

There is scope for further development of the HRMS function in health organisations. Comprehensive sets of records are commonly held manually by

unit managers. A missing link is between staff groupings and the data sets with which to manage the human resources of the organisation. While computerised personnel records create an electronic filing cabinet that allows the possibility for analysis, there remains the need to address the broader issues of cost-effective management to reflect contractual obligations and equitable group representations. HRMS are able to give the opportunity for insights into policy changes, for example, an impending pay award or cuts in staffing levels. Nursing homes represent an excellent small-scale model for the generation of these systems in their use of rostering systems to comply with complex staffing rules and requirements. There is a need for more effort to balance the costs of collecting and maintaining human resource data against the value of accessibility and ad hoc reporting from HRMS.

Information management

The operational roles of FMIS and HRMS have to be fully effective before management needs can be satisfied. Information management requires not only the provision of routine reports, but must also support complex and varied enquiries. To be efficient, management information systems must be functionally separated from operational systems, drawing data down and storing it independently. A layered approach to reporting, with high standards of graphics, should be part of a management information system. A well-designed network, consistent with the organisation itself, and capable of data modelling, are further requirements of management information systems. Once in place, the conditions are created for information management capable of problem-solving and decision support (Smith 1995). Primary health care organisations present some of the best opportunities for advancements in information management. In recent years a great deal of effort has been made in corporate restructuring, and the gradual introduction of unit costing emphasises the needs for a more integrated approach to information management.

Executive information and decision support

The challenge facing corporate information systems is to become the platform on which executive information systems and decision support systems can be built. The problems faced by senior managers in using traditional management information systems are well known and include:

- data saturation, often of a trivial nature
- a strong bias towards financial information, and an absence of information on other aspects of corporate performance

- reports which give no clue to underlying trends and variances
- data which are irrelevant to critical organisational issues
- tabular output with no graphical display.

The alternative of senior managers using query languages to address some of the problems is found to be not feasible, and an ineffective use of time. Executive information systems are a high risk venture which can quickly lead to disillusionment at a senior level, with the loss of many benefits. Despite this, it seems likely that executive information systems will grow significantly in the next few years. To be successful, such systems have to use flexible development methods and rapid prototyping, and directly involve senior management. Executive information systems are difficult to justify on cost because of intangible short-term benefits. The executive information system recently implemented at the State level in itself represents a noteworthy achievement in resolving these problems, although a further evaluation is awaited. Some of the re-assessment of the decision support tools being utilised in acute care is also perhaps a natural reaction to a bold new venture.

Planning and forecasting

A description of the business processes in health organisations forms a conceptual model for criteria which are consistent with corporate strategies and objectives. If the activities they embody are well understood, then the corporate data model to control and monitor business functions can be defined. The creation of a management information database which integrates corporate systems with service delivery outcomes enables planning to take place by projecting forward trends into areas such as health status improvement, demographic changes, changes in social status, and changes in government policies. Essential to such work are projections of cost levels and human resource requirements. Evidence is beginning to emerge, particularly at State departmental level, that models are being developed to plan the need for hospital beds, appraise capital investment options, and assist with locational analyses and performance of health services. Bearing in mind that planning and forecasting tools are used to inform, rather than prescribe, management action, it can be anticipated that there will be significant future developments in this direction, given the increasing sophistication and decreasing costs of hardware, software and data communication.

Conclusion

Corporate information systems in health organisations are here to stay. They play a major part in health management because they store much of the data essential to decision-making and control. Recognition of these factors leads to the conclusion that managers in different types of health organisations have to take care not to becomes slaves to the minutiae of transactional data that are held in individual FMIS and HRMS. It can be argued that the need is for a broad understanding of the systems, together with insights into how they might be geared towards the creation of a relatively clear and far-sighted vision of the strategic options available, and where these options might lead. If there is validity to such a view, then the implications for present needs have to be considered alongside the education and training of future health managers. The present paper represents a tentative step towards identifying the necessary strategic management objectives.

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Defining an episode of care: A study of five Case Types

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Abstract

This is the first study in Australia to test definitions of various types of 'episodes of care'. The definitions reported here are those used in the 1996 National Sub-Acute and Non-Acute Patient (SNAP) Casemix Classification Study.

The study collected data on a total of 683 patients at 10 hospitals and 2 community health services providing a range of rehabilitation, aged care and community care services. The kappa statistic (k) was used to determine the significance of the level of agreement between raters. The value of kappa was 0.838 with a 95 per cent confidence interval of 0.801 to 0.975.

The results of this study are encouraging and support the use of the five Case Types – Palliative Care, Rehabilitation, Psychogeriatric, Geriatric Evaluation and Management, and Maintenance Care. All five Case Types proved to have good interrater reliability, there was a good fit for most patients, and staff found the definitions easy to use.

Introduction

The question of how to define an episode of patient care has been the subject of much recent debate. This debate was triggered in part by the 1992 report of the National Patient Abstracting and Coding Project (Eagar & Innes 1992a, 1992b). Eagar and Innes argued that an episode of care should not be defined as that care which begins at admission and ends at discharge. Instead, they proposed that the definition of an episode of care be based on the acuity of the patient and the goal of care. They also proposed that the AN-DRG (Australian national diagnosis related group) classification be used to classify only 'acute' patient episodes of care and that existing information systems be amended to allow for 'statistical type changes' within the one hospitalisation. In response to that report, the Australian Health Ministers' Advisory Council (AHMAC) agreed in 1992 to the introduction of a standardised national data collection system to distinguish between different episodes of inpatient care (AHMAC 1992). The AHMAC resolutions are important. An episode of inpatient care is no longer defined as being the complete period from admission to discharge. Nor is it defined by the name of the ward to which the patient is admitted. Instead, it is now recognised that a patient can move through two or more acuity episodes during the one stay in hospital. Indeed, in the case of palliative care, it is recognised that an episode of care may continue after the death of the patient.

A definition of acute care was subsequently developed and included in version 4.0 of the *National Health Data Dictionary* on the basis that it be used only for casemix definition development until it had been tested and refined. In the process, the National Health Information Management Group recommended that the boundaries between care types be defined to allow for the identification of the beginning and end of an episode of care (Australian Institute of Health and Welfare 1995).

The most recent version of the *National Health Data Dictionary* (version 5.0) defines an episode of care as a phase of treatment and recognises six types of episode – acute, rehabilitation, palliative care, non-acute care, unqualified neonate, and other care (Australian Institute of Health and Welfare 1996). Consistent with the National Health Information Agreement, all States and Territories are implementing these definitions.

None of the definitions now incorporated in the *National Health Data Dictionary* have been subjected to testing and, in the absence of data, there are questions about their validity, reliability and clinical meaning. These questions apply equally to all episode types.

This paper presents the results of the first study undertaken to test definitions of care that is not 'acute' care. The definitions were developed by the Clinical Project Team of the National Sub-Acute and Non-Acute Casemix Classification Study (Centre for Health Service Development 1996).

