

# Asia Pacific Journal of Health Management

Volume 8 Issue 1 – 2013

*The Journal of the Australasian College of Health Service Management*

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*Cover picture:* Our cover depicts the need to be innovative and to work together in collaboration across health systems and the broader community sector. It suggests the need for creative individual health professionals, working together, utilising good data and evidence to underpin this approach.

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## So They Want Us to Collaborate and Innovate: how do we manage that?

The current health reforms in Australia were in part meant to achieve a shift away from the 'blame game' accentuated by the division of Commonwealth and State responsibility for the provision of healthcare and, to move towards 'taken for granted' assumptions that we all want to work towards better access, integration and continuity of care delivery and to have a patient-centred focus. Given that the reforms did little to change the divisions and the boundaries of responsibility, how were these objectives to be achieved? Well, in response, we have all been told to go out and partner, collaborate, establish alliances and innovate.

While this call is clearly being made at both the Commonwealth and State level, this acceptance and engagement could well be variable across Australia. However, the fact that this call is being made might just reflect a move from the view point that our health system lacks 'collaboratively orientated values' [1] to one that promotes the value of partnerships, collaborations and innovation. The experience in New South Wales, where the author is Chair of a Medicare Local is that the call is being responded to with some enthusiasm and a lot of activity around engagement.

The challenge for organisations and, in particular managers, is how we effectively respond to these calls so that we might provide effective and sustainable change to the provision of healthcare. The theorists and many practitioners understand that this is no simple challenge and requires a focus on developing a values-based system [1] and a fundamental shift in how we manage.

Often, when you question someone about the why and how of a health service, particularly if it is not functioning well, the response is 'well it's complicated, the context is complex'. This response is not the start of a presentation on the substantial literature about 'complexity and the adoption of innovation in healthcare' [2] but is mostly a euphemism for 'it's too difficult to change'. Before we get to complexity we need to understand that in healthcare innovation, context is important. Context is the environment in which

we all operate and while some theorists think that it is easily quantified and measured many believe that it is 'complex, not easily assessed and probably not quantifiable'. [3, p.214]

The dimensions of context are multiple. For example the call to collaborate and innovate comes from the macro political, bureaucratic Commonwealth/State health system level and as a consequence impacts on the meso organisational level, mostly Local Health Districts (LHDs) and Medicare Locals (MLs) and on the micro service delivery level. At the same time LHDs and MLs are different contexts, the former large state owned hierarchical structures directly accountable for service delivery while MLs are established under Australian company law and accountability is through a Board of Directors and contracted funding relationships. They deal in a coordinating framework role with largely independent Primary Healthcare (PHC) practitioners through funding, service provision and partnerships. So two different contexts at the very interface where we seek collaboration!

Good managers need to understand their context and that of others and to accept that it provides a complicated and complex 'mind map' in which they need to situate their thinking and action. In other words context will influence how you think and act and will provide the boundaries around what you as a 'manger' think is possible. Importantly, the constant and relentless focus on regulation, accreditation and adoption of best practice (innovation) tends to drive organisations to conformity to gain legitimacy, potentially by adopting practices that in fact do not provide improvement [6,7] and at the expense of achieving sustainable innovation! This is another point at which system and organisational values need to be emphasised. [1,8] Collaboration and innovation often occur at the boundaries of our highly structured and strictured organisations, are often emergent and occur when groups of people come together, either voluntarily or formally to solve a problem or provide a 'workaround' to improve care delivery. Good health managers will nurture and build on this innovation at the micro level, because it has potential

for organisations and their systems to become adaptive. It requires managers to give greater focus to relationships between the parts of the system to yield greater creativity. [4]

Good managers in this context value data because its analysis presents evidence of where improvements are required and motivates those professionals who are better prepared to change based on the evidence. [3] Dopson et al conclude that context has an active role in healthcare change and innovation. They suggest that a receptive context to change has common features of:

- Availability and engagement of local, credible and skilled opinion leaders.
- The presence of a foundation of sound or good inter-professional relationships.
- The structural characteristics of locations and the configuration of various organisational components.
- Availability of project and change management skills. [3, p.228]

In making these conclusions these authors also suggest that for them to be successful effective leadership that creates a shared vision [5] is required and it needs to:

- Be distributed throughout the organisation.
- Understand the issues of professional power.
- Acknowledge and discuss the complex social relationships found in healthcare organisations.
- Harness talent from all quarters.
- Value and utilise the contribution of the different perspectives provided. [3, p.229]

So, if we accept that context is important and that it requires attention and a certain type of leadership as described above, what about this complexity that has increasingly become part of the healthcare lexicon?

There is an increasing body of knowledge and research about complexity and innovation in healthcare. In the theorists' world it is definitely not a euphemism for inaction and health managers and health professionals should gain some appreciation of the theory because it, like the discussion on context, suggests different ways of thinking, engaging and managing health services and encouraging innovation are required.

Complex adaptive systems (CAS) are said to be a 'collection of individual agents who have the freedom to act in ways that are not always predictable, where actions are interconnected, creating change in context within and

amongst the agents'. [2] There are characteristics and properties important to complex systems but in CAS we need to emphasise that leaders and managers need to move from the paradigm of well organised hierarchical concepts of healthcare organisation and from relying on rational, traditional forms of management, that particularly focus on control. They need to move to a CAS paradigm that sees organisations as complex and adaptive and where those engaged learn and adapt as they go. Ideas can emerge from anyone not just from experts and managers and can generate relationships. Adaptation and implementation can be informed from elsewhere and is informed by structures, processes and patterns rather than requiring extensive formal planning. Adoption is informed by knowledge sharing, social relationships and adaptation to local conditions and important unique characteristics rather than suggesting that all health services are similar and can be similarly organised. [2]

In CAS innovative ideas are the products of creative minds that are not seen to be the exclusive domain of any particular group or health profession within the system. In commercial organisations some senior managers are held accountable to produce a level of income from products, technology or services that at a particular time frame did not previously exist or to spend a percentage of budgets in formal research and development! While we have a high level of acceptance of innovation in medical technology and the use of information technology, we tend to remain resilient in upholding the way we do things and evidence-based new practice or new public policy is often resisted. At best it is sometimes layered or sedimented onto existing practice.

In moving to a more CAS approach to management it is suggested that managers need to understand five key elements. These are described as 'the nature of relationships, how they are built and maintained; the nature of decision-making, how it is done and by whom; the nature of power, how it is acquired and how it is used; the nature of conflicts, how do they arise and how do we deal with them; the importance of learning, both individually and collectively'. [2]

These same authors suggest measures of success might start with a recognition that we need to move away from mechanistic, complicated approaches to innovation and its diffusion. We all should be encouraged to think creatively and work in a context where change becomes a habit and research and innovation is valued and is part of structure

and processes. [2] As managers we also need to understand how innovation is diffused, how it might be communicated to gain greater adoption or increased rates of adoption, and the importance of acceptance of innovation by peers within social systems. [9-11]

Health authorities and innovation centres should demonstrate leadership and serve as conduits for ideas. [2] In this author's view, the success of innovation and collaboration will require a greater focus on promoting common values across organisations, working more effectively and consistently at the boundaries of organisations and providing incentives in the system to those who demonstrate collaborative innovation across organisational boundaries. Perhaps collaborative innovation might become a key performance indicator for us all.

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While not noticeable to the reader this issue represents a milestone for APJHM moving from a manual/email submission and processing system for articles to our new online ScholarOne portal. Reviewers and authors seem to be embracing the new system with most experiencing little problem. However, if you are an author or reviewer and do experience any difficulty, please do not hesitate to contact us.

Our cover for this issue draws attention to the increasing call both within Australia and elsewhere for us to be more innovative and to work together in collaboration across health systems and the broader community sector: a topic that also informs our editorial. Given the relative rigidity of our various health organisational structures and diverse funding sources, the cover attempts to focus our attention on the individual practitioner/manager and the need to emphasise social relationships and networks necessary to meet the collaboration and innovation challenge. It is suggesting that we need creative individual health professions, working together, utilising good data and evidence to underpin this approach.

In this issue we present a diverse range of articles both in topic content and in reporting on different health systems including services in China and India. We include a letter to the editor from College member John Smith, writing from China.

Our first article is a collaboration from O'Connor and Peters from Monash University, Australia, submitted with their colleagues Min Zou from JiuJiang University, Jiangxi and Wang Jiejun from Shanghai Changzheng Hospital, Second Military Medical University, Shanghai, both located in the Peoples Republic of China. This article provides a viewpoint by addressing the barriers to the development of palliative care in Mainland China and offers suggestions to improve end-of-life care of people who are terminally ill.

Dawson and Homer provide a research article that examines the needs and experiences of health personnel involved in either development or humanitarian work, internationally. An important contribution given the increased mobility and global aspirations of the health workforce.

The importance of access to good quality dental care in Australia is informed by two research articles in this issue. The first, by Rocha, Kruger, McGuire and Tennant. This research article examines the socio-demographic characteristics of those attending a major public dental hospital for emergency treatment, utilising a geographic information system (GIS). The second article by Lam, Kruger and Tennant provides a retrospective analysis of patterns of care under the Chronic Disease Dental Scheme.

Hui provides a research article that describes a study that employed a performance-based approach together with fire safety engineering in a healthcare facility to develop holistic optimum fire safety solutions. In our final article we have a contribution from India, a research article that examines career opportunities for Master of Public Health graduates in India, another indication of the challenges of workforce planning. The authors are Kavya Sharma, Sanjay Zodpey from the Public Health Foundation of India and Quazi Syed Zahiruddin and Abhay Gaidhane of the Datta Meghe Institute of Medical Sciences, Wardha India.

Again, Graff our ACHSM Librarian continues the tradition of providing timely, relevant published material that provides readers with a host of additional resources to access.

## Communication: a question of good manners in modern day health organisations

Sir,

Much has been written both in professional and academic journals and indeed in the media about the lack of communication between staff and others within health services and the way this has led down to a breakdown of services. Look at the devastation that has been wrought in some parts of the National Health Service in England because of this. Nurses and doctors and one would have to accept others within the health service, simply didn't listen, and missed opportunities because they couldn't or didn't read the individual: communication can be both spoken and non-spoken. It has been said that with the advances in technology that make communicating that much easier, individuals have lost the ability to interpret what people are actually saying.

Gone are the days of letter writing and using the good old fashioned pen – be it ink or ballpoint; of learning grammar and being able to structure an argument; of being able to think on one's feet. Now we have to rely on the computer and software programs, on the spell checker, on PowerPoint presentations. I would agree that people are more educated and perhaps smarter but are they more capable at interpreting situations where subtlety is required or do they need it spelt out in black and white?

If one writes a letter to an individual, one would in normal circumstances expect a reply and if such a reply was not forthcoming then perhaps one would assume that the person to whom the letter was written was either extremely busy, not interested in what was said or ignorant of the fact that it was good manners to write a reply even it were simply a holding reply. If by way of complaining about a particular service, and nothing was heard or indeed no changes were forthcoming, then again one would, by implication, simply assume that the organisation was not interested in such a complaint nor were interested in making any changes to the service. A reply or response should be provided even if you don't agree with what is said. An old Proverb simply says 'Manners Maketh the Man'.

We have indeed moved forward much in the way in which we communicate in the last two decades or so but I don't think we have learned much in the way of good manners and in the way in which we communicate either in the written form or orally. Speed might be of the essence but when it comes down to it, that means nothing if it lacks substance.

Yours sincerely,

**John Smith**

## Palliative Care in Mainland China

M Zou, M O'Connor, L Peters and W Jiejun

### Abstract

Predictable deaths from diseases like cancer account for approximately 83% of deaths in China. Despite the growing numbers of terminally ill people from all diseases, palliative care is in its infancy. Factors that have slowed the development of palliative care include cultural values that encourage efforts to cure (even when such treatment is likely to be futile) over the alleviation of suffering, limited public policies and funding for palliative care, and poor education of healthcare professionals about end-of-life care. To improve the palliative care of people in China who are terminally ill, efforts should be made to integrate best practice into the healthcare system, while being sensitive to, and preserving cultural values. In this paper, suggestions

are made for the future development of palliative care in China. Based on the World Health Organisation's public health model for integrating palliative care into existing healthcare services, these suggestions focus on public policy, education and training of healthcare professionals, lobbying of policy makers, and public education and information campaigns. Through working on the issues highlighted in this paper, China has an opportunity to improve the end-of-life care of people who are terminally ill.

*Abbreviations:* WHO – World Health Organisation.

*Key words:* palliative care; cancer; comparison; Mainland China.

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### Introduction

By world standards, China has a high rate of mortality from non-communicable diseases. The World Health Organisation (WHO) reports that 21% die from cancer, 38% from cardiovascular disease and 15% from respiratory diseases. [1] The increasing prevalence of these illnesses, and the associated need to care for people who are predicted to die from these causes, comes at a time in China when traditional caring resources are being stretched [2] and palliative care is in its infancy. [3] A growing fragmentation of the extended family, with people seeking jobs outside of their community, is resulting in even fewer family members being available to care for those who are aging or terminally ill. [2] The care of seniors and others who are dying, including those who are dying from chronic and progressive diseases, necessitates consideration of new models of healthcare delivery. In a report in 2010 however, China was ranked 37th out of 40 countries across the world, in a study that measured and compared the overall quality of death. [4] Clearly, palliative care in China will need to be advanced to meet present and future needs of people dying from predicted illnesses. This

paper provides commentary on what China may have to do to develop palliative care. First, however, a brief background to palliative care and its development in China is provided.

### **Palliative care**

The WHO describes palliative care as 'an approach that improves the quality of life of patients and their families facing the problems associated with life-threatening illness, through the prevention and relief of suffering by means of early identification and impeccable assessment and treatment of pain and other problems, physical, psychosocial and spiritual'. [6 p.94] This model of care incorporates being responsive to the needs of the person, as situated in their support structure; delivering care holistically, underpinned by a biopsychosocial approach (as opposed to the dominant biomedical model); and using a range of disciplines to meet the person's needs. [6]

Modern palliative care began in the United Kingdom in the 1960s as a response to the unmet needs of patients with progressive incurable illness and their families. [7] Palliative care has subsequently spread rapidly throughout the world, with locally responsive models in both developed and developing countries. [8] Unfortunately, the development of palliative care in Mainland China appears to be proceeding at a much slower pace.

### **Palliative care in Mainland China**

In Mainland China, palliative care is an emerging specialty. [8] In 1988, the first institute for hospice care was established in Tianjin. [9] A decade later, China's first free hospice care facility was established at the First Affiliated Hospital of the Shantou University Medical College, with funding from the philanthropist, Li Jiacheng. Now, the Li Jiacheng Foundation funds around 32 hospice units throughout China. [10] These units provide pain relieving drugs to dying people free of charge, but are reliant on this charitable funding to remain open.

In 2004, the WHO authorised the Huaxi International Collaborating Center for Palliative Cancer Care in Sichuan province to be one of eight collaborating centres for palliative care around the world. [11] Although this centre has stimulated the growth of approximately 200 hospice wards around the Sichuan province, in many other parts of Mainland China hospice and palliative care is either non-existent or in its infancy, and there remains no formal inclusion of palliative care services into Government-supported mainstream healthcare.

### **Why is Mainland China behind the rest of the world in palliative care?**

There are three key constraints/barriers to the development of palliative care in Mainland China. These relate to attitudes towards palliative care and death, policy, funding and education.

#### **Attitudes to death and palliative care**

Chinese people's attitudes towards adverse health issues, death and therefore, palliative care are shaped by the country's socialist underpinnings and the philosophical legacies of Confucianism and Buddhism. [12] Terminal illnesses are widely believed to be the result of some wrongdoing on the part of the afflicted. Holding such perceptions means there is little hope for remission or cure. Families provide a buffer to the effects of such a pessimistic outlook, often colluding with healthcare staff to keep the truth about the type and severity of the illness from the patient.

