

The 500-bed hospital that isn't there: the Victorian Department of Health review of the Hospital in the Home program

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In 1994, Victoria was in the midst of severe state health budget tightening, coinciding with the introduction of casemix funding as the basis of hospital reimbursement^{1,2} and the creation of health networks responsible for acute services. Into that dance of the policy elephants, a mouse called the Hospital in the Home (HIH) program was released. It had no precedent in Australia.³ In 2010, the policy elephants are dancing again, so the progress and development of the HIH mouse deserve some attention.

Despite strong indirect incentives for change — portable hospital technologies, better drugs and delivery devices, better domestic technologies (mobile telephones, better housing) and increased need because of nosocomial infections, hospital access block or the desire of patients for more personal care⁴ — the delivery of hospital care at home had been overlooked. The introduction of the HIH program was an attempt to deliver on the ideal of hospital substitution, by using hospital technologies and skills to manage acute inpatients at home. HIH does not prevent admission — it is admission in another form.

Surprisingly, the state government followed casemix funding logic by allowing hospitals to treat an HIH episode as an inpatient service for the purposes of reimbursement. This was, and remains, an inspired decision, and peculiarly Victorian. HIH admissions were reimbursed equally with other admissions, but were included in the casemix payment cap. In return, hospitals were responsible for all service provision and expenditure. This allowed HIH to rank (or perhaps compete) with traditional hospital beds on equal terms.

The Victorian Department of Health (DOH) reviewed the HIH program in 1998 and found high levels of adoption and patient satisfaction.⁵ However, from that time, the DOH gave scant attention to its HIH policy. It had no departmental staff dedicated to the program, and it took the view that HIH was an integrated hospital service for providers to manage. The mouse was left without a cat.

Nevertheless, HIH activity and expenditure increased. In recent years, this increase has been dramatic. The Victorian Healthcare Association estimates that 75% of all HIH-type admissions in Australia occur in Victoria.⁶ Annual reimbursements for HIH reached \$110 million.⁷ However, the rate of growth raised concerns about whether hospital providers were strictly adhering to the concept of inpatient admission substitution. In 2008, the DOH sent a circular to hospitals to remind them of the HIH admission guidelines⁸ and, in 2009, commissioned a formal review and appointed staff to take responsibility for the program. At the same time, it issued further guidance to hospitals and introduced a series of audits of HIH activity.⁹

Here, I reflect and draw on the outcomes of the recent review, conducted in late 2009 and released in 2010.¹⁰

Key findings of the review

Key findings addressed activity within HIH; clinical scope and the appropriateness of the clinical activity; patient and carer satisfaction; and the service model development of HIH, including leadership. Unless otherwise stated, all data reported here are derived from this recent report.¹⁰

ABSTRACT

- The Victorian Department of Health reviewed its Hospital in the Home (HIH) program in 2009, for the first time in a decade. Annual reimbursements to all Victorian hospitals for HIH care had reached \$110 million.
- Nearly all Victorian hospitals have an HIH program. Collectively, these units recorded 32 462 inpatient admissions in 2008–09, representing 2.5% of all inpatient admissions, 5.3% of multiday admissions and 5% of all bed-days in Victoria. If HIH were a single entity, it would be a 500-bed hospital.
- Treatment of many patients with acute community- and hospital-acquired infections or venous thromboembolism has moved into HIH. There is still capacity for growth in clinical conditions that can be appropriately managed at home.
- The review found evidence of gaming by hospitals through deliberate blurring of boundaries between acute HIH care and postacute care.
- The Victorian HIH program is a remarkable success that has significantly expanded the overall capacity of the hospital system, with lower capital resources. It suggests HIH with access to equivalent hospital remuneration is necessary for a successful HIH policy.
- Hospitals should invest in HIH medical leadership and supervision to expand their HIH services, including teaching.
- HIH is a challenge to the traditional vision of a hospital. Greater community awareness of HIH could assist in its continued growth.

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A wave of activity

Every metropolitan and regional hospital in Victoria has an HIH program, with the exception of the Royal Victorian Eye and Ear Hospital (where HIH patients are transferred to another public HIH service). Only four small district hospitals do not provide an HIH service.

HIH activity in Victoria from 2004 to 2009 is summarised in Box 1. In the 2008–09 financial year, 32 462 admissions into HIH were recorded, representing 2.5% of all inpatient admissions in the state for that year, and nearly 5% of all bed-days. HIH multiday admissions comprised 5.3% of the state's total multiday admissions in 2008–09. In total, about 500 inpatient beds would have otherwise been required to accommodate patients who were treated in HIH. If HIH were a single entity, it would be among the biggest providers of acute inpatient care by bed-days in Victoria.