The definitions reported here are those employed in the 1996 National Sub-Acute and Non-Acute Casemix Classification Study. In addition to testing interrater reliability, the purpose of the study was to ascertain the views of clinical assessors regarding the adequacy of the Case Type definitions for the classification of sub-acute and non-acute patients and to assess the goodness of fit of the definitions. Five Case Types are included in the National Sub-Acute and Non-Acute Casemix Classification Study and a key research hypothesis to be tested is whether each Case Type is clinically distinct as measured by the patient attributes to be captured in that study. An algorithm is used to assign each patient to one, and only one, Case Type. In the event that there is more than one Case Type which could appropriately define an episode, the episode is allocated to the first Case Type identified in the algorithm. The five Case Types listed in the order in which they appear in the algorithm are:

- 1. Palliative Care
- 2. Rehabilitation
- 3. Psychogeriatric
- 4. Geriatric Evaluation and Management
- 5. Maintenance Care.

Each Case Type has been defined by *describing the patient*, by defining the *goal of care*, and by *describing the service characteristics* for the Case Type.

The definitions of the five Case Types are included in the appendix.

Method

Data were collected at 10 hospitals and 2 community health services in New South Wales, Victoria, South Australia and Western Australia. Sites in the study provide a range of rehabilitation, aged care and community care services. One site (representing less than 10 per cent of all observations) is a designated rehabilitation centre. Four sites provide a range of acute, rehabilitation and aged care services, whilst seven sites provide a range of rehabilitation and aged care but no acute care. Specialist palliative care services and specialist adult mental health services were excluded from the study because these units rarely care for patients whose episode is other than palliative care or mental health.

A study coordinator at each site provided instructions to raters and managed the on-site data collection. Site coordinators selected two clinical staff from each ward/service to participate in the pilot study. The clinical staff members acting as raters included registered nurses, specialist medical staff, medical registrars and allied health staff.

The site coordinators provided each rater with the definitions of each Case Type and ensured that they were familiar with the Case Type assignment logic. Each rater was given a written instruction sheet instructing them to assign each patient to one, and only one, Case Type. Using a scale of 0 to 4, where 0 indicates 'Very poor fit' and 4 indicates 'Very good fit', raters were asked to indicate how well the Case Type described the key attributes or characteristics of each patient. Likewise, raters were asked to assess how difficult it was to assign each person to a Case Type. A scale of 0 to 4 was used for this purpose, with 0 indicating 'Very easy' and 4 indicating 'Very difficult'.

Raters could also indicate if the patient did not fit into any of the five Case Types or, conversely, if the patient met the description of more than one Case Type. Finally, raters were asked to indicate any patient where they were not sufficiently familiar with the person's clinical condition to be confident about these ratings.

Each patient on the ward/receiving care was assessed independently by the two clinical raters and allocated to one of the five SNAP Case Types. Each assessment was made by each rater without discussion with the other rater. Both assessments were completed within the one 24-hour period. Single assessments were also collected for any patient/community client who was seen by only one practitioner on the day of assessment. These assessments were to be used solely to assess goodness of fit and ease of use.

After the data had been collected, clinical assessors were interviewed, either individually or in a group, by the site coordinator to identify any problems experienced in undertaking the required tasks and any suggestions for improving the wording of the definitions. These were documented and forwarded to the study team.

Results

In total, 683 patients were classified to one of the five Case Types. Of this total number, 559 patients (81.8 per cent) were assessed by two raters and 124 (18.2 per cent) by one rater. As expected, most of the sole ratings occurred in community settings where the patient was seen by only one practitioner on the day of assessment. These cases were excluded from the analysis of inter-rater reliability but included for other analyses.

Figure 1 shows the ratings for the 559 patients assessed by two raters. It also shows each combination as a percentage of total observations. There was a perfect match for 496 (88.7 per cent) patients. For the remaining 63 (11.3 per cent) patients, the largest number of mismatches are between Rehabilitation and Geriatric Evaluation and Management (19 or 3.4 per cent of total observations) and Rehabilitation and Maintenance Care (18 or 3.2 per cent). However, there were also a small number of mismatches for all other combinations except Palliative Care and Rehabilitation.

				Rater one			
		Palliative Care	Rehabilitation	Psychogeriatric	Geriatric Evaluation and Management	Maintenance Care	Total
	Palliative Care	21 (3.76%)	0 (%0) 0	1 (0.18%)	1 (0.18%)	4 (0.72%)	27
	Rehabilitation		232 (41.5)	2 (0.36%)	19 (3.40%)	18 (3.18%)	271
Rater two	Psychogeriatric			41 (7.33)	2 (0.36%)	4 (0.72%)	47
	Geriatric Evaluation and Management				85 (15.2)	12 (2.15%)	97
	Maintenance Care					117 (20.93)	117
	Total	21	232	44	107	155	559

Figure 1: Results of two rater assessments

Table 1 shows the mismatches in more detail. Three types of mismatch account for 78 per cent of all mismatches – Rehabilitation/Geriatric Evaluation and Management; Geriatric Evaluation and Management/Maintenance Care and Rehabilitation/Maintenance Care. Rehabilitation, Geriatric Evaluation and Management and Maintenance Care also account for 78 per cent of all matches.

Case Type Rater 1	Case Type Rater 2	Total number	Percentage of all mismatches
Palliative Care	Psychogeriatric	1	1.59
Palliative Care	Geriatric Evaluation and Management	1	1.59
Palliative Care	Maintenance Care	4	6.35
Rehabilitation	Psychogeriatric	2	3.18
Rehabilitation	Geriatric Evaluation and Management	19	30.16
Rehabilitation	Maintenance Care	18	28.57
Psychogeriatric	Geriatric Evaluation and Management	2	3.18
Psychogeriatric	Maintenance Care	4	6.35
Geriatric Evaluation and Management	Maintenance Care	12	19.05

Table	1:	Mismatch	by	Case	Type
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The kappa statistic (k) was used to determine the significance of the level of agreement between raters. The kappa co-efficient of agreement is the ratio of the proportion of times that the raters agree (corrected for chance agreement) to the proportion of times that the raters could agree (corrected for chance agreement). The value of kappa was 0.838 with a 95 per cent confidence interval of 0.801 to 0.875.
Goodness of fit

Each rater used a scale of 0 to 4 to indicate how well each Case Type described the key attributes or characteristics of each patient. A score of 0 indicated 'Very poor fit' and a score of 4 indicated 'Very good fit'. Goodness of fit was calculated based on a total of 683 patients. This includes the 124 patients with only one rater. The average goodness of fit score was 3.48, indicating that there was a good fit for most patients. Table 2 shows the goodness of fit score by Case Type. At 3.70 with two raters and 3.44 with one rater, the Maintenance Care Case Type had the best fit score. Among the Case Types, Geriatric Evaluation and Management had the lowest fit score (3.27). Not surprisingly, the mismatch group Rehabilitation/Geriatric Evaluation and Management has the lowest score overall (2.90), indicating that these patients did not fit the definitions as well as other patients assigned to either Rehabilitation or Geriatric Evaluation and Management.