Contemplating mortality is a source of discomfort for most people and in Chinese culture, it is usually met with denial. [13-14] Death is often considered to be a failure of medicine, rather than as the natural end of human life. Chinese people are encouraged to fight disease, based on the belief that scientific medicine can cure all diseases. As noted, in such a cure-oriented model, alleviating suffering is not valued as much as curing disease, and patients who cannot be cured feel distanced from the healthcare team concluding that when treatment has failed, they too have failed. The consequences are late or no referral to palliative care and dying in hospital is preferred.

Many health workers believe that palliative care is the 'soft option' to be adopted when 'active' therapy stops and this is the same in China. To date, palliative care has been regarded as the care employed when all avenues of treatment of the underlying disease are exhausted and further active medical treatment is considered inappropriate. [15]

Current international trends in palliative care, such as open disclosure of diagnostic information to the patient and the family, valuing individual autonomy and promoting dying at home, are based on assumptions that may not be shared among many Chinese communities. [16] Clinicians too often succumb to the temptation of using all available technology in order to avoid imminent death. At the same time, they seem to have special difficulties in accepting human finitude and death. Clinicians' reluctance to discuss disease (particularly bad news) and death openly with patients stems from their own anxieties about death as well as misconceptions about what and how much patients

want to know about their illness. [17] They do not know how to effectively deal with their own feelings of sadness and grief concerning illness and death. [18]

### Policy and funding

There are no guidelines and standards for palliative care in Mainland China. Although there are some guidelines for symptom management, [19] because the quality of palliative care services is variable, pain and symptom control remains inconsistent and inadequate.

Palliative care is delivered outside of the healthcare system. There is no government budget assigned to palliative care and there are no reimbursements for palliative care expenses. [3] The limited funding that palliative care services do receive comes via charitable donations and philanthropic activity.

Healthcare tends to be delivered in hospitals rather than via community and homecare health programs, which are rarely a priority. Few hospitals or other healthcare organisations, however, are interested in palliative care. Instead, the services of oncologists are highly valued. Given that little value is placed on hospice or palliative care, it is not a priority for public funding. The reason why the services of oncologists are so highly valued is because of the cultural emphasis on seeking cures through treatment. [13] The high expectations for curative treatment mean that there appears to be much funding wasted on high-cost medications, and unnecessary and futile treatments for incurable conditions.

Palliative care can be provided at very low cost at home or in very low budget facilities. [15] By increasing the proportion of community and homecare services, palliative care can reduce the costs associated with long hospital stays and emergency admissions. [20]

### Education

The education of health professionals in Mainland China reflects the cultural focus on curative treatment. [13] Many healthcare professionals in Mainland China have minimal knowledge about palliative care, [21] and lack the knowledge and skills necessary to provide adequate pain and symptom control at the end-of-life. [21,22] In one recent study of 201 clinical physicians from two Chinese cities, 66% of participants did not have adequate knowledge about the dosage of morphine and 77% lacked knowledge about targeting analgesic effects. [22] The most prominent barriers to the clinical use of morphine included (i) limited training in analgesia; (ii) concerns about patients becoming addicted

to the medication; (iii) preferences in prescribing alternative medications; and (iv) fear that the medications would be diverted to illegal practices.

For several years, the WHO has used morphine consumption as an indicator of adequate access to pain relief, one of the cornerstones of palliative care. [23] The use of morphine and other opioids for pain and symptom control is a fairly recent development in China, [24] with the Ministry of Public Health establishing a program for the improvement of cancer pain relief in 1992. Attitudes and beliefs about opioid use may be influenced by the Opium Wars that historically plagued the country, with concerns about addiction remaining. [25] Because opioid analgesics are insufficiently available, many patients die with inadequate pain relief.

Although the document *The Guiding Principle of Clinical Application of Narcotic Analgesic Medications* from the National Health Ministry was published in 2007, [3] Chinese healthcare professionals still seem to have inadequate knowledge and skills to assess and treat pain, and, in particular, knowledge of the WHO Three Step Analgesic Ladder. [26] Chinese healthcare professionals seem to have concerns about the possible side effects of pain medications, misconceptions about pain and opioids and misinformation about opioid tolerance and dependence issues. [27]

Education programs for health professionals are characterised by a strong medical orientation with little attention to psychosocial aspects of care, communication skills or education about death. Training for palliative care is rarely included in healthcare education curricula. [28] It was not until 1998 that the concept of end-of-life care was first included in a Chinese textbook in a chapter on community nursing. [29] Two years later, the first book about palliative medicine was published in China. [30] Palliative care education has not achieved widespread acceptance however, with respect to either the medical educational system or gaining the official status that other medical specialties hold, such as oncology. [31] Although some information about aspects of end-of-life care is delivered in schools of nursing, the lecturers are often not palliative care specialists and the number of class hours is insufficient.

### Suggestions for the future of palliative care in Mainland China

Palliative care should be developed in China consistent with best practice in end-of-life care and Chinese values. Using the WHO public health model for integrating palliative care into existing healthcare services [32] is important for establishing palliative care services, and includes engaging

opinion leaders and establishing a steering committee, as well as conducting a situational analysis to assess the country's socioeconomic and disease demographics and resources. There are four foundational elements of this model: policy development, education, drug availability and implementation.

Firstly, to set the foundation for integrating palliative care into healthcare systems, the Chinese government would need to incorporate palliative care strategies into national healthcare policy. Such a development would require budget and resource allocation for palliative care services to ensure availability, access and financial stability. Through using a model of shared service provision between the government health sector and non-governmental organisations (eg, volunteer or charitable groups), the government costs of developing palliative care services would decrease substantially. Supporting policies need to address aspects like palliative care availability and access, reimbursement and insurance issues.

Drug policies need to be developed and widely disseminated to ensure availability and accessibility to the patient population requiring palliative care. Specifically, access to opioid medications is vital. The WHO has suggested that a simple strategy to develop an estimate of opioid requirements is to assume that 60% of people with advanced cancer will require 100mg per day for the last 100 days of life, making a total of 10g per person. [32] Having opinion leaders responsible for drug availability as champions, will be vital in lobbying for access to the medications required.

Education related to palliative care is key to capacity building and should be promoted at all levels of society from providing specialist education for physicians and nurses to better equipping volunteers and informing the community. The inclusion of palliative care in undergraduate and post-graduate training programs in medicine, nursing and other health science disciplines is essential. The development of continuing education programs will help ensure that more healthcare providers acquire sufficient knowledge of palliative care and pain relief. The transfer of knowledge and experience will help all patients have adequate palliation of their pain and related symptoms.

Training in other areas, such as psychosocial care, counselling and communication is also important when considering the broader issues that palliative care must address. To develop a level of comfort and expertise in communicating with terminally ill patients and their families, healthcare workers

must first consider their own experiences with, and values concerning, illness and death. Reflection, reading and talking with family members, friends and colleagues can assist them to examine beliefs about death and dying.

Strong and effective lobbying directed towards policy makers and healthcare organisations, non-government organisations and universities will help promote palliative care programs that deliver a range of services in a variety of settings including hospitals, hospices, homes and aged-care facilities. The types of services include admitted patient services, outpatient, home-based and respite care, as well as bereavement care for the family/carer following the patient's death. In addition, the development of palliative care programs that have clear guidelines and strategies will raise awareness and popularise knowledge of palliative care in the community and among professional groups, improve palliative care quality and provide partnerships for the facilitation of palliative care across all sites of care.

Finally, public education and information campaigns are important in changing public attitudes towards palliative care and to the implementation of palliative care services. Public awareness at a national level can be a catalyst for the improvement of palliative care services. Utilising key opinion leaders, healthcare professionals must strive to disseminate knowledge about palliative care to the public through educational materials and the media. Community efforts need to be made to reduce fear of death and generate enough awareness of and demand for palliative care.

### Conclusions

A significant percentage of people in China die predictably from a number of diseases. In a culture that seemingly values providing treatment ahead of alleviating suffering, palliative care has been slow to develop. Through policy development, funding and education, China has an opportunity to improve the end-of-life experiences of those who are terminally ill.

### Competing interests

The authors declare that they have no competing interests.

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## Managing the International Humanitarian and Development Health Workforce: a review of experiences and needs

A Dawson and C Homer

### Abstract

The overseas development and humanitarian assistance provided by high income nations includes considerable investment directed at improving health in low and middle income countries. Governments, non-government organisations and consulting companies employ international health staff in low and middle income countries to deliver health interventions, manage programs and provide technical assistance. There are no reviews of evidence to guide the management, support and training of these staff, especially in relation to capacity building. We undertook a narrative synthesis of research to examine the needs and experiences of international health personnel engaged in development and humanitarian work. We found that altruism and a desire for professional and personal development motivated most international workers, however their roles are not always clear,

affecting the delivery of quality care and services. Staff supply and skill-mix, short contracts, remuneration, leadership and workload were highlighted as issues. A lack of preparedness was also noted and staff identified strategies for coping in the field. Current efforts towards the professionalisation of health development and humanitarian staff may provide mechanisms to better support the workforce to respond and be accountable to the needs of countries. A performance management framework may need to be developed requiring research and validation.

*Abbreviations:* MDG: Millenium Development Goals; NGO – Non-Government Organisation.

*Key words:* developing countries; international workforce; professional standards; performance management; AID effectiveness.

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### Background

One of our current global health challenges is to meet the Millennium Development Goals (MDGs) that focus on improving child and maternal health outcomes and combating HIV/AIDS, malaria and other diseases by 2015. [1] International aid has been crucial in assisting many countries to deliver health interventions, manage programs and provide technical assistance. As a result of significant investments in aid around the Asia and Pacific regions,

program effectiveness and funding approaches are currently on the agenda of agencies and donors, keen to see that their investments are coordinated, transparent and targeted towards progressing the MDGs. [2]

Human resources account for a major share of aid budget costs and therefore warrant special attention from donors and international non-governmental organisations (NGOs) so that resources can be used efficiently. Available figures show that forty-six per cent of the Australian government's international development (known as AusAID) budget of 1.8 Billion AUS dollars in 2003 was spent on human resources technical assistance across all program areas where Australian experts undertake tasks where there are skill shortages. [3] In order to attract and retain experienced field professionals to work in often insecure contexts, international NGOs provide premium salaries alongside those of security staff which draw a significant share of agency budgets. [4]



International health staff employed on aid programs may reside for long or short-term periods in developing countries to perform clinical, technical, management or health promotion roles and function in a voluntary, salaried or contract capacity. Staff are generally engaged in capacity building and transferring skills and knowledge to local staff, building networks and partnerships, providing leadership and assisting with infrastructure development [5] such as repairing health clinics in rehabilitation projects or building facilities as part of long-term development missions. Large numbers of foreign nationals may be posted overseas for the duration of international development or humanitarian missions. For example in 2011, USAID staff totalled 9,475 of which more than 70% were United States nationals overseas. [6]

International health personnel are drawn from a variety of professional and education backgrounds, undertake a range of service functions and are selected and contracted through numerous mechanisms and by various employers. We focus on international health staff for the purpose of this paper. We define international health staff as professionals formally contracted to undertake specific health-related tasks that may be part of a government, NGO or donor program. We will not include students or holiday visitors. International staff involved in humanitarian missions are typically engaged in short-term relief rehabilitation and risk reduction activities in the immediate aftermath of a

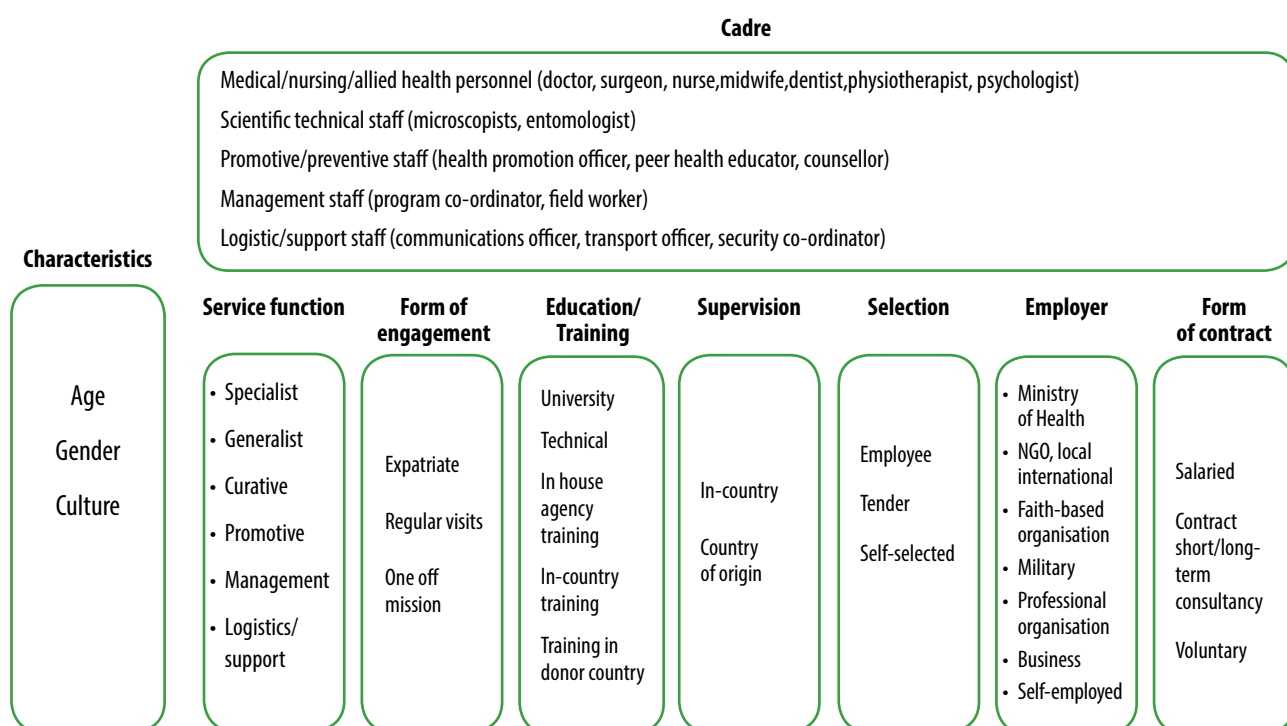
disaster or emergency. [7] On the other hand, development personnel are involved in longer-term activities designed to improve the level of a country's health system and associated infrastructure.

Figure 1 provides an outline of diverse staff characteristics. For example, government international aid agencies including AusAID and USAID not only have their own programs and technical advisors in countries but contribute to the remuneration of other Australian and American health staff working for accredited organisations through grants to NGOs; [8,9] funding to health professional organisations; [10,11] and, joint operations with the Defence Force. [12,13] Government aid also funds staff costs through consultancies and tenders won by donor country and international companies. International NGO staff salaries are funded through public donations and private benefactors, while private industry employs other personnel.

### The need for a synthesis of evidence

Despite considerable donor investment in building the human resource capacity of their organisations, evaluations of international staff management have called for efforts to be focused on improving workforce efficiency. [3,4] There is no systematic review that synthesises current research knowledge to indicate how international health workforce needs and performance issues can be best addressed.

Figure 1: Humanitarian and development personnel characteristics



### The need for a synthesis of evidence

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This paper aims to identify the needs and experiences of international health workers in development and humanitarian settings. Specifically:

- How do health staff view themselves and the roles they perform?
- What strategies do staff perceive will improve motivation and contribute to their effective management, training and support?
- What barriers and constraints affect performance?