However, activity in HIH in 2008–09 decreased 20% from its peak in 2006–07, with a dramatic reduction of 75% in overnight admissions. A reduction in multiday admissions of about 10% was recorded between the peak in 2004–05 and 2008–09. These changes presumably reflect efforts on the part of the DOH to ensure that hospital providers were meeting objective admission criteria.

1 Summary of Hospital in the Home (HIH) activity in Victoria, 2004–2009¹⁰

Year*	HIH admissions				Average LOS	
	Same day	Overnight	Multiday	Total	All†	HIH
2004–05	6 304	8 399	23 397	38 100	8.43	6.05
2005–06	7 294	9 133	22 240	38 667	7.33	4.90
2006–07	8 627	10 503	21 749	40 879	7.11	4.72
2007–08	9 177	7 830	21 448	38 455	7.70	4.98
2008–09	9 010	2 477	20 975	32 462	8.97	5.77

LOS = length of stay (days). * Financial years. † All hospital admissions. ◆

Expanding clinical scope

A variety of interventions can be delivered to HIH inpatients across a spectrum of clinical conditions and patient ages. The most common categories of care are: community-acquired acute infections (skin, lung, urinary tract); hospital-acquired, multiresistant or complicated infections; acute venous thromboembolism (deep vein thrombosis [DVT] and pulmonary embolism); perioperative anticoagulation; chemotherapy and other cancer care; heart failure management; and some complex wound management. The list is growing, but these represent the core conditions suitable for HIH treatment.

HIH has the capability for administration of interventions such as intravenous antibiotics, antivirals, antifungals, fluids, blood products, inotropes, steroids, and enzyme replacement agents. HIH delivers hospital staff, drugs and technologies to home-based patients with a level of involvement and response that exceeds that provided by normal community health agencies. Paradigm-shifting technologies often open new areas for HIH; examples include portable electronic pumps, peripherally inserted central lines, low-molecular-weight heparin, a variety of new antibiotics and other drugs, and vacuum-assisted wound therapy.

Box 2 shows that Victorian HIH programs have admitted many patients within the accepted ambit of HIH. Cellulitis, DVT, pulmonary embolism and complex or hospital-acquired infections form an important part of the service profile.

The evaluators observed that about 25% of all patients admitted for acute cellulitis enter an HIH program. The management of this common reason for hospital admission has been irrevocably changed by the introduction of HIH. However, if the rate of admission of patients with cellulitis into HIH were to increase to 60%, the evaluators project that 2700 more patients could be treated at home each year, with the result that 11 000 hospital bed-days could be transferred from traditional beds to HIH beds. This does not include the gains possible from transferring patients into HIH even earlier. More strikingly, 58% of all patients with DVT are admitted into HIH. There is no doubt that DVT management is now primarily HIH-based in Victoria. However, an increase in DVT admissions to 90% would see a further 600 patients treated in HIH for 2400 bed-days. Rates of admission to HIH for cellulitis and DVT of 60% and 90%, respectively, would be clinically realistic targets, as long as HIH units are capable and hospitals are willing. Meeting these targets would allow 13 400 additional bed-days (or 38 fully occupied beds) to be “opened”, with relatively low capital investment.

The impact of HIH on the management of serious bone, joint, cardiac and postoperative infections is also important, although the evaluators did not quantify this as a percentage of all admissions.

Some conditions are “missing” from Box 2; for example, chemotherapy, urinary sepsis, heart failure¹¹ and respiratory infection could reasonably be expected to have a higher profile in HIH. Only 3% of admissions for respiratory infection and 2% of admissions for chemotherapy in Victoria occurred in HIH in 2008–09. An increase in admission rates for respiratory infection would have a substantial impact on HIH activity, even if it were restricted to certain demographic groups such as nursing home residents. While the efficiency of administering day infusion therapy at home for mobile patients is not clear, unwell or immobile patients who require transportation to hospital for infusions shift the efficiency and viability equation in favour of HIH.

On the other hand, some inclusions in Box 2 cause a different kind of concern. The presence of diagnosis-related groups representing non-acute, non-specific conditions is significant. Diagnoses including “other”, after care, sleep apnoea, uncomplicated postoperative care, and endoscopy cannot be explained using any reasonable, acceptable definition of HIH. Even if these types of dubious activity were excluded from the current capacity of HIH, the same level of overall activity could be achieved by reaching higher targets for conditions already appropriately treated in HIH, such as cellulitis and DVT.