Ease of assignment

Each rater used a scale of 0 to 4 to indicate how easy it was to assign each patient to a Case Type. A score of 0 indicated 'Very easy' and a score of 4 indicated 'Very difficult'.

Again, ease was calculated based on a total of 683 observations. The average ease score was 0.91, indicating that there were no significant difficulties assigning sub-acute and non-acute patients to one of the five Case Types.

Table 3 shows the ease of assignment score by Case Type. At 0.54 with two raters and 0.17 with one rater, the Psychogeriatric Case Type had the best ease score. Among the Case Types, Geriatric Evaluation and Management had the lowest ease score (1.15). Overall, the match groups have better ease of assignment scores than the mismatch groups. However, the numbers in some cells are very small and so it is difficult to draw any definitive conclusions.

Feedback on the Case Types

Raters were asked to identify any patient who could be assigned to more than one Case Type and to identify patients who did not meet the description of any Case Type. In addition, raters were asked to identify any patient where the rater was not sufficiently familiar with the person's clinical condition to be confident about the ratings given.

Rater 1	Rater 2	Number of raters	Mean fit score
Palliative Care	Palliative Care	40	3.54
Rehabilitation	Rehabilitation	464	3.56
Psychogeriatric	Psychogeriatric	82	3.54
Geriatric Evaluation and Management	Geriatric Evaluation and Management	150	3.27
Maintenance Care	Maintenance Care	212	3.70
Palliative Care	Nil	7	4.00
Rehabilitation	Nil	30	2.93
Psychogeriatric	Nil	6	4.00
Geriatric Evaluation and Management	Nil	36	3.27
Maintenance Care	Nil	45	3.53
Palliative Care	Psychogeriatric	2	3.00
Palliative Care	Geriatric Evaluation and Management	2	3.50
Palliative Care	Maintenance Care	8	3.14
Rehabilitation	Psychogeriatric	4	3.00
Rehabilitation	Geriatric Evaluation and Management	40	2.90
Rehabilitation	Maintenance Care	38	3.19
Psychogeriatric	Geriatric Evaluation and Management	4	4.00
Psychogeriatric	Maintenance Care	8	3.48
Geriatric Evaluation and Management	Maintenance Care	28	3.14

Table 2: Goodness of fit by Case Type

Rater 1	Rater 2	Number of raters	Ease of assignment
Palliative Care	Palliative Care	40	1.02
Rehabilitation	Rehabilitation	464	0.78
Psychogeriatric	Psychogeriatric	82	0.54
Geriatric Evaluation and Management	Geriatric Evaluation and Management	150	1.15
Maintenance Care	Maintenance Care	212	0.72
Palliative Care	Nil	7	0
Rehabilitation	Nil	30	1.87
Psychogeriatric	Nil	6	0.17
Geriatric Evaluation and Management	Nil	36	1.62
Maintenance Care	Nil	45	1.11
Palliative Care	Psychogeriatric	2	0.5
Palliative Care	Geriatric Evaluation and Management	2	2.00
Palliative Care	Maintenance Care	8	3.00
Rehabilitation	Psychogeriatric	4	1.50
Rehabilitation	Geriatric Evaluation and Management	40	1.48
Rehabilitation	Maintenance Care	38	0.82
Psychogeriatric	Geriatric Evaluation and Management	4	0.25
Psychogeriatric	Maintenance Care	8	1.88
Geriatric Evaluation and Management	Maintenance Care	28	0.78

Table 3: Ease of assignment by Case Type

Raters indicated that 11.7 per cent of cases could be assigned to more than one Case Type and included a brief description of difficult cases. These cases were spread across all Case Types. In total, 3.4 per cent of patients did not meet the criteria for any Case Type. These patients were mostly identified as acute care. There were 12 cases where one or other of the raters indicated that they were not sufficiently familiar with the person's condition.

Discussion

The results of this study are encouraging and the five Case Types are to be employed in the 1996 National Sub-Acute and Non-Acute Casemix Classification Study. Although there were some differences in the performance of the five Case Types, all five proved to be reliable. Most patients fitted into only one Case Type and staff found the definitions easy to use.

The kappa value indicates that there is very good inter-rater reliability. Likewise, the assessments completed by the raters indicated that they found the definitions easy to use. In addition to the quantitative ratings reported above, raters also provided subjective comments on the definitions and their application. Raters reported that they were happy with the wording of the definitions of the five Case Types and had few suggestions for improving them.

For raters in a community setting, the key issue was the boundary between primary care, post-acute care and maintenance care. For example, it was unclear to community raters whether care of a patient with a chronic leg ulcer was primary care or maintenance care. A further example given was an elderly lady referred for monitoring and wound dressings following surgery. She was expected to require dressings for 6–12 weeks. The rater found it hard to determine if this was acute, post-acute or maintenance care.

With the exception of this one issue, community raters indicated no significant difficulties with applying the definitions. On the whole, their inter-rater results, goodness of fit scores and ease of use scores were equivalent to, or better than, those of hospital-based raters.

The issue of the boundary between acute care and other care was also raised by some hospital raters. Some suggested that a clearer definition of acute care is required.

However, a more important issue in this study is whether assignment to a Case Type is based on the reason for admission/episode start (a prospective assessment) or on an assessment of the whole episode (an assessment that can be made concurrently or retrospectively). This study was a snapshot study. It captured all patients receiving care on a specific day. As such, most patients were well into an episode of care at the point at which they were assessed. Vignettes provided by the raters indicated that some patients had been admitted for one reason and, subsequent to the admission, new problems had emerged which required a new care plan. The most obvious example given was a patient admitted for palliative care who fractured their femur during the hospital stay. The patient is now receiving rehabilitation. However, there were other less extreme examples. This includes patients who were admitted for rehabilitation and who have subsequently demonstrated little capacity for functional improvement.

An analysis of the comments provided indicates that about half of the mismatches occurred because one rater based their assessment on reason for episode start and the other rater based their assessment on the situation at the time of rating. Not all raters commented on all patients subsequently in the mismatch cohort and so a more detailed analysis is not possible.

There are two differences between this inter-rater study and the way that the definitions are applied in the National Sub-Acute and Non-Acute Casemix Classification Study. In the latter study, all patients will be assigned to a Case Type at the start of their episode of care. Further, for patients whose Case Type changes during the one hospitalisation or episode of community care, there will be capacity for a 'type change'. Episode end data will be collected when a type change occurs and the patient will be admitted to a new Case Type. All patient data items will be repeated at each type change. This should overcome the problems reported in this study.