### Method

An initial scoping exercise revealed that relevant research literature comprised quantitative and qualitative study designs disallowing the pooling of research results. No randomised control studies were identified, therefore we

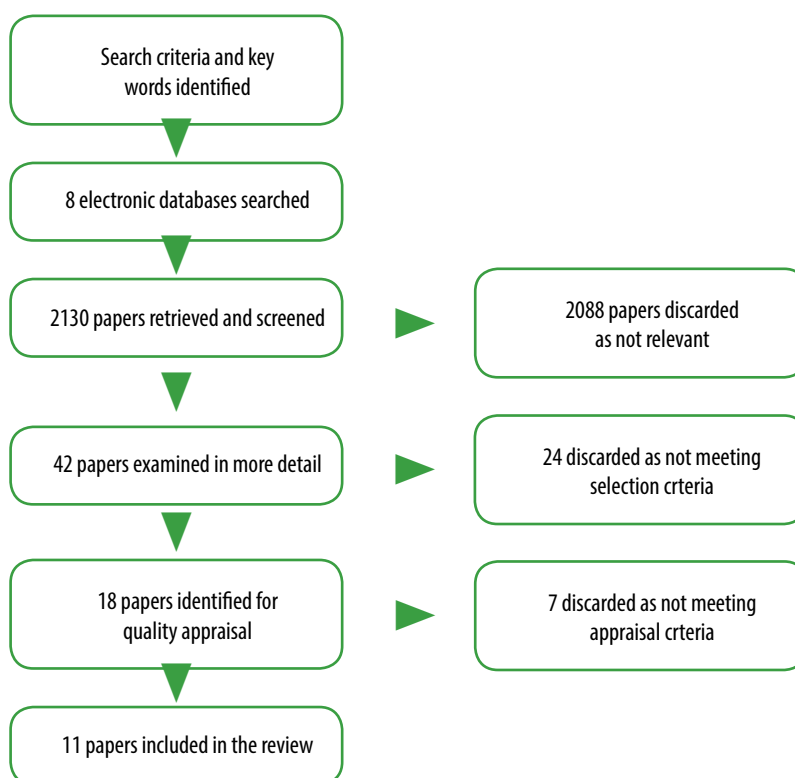
decided that observation studies would be considered eligible for inclusion alongside quasi experimental and non-experimental descriptive studies. Based on this, a narrative synthesis methodology was selected to analyse the research papers and was conducted as per current guidelines. [15,16]

### Search protocol

A systematic search of the literature published between 2000 and 2011 was undertaken of eight bibliographic databases (MEDLINE, CINAHL, MEDLINE, Web of Science, PubMed, Scopus, and ProQuest Health & Medical PsycINFO [OVID]). Medline MeSH subject headings were used: 'Health Manpower' or 'Foreign Professional Personnel' or 'Health Personnel' or 'Voluntary Health Agencies' and 'Relief Work' or 'Altruism' and 'Delivery of Health Care' and 'Developing Countries'; or 'International Cooperation' and augmented by 'technical assistance'.

Retrieved records were screened using an inclusion/exclusion criterion for their focus on development and humanitarian health workers and duplicates removed. Discursive papers and those older than ten years were removed. The PRISMA guidelines [17] were used to report process (Figure 2).

Figure 2



### Appraisal of quality

Eighteen papers (11 qualitative, six quantitative and one mixed methods) were appraised to establish if the research aim and the methodology were aligned and to evaluate the recruitment, settings, data analysis, ethics, findings and contribution to knowledge. The 11 qualitative papers were assessed for quality using the CASP tool for qualitative research, [18] the six non-experimental studies and the mixed methods paper were assessed using the scoring system designed by Pluye et al. [19] Seven papers were discarded as quality was deemed low including a lack of ethical processes.

### Analysis

Using narrative synthesis we analysed the results section of the 11 papers using a framework based upon the Human Resources for Health Action Framework [20] to identify the experiences of development and humanitarian workers. This framework was adapted according to emergent themes (see Table 3). A thematic analysis was conducted by the first author using tables and discussed with the second author. The relationships within and between studies was explored and coded under each theme. A concept map was built to plot patterns and relationships across themes and sub themes.

### Findings

Of the 11 papers, two focused on health staff in development settings, [21,22] one on humanitarian and development health personnel, [23] and eight on staff engaged in health work in humanitarian settings. [24-31] These papers are summarised at Table 1. Eight themes emerged and are outlined at Table 2. These themes are discussed below according to humanitarian or development context.

### Challenges of humanitarian and development workers

Several papers described challenges relating to humanitarian work, including society's indifference to it and problems related to power, dependence and aid effectiveness. Participants commented on the need for aid efforts to be consolidated for impact. [26] Staff felt that, despite years of effort, little gain had been made with global injustice and inequity still endemic. [28] Workers regarded this as the result of high income country public ignorance of the challenges faced by poorer nations reflected by the hostile attitudes often shown towards humanitarian workers in their home countries. [28]

Participants described the effect that their employer's organisational culture had on their ability to undertake their work. One study described aid culture as 'self-congratulatory', preventing reflection and learning from unsuccessful efforts. [28] Organisational policy and regulations were described as problematic, creating boundaries between international and local staff and in one case affecting patient evacuation. [25] Incompetent leadership was challenging, [29] affecting agency functionality [26] and hindering teamwork. [25] Teamwork was critical [26] with collaboration being ultimately dependent on developing 'trust relationships' requiring communication skills and time to develop. [25] Causes of poor teamwork included burn out [28] and poor role definition. [29]

Development workers reported feeling overwhelmed by the limited nature of their contribution: [23] that relates to humanitarian workers' expressed need to unify efforts in the field. Workers involved in development work also felt hostility from Australians when they returned home from working overseas. [21]

### Having the right identity and personal characteristics

Identity and personal issues relating to being a moral and altruistic person, a health professional and a humanitarian worker were a recurrent theme through all the studies. Hunt's research [23] found that a sense of professional identity enabled staff to deal with ethical issues. Participants were concerned that their colonial heritage would affect how local people perceived them. However in response participants felt it necessary to develop a clear notion of themselves as humanitarian workers in order to define their work and communicate their altruistic role to others. [23] Participants in Bjerneld's study looked forward to being part of the humanitarian community perceiving their personal characteristics as either fully formed or 'in development' and seeking assignments suited to these. [26]

### Role confusion

Participants in Hunt's study described the need to understand the local culture and context before establishing their humanitarian role. In addition confusion surrounding one's role was seen as stressful and was amplified by poor training and supervision. [25] Participants felt forced into humanitarian roles that were not their own, ranging from organising the burial of children to performing clinical procedures without adequate training or equipment. [23] Hunt's 2009 study highlighted the importance of leadership, clear decision-making structures and role definition, [25]

**Table 1. Summary of studies included**

REFERENCE	CONTEXT / AGENCY TYPE AND PROGRAM STAFF	METHOD/DATA GATHERING	SAMPLE	AIM/S/OBJECTIVE/ PURPOSE
(Aitken 2009)	Humanitarian relief /Australian Government Overseas Disaster Assistance Plan medical disaster team deployed to Aceh, Maldives and Sri Lanka.	Descriptive survey design.	59 Australian post mission disaster medical assistance teams members (DMAT) medical (24), nursing (11), logistics (6), allied health (3) and command (3) roles as well as mixed roles consisting of medical/command (2), medical/logistics (1), nursing command (1) and nursing logistics (1).	To evaluate Australian DMAT experience in relation to health and safety aspect of actual deployment.
(Bjernerud 2006)	Humanitarian relief /potential health staff no specific agency interviews.	Descriptive qualitative using content analysis of focus group.	Scandinavian health professional volunteers (10 nurses, 9 doctors) attending a 2-months International Health course at Uppsala University, no previous experience of humanitarian work abroad.	To explore motivations, concerns, and expectations.
(Dahlgren 2009)	Humanitarian relief / Red Cross, International NGO including health team.	Descriptive survey design using a self-administered anonymous questionnaire.	1250 International Committee of the Red Cross expatriates who underwent debriefing during the study period having mission greater than 1 month included delegates (40%), administrative personnel (20%, e.g., secretaries, logistics), and different specialists like medical staff and engineers (40%).	To assess self-reported health risk and risk-taking behaviour of humanitarian expatriates.
(DeZee 2006)	Humanitarian relief / US Army medical team	Descriptive survey-based needs assessment using the internet	89 of 186 US Army internal medicine residency graduates	To examine perceptions of preparedness.
(Hunt 2008)	Humanitarian relief and development context / various NGOs with health programs	Phenomenology: using semistructured interviews.	10 participants six nurses, one physical therapist, one physician and one social worker. One participant was the Executive Director of an NGO	To determine how health workers experience ethics in the course of humanitarian assistance and development work.
(Hunt 2009)	Humanitarian relief/ various NGOs with health programs.	Interpretive Description methodology using semi-structured individual interviews.	15 Canadian healthcare professionals (nine doctors, five nurses, and one midwife) with more than three months experience in humanitarian work; and (2) three individuals who have experience as human resource or field coordination officers for humanitarian, NGOs.	To explore the moral experience of healthcare professionals during humanitarian relief work.
(McCormack 2009)	Humanitarian relief / various NGOs and consultancy.	Phenomenology using semi-structured interview.	Single individual who spent more than 35 years in field as a senior manager and consultant.	To explore the altruistic identity and experiences.
(Melby 2008)	Development expatriate setting, Eastern Asia / University nursing faculty.	Phenomenology using semi-structured interviews.	Eight expatriate nurse educators 7 female 1 male.	To describe the lived experience of English-speaking Western nurse educators.
(Rowley 2008)	Humanitarian relief / secular and faith-based international NGOs.	Surveillance study of fieldbased.	18 humanitarian organisations reported on any death, medical evacuation, or hospitalization of any national or expatriate staff for any cause, in any field location during the study period.	To describe the distribution of all-cause and cause-specific mortality and morbidity of humanitarian workers with regard to possible risk factors.
(Selby 2009)	Development setting / faith-based Australian NGOs with health programs.	Descriptive survey based study and descriptive qualitative using semi-structured interviews.	15 participants from Australian interdenominational Christian mission organisations: 8 administrators or involved in support roles such as cultural training and childcare, 4 were health professionals, and 3 teachers.	To explore loss and grief issues for adult Australian missionary cross-cultural aid workers during their re-entry adjustment.
(Tuhkanen 2008)	Humanitarian relief, Afghanistan/ Red Cross medical team.	Ethnography using interviews and focus groups discussions.	7 Afghan Red Cross healthcare professionals and 3 expatriates who had facilitated Emergency Mobile Unit training.	To describe Emergency Mobile Unit team members' and healthcare professionals' perceptions of a disaster preparedness and response project and to explore the elements of participation that could support its sustainability.

**Table 2. Themes related to the experiences and needs of humanitarian and development health workers identified in papers in the narrative synthesis**

REFERENCE	AID WORK CHALLENGES	IDENTITY	ROLES	MOTIVATION	HUMAN RESOURCES FOR HEALTH MANAGEMENT ISSUES					ETHICAL DILEMMAS	HEALTH AND PERSONAL ISSUES	RELATIONSHIPS WITH LOCAL PEOPLE/STAFF	LOCAL CULTURE
					TEAM WORK PEER SUPPORT	WORKLOAD	STAFF SUPPLY	WAGES, INCENTIVES AND EMPLOYMENT CONDITIONS	EXPERIENCE: PRE AND POST ASSIGNMENT PHASES				
(Aitken 2009)	✓				✓	✓		✓	✓		✓		
(Bjermeld 2006)	✓	✓	✓	✓	✓			✓	✓		✓		
(Dahlgren 2009)											✓		
(DeZee 2006)									✓				
(Hunt 2008)	✓	✓	✓				✓			✓		✓	✓
(Hunt 2009)	✓		✓	✓	✓				✓	✓	✓	✓	✓
(McCormack 2009)	✓	✓		✓	✓		✓		✓		✓		
(Melby 2008)			✓				✓		✓		✓		✓
(Rowley 2008)											✓		
(Selby 2009)	✓								✓		✓		
(Tuhkanen 2008)						✓						✓	✓

while Bjerneld's research study demonstrated the need for staff to understand how their roles related to other field-work. [26]

Development workers said that they were sometimes unable to gauge local expectations in order to define their role but that acting as a role model to local staff was regarded as a valuable contribution. [22]

### Motivation to do humanitarian work

Related to roles were factors linked to staff motivation. Some reported initially wanting to play a 'hero role' [26] others discussed aspirations to 'save the world' [25] that were criticised as unhelpful contrasts between international health professionals as rescuers and beneficiaries as passive recipients. [25] Humanitarian workers were described as driven by adrenaline and their regular field missions increased the likelihood of mental health issues that impeded team performance. [28] For most, the need for fame, bravery and glory, gleaned through the media, was soon replaced by a desire to make a contribution to society linked to participants' understandings of their privileged position and dissatisfaction with their current work in their home countries. [26] Others were motivated by a desire

for personal development and forming new relationships, which were intensely satisfying, [28] and would help them learn more about themselves. [25] Related to this was the desire to test themselves in new situations.[26] Participants noted that motivations must be realistic, as idealised motivations lead to disillusionment or anxiety. [25]

### Being managed as human resources

Human resource management issues included staff supply, workload, remuneration incentives and employment conditions, the organisational culture of the aid agency and team work. High staff turnover rates among humanitarian workers were reportedly due to short-term contracts and the limited timeframe of aid projects. This was seen as potentially damaging to individuals as they were not able to achieve stability contrasting with the compassionate work that staff were paid to undertake. [28] Skill-mix was not always optimal, impacting upon humanitarian team performance. [28] Remuneration concerned humanitarian aid nurses who believed that their NGO salary was too low. [26] A heavy workload affected development workers' ability to reflect and improve on practice [23] with a trip home being the only respite available. [22]

## Skills, experience and needs in pre and post assignment phases

### Preparation

Humanitarian study participants reflected upon their level of preparedness for humanitarian and development work often expressing self-doubt concerning their ability to contribute and desire for a high level of preparedness beyond formal education and training. [25] For example, most participants in De Zee's study did not feel prepared for medical humanitarian assistance and requested additional training on the clinical management of tropical diseases, sanitation and how to interact with civilian humanitarian and military civil affairs workers. [27] Some felt that not knowing what to expect was a hardship [29] while others anticipated learning a great deal. [26] Participants identified personal qualities required for field-work including confidence in their professional abilities and need for acceptance of individual limitations. [26]

### Post assignment

Humanitarian workers expressed fear that recurrent periods away would result in the loss of their cultural identity. [26] This stemmed from the fact that family and friends could not appreciate the profound experiences or were unable to listen. [28] These difficulties were said to result in stress, grief and loss. Returning staff also felt patronised by friends. [28] Development staff in Selby's study felt that the community regarded their assignments as an adventure and expected them to adjust, or that their re-entry was not especially significant and hence there was little acknowledgement of support needs. [21] Development workers described feelings of alienation on return home while others felt isolated and without networks. [21] They felt that friends and family did not acknowledge that relationships had changed during their absence or understand the strength of relationships formed overseas. [21]

Strategies were described by humanitarian workers to cope with rejection or alienation including seeking support from other aid personnel, or by returning to the field to regain purpose and focus. [28] Others felt aid organisations should recognise and appreciate the contribution of international staff so that they would feel valued and build self-esteem. [26] For development workers rest and relaxation upon return was critical. [21]

### Facing ethical dilemmas in the field

Dilemmas were reported by humanitarian workers around clinical situations where health workers' decisions concerning patient treatment were affected by priority issues, public health considerations, poor prognoses or

the lack of medications or money to purchase them. [23, 25] Participants felt unprepared for these decisions and described feelings of guilt. Other dilemmas related to observing incompetent and inappropriate care by local health professionals and situations where international workers' recommendations for improvements were rebuffed. Clinicians reported undertaking tasks for which they themselves were not trained or resisting pressure to carry out work beyond their remit and feeling guilty as a result [23] They struggled with differences in standards of care and how to apply global standards, or those responsive to the local context with the best patient outcomes in mind. [23] Corruption and distrust were problems participants could not easily resolve, along with working under the vestiges of colonialism and/or under dictatorships that compromised care. Participants responded by lowering expectations or striving to do their best. [25] Development workers spoke of difficulties they had putting mechanisms in place to advance practice towards global standards. [22]

### Meeting their own health and personal issues

During deployment in a humanitarian setting, the majority of participants in Aiken's study felt that their basic health needs were adequately met. [29] Malaria affected one-in-ten workers returning from sub-Saharan Africa and one-in-ten expatriates reported having injuries during their mission. [30] Another study identified that the risk of violence-related deaths, medical evacuations, and hospitalisations was six per 10,000 humanitarian worker person-years. [31] It is difficult to contextualise these figures as the only similar study describing violence against healthcare workers across 16 countries does not seek to establish trends. [32] However, by way of comparison the World Health Organisation report into violence and health states that, in 2000, the rate of violent death in low to middle income countries was 32.1 per 100,000 population, more than twice the rate in high income countries (14.4 per 100 000), [33] but half the reported risk of humanitarian workers demonstrating their high exposure to risk of violence-related deaths, medical evacuations and hospitalisations.