Very satisfied patients

The review makes no new ground over the previous literature^{5,12} in its finding that HIH is a widely accepted form of care. Patients interviewed were strongly supportive of both the concept and, in general, the delivery of care, despite many expressing surprise that the service existed at all. The low level of prior awareness of the program is an important observation. The counterintuitive finding that patients feel that communication is better in HIH than in

2 Rank of top 15 DRGs for HIH bed-days and concomitant rank for HIH separations in Victoria, 2009¹⁰

DRG	Descriptor	Rank for HIH bed-days	Rank for HIH separations
J64B	Cellulitis	1	2
F63B	Venous thrombosis	2	5
Z64B	Other factors influencing health status	3	1
K01Z	Diabetic foot procedures	4	65
E63Z	Sleep apnoea	5	4
E61B	Pulmonary embolism	6	8
T61A	Postoperative and post-traumatic infections	7	29
I12A	Infection of bone and joint	8	78
F71B	Non-major arrhythmia	9	13
I04Z	Knee replacement	10	17
E60A	Cystic fibrosis	11	49
Z63B	Other after care	12	15
T01A	Procedures for infectious diseases with complications	13	89
I64B	Osteomyelitis	14	84
G44B	Other colonoscopy	15	7

DRG = diagnosis-related group. HIH = Hospital in the Home. ◆

hospital wards was again made. Interpretation should be cautious, given that the sample population interviewed was selected by hospitals. However, some negative comments were made regarding having less access to consultant medical opinion than would be the case in the hospital, and confusion about who was supervising the whole episode of care.

Different models of care

The evaluators found a variety of models were used to deliver HIH in Victoria. While no model is prescribed by the state, it is notable that hospitals in the same city — funded in a similar way to deliver a defined service — still exhibit wide variations. Evaluators struggled to categorise HIH programs into two broad types: “admission avoidance” and “early discharge”. This taxonomy is unwieldy, as there was found to be much overlap. The difficulty for evaluators arose because many hospitals deliberately blur the distinction between postacute care and HIH, through overlap in organisation, structure, staffing and funding. The evaluators discussed the relationship between HIH and postacute care at some length but skirted the most sensitive topic: the tension between a program designed and funded to deliver acute hospital-level technologies and skilled care to usually fit people being housed with programs (less well) funded to manage straightforward community care for either chronically unwell patients with significant social needs or routine low-level postacute care.

Varied medical involvement

The evaluation noted that only two Victorian public hospitals had appointed a medical director for HIH services. This role generally involves providing direct medical care to HIH patients at home, as well as unit leadership. Both these hospitals have an HIH bed card unit and dedicated resident staff, with medical visits undertaken at patients’ homes and 24-hour cover provided internally.

In most other HIH services with medical input, overview is provided by medical staff affiliated with either inpatient units or the emergency department. Patients in these HIH programs need to return to hospital for their reviews. Other hospitals, usually regional, have arrangements with general practitioners to manage patients on behalf of the hospital. Review of these patients usually occurs in clinics rather than at home.

Where hospitals do not employ medical staff for HIH, clinical reviews are likely to occur in the hospital, and all problems require attendance at hospital, usually in the emergency department. This blurs the distinction between inpatient and outpatient.

The evaluation found that the medical model employed, rather than clinical need or the capacity of patients, determined the type of review.

Analysis of the review findings

Despite the qualifications presented here, the activity delivered through the HIH program and the success of the policy in Victoria is remarkable. HIH has successfully delivered significant benefit for the Victorian community, as well as improving access for patients who still need a traditional hospital bed. It has saved hundreds of millions of dollars in capital expenditure through this expansion of beds. Arguably, the basis for Victoria’s HIH success is that it is based in hospitals, it has access to equivalent funding to traditional care, and it has significant goodwill from the community. But, despite this success, there are areas that demand further attention.

There is a knowledge gap — the community lacks awareness of the option of receiving high-quality care in HIH. If HIH were more widely known and understood, patients might seek it out and expect that providers would deliver all required components of acute care. This awareness could drive further growth in HIH.

The ability to manipulate the admission threshold for HIH and to limit the service delivered to patients has allowed some hospital providers to capture the area for the purposes of generating cash. The simplest of these methods, seen clearly in the review report, is to place patients undergoing routine postsurgical or day-case procedures into HIH rather than discharging them to community-based nursing care. While delays in accessing postdischarge nursing care are common, and that might justify a brief stay in HIH if the patient would otherwise remain in hospital, the observed level of such activity seems excessive. Aside from any ethical questions, this activity has held back the genuine clinical development of HIH.

Prudent management would suggest that HIH and routine post-acute care should be separate entities — there is no real link between them. HIH is usually provided to patients with short-term, high-intensity, high-technology needs but who have good social supports and coping capacity at home (or for whom these can be arranged). The fact that postacute care and hospital avoidance or chronic care programs also provide care at home should not imply that they are the same as HIH. The staffing, 24-hour backup, medical role and technology inputs are, or should be, different. The Victorian Government (or any other funder of HIH) should continue its audit program to encourage strict separation of postacute care from acute HIH services, because this blurring of boundaries is the main source of gaming. It could help the development of HIH if the state were to house HIH within its acute hospitals division, just as hospitals could place HIH within their divisions of medicine. It remains a sad observation that some hospitals have forgone the long-term benefit of genuine bed substitution for short-term cash flow, and funders will need to remain vigilant for this kind of abuse.