Finally, some raters reported difficulties with assignment when the evidence as stated in the definition was not available. For example, the study cohort included six patients admitted to a designated rehabilitation unit and who were reported as receiving rehabilitation. However, there was no rehabilitation plan and no indicative time frame. This issue has implications for both quality and for funding. The section 'as evidenced by' is included in the definitions to minimise the capacity for manipulating the classification in order to receive a higher level of funding. It is reasonable to expect evidence to exist if a provider is to be funded for providing a specific type of care.

Case types as defined in this study have not been used before and it will be important to ensure that appropriate training is provided to all staff making Case Type assignments. Staff need to know that they are classifying the patient and not the stream of care in which they work. Further, they need to know that patients are classified to a Case Type at the beginning of their care. Given that some patients could be assigned to more than one Case Type, it is critical that staff making Case Type assignments understand the algorithm. Of specific importance is that Rehabilitation overrides both Geriatric Evaluation and Management and Maintenance Care.

A test of the inter-rater reliability of the definition of 'acute care' is yet to occur. A fundamental issue to be resolved is whether, for casemix purposes, the unique feature of acute care is actually the acuity of the patient or the presence of a clearly identified principal diagnosis that can be used to assign a patient to a 'diagnosis related group'.

Once this issue is resolved, it will be necessary to test the boundary between 'acute care' and the care reported in this study. It seems likely that the debate about the boundary of acute care will continue at least until such time as health care providers understand the definition of an episode of care.

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Appendix

The five Case Types

Palliative Care

An episode of care:

- provided for a *person* with an active, progressive, far advanced disease with little or no prospect of cure and
- for whom the *primary treatment goal* is quality of life
- which is evidenced by:
 - + multidisciplinary assessment and/or management of the physical, psychological, emotional and spiritual needs of the person
 - + a grief and bereavement process for the person and their carers/family.

Inclusions:

- A palliative care provided in both community and hospital settings
- B grief and bereavement support services for the family and carers during the life of the person and continuing after death

Rehabilitation

An episode of care:

- provided for a *person* with an impairment, disability or handicap and
- for whom the *primary treatment goal* is improvement in functional status
- which is *evidenced by*:
 - + an individualised and documented initial and periodic assessment of functional ability by use of a recognised functional assessment measure
 - + an individualised multidisciplinary rehabilitation plan which includes negotiated rehabilitation goals and indicative time frames.

Inclusions:

A Rehabilitation care provided in both community and hospital setting

Psychogeriatric Care

An episode of care:

- provided for an elderly *person* with either an age-related organic brain impairment with significant behavioural disturbance or late onset psychiatric disturbance or a physical condition accompanied by severe psychiatric or behavioural disturbance and
- for whom the *primary treatment goal* is improvement in health, modification of symptoms and enhancement in function, behaviour or quality of life
- which is *evidenced by*:
 - + multidisciplinary assessment and/or management of complex medical, psychiatric and functional conditions and needs
 - + regular reassessments
 - + working towards negotiated goals within an indicative time frame.

Inclusions:

- A psychogeriatric care provided in both community and hospital settings
- B psychogeriatric care of younger adults with clinical conditions generally associated with old age
- C psychogeriatric care of people with long-term psychiatric disturbance and/or substance abuse

Geriatric Evaluation and Management

An episode of care:

- provided for a *person* with complex multi-dimensional medical problems associated with disabilities and psychosocial problems, usually (but not always) an older person and
- for whom the *primary treatment goal* is maximising health status and/or optimising living arrangements
- which is *evidenced by*:
 - + evaluation and formulation of a management plan for complex medical problems
 - + multidisciplinary assessment and management of functional and psychosocial needs
 - + regular assessments of current management plan working towards negotiated goals within indicative time frames.

Inclusions:

- A geriatric evaluation and management provided in both community and hospital settings
- B evaluation and management of younger adults with clinical problems generally associated with old age

Maintenance Care

An episode of care:

- provided for a *person* with a disability who, following assessment or treatment, does not require further complex assessment or stabilisation and
- for whom the *primary treatment goal* is the maintenance of function and current health status if possible
- which is evidenced by:
 - + the provision of health and treatment services and psychosocial support.

Types of maintenance care:

- A maintenance care provided in both community and hospital settings
- B care and support of a person in an inpatient setting whilst the patient is awaiting transfer to residential care or alternate support services or where there are factors in the home environment (physical, social, psychological) which make discharge to home inappropriate for the person in the short term
- C ongoing care and support of a person in a residential setting
- D patients in receipt of care where the sole reason for admitting the person to hospital is that the care that is usually provided in another environment, eg, at home, in a nursing home, by a relative or with a guardian, is unavailable in the short-term
- E care and support of a person with a functional impairment for whom there is no multidisciplinary program aimed at improvement of functional capacity
- F patients classified as Nursing Home Type Patients, ie, when a patient has been in hospital for a continuous period exceeding 35 days and does not have a current acute care certificate

A literature review of rehabilitative intervention for chronic obstructive pulmonary disease patients

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Abstract

Pulmonary rehabilitation programs contribute to physical and psychological well-being and improved quality of life. Pulmonary rehabilitation reduces fear and depression, and increases self-esteem; it improves feelings of well-being and lowers levels of mood disturbance, but does not seem to change lung function and perfusion.

Patients with chronic conditions are reported to have problems complying with rehabilitation programs, especially when these programs require lifestyle modification. Community-based programs are therefore attractive for reasons such as addressing the specific needs of the population, cost-benefit and flexibility in delivery.

Introduction

The treatment of chronic obstructive pulmonary disease (COPD) has become an important part of the workload of professions such as physiotherapy (Ellis 1992, pp 163–5), and requires a multidisciplinary approach. Patients with pulmonary diseases, especially those with COPD, tend to get caught in a vicious circle (American Thoracic Society 1987, pp 225–44). Because they experience dyspnoea during physical activities, these activities will be rewarded negatively. This may eventually lead to inactivity, frustration, social isolation and a low exercise tolerance (Sandhu 1986, pp 629–42) which, in turn, causes reduced fitness and will impede further activities (Belman 1986, pp 585–97).

Rehabilitation goals and effects

Goals for rehabilitation of COPD patients have to be realistic and well understood by the patients as well as the provider because of the permanent and progressive nature of the disease process. FEV¹ (Forced expiratory value – the amount of air blown out in the first second of the forced vital capacity (FVC) manoeuvre) normally decreases with ageing at a rate of approximately 30 ml per year according to Kory et al. (1961, pp 243–58), while it decreases at a rate of 45 ml to 55 ml per year in COPD patients (Burrows 1985). It can even decrease at a rate of 60 ml to 80 ml per year in cigarette smokers (Johnson & Pierson 1992, p 214).

Even comprehensive ongoing rehabilitation programs do not alter the rate of spirometric decline significantly, and survival chances are not significantly increased by multidisciplinary intervention (Burrows 1985). However, this type of intervention leads to subjective improvement in dyspnoea severity (related to functional mobility and self-care) and a reduction in the average number of hospital days per year (Sahn et al. 1980). Objective performance improvement occurs in the first three months of training after which progress plateaus (Geul-Klaren & Hekking 1991, pp 190–5).