Lifestyle and risk-taking behaviours among humanitarian workers were reported including increased alcohol use and sex with someone other than their regular partner. Two-thirds reported condom use, with one-fifth using condoms 'only sometimes', or never. [30] Stress, exhaustion and sleeping problems affected international health staff. [29,30] Participants in the studies regarded psychological distress as significant and related this to witnessing human suffering, death and destruction. [29] Distress was also said to be

related to participant's feelings of self-doubt and questions concerning whether their work was making a difference and guilt associated with poor or ineffective humanitarian work. [28]

Personal coping strategies to deal with difficult and stressful situations were described by humanitarian workers including self-monitoring of physical responses to work demands, reflecting on events and accepting situations that are beyond individual control. [28] Building relationships with colleagues was regarded as critical for support and advice. [28,30] Regression analysis in Dahlgren's study revealed that expatriates who reported having had someone to talk to during the mission 28% (RR = 0.72, 95% CI 0.51–1.03) were less likely to report exhaustion. [30]

### **Living in the local culture and having relationships with local people/staff**

Humanitarian staff reported feelings of solidarity with local people and a shared sense of humanity which was necessary to progress aid work. [25] They were aware of the power wielded by aid workers and the need to include local voices. However, organisation policy sometimes reinforced the differences between local and international staff by segregating living quarters and security protocols. [25] Different levels of trust affected the working relationships between local and international staff.

Development workers found living in a different cultural environment challenging and recognised that their values were not always those of the local population. [23] Learning another language was difficult [22] but learning the local culture was described as critical to addressing one's own ethnocentrism and developing working relationships, strategies and defining roles. [22] Other humanitarian and development personnel reported that they had been confronted by different concepts of health including practices that may be harmful. [23, 25] Development staff saw the need to adjust to culture and make compromises on their behalf [22] while humanitarian workers felt that it was important to work towards changing practices, for example, discrimination or violence towards women. [25]

### **Discussion**

Our narrative synthesis found that the ways in which international health development and humanitarian workers view themselves and the factors that motivate them to undertake this employment are related to the roles they play or seek to achieve. Altruism and a desire for professional and personal development reportedly inspired most international workers. Poorly defined roles affected

the delivery of quality care and services. Staff supply and skill-mix, short contracts, remuneration, leadership and workload were highlighted as issues affecting teamwork and performance. A lack of preparedness and debriefing upon return were outlined. Despite these challenges participants described strategies for coping in the field and improving practice.

Hero roles mentioned in other studies appear to be motivated by notions of rescuing people in crisis and may relate to the missionary label previously used to describe the actions of faith-based workers and now applied to aid personnel to describe the fanatical zeal that they supposedly have for their work. [34] Images of international workers have been found to be accompanied by descriptions such as 'aid cowboys' and 'aid mercenaries' [35] and 'misfits' [34]. These labels serve to typecast international workers who according to this synthesis are more interested in professional and personal development than addressing health inequity. However unclear roles, poor supervision and leadership were found to result in stress, ethical dilemmas and feeling disconnected from the work of other international personnel.

Strengthening the professional identity of humanitarian and development workers may help to clarify roles, improve staff support, teamwork and public perceptions and understanding of aid work at home and in developing countries. Professional associations have been argued as essential to ensuring professionalism [36] and can provide networking, advocacy and the development of core standards, competencies and certification. [37] However, efforts to establish a professional association remain untried and focus on the humanitarian sector not workers in development settings. Competencies for Australian international health professionals have been proposed [38] but these do not appear to have been evaluated nor applied in any systematic manner. This review shows that these proposed core competencies have validity particularly those related to cross-cultural, communication and management skills. However the diversity of staff roles and the different contexts of humanitarian and development health work will necessitate that specific public health and research skill requirements are developed for each cadre.

Our review identified strategies to improve staff motivation and efficiency including team building. Teamwork can be enhanced through the clear delineation of roles and responsibilities, structured protocols or policies and standards for communication, as well as mechanisms for exchanging information and coordination. [39] Such

approaches could be incorporated into program and assignment plans and covered in preparedness training for international health staff. Inter-professional education and training may be useful to foster collaboration across sectors in low and middle income countries but this requires further investigation. [40]

Self-assessment was found in this review to be an important tool for regulating learning and managing personal, cultural and ethical issues in the field. According to Boud, [41] self-assessment refers to reflecting upon and judging one's own learning and behaviour and taking action. This can involve evaluation of practice against professional benchmarks such as competencies or personal development goals. Self-assessment could assist international health workers to devise strategies for dealing with the challenges of field work such as health threats [42] and build relationships for friendship and networks for support. Self-regulation through the assessment of one's professional practice has been shown to increase motivation and morale improving knowledge and performance. [43]

Self-regulation is useful for career planning [44] and could assist international health workers to make decisions concerning which projects and short contracts to pursue. Self-regulation is an important component of formal performance management [45] that can help health workers develop skills, knowledge, leadership capacity and partnerships with other professionals [46] that could be linked to attaining competence and certification. These aspects of professionalism need to be taught [47] and international health workers may benefit from guidance in self-regulation with structured activities built into preparedness and in-service training and in debriefing exercises on return home.

Developing a strong connection between self-regulation, on-going performance management, capacity building and aid effectiveness could be the next logical step towards a comprehensive approach to improving individual, team and aid program performance. Measurable indicators assessing international worker performance must be included as part of continuous monitoring and evaluation of development and humanitarian efforts and aid effectiveness. [14] Australia is recognising the need for such an approach as evidence by the latest AusAID Workforce Plan, [48] however little knowledge is available concerning how performance review and planning can be developed, best managed and mapped against health goals such as health systems strengthening and achieving the MDGs.

A framework for the performance management of development and humanitarian personnel incorporating self-regulation and workforce capacity building could be useful alongside other aforementioned efforts towards the professionalisation of international health workers. A matrix of human resources for health performance fields, [49] capacity building dimensions [50] aligned with health system strengthening criteria [51] and MDG health targets will enable the development of input, process and output level workforce performance indicators. [52] Clarifying performance indicators for humanitarian and development health workers may realise both horizontal and vertical alignment [53] at multiple levels in order to ensure that staff performance is fully integrated across all possible objectives of aid activities. Organisations such as the Australian Council for International Development may be able to play a strategic role in the development of professional associations for humanitarian and development workers. The leadership of this coordinating body for non-government overseas aid and international development organisations in Australia could assist with setting out appropriate education and training, regulation and accreditation to meet required performance goals and the professional and personal aspirations of those working in the humanitarian and development fields.

The study excluded grey material from evaluations and project reports that may have shed light on other international health worker challenges and lessons learnt, however the quality of such evidence may be questionable due to methodological issues.

International health workers make a valuable contribution to progressing humanitarian and development goals of lower and middle income countries. This review has highlighted the needs and experiences of international health workers, identifying gaps and strategies that could be harnessed to improve staff management and international aid practice.

### Competing interests

The author declares that she has no competing interests.

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## Weekend Emergency Dental Care Demand: a study of the geographic and socioeconomic catchment for a major metropolitan dental hospital in Australia

C M Rocha, E Kruger, S McGuire and M Tennant

### Abstract

**Background:** The weekend emergency service of the Royal Dental Hospital Melbourne (RDHM) provides a model of urgent, symptom-driven demand for dental care for Australian metropolitan areas. The aim of this study was to assess the geographical distribution of patients seeking emergency care at the RDHM during weekends and public holidays, and associate the utilisation pattern to the socioeconomic status of the area in which the patients reside.

**Methods:** All patients requesting emergency dental care at the RDHM that met the inclusion criteria in calendar years 2006, 2008 and 2010 were included in the data frameset. Geographic Information Systems (GIS) tools were used to geocode and overlay each patient address on the socioeconomic data.

**Results:** For the three calendar years studied, 95% of the patients were living within a 50km radius of the RDHM, and the majority of patients seeking emergency care lived within a 20km radius from the RDHM. Patients from areas with similar socioeconomic status living more

than 10km away from the hospital, had poorer access to dental emergency treatment. The rate of patients (per thousand head of the population) requesting emergency care was between two and four times higher in the one-third most deprived areas of the population when compared to the whole population.

**Conclusion:** Areas of greater socioeconomic disadvantage had higher rates of emergency events, and geographic closeness to the dental hospital significantly increased access to care.

**Abbreviations:** CD – Census Collection District; ECDMS – Emergency Care Demand Management Systems; GIS – Geographic Information Systems; RDHM – Royal Dental Hospital Melbourne; SEIFA – Socio-Economic Indexes For Areas; SES – Socio-Economic Status.

**Key words:** dental health service mapping; density mapping; GIS; major metropolitan city.

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### Introduction

The vast majority of dental care in Australia is provided by private practitioners on a fee-for-service basis, with cost of care being a known factor in attendance. [1] A small share, approximately 10% of total service, is provided by the public system for eligible Australians (means tested). Despite this safety net for care, significant inequalities in oral health still exist, with a higher burden of dental disease in the low socioeconomic groups of the population, and high levels of emergency care and tooth extractions being reported by public dental clinics. [2,3]

Australia's second largest city (by population) is Melbourne, which is the capital of the State of Victoria. The Melbourne metropolitan area covers approximately 7,700 square kilometres and has a population of around 4.1 million. [4] For the last 120 years, public emergency dental treatment has been provided mainly by the Royal Dental Hospital of Melbourne (RDHM), and until about 15 years ago the hospital was supporting all public and private clinics for emergency care, especially after hours. Currently, during weekends, RDHM is the principal provider of public dental services (a small number of public clinics provide services on Saturday), being the only public provider on public holidays and by far the largest of the handful of all weekend emergency services accessible in metropolitan Melbourne. The service is open to all community members (ie, it is not means tested) but those without government issued health care or pension cards pay fees at a rate of approximately 75% of private fees.

A detailed understanding of the local demographics, dental needs and dental providers is necessary to plan for the effective delivery of public oral health services. In this sense, GIS, a computer-based system for the input, storage, maintenance, management, retrieval, analysis and output of geographic or location-based information, is an important tool in healthcare planning and understanding of disparities locally, regionally and nationally. GIS is now used in a variety of public health and social science applications. [5]

The weekend emergency service of RDHM provides a model of urgent, symptom-driven demand for dental care for Australian metropolitan areas. An analysis of the dental emergency attendance at the RDHM by Socio-Economic Status (SES) and geographical location of the patients, can not only aid in understanding the access to dental emergency services but also in planning location and size of emergency services required in Melbourne and/or other capital cities based on their population demographics. Thus the aim of this study was to assess the geographic and socioeconomic distribution of patients seeking emergency care at the RDHM during weekends and public holidays. In order to do so we mapped the geographical distribution of patients requesting dental emergency care at the RDHM and the SES of the area they reside in to define catchment zones for a dental hospital.

### Materials and Methods

Ethical approval for the study was obtained from the Ethics Committee of Dental Health Services Victoria (the organisation responsible for RDHM). All data were de-identified.

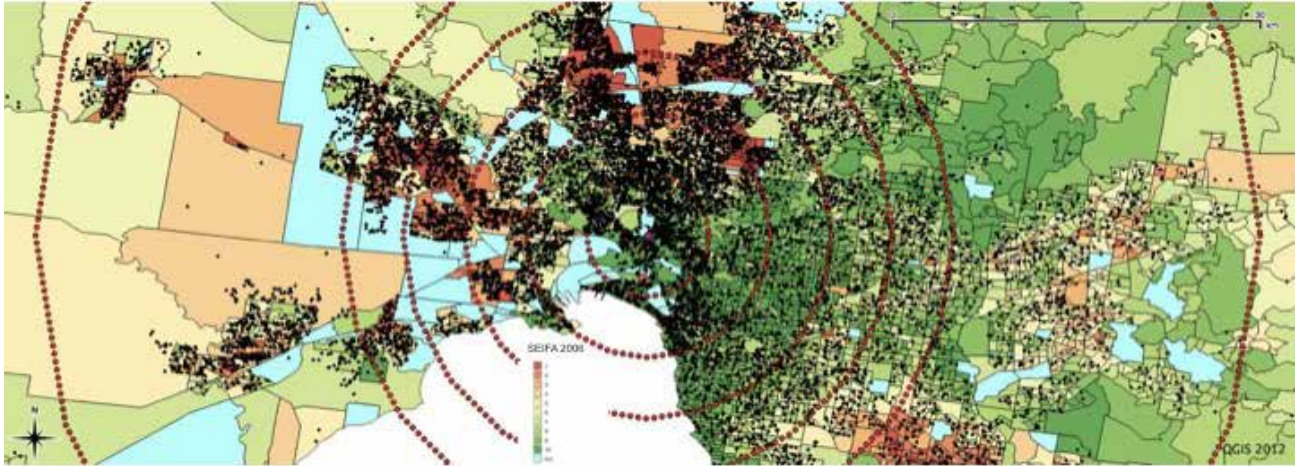
**Sample:** All patients requesting emergency dental care at RDHM that were classified as category one and/or two of the Emergency Care Demand Management System (ECDMS) [6,7] over weekends and public holidays from 1 January to 31 December 2006, 2008 and 2010 were included in the data frameset. The ECDMS triage category one and two refer to patients with acute dental pain (interfering with sleep or caused by pressure/hot stimuli), patients presenting with swelling (gums, face, neck or mouth), patients unable to fully open mouth, accidents with patients under 14 years of age, patients bleeding from a recent extraction, patients with a dislodged or loose crown or bridge and all patients suffering from intellectual disability, immunosuppression and patients over 80 years old. Patients triaged as categories three, four and five were excluded as these relate to cases of less urgency. Although the study was based on a convenience sample, care was taken to minimise bias. The first calendar year included (2006) coincided with the most recent Australia Census available at the time of the study and data for every second calendar year was included in order to increase the number of emergency events analysed and time period over which they occurred, reducing the risk of selection bias.

**Dental hospital and patients' residence location:** The longitude and latitude of each patient address was obtained through a free access geocoding system (Google Maps API). The integrity of the data was measured using the accuracy level of geocoding given by Google Maps. Only addresses geocoded to the 'address' or 'premise' level of accuracy (levels eight and nine) were included in the analysis. Approximately four percent of the triage events were excluded due to a lack of geocoding accuracy. Patients with unknown residence address were also excluded (approximately ten percent of the patients in 2006 and only two percent of the patients in 2008 and 2010).