The DOH and hospitals should address the clinical vacuum created by a policy that was ahead of its time. Hospital-based delivery of medical care to patients at home forms the basis of most international definitions and practice of HIH where it has been researched, particularly in Baltimore and Turin.¹³ Too few HIH doctors have been employed by Victorian hospital providers, even though there is evidence that direct involvement of medical staff in HIH leadership roles and delivery of care (both scheduled and on-call) results in more direct admissions into HIH from emergency departments and GPs, higher acuity of patients treated in HIH, greater patient acceptability, and fewer unwarranted returns to hospital.¹⁴ If nothing else, it seems unfair to ask unwell patients being treated at home to present frequently to hospital for medical reviews, or to take their turn in the emergency department for unexpected events (given they are already hospital inpatients). The absence of medical salaries from inpatient reimbursement may be the hospital manager’s dream, but it has drawbacks. Managing patients in HIH care, whether referred from the emergency department or the wards, requires detailed medical input.^{13,15} Many hospital clinicians still do not trust HIH with unwell patients because of this paucity of formal medical input. Yet, the evaluation has shown that dedicated HIH units, with their own staff and bed cards, are already realities and can be duplicated.

HIH will need to have a role in medical education, because patients with many important and common medical conditions — such as cellulitis, venous thromboembolism, and other community-acquired

infections and complex and multiresistant infections complicating medical and surgical stays — will find their way to HIH quickly and deny hospital-based junior doctors the opportunity to learn about these conditions. For that teaching to occur, direct medical management and clinical leadership in HIH are required.

The future of hospital in the home

The progress of HIH over the past 16 years has been impressive. There are tremendous benefits yet to be achieved by moving HIH from the back door of the hospital to the front door — from early transfer to direct admission into HIH. The explosive demographics of our population will, in the near future, see large numbers of people in nursing homes equipped with thinly available clinical expertise. The ability of HIH to effectively and safely respond to the acute clinical need that will arise in this group should be grasped. HIH has created a whole platform for the efficient use of new technologies that have emerged, and for the rapid integration of technologies that will arise in the future. (Perhaps the most important of these is finally finding a use for telemonitoring that will justify the cost of its implementation.)

Current Victorian policy on HIH is as good as it gets and deserves to be closely examined, if not copied. Critical questions remain for hospitals: is HIH a tangible part of the evolution of the historic mission of hospitals? Or is HIH a sham — an overdressed outpatient program? In the Victorian public sector, these questions rest entirely with the hospital providers, and the managers and clinicians within hospitals. Their answers will be found in how they allocate funds and organisational effort into HIH. A tangible outcome would be the employment of doctors with direct clinical responsibility for HIH patients. While the report found that 2.5% of admissions and 5% of bed-days are delivered by HIH, it is doubtful that hospitals' HIH budgets reflect those proportions. There is still debate about the best way to arrange HIH services, but the hospital-based, medical clinical unit approach could be proposed as a standard.¹⁵ Such units are able to admit patients directly from emergency departments and to manage patients with severe illness and clinical complexity in a manner that respects the traditional hospital experience to which it will be compared.

The DOH has issued a response to the review.¹⁶ In essence, it has sought no change to the current status of HIH — it advises ongoing financial support, ongoing audits of activity, and ongoing efforts to expand appropriate HIH. However, it does not specify the organisation of medical care delivery.

The last word

Hospital services start with a predetermined organisational and cultural structure and bias, and the initial response to changes in technology and practice is to fit those innovations into that structure. Nothing odd there. Our cultural retina sees the hospital as a “big box”, and this perception colours our expectations for its future. But the principle behind HIH is genuinely disruptive: it defines hospital care other than by the physical location of the patient within the walls of the hospital. Being disruptive might be applauded by organisational theorists, but it is less often admired in practice.

It may be that big-box hospitals will not be the drivers of HIH, in the same way railways ignored air travel and mainframe computer companies ignored personal computing. That would be a pity. The constituent parts of hospital care are rapid and all-hours availability of intensive medical and nursing care, concern for the individual and

his or her outcome, and the dedicated application of technology and knowledge. Sometimes that is best organised within the big box. Sometimes it is best delivered, well ... outside the box. There is intense competition for discretionary funding for capital growth in the health sector. Further investment in HIH should be considered, as it could yield measurable, acceptable reform in a sizeable niche of hospital services.

Competing interests

I was a member of the Advisory Committee for the Department of Health's 2009 HIH review. The views expressed here are my own, and readers should not infer the endorsement of the Advisory Committee, the evaluators, or the DOH.

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