The aim of pulmonary rehabilitation (Folgering et al. 1991, pp 464–71) is to break the vicious circle of inactivity, frustration, social isolation and low exercise tolerance by:

- 1. decreasing the physical and psychological manifestations of the underlying disease in other words, a reduction of the impairment due to the disease
- 2. increasing physical and mental fitness and performance, with a reduction of the disability of the patient
- 3. reducing the handicap by maximal social integration of the patient.

Alternatively, exercising can also cause more discomfort in COPD patients. Chronic dynamic exercising causes adaptations affecting the cardio-respiratory system and the peripheral muscles. A sense of discomfort and fatigue in exercising muscles is a component of perceived exertion in any patient with chronic illness, causing enforced periods of inactivity (Clausen 1976, pp 459–95). An increase in work capacity may occur by increased peripheral oxygen extraction through muscle fibre hypertrophy, increased capillary blood volume, and shunting of blood from inactive muscles to active muscles (Holloszi 1976, pp 445–58).

Although circumstantial, the evidence of skeletal muscle deconditioning as a contributory factor limiting exercise tolerance in COPD patients is convincing (Jones et al. 1989, part 2, A319). The intensity of leg discomfort at maximal

exercise appeared to be on average twice that expected for normal subjects at the same exercise intensity. Guell, Gimenez and Marchand (1989, p 385s) found some evidence that muscle fatigue occurred at maximal exercise in patients with COPD.

Pulmonary rehabilitation is defined by Petty (1977, pp 68-77) as the

art of medical practice where an individually tailored, multidisciplinary program is formulated, which, through accurate diagnosis, therapy, emotional support and education, stabilises or reverses both the physiological and psychological pathology of pulmonary diseases, and attempts to return the patient to the highest possible functional capacity allowed by his pulmonary handicap and overall life situation.

The goals of therapeutic intervention may be achieved by designing a methodical program, tailored to each individual patient (American Thoracic Society 1987, pp 225–44), consisting of:

- 1. an accurate diagnosis of the disease and of the functional limitations of the patient
- education about the disease, its pathophysiology, the use of a peak-flow meter, the use of medication (Note: Some researchers argue that prolonged use of beta-mimetica contributes to an increased morbidity and mortality from asthma – Postma & Kraan 1995, pp 5–7), and the avoidance of aggravating or harmful influences such as smoking
- 3. physical training to improve the physical fitness and performance
- 4. psychosocial support of the patient.

A satisfactory program can only be based on an adequate diagnosis of the extent and the specific character of the limitations of each individual patient (van Herwaarden 1990, pp 9–10). The limitation can be cardiocirculatory, ventilatory, diffusion-perfusion or psychophysiological (Folgering et al. 1991, pp 464–71). Folgering therefore describes the need for three different basic programs, namely, for:

- 1. the lightly affected patient who has a condition problem
- 2. the more severely affected patient with a poor performance of the breathing pump, especially in regard to CO^2 elimination
- 3. the patient with severe pathology such as emphysema who is hypoxic during activity.

Decramer and Dekhuijzen (1995, p 12) note progress in treatment of patients with a FEV^1 of 40 per cent or less than the predicted value. However, these

patients encounter difficulties in gaining a training effect because of the problems associated with prolonged exercising.

The Dutch Asthma Foundation recommends exercise programs with a lower intensity when the FEV¹ value is lower than 70 per cent of the predicted value. At the same time, it excludes participation in their organised sports when the FEV¹ is lower than 45 per cent of the predicted value. These patients, who still prefer participation in organised physical activities, are referred to special rehabilitation programs (Rameckers 1995, p 23).

Geul-Klaren and Hekking (1991, p 193) found that the results of participants with the most limited lung function (FEV¹<55 per cent of the norm and a reversibility of <30 per cent) showed a similar improvement in percentages of certain parameters to the participants with a less disturbed or totally reversible lung function pathology. It is important to cater for individual needs if possible (Donner, Braghiroli & Lusuardi 1991, pp 472–4).

Rehabilitation programs and their benefit

There is a general consensus in the literature that exercise tolerance improves as a result of rehabilitation programs (Ioli et al. 1991, pp 486–9), even though the mechanism of this benefit is controversial. It is still not quite clear whether a physiological improvement in the ability to perform activities is the basis of improvements in exercise tolerance or whether psychological factors play the major role. Swinburn, Wakefield and Jones (1985, pp 581–6) note no significant relation between exercise performance and FEV¹ and FVC.

There is, in general, no evidence of respiratory changes as a result of respiratory rehabilitation programs (Booker et al. 1985, pp 31–6; Folgering et al. 1991, pp 464–71). According to Folgering et al., pulmonary rehabilitation does not change oxygen tension in the blood.

Geul-Klaren (1991, pp 190–5) noted that heart rate at rest decreases with improvement in physical fitness when measured at the end of a three-month training program for COPD patients.

Exercise programs aim to cause a training effect, which means that the distance covered during a walking test should be greater at the end of a rehabilitation program if a training effect took place (Alison, Samios & Anderson 1981, pp 1273–7; Strijbos 1990, pp 41–4; Goldstein et al. 1994, pp 1394–7).

Recently the emphasis in exercising in rehabilitation programs for patients with chronic respiratory dysfunction has changed from lower extremity training and

specific muscle training to upper limb and accessory respiratory muscle training (Piper 1992, p 181).

Inspiratory muscle training produces, according to McKeon et al. (1986, pp 648–52), no additional improvement in exercise capacity beyond that achieved by conventional bronchodilator and rehabilitation therapy. Flynn et al. (1989, pp 535–40) and Nosworthy et al. (1992, pp 189–93) confirmed that inspiratory muscle training did not affect exercise performance.

The psychological improvements have been recognised by many researchers (Cox 1990, pp 16–18; Dekhuijzen et al. 1990, pp 109–17; Geul-Klaren & Hekking 1991, pp 190–5; Ioli et al. 1991, pp 486–9). Dekhuijzen et al. (1990, pp 109–17) measured significantly decreased scores on anxiety and depression after the administration of a pulmonary rehabilitation program. Booker et al. (1985, pp 31–6) noted significantly improved feelings of well-being and a significant fall in levels of mood disturbance in patients receiving physiotherapy. Henderson and Cole (1992, pp 195–201) noted also improved emotional efficacy as a result of exercise rehabilitation.

Most of the programs described in the literature are institutionalised and comply with research-based physiological specifications with regard to training frequency and intensity (Ioli et al. 1991, pp 486–9; Folgering et al. 1991, pp 464–71; Rampulla & Ambrosino 1991, pp 490–7). Goldstein et al. (1994, pp 1394–7) describe a more costly program which required patients to be rehabilitated as inpatients for eight weeks and as outpatients for 16 weeks. Strijbos (1990, pp 41–4) noticed no significant difference in results of patients who participated in an outpatient program organised by an asthma centre versus patients who attended a more community-based program run by a physiotherapist, a community nurse and a general practitioner. A program devised by Schoo (1995) consisted of 24 sessions over 12 weeks. Community-based programs can be very attractive for reasons such as cost-benefit, flexibility in delivery and catering for the specific needs of the population.