**Population statistics:** All population data was obtained from the Australia Census (2006) data. Population data was divided by census collection district (CD) and the geographic boundaries of each CD were obtained from the Australian Bureau of Statistics website. [8]

**Socioeconomic status:** The basis of the measure of socioeconomic disadvantage was the Index of Relative Socio-economic Disadvantage at CD level. This is one of the Socio-Economic Indexes for Areas (SEIFA) indices and will be referred to as SEIFA 2006 in the present study. The SEIFA 2006 is a composite measure derived from multiple weighted socio-economic variables collected in the 2006 Australia Census. [9] This index includes variables that either reflect

**Figure 1. Geographic distribution of patients requesting emergency dental care at the Royal Dental Hospital Melbourne in 2006, 2008 and 2010 (black dots). Socioeconomic status of the Census Districts colour-coded according to their SEIFA 2006 deciles. Note the concentric areas of 5km, 10km, 15km, 20km, 25km and 50km radius respectively with the RDHM as centre-point (purple dot).**



or measure material and social disadvantage. SEIFA 2006 values were ranked into deciles ranging from one (highest deprivation) to ten (lowest deprivation). Because this index contains only disadvantage indicators, it has more scope to distinguish between disadvantaged areas. Therefore, results were presented for the lower three and five deciles and compared to the total population.

**Geographic information system:** Quantum GIS (QGIS), version 1.8.0 – Lisboa (Open Source Geographic Information System – GIS, licensed under the GNU General Public License), was used to map the population and socioeconomic data and to complete all the analysis of geographic measures. Minor results tallying were achieved using Microsoft Excel (Version 14.2.2, Microsoft, Redmont USA).

## Results

A total of 16140 patients met the inclusion criteria for the study sample. Although detailed analysis was done only for the area covered by a 50 kilometre radius from the RDHM, the study area included the whole State of Victoria due to the substantial number of patients coming from outer Melbourne (Figure 1).

## Catchment zones

Access to emergency treatment was analysed as a factor of straight-line distance from home address to the RDHM. In order to do so, concentric areas of five kilometre, ten kilometre, 15 kilometre, 20 kilometre, 25 kilometre and 50 kilometre radius respectively (with the RDHM as centre-point) were marked and the proportion of patients living

in each area recorded. The catchment zone reflected population density and was similar for the three years analysed in this study, with 95% of the patients living within a 50km radius of the RDHM (Figure 1).

The cumulative proportion of home distance to RDHM is presented in Table 2. Whilst roughly 30% of the patients lived within ten kilometre radius of the RDHM, the majority of patients seeking emergency care lived within a 20 to 25 kilometre radius from the RDHM.

## Socio-economic status

The Census population of Greater Melbourne in 2006 was 3,647,021. Table 1 presents the population (by socioeconomic status of CD) residing in each of the concentric areas defined in this study. In 2006, approximately 20% of the Melbourne population lived within ten kilometres from the RDHM and from these roughly eight percent resided in areas considered to be of low socioeconomic status.

A comparison of the socioeconomic status and distance from the patient's home to the RDHM is presented in Table 2. Approximately 30% of the patients living within ten kilometres from the RDHM come from the most deprived neighbourhoods in Melbourne. Meanwhile, half of the patients living within 20 kilometres from the RDHM resided in the poorest (most deprived) areas of Melbourne. Patients coming from the one-third of the most deprived areas (SEIFA one to three) accounted for approximately 30% of the total number of patients and tended to live more than 15 kilometres away from the RDHM (Table 1).

**Table 1. Population distribution by SEIFA category (of residential Census District), across concentric distance areas from RDHM.**

DISTANCE	POPULATION		
	SEIFA 1-3	SEIFA 1-5	ALL SEIFA
5km	14,926	19,595	219,138
10km	51,491	122,937	659,217
15km	193,291	324,234	1,157,466
20km	298,633	504,640	1,664,672
25km	370,743	634,165	2,073,941
50km	631,092	1,162,448	3,196,184

\*Melbourne's total population in 2006: 3,647,021

**Table 2. Patients distribution by SEIFA category (of residential Census District), across concentric distance areas from RDHM, by year.**

	2006			2008			2010		
	SEIFA 1-3	SEIFA 1-5	ALL SEIFA	SEIFA 1-3	SEIFA 1-5	ALL SEIFA	SEIFA 1-3	SEIFA 1-5	ALL SEIFA
5km	63	82	317	169	185	816	70	86	438
10km	158	322	952	331	670	2,122	173	362	1,271
15km	474	735	1,565	1,126	1,196	3,577	685	1,009	2,229
20km	705	1,081	2,149	1,666	2,459	4,849	1,023	1,508	3,068
25km	819	1,293	2,546	1,881	2,891	5,738	1,190	1,806	3,711
50km	988	1,612	3,161	2,253	3,640	7,103	1,497	2,514	5,044
All	1,050	1,723	3,325	2,403	3,877	7,465	1,612	2,705	5,350

When adjusted to the population of each socioeconomic stratum, during 2006 and 2008 it could be seen that patients from areas with the same socioeconomic status living more than 10 kilometres away from the hospital had poorer access to dental emergency treatment (Table 3). The rate of patients (per thousand head of the population) within five kilometres from the hospital was double that within 15 kilometres. For 2010 the decrease in access due to linear distance to the hospital was not so steep, with a more even distribution across the areas

## Discussion

The RDHM is located in the city centre, where most of the population can be classified as wealthy (least deprived). Since the purpose of a public dental hospital is to primarily provide care to the socioeconomically disadvantaged population it would be reasonable to expect that the hospital

should be located near those groups of the population. However, the RDHM also operates as a tertiary teaching facility and is co-located with two universities. Moreover, having a history of more than 100 years, the demographics of the area surrounding the hospital have changed over the years. Despite that, dental emergency care is also available on a pay-per-service basis for non-card holders. Our results indicated a very equal distribution of the patients seeking emergency care over weekends and public holidays at the RDHM across socioeconomic strata, with half the patients coming from the one of the least deprived areas of Melbourne and half from the one half more deprived areas. It should be noted though that this even distribution was not seen within a radius of ten kilometres of the dental hospital, where only 30% of the patients come from the one half more deprived areas of Melbourne.

**Table 3. Population rates of dental emergency events by SEIFA category (of residential Census District), across concentric distance areas from RDHM, by year.**

	2006 POPULATION RATE*			2008 POPULATION RATE*			2010 POPULATION RATE*		
	SEIFA 1-3	SEIFA 1-5	All SEIFA	SEIFA 1-3	SEIFA 1-5	All SEIFA	SEIFA 1-3	SEIFA 1-5	All SEIFA
5km	4.3	4.2	1.5	11.4	9.5	3.8	4.7	4.4	2.0
10km	3.1	2.7	1.5	6.5	5.5	3.3	3.4	3.0	2.0
15km	2.5	2.3	1.4	5.9	3.7	3.1	3.6	3.2	2.0
20km	2.4	2.2	1.3	5.6	4.9	3.0	3.5	3.0	1.9
25km	2.3	2.1	1.3	5.1	4.6	2.8	3.3	2.9	1.8
50km	1.6	1.4	1.0	3.6	3.2	2.3	2.4	2.2	1.6

\* Per 1000 population

Catchment zones have previously been defined as the area where 95% of the patients live. [10] In this study, 95% of the patients were living within 50 kilometres from the hospital and only 30% of the patients lived less than 10km away from the hospital. This catchment zone is surprisingly large for a metropolitan area. Also the long distance that patients have to travel to access emergency dental treatment (some 30% of the emergency patients had to travel 20km or more to get to the hospital) would be unexpected. A previous study focusing on access of outer capital residents to dental care in Melbourne found that, on average, 75% of the patients of the dental clinics studied were living within 10km from the clinic's location. [10] However, their results reflected an asymmetric arrangement of patient distribution around each clinic, and appeared to be driven by differences in the distribution of socio-economics of populations, transport and other access factors. It is also important to notice that, in the case of the present study, there is a very limited choice of service during weekends and the RDHM is essentially the only public emergency care available over public holidays.

The strong association between dental disease and socio-economic factors has been exhaustively explored in the literature, the more disadvantaged suffering greater burdens of disease [11-13] In the present study, over the year of 2006 the rate of patients (per thousand head of the population) seeking emergency care was between two and four times higher in the one-third most deprived areas of the population when compared to the whole population. This could be partly related to the ten per cent missing patients in the 2006 data (due to unknown residential address), but the trend persisted for both 2008 and 2010. Despite that, the gap between low and high socioeconomic

seemed to be closing as the disparities were smaller in 2008, and continued decreasing in 2010, but inequalities were still shown. This can be seen as a confirmation of the association between dental disease and socio-economic disadvantage. Although socioeconomic status was based on the area of the patient's dwelling, an argument can be made that it may not reflect each individual patient's status, but a strong correlation between census-level and individual-level socioeconomic measures has been shown before. [14] Moreover, the attendance profile of the private emergency dental care available in Melbourne should also be taken into account, including the possibility that the number of people not eligible for a healthcare card but who have less discretionary income is increasing. [15] Various reasons have been proposed for the high number of dental emergencies within some groups of the population and usually refer to poor access to dental treatment, [2,16] low socioeconomic status [2,12] and dental anxiety. [17,18] The present study did not explore the underlying reasons for emergency care seeking and more research is needed to assess if these emergencies could be prevented to a certain degree.

This study contributes to an understanding of the geographical distribution of patients seeking dental emergency treatment and the influence of the socio-economic status of the area they come from, in the number of emergency events. It also demonstrates the ability of GIS to not just map, but analyse the diverse factors that influence health care accessibility, facilitating understanding and planning of healthcare provision. Understanding the interaction of such factors is essential in decision-making for health workforce and location of healthcare hospitals and clinics.

## Conclusion

The RDHM with its central location serves a very large catchment zone (stretching to near 50km), providing emergency dental care across all socioeconomic strata in the Melbourne metropolitan area. Areas of greater socioeconomic disadvantage had higher rates of emergency events, and geographic closeness to the dental hospital significantly increased access to care. Further studies are required to develop policies that can overcome the inequalities in service provision created by the long distances some patients have to travel to obtain emergency care.

## Competing interests

The authors declare that they having no competing interests.

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## Dental Demystification: a retrospective analysis of patterns of care under the Chronic Disease Dental Scheme

R Lam, E Kruger and M Tennant

### Abstract

**Objective:** This study examines patterns of care from utilisation of the Chronic Disease Dental Scheme (CDDS). By firstly providing a descriptive summary of dental services, the study aims to provide information for health professionals so that patterns of care may be better understood in the context of this scheme and its cost/benefit to general health.

**Methods:** A retrospective analysis of data pertaining to Medicare items related to general dentistry (85011-87777) were extracted from the Medicare Benefits Schedule database (MBS) online for years 2007-2010, and formed the basis for this study.

**Results:** Approximately 420,000 patients were seen under the CDDS representing 2% of the Australian population and costing over \$A1.2 billion. Based on number of services, the most frequent services were diagnostic, restorative and prosthodontic. Adjusting for population discrepancies, there appears to be an over-utilisation of services in the state of New South Wales, predominately in the provision of fixed prosthodontic services (crowns). A majority of restorations and crowns were aesthetic. Males had higher frequencies of extractions and tended to have longer functioning metallic restorations placed.

Females presented more frequently for periodic reviews. Preventive procedures such as saliva testing were infrequent in this medically compromised cohort and were overshadowed by the provision of aesthetic crowns.

**Conclusion:** A retrospective analysis of the CDDS highlighted variability in patterns of care across jurisdictions. The CDDS resulted in the unsustainably high provision of services that may not justify its expenditure from a disease management perspective. There is a need for greater emphasis on preventive procedures under this program but the challenge is emphasising this in private practice where financial incentive appears to be a driver for service provision.

**Abbreviations:** ADA – Australian Dental Association; CDDS – Chronic Disease Dental Scheme; DHS – Department of Human Services; DVA – Department of Veteran Affairs; EPC – Enhanced Primary Care Program; MBS – Medicare Benefits Schedule; PFM – Porcelain Fused to Metal Crown.

**Key words:** dental public health; Medicare; chronic diseases; Australia.

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### Introduction

It has been estimated that over one third of problems encountered in medicine are chronic in nature, responsible for over 80% of the total burden of disease and form a significant part of health expenditure. [1,2] The Australian government has implemented policies to integrate health services under an initiative known as the Enhanced Primary Care Program (EPC). Under this scheme, a range of healthcare professions are funded by the government to provide services with the objective of enhancing and improving the lives of patients with chronic or complex conditions. These conditions are determined by the general medical practitioner who is responsible for formulating the management plan required by the program. The



Department of Human Services (DHS) considers a chronic condition as any condition lasting for six months or longer. [3] One aim of this study is to demystify these aspects with respect to dentistry and therefore enable healthcare planners and health managers to formulate and implement policies from a better informed position.

The DHS stated that, the 'primary purpose (of CDDS) is to improve oral health and function. Not for paid dental services that are purely cosmetic in nature'. [3, p2] Justification of the program into the EPC is undisputed as dental diseases in the form of caries and periodontal diseases are the most prevalent chronic diseases in the community. [4,5] The United States General Surgeon Report frequently quotes 'you cannot have good general health without good oral health'. [6, p18] The Chronic Disease Dental Scheme (CDDS) caters for patients with a chronic or complex disease for an unrestricted scope of treatment in private practices to a budgetary limit to a final value of \$4250 per individual recipient over a two-year period.

Utilisation of the CDDS proved to be unsustainable with a 13350% increase in cost coinciding with the time the CDDS received an increase in subsidy. [7] This increase was in response to initial poor utilisation rates. With expenditure well over one billion dollars in less than two years when initially budgeted at \$385 million over four years, a series of reactionary measures were undertaken by the government to contain cost. These included several unsuccessful attempts to close the scheme, changing criteria in the program and ultimately an aggressive auditing campaign to recoup expenditure for clinicians identified to have misused the scheme. This drew the Australian Dental Association (ADA), which consists of approximately 90% of private practice dentists, to appeal the decisions. As a result of this ongoing stalemate and disagreement, a Senate inquiry was eventually formed involving key stakeholders and professional groups.

One key finding of the inquiry was that there was a misunderstanding between health policy makers and the dental profession. [8] It has been shown that dentistry may be an outlier in the health profession with factors that may be specific to private practice dentistry as it relates to the delivery of public health. [7] Other participating allied health professionals under the EPC and medicine itself under Medicare did not experience these problems with the CDDS. At the inquiry, the DHS accused parts of the profession of abusing the system whilst a criticism by the ADA was that it was not involved with the consultation process when this policy was formulated. With this misunderstanding, there is

a clear need to demystify aspects of dental care. This is an unprecedented opportunity to indirectly benefit from the CDDS with a retrospective analysis of population level data relating to actual patterns of treatment without the fallacies of statistical sampling and forecasting.

Whilst acknowledging that in certain cases the CDDS provided meaningful outcomes, there is an emphasis on particular areas of dentistry that the authors believe are responsible for the high costs associated with the program. As the data available is a national dataset of actual treatment, jurisdictional comparisons can be explored to provide location-specific patterns of care. This is important as there is immense variability in treatment given that there are no nationalised standards of care and the fact that most dentists practise in the state in which they obtained their qualification. [9] There may also be other drivers that influence service provision. Dentistry is a highly autonomous profession with over 85% of the workforce in the private sector where practices are increasingly becoming more customised to suit their independently structured business model and cohort of patients.

### Rationale for dental services

The two most classic studies in the dental literature implicate dental plaque as the cause of a majority of dental diseases. [10,11] Caries and periodontal disease and its sequelae are termed plaque related diseases. Dental plaque is a structured consortium of various bacteria that adhere to the soft and hard tissue of the mouth with adherence assisted by chemical receptors present in saliva (pellicle). Kakehashi implicated bacteria as causing pulpal problems and the disease at this stage is able to progress through the apex of the tooth root to have systemic implications beyond the confines of the oral cavity. [11] Similarly, plaque also attaches to the soft tissues of the mouth such as the gums and this may trigger the defense mechanisms in the body to attempt to rid this insult by a strategy which causes bystander damage to the periodontium (bone and gums).

Restorative dentistry is usually at the late phase of dental treatment. Restorative dentistry is the reparative effects of disease rather than its therapeutic management. It fills the void caused by the disease by placing a restoration but has no involvement in managing the disease (caries) that has caused the cavity in the first place. There are a variety of restorative materials and they fall under the category of tooth coloured or metallic. A direct restoration is a restoration that is placed in the chair. In certain circumstances, a tooth that has a direct restoration may subsequently receive an indirect restoration, in the branch of prosthodontics.

An indirect restoration is most commonly a crown. The most common crown is porcelain fused to metal crown (PFM) which is essentially a metal crown with an aesthetic porcelain coating. In general, reasons for the placement of a crown fall into three categories; aesthetics, major changes to shape and morphology and extensively broken down teeth such as teeth treated endodontically (root canal treatment). [12,13]

Prosthodontics (prosthetic dentistry) is the branch of dentistry that involves the reconstruction of dentitions with artificial devices to replace or restore teeth and jaws that are deficient. There are two forms of prosthodontics; Fixed Prosthodontics with prosthetic devices that are anchored to the teeth and jaws (implants, crowns, bridges) and Removable Prosthodontics relating to dentures. Prosthodontics is the most expensive form of dentistry and is often considered elective as its financial cost is high compared to other forms of dentistry.

Preventative dentistry is an important part of dental management. Fortunately, the level of understanding is sophisticated, where caries and periodontal diseases are entirely preventable diseases with basic dental care aimed at remineralisation. Remineralisation is the process whereby minerals are deposited on tooth surfaces via a concentration and pH gradient. This has seen a range of products and the introduction of the concept of minimal interventional dentistry. Initial caries is reversible without restorative intervention meaning that teeth affected by decay can be cured by early conservative management without the need for an expensive filling. [14,15] Underpinning this philosophy of treatment is the assessment and integrity of saliva. Saliva is the most important ingredient in the maintenance of oral function and is the key to a disease free and stabilised oral cavity. With its ability to buffer acids and to be supra-saturated with minerals, saliva is a fundamental agent in remineralisation.

## Methods

All data were obtained from open sources. [16] The data consisted of dental item codes that corresponded to single act of treatment according to the Australian Dental Services and Glossary. [17] These item codes are de-identified with no privacy or confidentiality issues. Due to the nature of these data, it was not possible to correlate item codes to a particular individual and typically a course of treatment would itemise approximately two to three item codes per visit. [18] More specifically, data pertaining to Medicare items related to dentistry (85011-87777) by general dentists (excluding specialists and prosthodontists) were extracted from

the Medicare Benefits Schedule database (MBS) online for the calendar years 2007-2010. Approximately nine million service items were available for analysis during this study period. Comparisons between clinicians and jurisdictions were made based on data obtained from the 2009 Australian Bureau of Statistics. [19] Dentist numbers for each jurisdiction were obtained from the Australian Institute of Health and Welfare. [20] Cost calculations were completed using the 2009 Department of Veteran Affairs (DVA) – based dental fees. [21] The data were extracted, exported and analysed in Excel 97 (Microsoft Corp Redmont WA) for analysis. Figure 1 relating to net utilisation of the CDDS was formulated based on considering the weighted average of each jurisdiction compared to the national average based on gross population.

## Results

Based on standard practice where each new patient receives a comprehensive examination, the number of CDDS patients during 2007-2010 is estimated at approximately 460,000 with a gender discrepancy favoring females (54%) compared to males (46%). As seven million Australians are estimated to have one or more chronic conditions, the CDDS represented 6% of this medically compromised cohort. [22] Over nine million items of dentistry were provided with the predominant types of services being restorative (25%), diagnostic (23%) and prosthodontic (19%).

Based on adjusted (average) population statistics, discrepancies in utilisation and patterns of treatment were noted between jurisdictions. It appears that services in New South Wales were over-utilised whilst all other jurisdictions, by the same measure, were under-utilised (Figure 1). This was also reflected in costs with the majority of expenses from the CDDS claimed in NSW (62%). Of these expenses, fixed prosthodontic services (crowns) accounted for approximately two thirds of the total state expenditure which also happens to be the greater proportion of CDDS expenses at the national level.

Using the standard ADA schedule for classifying the nature of services and adjusting for differences in population, the results show that treatment patterns varied between jurisdictions (Table 1). New South Wales had a tendency to restore dentitions with full coverage crowns. Treatment in New South Wales also favored endodontic and prosthodontic options rather than oral surgery meaning that compromised teeth with questionable prognosis tended to receive attempts at rehabilitation before its subsequent removal if the tooth became problematic. Queensland had the highest rates of restorative services without transition to prosthodontics. Preventive services were low by comparison

**Figure 1: Net Utilisation of CDDS**



Notes:

1. Each item number was grouped into category of treatment (eg, diagnostic, restorative, prosthodontic etc) for each jurisdiction
2. The number of services for each category in each jurisdiction was converted to a percentage of national total for that category. (eg, NSW yielded 61.5% of national total for diagnostic services)
3. The figure was adjusted to account for the differences in population to yield a net result. (eg, NSW was approximately 32% of national population, 61.5-32 = +29.5%).
4. An average was obtained by obtaining a mean value of all categories of treatment for each jurisdiction with values shown in the figure.
5. Overutilisation based on relative population of jurisdiction.

**Table 1. Variability in treatment planning across jurisdictions (top) and cost of these differences in treatment variability and utilisation (bottom)**

Discrepancies and variability in treatment planning across jurisdictions

TREATMENT CATEGORY	NSW	VIC	QLD	SA	WA	TAS	ACT	NT
Diagnostic Services	1.6%	-0.9%	0.3%	0.2%	0.0%	-2.3%	4.0%	-2.8%
Preventive Services	0.4%	0.4%	0.9%	1.4%	-3.6%	2.3%	-0.6%	-1.4%
Periodontics	0.6%	0.8%	-0.2%	-0.8%	-0.2%	-1.7%	0.9%	0.5%
Oral Surgery	-3.3%	-2.0%	-1.3%	-3.1%	3.3%	4.3%	-0.2%	2.4%
Endodontics	0.7%	0.1%	0.3%	0.1%	-0.3%	-0.6%	-0.1%	0.0%
Restorative Services	-2.8%	0.0%	4.1%	1.3%	-1.3%	-3.1%	0.6%	1.2%
Crown and Bridge	2.2%	0.5%	0.0%	-0.8%	0.5%	-0.1%	0.3%	-2.6%
Prosthodontics	0.7%	0.9%	-4.1%	2.2%	1.6%	1.4%	-4.8%	2.1%
Orthodontics	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
General Services	-0.2%	0.1%	0.0%	-0.3%	0.0%	-0.1%	0.0%	0.5%

Notes:

1. Each dental service was grouped into main category (eg, diagnostics, restorative, etc) of treatment according to the Australian Schedule of dental services.
2. For each dental category, a per capita figure was obtained showing number of services per 100,000 of the population for each jurisdiction.
3. A proportion of total (%) was calculated to each category belonging to a jurisdiction (eg, NSW 23.5% of state activity belonged to diagnostic).
4. An average value (%) was obtained for each corresponding dental category across all jurisdictions (eg, National average in the diagnostic category was 21.9%).
5. A net value of under or over utilisation for each category from all jurisdictions were calculated (eg, NSW diagnostic = 23.5 - 21.9 = +1.6% overutilisation).
6. Over 9 million dental items were considered for the analysis.
7. This analysis assumes no significant discrepancies in chronic conditions between jurisdictions enabling mean values to be considered as a general indication.

CDSS 2007-2010	NSW	VIC	QLD	SA	WA	TAS	ACT	NT	TOTAL
Diagnostic	\$41,707,129	\$13,799,187	\$6,480,727	\$4,787,383	\$499,945	\$251,094	\$312,744	\$33,888	\$67,872,098
Preventive	\$26,489,920	\$9,992,972	\$4,499,343	\$3,742,501	\$226,804	\$224,508	\$168,428	\$23,895	\$43,368,369
Periodontics	\$19,734,071	\$7,440,862	\$2,473,520	\$1,448,530	\$192,461	\$57,900	\$131,229	\$16,859	\$31,495,432
Oral Surgery	\$36,208,718	\$15,787,100	\$7,662,877	\$4,241,636	\$910,063	\$513,154	\$353,049	\$60,374	\$65,736,971
Endodontics	\$31,553,344	\$9,817,026	\$4,542,926	\$3,334,985	\$298,021	\$160,341	\$152,242	\$25,080	\$49,883,965
Restorative	\$139,394,282	\$55,430,161	\$28,954,884	\$19,793,698	\$1,767,810	\$945,300	\$1,004,592	\$150,269	\$247,440,996
Crown and Bridge	\$269,724,819	\$69,731,593	\$30,062,674	\$19,299,740	\$2,485,644	\$1,428,213	\$1,358,116	\$74,640	\$394,165,439
Prosthodontics	\$198,754,431	\$71,212,597	\$22,412,662	\$23,318,554	\$2,382,414	\$1,363,113	\$943,539	\$152,121	\$320,539,231
Orthodontics	\$3,203,862	\$1,050,186	\$243,534	\$44,182	\$6,647	\$6,485	\$4,656	\$671	\$4,560,223
General Services	\$6,228,770	\$2,793,516	\$1,036,814	\$827,524	\$76,718	\$63,144	\$47,793	\$5,758	\$11,079,038
General Dental Practitioner Costs to CDDS									\$1,238,141,762

**Table 2: Treatment items of interest**

CDDS ITEMS OF INTEREST 2007-2009	MALE NUMBER	%	FEMALE NUMBER	%
Total Australian Population	10,110,800	49.7%	10,217,800	50.3%
Total Proportion of CDDS Population	210,034	46%	248,976	54%
Number of Extractions (all types)	158,048	53%	140,689	47%
Metallic Restorations	39,586	51%	37,807	49%
Metallic Crowns	4,379	54%	3,684	46%
Periodic Examinations	70,568	43%	93,543	57%

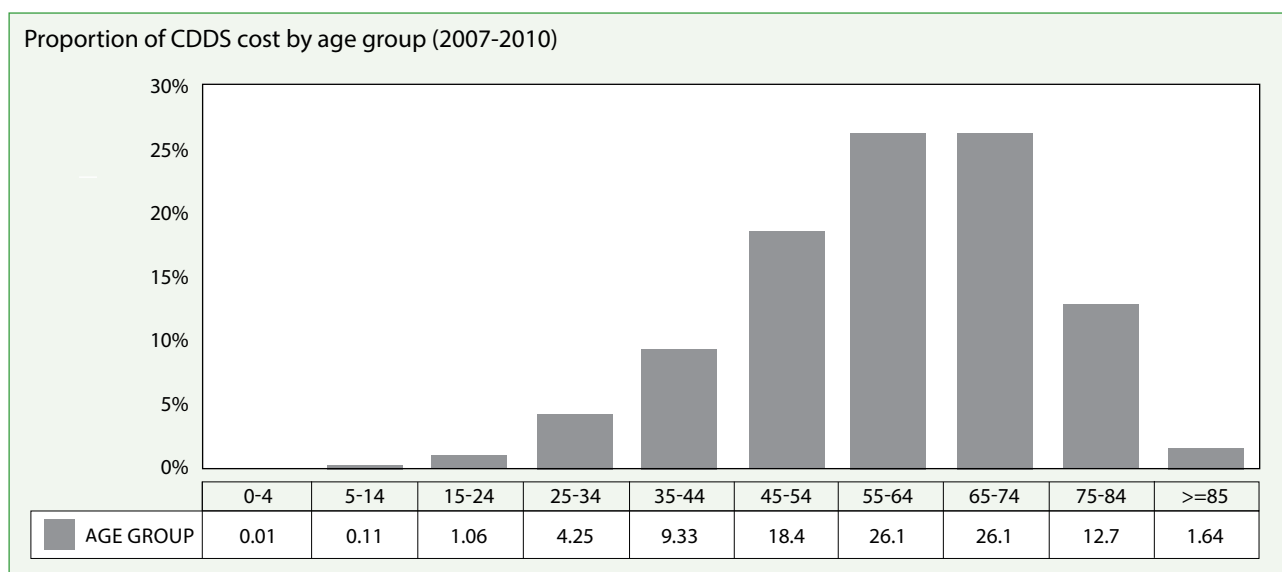
in Western Australia and the Northern Territory with higher rates of extractions. Denture prosthodontics was most common in the Northern Territory with the corresponding lowest rate of crown and bridge dentistry. The Northern Territory expended almost the same on restorations as on prosthodontics. Diagnostic services were highest in the Australian Capital Territory with a slight predisposition towards restorative and crown and bridge dentistry. Tasmania had the highest rates of preventive dentistry and oral surgery with the lowest rates of rehabilitative dentistry (endodontics, restorative, crown, bridge and implants), which may suggest that reduced prognosis teeth were removed rather than attempting replacement/restoration. There were disparities in the use of the CDDS between genders. Females were generally more proactive with their health and had a greater likelihood of returning for regular dental visits. The female to male proportion of the entire Australian population at the time was 50.3% and 49.7% respectively with 54% of the CDDS cohort females. [23] As shown in Table 2, regular presentation for subsequent examinations correlated to less invasive procedures. Females required fewer extractions compared to males despite outnumbering males in the CDDS cohort. Females presented more frequently for routine review and preventive oral hygiene procedures, required fewer extractions and therefore were considered to be more proactive with their health when compared with males. This was universal to almost all age groups, inclusive of the dominant age groups from 45-84 years.

A high number of direct restorations were adhesive restorations in contrast to metallic restorations (96% vs. 4%). Males had higher rates of metallic (amalgam) restorations across all age groups (Table 2). Of the indirect restorations placed, an overwhelming number were tooth coloured crowns in lieu of fully metallic (85% vs. 15%). As metallic indirect restorations (gold) were traditionally more conservative with greater function and longevity but

less aesthetically pleasing, it was interesting to note the disparities between genders. With males consisting of 46% they tended to accept function and longevity in preference to aesthetics with a greater acceptance of metallic direct and indirect restorations. Teeth in male dentitions were also more likely to require extraction indicating that these teeth deteriorated to the extent that any form of restoration could no longer be placed on the remaining tooth. The provision of tooth coloured restorations between genders was more consistent with the entire cohort based on gender.

In extensive cavities, rates of cusp capping (extension of a filling over a tooth cusp) to protect remaining tooth structure for large direct restorations were amongst the lowest in New South Wales on a per capita basis. These teeth tended to be crowned with porcelain fused to metal crowns. As the geriatric cohort experiences the highest levels of synergy with systemic chronic conditions and poly-pharmacy, periodontal diseases were expected to be more prevalent in this cohort translating to more periodontal based treatment in comparison to the general population. However, periodontal treatment remains similarly low under the CDDS compared with general practice dentistry (3.5% versus 1%). [24]

The largest proportion of cost was in the 55-64 age group followed closely by the 65-74 and the 45-54 age groups (Figure 2). This is consistent with epidemiological studies in which the number and nature of chronic diseases progresses with age. [22] In atypical cases, the youngest age group of 0-4 years recorded claims to Medicare for full coverage PFM crowns, deep periodontal root debridement and oral hygiene instructions. Crowns in children are usually stainless steel temporary crowns instead of PFM which are more destructive to teeth especially in primary teeth with bigger pulps. The youngest age group for a bridge was in the 5-14 year group. Fitting of an implant abutment was placed as early as the 15-24 year group. There were 65 documented

**Figure 2: Age of patients seeking care by cost**

claims of providing full maxillary complete dentures in the 15-24 year group with one solitary case in the 0-4 year group. Age is usually a contraindication to placing or providing these types of services within these age groups. Besides oral hygiene instructions to toddlers, the remainder of services fit the category of reconstructive and prosthodontic dentistry.