Geul-Klaren (1991, pp 254–9), in particular, describes a program in detail, based on weekly attendance for 20 weeks and stressing training at home. According to the same author, younger patients with asthma require fewer sessions, while chronic patients require continuous attendance at the sessions over a 10-month period. The research of Geul-Klaren and Hekking (1991, pp 190–5) measured the outcome for 52 patients who attended the program for one calendar year. The program emphasised training at home. The results were measured up to a year after administering the program. The results showed no change of the peak flow after three months of training, while the breathing frequency in rest and during exertion decreased respectively in 67 per cent and 61.5 per cent of the participants. The distance of the 12-minute walking test increased in 90 per cent of the group by 35 per cent on average.

Similar results were produced by a 12-week bicycle training program (Alison, Samios & Anderson 1981, pp 1273–7). A statistically significant improvement was noticed on assessment in maximum working capacity and in distance walked during the 12-minute walking test following training. There was no significant change in FEV¹ value. Ventilation and frequency of breathing were lower following training at equivalent work loads.

Gaining compliance with programs is reported to be a problem (Carmody et al. 1980, pp 163–78; Clark 1991, p 479; Geul-Klaren 1991, p 190). It will be worthwhile for these reasons to design a program which requires minimal attendance, and which still approaches the beneficial outcomes of other programs. A small study by the author (Schoo 1995, pp 71–3) demonstrates that a program which required minimal attendance caused significant changes in the perception of the quality of life of COPD patients.

Evaluation of rehabilitative intervention

Aspects of evaluation of rehabilitation treatment (Clark 1991, pp 475-81) include:

- spirometry
- measurement of arterial blood gases at rest or during exercise
- determination of exercise tolerance
- maximal exercise performance measured directly by progressive incremental exercise or indirectly by timed walking tests
- endurance of submaximal exercise by treadmill or bicycle
- respiratory muscle strength and endurance measurement
- iso-kinetic muscle function testing of other skeletal muscles
- longevity
- quality of life
- analysis of failure to achieve physiological goals
- cost-benefit analysis.

The physical status is tested by means of a lung-function test and pulse oximetry during a maximal test (Folgering et al. 1991, pp 464–71). Measurement of

arterial oxygen saturation with a pulse oxymeter during exercise testing, because of its portability, provides continuous information about the hypoxiaemia. Pulse oxymetry is a less invasive procedure, but also less accurate than measuring the oxygen saturation of blood samples.

Exercise performance can be measured with the help of bicycle ergometers, treadmills, or by less expensive methods such as six-minute or 12-minute walking tests as used by McGavin et al. (1978, pp 241–3), or by the progressive Shuttle Walking Test (Singh et al. 1992, pp 1019–24). The patient is usually linked to a pulse oxymeter during these tests.

Even though improvements in muscle strength and endurance are reported in the literature (Folgering et al. 1991, pp 464–71), this testing requires expensive iso-kinetic equipment to measure these variables.

The Chronic Respiratory Disease Index Questionnaire (Guyatt et al. 1987, pp 773–8) is a validated test to measure quality of life of patients with COPD.

Other specific measurement devices commonly used are the Minnesota Multiphasic Personality Inventory, the Profile of Mood States, the Berle Index for Psychological Assets, the Katz Adjustment Scale-Relative's Test, the Transition Dyspnoea Index, the Oxygen Cost Diagram and the Million Behavioural Health Inventory (Smeets 1991, pp 520–4).

Borg (1970, pp 92–8) developed a scale using perceived dyspnoea as an indicator of somatic stress. Breathlessness is a major limiting factor and the Borg-scale measures this aspect only (Belman et al. 1991, pp 566–71). The use of this scale would have made it compulsory to use other functional assessment tests as critically reviewed by Eakin (1989, pp 11–15), and as used by Granger, Albrecht and Hamilton (1979, pp 145–54) to measure rehabilitation outcome.

Other parameters which could be measured are longevity, hospital admissions and doctor visits. There is evidence that pulmonary rehabilitation in its most comprehensive form, which includes rationalisation of oxygen therapy, can improve life expectancy (Petty 1980, pp 159–61; Muir 1991, pp 550–62).

Measuring the long-term effect of rehabilitation programs by life expectancy would necessitate setting up, running and evaluating comprehensive standardised rehabilitation programs in many centres over a number of years (Clark 1991, p 478). Geul-Klaren and Hekking (1991, pp 190–5) recorded a decrease in emergency visits and medicine use after administering a rehabilitation program for a longer period of time.

In a study comparing 252 COPD patients who participated in a comprehensive pulmonary rehabilitation program with 50 non-rehabilitation patients selected

from an outpatient clinic, Haas and Cardon (in Ries, 1992, pp 1139–54) reported that 8 per cent of the rehabilitation patients and 17 per cent of the control patients were placed in nursing homes after five years; 19 per cent of the rehabilitation group and only 5 per cent of the control group were able to care for themselves. They reported five-year mortality rates from respiratory failure of 22 per cent in the rehabilitated patients and 42 per cent in the control group.

Rehabilitative intervention which has the positive outcomes outlined should also reduce the cost to the community which could be measured by means of costbenefit analysis (Toevs, Kaplan & Atkins 1984, pp 1088–1100).

In general, it can be concluded that pulmonary rehabilitation programs have positive effects for participants. They can be delivered competitively in the form of community-based programs.

Questions raised and further lines of study

What are the possible physical changes (for example, heart rate at rest) caused by a program in the longer term?

What is the long-term effect of educational programs on COPD patients in regard to factors such as motivation and dependency?

Is there a need for follow-up sessions? If yes, how often?

Can the outcome of medical intervention be improved when more time is spent on education, and how does that affect visits to doctors, use of medication and the need for hospitalisation?

Could an educational program, which requires limited attendance and is conducted by Aboriginal health workers, reduce morbidity rates and mortality rates in the Aboriginal community?

Further lines of study could encompass a cost-benefit analysis of more intensive inpatient and outpatient programs (Goldstein et al. 1994, pp 1394–7) versus educational programs which require minimal attendance. Nosworthy et al. (1992, pp 189–93) note that no cost comparison is available for pulmonary rehabilitation programs conducted in Australia.

More research is required to examine the influence of pulmonary rehabilitation on morbidity and mortality rates.

Conclusion

Many authors claim the beneficial effects of rehabilitation programs, especially in regard to physical performance and psychological well-being.

Most of the rehabilitation programs are multidisciplinary programs requiring attendance more than once a week. Compliance with the program has been recognised as a problem with COPD patients.