Different priorities were noted in dental service provision: 1142 saliva tests were performed as a diagnostic test in contrast to 323,942 crowns fabricated. This equates to an average of one in every 400 medically compromised patients receiving a saliva test compared to fabricating two crowns for every three patients. Based on DVA fees as an estimation of cost and using mean clinical time estimates for both services, the fabrication of crowns is more expensive (higher financial reward) compared to saliva testing by a factor of 20:1, with the mean clinical time of fabricating a crown more time consuming by a factor of three. [18] Additionally, fabricating crowns requires two appointments in contrast to one for saliva testing. Crowns are also labour intensive requiring more materials, transport and laboratory costs. Using the most common fabricated crown (PFM), the number of crowns fabricated significantly rose from 325 (2007) to 59,134 (2008) and 86,506 (2009). This represented a 266-fold increase in provision of crowns which was the most significant increase in terms of overall cost to the scheme.

## Discussion

This study aimed to demystify aspects of dentistry to those involved with integrated health planning as well as highlighting specific CDDS patterns of care. Given the problems encountered with the CDDS there appears to be

a misunderstanding between vital stakeholders and interest groups responsible for the delivery of dental public health.

Limitations of this paper include restrictions in data, where a patient level analysis with reference to specific chronic conditions and clinical outcomes was not possible. The data only represented a sub-set of the population. Data was de-identified and individual dentists or specific private practices were not considered in this study. It was possible that a small number of practitioners may have skewed the results. As the highest documented audit value was in the vicinity of \$700,00 in a group practice (equating to only a maximum of 550 crowns compared to over 150,000 fabricated as well as a subsidiary limit of \$4250 per two years for each patient), we consider this to be a generalised finding rather than relating to specific practices. The data did not allow for a logistic regression analysis, but we believe that by observing and reporting on large numbers of actual treatment data, the patterns of care reported in this report are accurate. DHS was responsible for processing all claims and we assume that data collation was accurate and free of bias. Whilst the CDDS provided a broad range of services over the entire field of general dentistry, this paper focused on prosthodontic services. This was intentional as the authors believe this to be the source of expenditure that pushed the scheme towards its unsustainability and premature closure. Gender-based comparisons at a national level are generally fraught with inconsistencies as there are many complex factors. Despite this we believe these findings to be consistent for each gender for a particular locality. If a proactive patient presented for a condition that was later diagnosed as

complex or chronic, we assume that their gender would not hamper their chances for endorsement into the CDDS by their medical practitioner. The premise that females may have more funding left available for periodic examinations may also be a source of inaccuracy. We believe this to be minimal due to the generous amount of funding under this scheme. If patients deviated from the norm and presented for an examination every month instead of the typical six monthly, there would still be ample funds left as this would only consume less than one third of the maximum allowable expenditure in this two-year period. This finding also supports reports by Ellershaw and Stewart in higher rates of females presenting for dental services. [25] The more critical and limiting factor to presentation and the source of greatest expenditure is the provision of fixed prosthodontic services.

As fixed prosthodontic services, mainly in the form of the aesthetic crowns, formed the majority of expenses under the CDDS, it is necessary to ask the responsible question. For the significant expenses incurred, what benefit has fixed prosthodontic services contributed to the principles of the scheme that subsidised its treatment? Has the provision of crowns that constituted two thirds of the funding improved chronic health conditions in patients? This is a complex question and understandably, the literature has no clear answer. Using an accepted hierarchy in evidence-based dentistry, there are no high quality systematic reviews or randomised control trials to conclusively outline the benefits of fixed prosthodontic services to general health. Smaller case studies have outlined a small and insignificant association but researchers have conceded a strong causal interference in the small data with a responsive shift and regression towards the mean. [26] A review by Radford has concluded 'No perceived improvement in general health when patients receive either fixed prosthodontics or complete dentures'. [27, p373] Reviewing the biomechanics of placing a crown, the tooth is reduced in all dimensions to ensure that the final crown is similar in dimension to the tooth. The union between the crown and the remaining tooth is known as the margin and this is the area most susceptible to recurrent decay; which is the primary reason for failure of crowns. [28] Biologically, Saunders and Saunders have estimated that one in five teeth are traumatised whilst fabricating a crown with the pulp subsequently becoming necrotic requiring more extensive therapy. [29] Based on these considerations, for the high cost involved in funding for crowns, there may not be a corresponding increase in health benefit.

Maintaining the premise that evidence-based science should be the driver for clinical practice, there is no dispute in the benefits of preventive dentistry. From a public health perspective, this translates to timely access, availability and affordability of services. A classic study in the dental literature by Loe has shown that with plaque removal and preventative procedures, gingivitis which is the precursor for periodontal disease, can resolve and resort to a condition of health. [10] This paradigm shift in dentistry has seen the introduction of a range of products aimed at remineralisation. These products include fluoride gels, casein complexes and hydroxyapatite crystals. Common to all these products is the reliance of one key physiological ingredient; saliva. Given its importance, it is unfortunate that saliva testing was overshadowed by the provision of crowns, especially in the most compromised cohort with complex and chronic conditions. Quantifying the conditions of saliva is essential as the quality of saliva is influenced by systemic conditions (ie, diabetes) and poly-pharmacy (medication induced dry mouth). Crowns are commonly placed in general practice dentistry and the revenue from this procedure makes up a significant portion of a typical general dentist's income. [12] The replacement of existing restorations makes up the majority of a dentist's clinical time. [18,30] Based on these considerations, there is evidence to suggest that patterns of care are influenced by financial incentive that may not be fully aligned to the principles of the scheme that funded its service.

At a jurisdictional level and adjusted for differences in population, there appears to be an over-representation in the state of New South Wales in the utilisation of the scheme, especially in the provision of prosthodontic services. Although New South Wales has the highest population, its workforce relative to its population is similar to other jurisdictions. Estimations indicates that there are approximately 52 dentists per 100,000 of the population in New South Wales which is similar to the national average (50/10000). [31] A major study in New South Wales has highlighted that cardiovascular disease and diabetes are the prominent chronic conditions in this state which is similar to Western societies worldwide. [32,33] There is no evidence to suggest that chronic conditions are more severe in this state, especially when other jurisdictions have fewer dentists or are more remote. It has been postulated that the scheme was heavily promoted in this state with dentists and patients actively requesting the use of this scheme. There has been documented evidence of practitioners actively engaging their general practitioners for referrals under the

EPC. [34] A recent practice survey also indicated that New South Wales dentists were generally older and had more spare appointments available. [35] Without the financial barriers for the patient that have traditionally restricted the provision of expensive reconstructive services, offering treatment plans with a greater financial incentive have a higher chance of acceptance by the immediate parties at the expense of the policy that has funded its services.

This paper highlighted patterns of care from use of the CDDS and this is of particular concern to future policy, especially in its sustainability. The continual provision of expensive fixed prosthodontic services and the increasing tendency to provide more aesthetic restorations which typically do not last as long as metallic alternatives in patients with deteriorating conditions is a concern. There is little doubt that fixed prosthodontic services will increase in the future. Projections by the Australian Research Centre for Population Oral Health have forecasted that the geriatric population will increase from 2.8 million in 2009 to 3.8 million in 2019. [36] On this accord, the edentulous rates will decrease from a recorded high of 67% in 1979 to 16.5% in 2019. [36] Furthermore, a report by Sanders has indicated that tooth loss in dentate persons is on the decline in every age group as has the proportion of persons in every age category wearing a denture. [37] Studies have also indicated that a greater proportion of patients approaching the geriatric age will not accept the prospect of becoming edentulous and hence having to wear a full denture compared to previous generations. [38] The reduction in removable prosthodontic services (dentures) as well as the increase in number of teeth requiring restorative services will subsequently result in a greater number of fixed prosthodontic services if the provision of services follows the patterns of care identified in this study.

### Conclusion

The CDDS provided the unprecedented opportunity to observe patterns of care across jurisdictions. As the most expensive dental care initiative in Australian history, its audit and subsequent closure identified concerns with regards to formulating oral health policy. There is a need to demystify aspects of dentistry to those involved with integrated health policy planning. The CDDS resulted in the unsustainably high provision of services that may not justify its expenditure from a disease management perspective, especially where inexpensive but essential preventive procedures were limited under this scheme. Fixed prosthodontics services mainly in the state of New South Wales constituted the overwhelming majority of expenditure. There was also a

predisposition towards aesthetic restorations that have reduced longevity and function in comparison to the metallic alternative. The problems associated with the CDDS are clear but the solution may not be straightforward. There is a need for greater emphasis on preventive procedures under this program but the challenge is emphasising this in private practice where financial incentive appears to be a driver for service provision. Given the nature of chronic conditions there is a need for policy that is cost effective and sustainable.

### Competing interests

The authors declare that they have no competing interests.

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## An Approach to Provide Cost Effective Patient Fire Safety

MC Hui

### Abstract

A study of employing a performance-based approach and fire safety engineering to healthcare facilities planning and design, in order to develop holistic optimum fire safety solutions, is presented. Optimum fire safety solutions are desirable because there are a number of hazards in healthcare facilities that can impact on patient safety, and fire is only one of them. If the same level of fire safety can be achieved through a more cost effective means, then the savings can be utilised to address other patient safety hazards, for instance, infections, treatment delays, slips, trips and falls. By using a case study on the provision of smoke control systems for the new Acute Hospital building at the Royal North Shore Hospital, the significant benefits

of developing and implementing a holistic optimum smoke control strategy instead of purely following what is prescribed in the building code are demonstrated. A close collaboration between the fire safety engineer, the architect, the operators and the users of the healthcare building would however be needed to ensure the fire safety strategy works in harmony with and not opposition to healthcare objectives.

*Abbreviations:* AS – Australian Standard; BCA – Building Code of Australia; NZS – New Zealand Standard.

*Key words:* health facilities planning and design; evidence-based design; built environment; fire safety engineering; fire safety strategy; life cycle cost.

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### Background

Hospital buildings, healthcare and aged care facilities are meant to be designed for the treatment and healing of patients and residents. However, fires do occur and the consequences can be devastating for patients, carers and the community. It has been recommended that patient safety should be the number one priority in healthcare design. [1]

There are a number of hazards that can impact on patient safety, such as infections, treatment delays, slips, trips and falls, and fires. One of the challenges is how to prioritise the funding to alleviate these hazards, given that funding is always limited and can diminish in economic downturns.

Another challenge is how to design a built environment that satisfies operational or functional needs as well as the healthcare objectives of healing and wellbeing, and at the same time provides a level of fire safety that meets community expectation, through compliance with the Building Code of Australia (BCA). [2] On the other hand, there are doubts about whether the allocation of investments in mitigation and response to fire in Australia is optimal and suggestions that a decrease in the investment in fire protection and preventative measures may lead to a positive economic net benefit. [3]

It has been reported that the majority of fire-related deaths (60 to 80 percent) are caused by smoke inhalation of the toxic combustion products generated by fires, rather than from burns. [4,5,6] Accordingly management of smoke hazards is one of the most important components of a fire safety strategy. For hospitals in Australia with an effective height of over 25m, the BCA Deemed-to-Satisfy Provisions require the following smoke hazard management measures to be provided:

- (a) an automatic smoke detection and alarm system complying with BCA Specification E2.2a; and

(b) a zone smoke control system in accordance with Australian Standard/New Zealand Standard (AS/NZS) 1668.1; [7] and

for required fire isolated stairways:

(c) an automatic air pressurisation system in accordance with AS/NZS 1668.1; or

(d) open access ramps or balconies in accordance with BCA section D2.5.

Of particular interest is the zone smoke control system which is the subject of this study. The purpose of a zone smoke control system is to inhibit the spread of smoke from the fire-affected compartment to non-fire-affected compartments.

According to the informative Appendix B 'Health Care Buildings' in AS/NZS 1668.1, [7] the smoke control system in patient care areas should be capable of achieving a positive pressure of not less than 20 Pascal (Pa) and not more than 100 Pa in all non-fire-affected compartments relative to the fire-affected (smoke) compartment, and smoke-spill from a fire-affected compartment in a patient care area should be achieved by mechanical means. Particular attention should be given to the location and distribution of smoke inlet (ceiling) grilles and the operation of the smoke-spill system to ensure that it inhibits the spread of smoke to principal evacuation routes. Where the smoke-spill air inlets are located in corridors only, the smoke-spill fan should be controlled to start on the activation of the corridor smoke detectors only, to avoid smoke from adjacent patient care areas being actively spread to corridor escape routes.

The prescribed zone smoke control system is a complex system and its correct operation requires an accurate identification of the zone of fire origin and precise status (open or closed) of the supply air and spill air dampers and their associated fans in all zones. Based on the research by Fire Code Reform Centre, an estimate of the reliability of this system in a 10-storey building is only about 34%. [8]

During the service life of a hospital building, it is likely that parts of the building may have undergone significant changes a number of times to suit the operational needs, due to demographic changes (eg, ageing population) or changes in funding priorities. With a prescribed zone smoke control system provided in the building, these changes could be very difficult or costly due to the complexity of the system and the need to balance pressure differentials between compartments.

## Method

In order to comply with the BCA and satisfy various healthcare needs and objectives simultaneously, the flexibility built into the BCA that allows performance-based fire safety designs will need to be utilised. From a building regulation point of view, it is the Performance Requirements in the BCA that are required to be satisfied. The BCA states that compliance with the Performance Requirements can only be achieved by:

(a) complying with the Deemed-to-Satisfy Provisions; or

(b) formulating an Alternative Solution which:

(i) complies with the Performance Requirements; or

(ii) is shown to be at least equivalent to the Deemed-to-Satisfy Provisions; or

(c) a combination of (a) and (b).

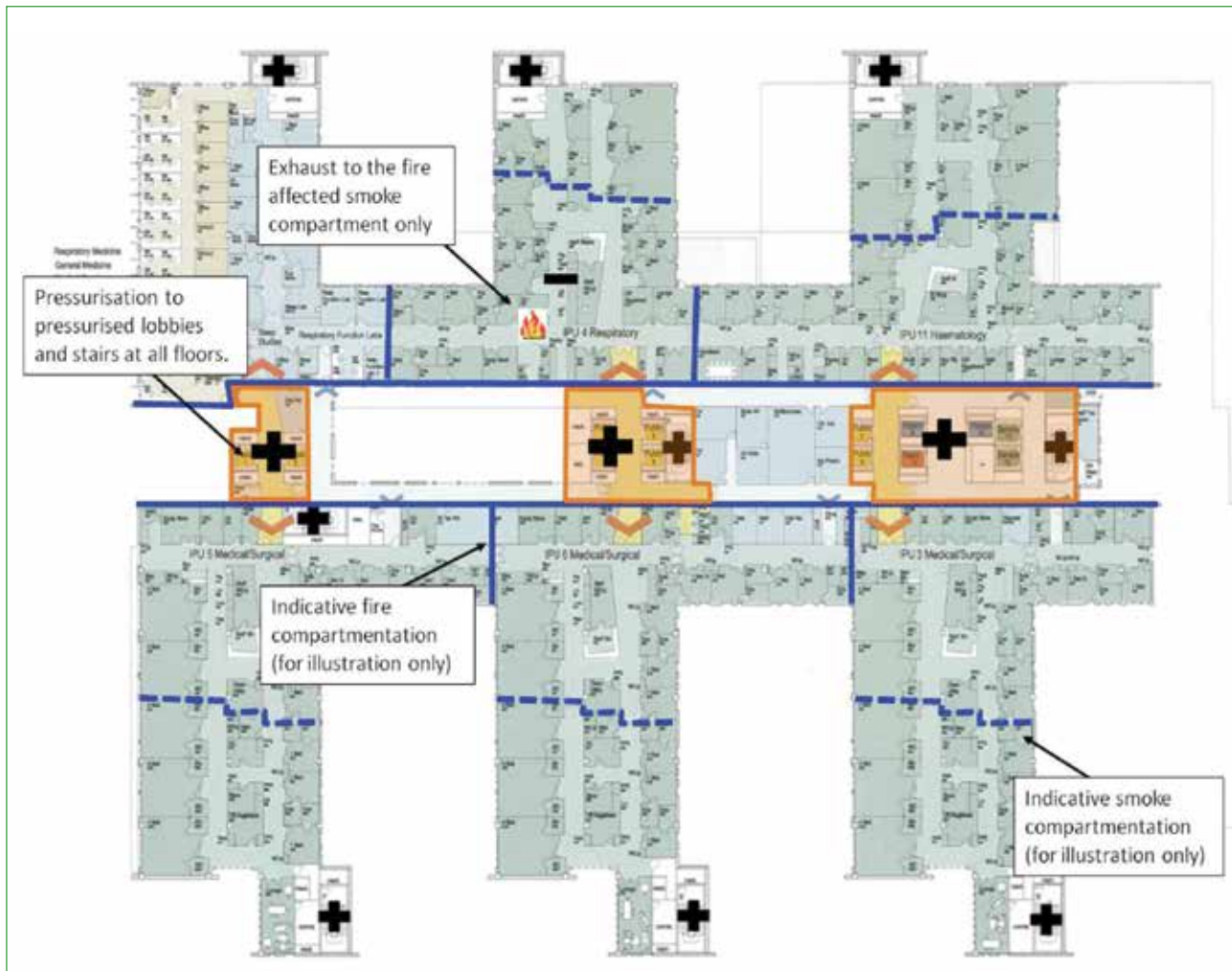
With this compliance option in the BCA, a holistic optimum solution can be formulated by using fundamental fire engineering principles to develop a performance-based fire safety design, which is evidence-based and satisfies the functional and operational requirements of the building as well as the Performance Requirements of the BCA.