An educational, community-based program with regular follow-ups may be sufficient to improve perceived quality of life in patients who are motivated to maintain their exercise routine. Further research is warranted to address the respiratory needs of the community in the most efficient way.

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Towards equity in long-term care

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Abstract

There are considerable similarities and overlap in the levels of disability and dependency between those who receive home-based long-term care and those who receive long-term care on a residential basis. These similarities are demonstrated from analysis of clients of the Western Domiciliary Care and Rehabilitation Service. When services are costed, it is shown that there is a very large discrepancy in the levels of government support that clients of home-based care agencies attract compared to residents in subsidised hostels and nursing homes. This paper discusses the need for parity of funding to care providers and recognition of the economic value of the contributions of carers. It considers principles for the development of a casemix model for home-based care analogous to the Care Aggregated Module/Standard Aggregated Module (CAM)/(SAM) model applying to nursing home care.

Introduction

Historically, long-term care in Australia has equated to residential care, particularly to nursing home care. The modern era of aged care in Australia dates back to the passage of the Aged Persons Homes Act of 1954. This resulted in a burgeoning of the provision of nursing home beds, mostly by non-government and private organisations. 1972 saw the passage of the Aged or Disabled Persons Homes Act, which introduced a less intensive form of residential care, hostel care.

The States Grants Acts of 1969 signalled the beginning of large-scale home-based care for aged people with disability. Funding under these Acts was used to

establish the Domiciliary Care Services in South Australia, the first being the now Western Domiciliary Care and Rehabilitation Service (WDC&RS), which commenced in July 1971.

The home care movement gained great momentum from the 1982 McLeay Report, *In a Home or at Home: Accommodation and Home Care for the Aged*, (House of Representatives Standing Committee on Expenditure 1982). Many of the recommendations in the report were reflected in the *Home and Community Care (HACC) Act 1985*.

The principles and goals of the Home and Community Care Program included (Section 5.1):

(a) to promote the provision of a comprehensive and integrated range of home and community care designed to provide basic maintenance and support services, both directly and through their carers, to persons within the target population and thereby to assist them to enhance their independence in the community and to avoid their premature or inappropriate admission to long term residential care;

Eligibility for support under the Act is conditional:

The program shall be directed towards assisting -

- (a) persons living in the community who, in the absence of basic maintenance and support services provided or to be provided within the scope of the program, are at risk of premature or inappropriate long term residential care, including –
 - (i) frail or at-risk aged persons, being elderly persons with moderate or severe disabilities;
 - (ii) younger disabled persons, being persons with moderate or severe disabilities; and the carers of those persons.

The Nursing Homes and Hostels Review (1986) set out the principles of the Commonwealth Government's Aged Care Reform Strategy. These principles included:

Aged and disabled people should as far as possible be supported in their own homes, in their own communities.

Aged and disabled people should be supported by residential services only where other support systems are not appropriate to meet their needs.

It is evident that the authors of the reform strategy assumed that there was a progression from community care to residential care, and that residential care was both a last resort and a less desirable alternative than community care.

We will demonstrate that there is no such clear-cut progression and, although entry into residential levels of care is strictly (and effectively) controlled to the higher levels of disability, there is no clear dividing line or distinction between people who reside with support in the community and those who are in residential care.

The Western Domiciliary Care and Rehabilitation Service

The WDC&RS is a regional aged and extended care service serving the population of the western metropolitan region of Adelaide. Since its inception, the service has attempted to provide a broad range of services, interventions and support to enable people with disability to return to and remain in their chosen environment, with the best attainable quality of life (as judged by the client).

All activities of the service are directed towards defined ends, namely, *client outcomes.* For the majority of our clients, the desired outcome is the maintenance of the highest attainable quality of life in their own homes in the community. For others, there are defined therapeutic, rehabilitation and preventive endpoints.

Two of the programs managed by the WDC&RS are devoted to long-term care – the Home Based Long Term Care Program, which supports clients whose dominant problems are related to physical disability, and the Dementia Support Program, where problems are predominantly related to dementia.

The program staffing model consists of a program manager, who is a senior health professional, and a core staff of case managers who can access packages of care funds. The case managers are also trained health care professionals.

Within the programs, case management consists of the following.

- Care planning assessment (setting goals and developing a negotiated care plan in conjunction with the client and carers). The care plan can include:
 - home-based care
 - centre-based care
 - respite care
 - prevention and health promotion activities.
- Implementation and monitoring of the care plan, including:
 - deployment and clinical supervision of care workers
 - individual care within own area of clinical expertise

- group work
- referral for consultation and short-term interventions.
- Client and carer support and counselling.
- Client/carer advocacy.
- Participation in quality improvement activities.
- Participation in community and service development.

Study methodology

In order to make judgements about the comparability of clients who remain at home with support and those who enter residential care, we analysed a number of caseloads in accordance with the Resident Classification Instrument (RCI) and the Personal Care Assessment Instrument (PCAI) (see below), which are the casemix measures determining government subsidies in residential care. The RCI applies in nursing homes, and the PCAI in hostels. These analyses were undertaken by appropriately trained staff and an external consultant experienced in assessment for residential care.

Findings

Home Based Long Term Care Program

Two caseloads were analysed, a general aged care caseload, and the clients of the Adult Personal Care Program, which is a specifically funded Home and Community Care project providing care for people under 65 who have a severe disability. The Adult Personal Care Program operates on a 24-hours-per-day, 7-days-per-week basis.

Table 1 shows the findings from the general caseload, comprising 130 clients managed by an occupational therapist.

RCI classification	Number	Percentage of total
1	Nil	0
2	1	0.7
3	2	4.5
4	32	24.6
5 (>11)	37	28.5
5 (<11)	20	15.5
Not rated	34	26.2
Total	130	100

Table 1: Findings from the general caseload

The 34 clients who could not be classified under the RCI and the 20 who rated less than 11 points were then re-examined using the PCAI. A further eight clients scored more than 101 on the PCAI, which would have made them eligible for subsidy payments in hostel care.

There are currently 1903 clients in the general Home Based Long Term Care Program. If the caseload studied is representative, then up to 1109 (58.3 per cent) may be eligible for entry into nursing home care.

The average cost of provision of services to clients in the Home Based Long Term Care Program is \$868.00 per annum, or \$2.40 per day. This is an average figure which includes all levels of intensity of care packages. In comparison, a resident in a nursing home at the lowest rating (5) would attract a daily government subsidy for care (CAM) payment of \$24.40 and a subsidy for administrative overheads (SAM) of \$37.22, a total of \$61.62 funding per day, or \$22 491.30 per annum.

Table 2 shows the results of the analysis of the 22 Adult Personal Care Program clients.

RCI classification	Number
1	4
2	6
3	10
4	2
5	Nil
Total	22

Table 2: Findings from Adult Personal Care Program group

These data, particularly the inclusion of 10 clients in the highest dependency ratings, may surprise some readers familiar with nursing home care. All but one live with a carer or carers. The one who does not falls into category 4. Diagnoses in this group include cerebral palsy, head injury, muscular dystrophy and Friedriech's ataxia. Thirteen of these clients are quadriplegic. Ages range from 29 to 50.

These clients receive the most comprehensive package of care that we can offer. The cost of providing our services for these clients averages \$6122 per year, or \$16.73 per day. By maintaining these clients in the community, there is a saving to the system of \$587 000. From this saving, we could maintain nearly 100 additional clients in the community.

Dementia Support Program

A Dementia Support Program caseload managed by a psychiatrically trained nurse (AF) was similarly analysed. This group consisted of 60 clients, of whom 58 were fully analysed. There were 29 males and 31 females. Ages ranged from 55 to 98, with 58 per cent being over the age of 75. Three males and 10 females were living alone. Their dependency levels ranged from hostel level to RCI 4. There was one couple, both of whom were clients, and had no other household support. Six were of non-English-speaking background. Their dependencies ranged from hostel level to RCI 3.

Table 3 shows the scores recorded for this group.

Classification	Number	
1	0	
2	2	
3	8	
4	23	
5	7	
RCI total	40	
Hostel level	18	
Not classified	2	

Table 3: Findings from Dementia Support Program group

A number of clients held current NH5 and 197 forms but had chosen not to enter residential care. Sixty-seven per cent would have been eligible for nursing home admission and the remainder for hostel admission.

The Dementia Support Program has 540 clients. If this caseload is representative, then 360 clients could be eligible for nursing home admission. The cost of providing care packages for this client group is \$2978 per year, or \$8.14 per day.

Requirements of a casemix system for home-based long-term care

Nursing homes are funded under a formula that incorporates a moiety for the provision of care, described as the Care Aggregated Module (CAM), and an infrastructure component, the Standard Aggregated Module (SAM), with provision for other costs as Cost Reimbursed Expenditure. This is often abbreviated to the CAM/SAM model. The CAM component is variable and the SAM component is fixed.

The CAM funding provides for the cost of nursing and personal care needs of residents. The mix of staff deployed is at the discretion of the director of nursing. The level of funding is determined by the level that the resident achieves on the RCI. There are five levels, as shown in Table 4.

Category	Hours of funded care per day	Hours of funded care per week
1	3.857	27.0
2	3.357	23.5
3	2.786	19.5
4	1.857	13.5
5	1.286	9.0

Table 4: RCI levels

The SAM component is a national standard bed-day amount that provides for infrastructure costs including such items as wages for domestic and administrative staff, food, laundry, cleaning, plant, equipment and a return on investment. Cost Reimbursed Expenditure covers the costs of workers' compensation premiums and payroll tax for all nursing home staff, and superannuation and long service leave for CAM staff.

The RCI score is determined from a questionnaire that covers four domains in 14 questions:

- clinical care
- social and emotional support
- communication and sensory processes
- activities of daily living.

Each question has four possible responses, A–D, each representing a higher level of disability or dependency.

The model was very widely researched before its introduction and has now been applied to many thousands of residents. While not wishing to enter the debate about the virtues or shortcomings of the details of its application, we wish to focus on the principles that underlie the model.

The attraction of the model is based on a number of considerations, including:

- the separation of the care package component (variable) from infrastructure costs (fixed)
- being based on measured disability/dependency level rather than diagnosis
- the simplicity of the instruments
- the small number of categories.

The simplicity of the process enables the system to operate without relying on very high levels of diagnostic competence or higher order information technology. Given the number of people involved and the nature of the care organisations, the more complex diagnosis-based models would be impractical, apart from any other consideration of their applicability.

As there are many qualitative similarities between residents of nursing homes and long-term care clients in the community, as well as the range of activities required to maintain them, there should be some parity of categorisation. As we have demonstrated, there are exactly equivalent clients resident in the community, but the community group also contains clients who do not meet the criteria for either nursing home or hostel admission. Any extension of the CAM/SAM model to include community long-term care would have to include some 'lower end' categories that cover these lower levels of disability/dependency.

Simplicity could be carried too far. Any attempt to reduce all home-based care interventions to some average hourly rate would be absurd, given the range of activities that are undertaken by home care services. It would also restrict flexibility by tying care delivery too closely to specific activities, or only activities that can be offered within the price. The care package approach offers a much better and more flexible alternative to both purchasers and providers in that it allows scope for substitution and innovation.

We are aware of work being undertaken to develop casemix systems for longterm care based on variations of the diagnosis related groups system or the Resource Utilisation Groups system. Both are considerably more complex and would be much more difficult and costly to implement than a simpler system based on a hierarchy of disability and dependency. The RCI is one such instrument.

While the CAM component could be very similar in content to the nursing home model, the SAM component would be of a different order because the 'SAM-type' costs in the community are shared between the client and the client's household and a service organisation. We identify the following organisational infrastructure costs as distinct from package of care costs: motor vehicles, corporate and support services (such as reception and supply), and general goods and services (such as heat, light and power). We also have a capital component (depreciation on assets).

Discussion

We have demonstrated that there is little qualitative difference between those people who, by virtue of their disability and dependency needs, opt to enter residential care and those who choose to remain in the community. We do not believe that this is a surprising disclosure. The shift to community care has been government policy for many years, for both social and economic reasons, and staying at home has always been the preferred option for most aged people faced with the decision to move. In recent years the introduction of Community Aged Care Packages by the Commonwealth Government has been an obvious recognition that many aged people will opt to remain in the community if care that is seen to be at a higher level than that generally available through the Home and Community Care Program is offered. The more recent trials of Nursing Home Option Packages is further recognition.

What has not been acknowledged is that this level of care has been provided in the community for a long time and on a large scale at very inadequate levels of funding. Overall, our care packages range from approximately \$2000 to \$10 000 per annum, compared to CAM/SAM costs which range from \$23 000 (Category 5) to \$44 000 (Category 1). There is a massive discrepancy.

We would contend that the reason that these clients continue to survive in the community is twofold: it relies on the nature of our intervention and, particularly, on the level of input by informal carers. It should be noted that the clients in the highest dependency categories all had a carer in residence.

Our input, while seemingly small in relation to need, is professionally highly skilled and strategically directed at the most urgent priorities.

Equity considerations demand, at the very least, that people with like needs and circumstances should be treated equally. The client's chosen residence should not be the sole determining factor in attracting a level of resources that is commensurate with care need. In order to achieve an equality of care and resource allocation, clients should be assessed in accordance with identical criteria. The same casemix system should apply to all those who require long-term care, not only to those who choose a residential option.

Many carers provide heroic amounts of care. The most recompense that they can hope for their efforts is the Domiciliary Nursing Care Benefit. This should be restructured to reflect the amount of care that they provide or even extended to a form of client-centred funding from which care services could be purchased at the discretion of the client and carer.

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