To develop such holistic optimum solution, the fire safety engineer must understand the challenges of functionality and logistics in healthcare building designs as well as the risks of infection control. This will need a close collaboration between the fire safety engineer, the architect, the operators, and the users of the building, to ensure the fire safety strategy works in harmony with and not opposition to healthcare objectives.

In the case of zone smoke control systems, their design objective is to confine the smoke within the fire-affected compartment so that occupants in non-fire-affected compartments are protected and can be evacuated safely. Whilst the fire-affected compartment is to be exhausted, all non-fire-affected compartments are required to be provided with supply air so as to achieve the relative positive pressure differential. [7]

An alternative approach to achieving the same design objective of the prescribed zone smoke control system is to design an innovative pressurisation scheme by taking into account the contribution of automatic sprinklers in reducing the buoyancy pressure of smoke, the arrangement of hospital wards and their paths of travel to exits and the contribution of passive smoke barriers including service penetration systems in minimising the paths available for the spread of smoke.

Figure 1: Alternative smoke control strategy for the Royal North Shore Hospital (typical floor)



## Results

By employing the method above, a fire safety strategy has been developed for the new Acute Hospital building at the Royal North Shore Hospital that incorporates some innovative solutions, including the aforementioned alternative smoke control strategy that is illustrated in Figure 1.

The alternative smoke control strategy is to exhaust smoke from the fire-affected compartment, but instead of pressurising all other compartments, only specific areas are pressurised. All fire isolated stairs are pressurised to maintain tenability within the egress stairs. Additionally, pressurised lobbies are specified, which are located in the centre of the building (depicted in orange in Figure 1). These pressurised lobbies act as a 'bridgehead' between the northern and southern portions of the building.

The aim of the strategy is to provide most patient care compartments with a minimum of two horizontal egress

routes to different but adjoining compartments and where this cannot be achieved, provide additional protection in the form of increased exhaust or additional smoke compartmentation.

As horizontal egress is the primary form of egress in hospital buildings, the pressurised lobbies aim to minimise smoke spread in the north-south direction (particularly at upper levels) so that occupants can move from a fire-affected compartment in the northern half of the building (for example), through a pressurised lobby to the southern portion of the building. The pressurised lobbies are enclosed in two-hour fire rated construction and are to be pressurised at all levels in fire mode, so they form a place of relative safety on all floors through which occupants can access another compartment or a fire isolated stair.

The purpose of lift shaft pressurisation is to minimise smoke moving into the shafts and spreading to other levels. However, not all the lift shafts are pressurised. Lift shafts,

which are completely enclosed within the pressurised lobbies at all levels, are not pressurised because the pressurisation will minimise smoke movement into the lobbies and lifts. If the lift shafts are within a pressurised lobby at some levels but are outside a pressurised lobby at other levels, pressurisation is provided. Accordingly, lift shafts one to eight are pressurised, as they open inside the atrium at Level 03.

All other non-fire-affected compartments within the building are to remain unpressurised, with the exception of critical patient care areas such as operating theatres and ICU. These are to remain operational (these areas are normally pressurised for infection control), though under fire brigade control. This will assist in minimising smoke movement into these areas and allow continuity of patient care.

The alternative smoke control strategy can be summarised as follows:

- Exhaust fire-affected compartment (compartment means smoke compartment in patient care areas and fire compartment in all non-patient care areas);
- All fire isolated stairs pressurised;
- Lift shafts one to eight pressurised (those lifts not contained wholly in a pressurised lobby on all levels);
- Lobbies pressurised on all floors, depicted in orange in Figure 1;
- Systems serving critical patient care areas remain operational (ICU, operating theatres, etc likely to remain positively pressurised under control of fire brigade);
- All other compartments to shut-down air handling systems and remain unpressurised;
- Ductwork (not forming part of the smoke control system) where penetrating smoke or fire compartment walls provided with smoke or air control dampers that will close on activation of the smoke detection system; and
- Well sealed penetrations through fire and smoke walls as per the BCA. Register of penetrations, ongoing 'permit to work' type system required for maintenance and sealing of new penetrations through fire and smoke walls for the life of the building.

When compared with the prescribed zone smoke control system, the alternative smoke control strategy has the following benefits:

- A less complicated system to commission, operate and maintain, because:

- The alternative strategy is to pressurise lift shafts, stairs and safe lobbies irrespective of the fire-affected compartment location, with smoke spill being the only component that changes as the fire-affected compartment changes.
- A simpler system is more reliable in achieving the required performance.
- There are less moving parts and operating equipment to achieve the outcome resulting in a more robust system, because:
  - The alternative strategy does not rely on pressurising all non-fire-affected zones, resulting in a significant reduction in fans required to operate in fire mode.
  - Fewer items in the smoke control system mean there are fewer items that are likely to fail.
- Improved flexibility for future hospital ward layout changes due to the simpler system.
- Less interference with high risk patient areas such as Operating Theatres due to the simpler system.
- Fire brigade access available through fire isolated and pressurised routes including stair lobbies that create a bridge head for fire fighting.
- Pressurised lobbies in the centre of the building provide safe access across North-South halves of the building for horizontal evacuation.
- Does not require the atrium to be pressurised.

Fire protection systems in Australia are required to be maintained, by regulation, to a prescribed maintenance regime. Active smoke control systems are required to be tested annually on their performance and functionality requirements. A survey of the active systems is also required for identifying changes to Heating, Ventilation, and Air-Conditioning systems or the building and its environment that could affect the performance of the smoke control system. Table 1 and Table 2 are a comparison of performance and functionality tests respectively that are required to be carried out on an annual basis between the prescribed smoke control systems and the alternative smoke control strategy.

It can be seen from these tables that the alternative smoke control strategy reduces 60% of maintenance tests and 70% of system components when compared with conventional smoke control systems prescribed in the building code. The alternative smoke control strategy not only meets the BCA Performance Requirements, but also helps to make the hospital easier and more cost effective to manage and maintain in the long-term.

**Table 1: Comparison of performance tests required on an annual basis**

Active smoke control system performance test	BCA prescribed smoke control systems		Alternative smoke control strategy	
	REQUIRED	APPROXIMATE NUMBER OF TESTS	REQUIRED	APPROXIMATE NUMBER OF TESTS
Zone pressurisation system	Yes	325	No	0
Safe lobby pressurisation system	No	0	Yes	70
Fire-isolated exit pressurisation system	Yes	75	Yes	75
Lift shaft pressurisation system	No	0	Yes	8
<b>TOTAL</b>		<b>400</b>		<b>153</b>

**Table 2: Comparison of functionality tests required on an annual basis**

Active smoke control system component	BCA prescribed smoke control systems		Alternative smoke control strategy	
	REQUIRED	APPROXIMATE NUMBER OF COMPONENTS	REQUIRED	APPROXIMATE NUMBER OF COMPONENTS
Air handling units for zone pressurisation systems	Yes	60	No	0
Air control dampers for zone pressurisation systems	Yes	420	No	0
Smoke spill systems	Yes	12	Yes	12
Air control dampers for smoke spill systems	Yes	110	Yes	110
Air handling units for safety lobby pressurisation systems	No	0	Yes	10
Air control dampers for safe lobby pressurisation systems	No	0	Yes	53
Fans for lift shaft pressurisation systems	No	0	Yes	8
Fans for fire isolated exit pressurisation system	Yes	17	Yes	17
<b>TOTAL</b>		<b>619</b>		<b>210</b>

## Conclusions

Application of a performance-based approach and fire safety engineering on healthcare facilities planning and design can lead to a safer environment, provide more reliable fire protection and reduce life cycle costs of these facilities.

Close collaboration between the fire safety engineer, the architect, the operators and the users of the building is needed, to ensure the fire safety strategy works in harmony with and not opposition to healthcare objectives.

## Competing interests

The author declares that he has no competing interests.

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## Career Opportunities for Master of Public Health Graduates in India

K Sharma, S Zodpey, Z Quazi Syed and A Gaidhane

### Abstract

In India, in spite of obvious need, there is a lack of clearly defined career plans for non-medical public health graduates. This study was undertaken to identify potential career options, opportunities and challenges for Master of Public Health (MPH) graduates to work in both public and private health sectors in India. Information was collected by undertaking a literature search, six focus group discussions, 50 in-depth interviews of public health professionals and a national consultation on MPH program development in India. Twenty three institutions in India offer MPH programs and three quarters of MPH graduates are from a non-medical background. MPH graduates have opportunities in the health system and academic institutions and jobs in academic and research institutions are likely to increase in the near future. Non-academic jobs are in healthcare delivery, monitoring and evaluation, health and financing. There are significant challenges for entry

into the public and private health sector, which are due to limited awareness of opportunities, lack of requisite skills for searching and applying for jobs, uncertain recruitment processes, poor working conditions, poor living conditions in rural areas, frequent transfers, lack of competitive salaries, unclear expectations of work roles and feedback. Institutionalising public health service at central, state and district levels, with clearly defined career pathways is required.

*Abbreviations:* FGD – Focus Group Discussion; IDI – In-Depth Interview; MPH – Master of Public Health; NGO – Non-Government Organisation; NRHM – National Rural Health Mission.

*Key words:* career opportunities; public health; MPH graduates; India.

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### Introduction

The health services delivery sector is undergoing rapid change. Greater emphasis is being placed on health promotion and disease prevention as a means to reduce the cost of care by improving the population's health. Development and application of population-based prevention programs by multidisciplinary teams of competent public health professionals is essential to achieve desired health outcomes. [1-3]

Traditionally public health education in India was offered through medical schools and the public health professionals produced by such schools were medical doctors. Recently in India, several institutions launched Master of Public Health (MPH) programs which are open to both medical graduates as well as graduates from allied health professions. Thus there is a conscious effort to open public health education to non-medical professionals with an aim to create multidisciplinary teams of public health professionals in the

country. However, career opportunities for MPH graduates remain unclear. [5] Furthermore, the health sector in India is facing a need and demand paradox. [6] There are poorly defined public health career opportunities for MPH graduates. [5,6] In the Government sector, public health managerial and leadership positions are mostly occupied by physicians/doctors with additional qualifications in either public health or community medicine or preventive and social medicine.

MPH reflects an emerging discipline with the potential to create a competent and effective public health workforce, contributing significantly towards the delivery of essential public health services. However, there is a need to create career opportunities and a structured career advancement plan for MPH graduates for entry into public and private health roles. [1,2,4] Many initiatives have been taken up by the Indian Government in the last decade which has built in scope and future dimensions for public health professionals. The launch of the National Rural Health Mission (NRHM) in 2005, public-private initiatives like the Public Health Foundation of India and, several programs and policy initiatives, have opened up avenues for work for these professionals. The purpose of this study was to explore potential career opportunities for MPH graduates, to find out the challenges for MPH graduates entering the health sector and to propose a broader framework for developing a career plan for MPH graduates in India.

### Methodology

The study used four approaches to collect the data: a literature review; focus group discussions; in-depth interviews; and a national consultation. The study protocol and study tools were approved by the Institutional Ethics Committee.

**Literature review:** A comprehensive literature review was undertaken to understand existing career opportunities for MPH graduates. Literature relating to opportunities and challenges for MPH graduates was reviewed. This review utilised Pubmed, Embase, Scopus and Google Scholar search engines and the websites of various Indian universities/institutes offering MPH or any public health programs. Key words used for the literature search were MPH graduates; future prospects; career opportunities; models of career plans; public health professionals; health workforce planning and building; and challenges for public health career pathways.

**Focus group discussion (FGD):** Six FGDs were conducted for the purpose of this study. Participants were graduates who were about to complete the MPH program (three

FGDs) and those who had successfully completed MPH courses in the last year from any public health institute in India (three FGDs). Women MPH graduates were an equal part of all FGDs. The FGD guide was prepared after expert consultations and each session lasted around 80 to 120 minutes. The purpose of FGDs was to study the opinions and perceptions of MPH graduates on issues like reasons for taking up an MPH course, awareness of career options and the challenges in accessing a career in the health sector.

**In-depth Interviews (IDI):** Fifty in-depth interviews of public health professional were conducted to study existing career opportunities and challenges in the public and private health sectors for MPH graduates. Thirty IDI were conducted with public health professionals currently practising at various levels in the public health system, international organisations or donor agencies and Non-Government Organisations (NGOs), whereas 20 IDI participants were drawn from academic institutions. IDI interviews lasted for 45 to 60 minutes. During the IDIs professionals' perceptions of changing trends in the health sector and suggestions for developing a career plan for MPH graduates were also discussed.

**National consultation:** A national consultation on MPH program development in India was organised by the Public Health Foundation of India, New Delhi. The consultation's agenda was to discuss the overall scenario of public health education in India, situational analysis of MPH programs, a competency framework for the MPH syllabus, career pathways for MPH graduates and accreditation of MPH programs. Around 55 participants, representing institutions offering MPH programs, Ministry of Health and Family Welfare – Government of India, Medical Council of India, National Board of Examinations, University Grants Commission, Institutes and Universities offering public health programs, The Nossal Institute for Global Health - University of Melbourne, Australia and the Public Health Foundation of India, New Delhi, attended the consultation. A Working Group was constituted to review career opportunities and challenges in seeking jobs for MPH graduates and to develop a broad framework for career pathway plans in India.

All FGDs and interviews were recorded, with the consent from participants being interviewed. After the interviews, the recordings were transcribed into computer files. Care was taken to assure the respondents that the data were confidential and they would not be identifiable in any subsequent report. Interview transcripts were read by the



researcher and coded. Category headings were generated and all of the data were accounted for under these headings. Two independent researchers verified the accuracy of the category system and after discussion minor modifications were made to it. Findings of the FGDs, IDIs, national consultation and literature review were triangulated and a broad framework for public health career plans was proposed.

## Results

**Reason for choosing MPH course:** Currently 23 institutes offer MPH courses in India with an annual intake capacity of 573. [5,6] However, there is a gap between the total places available and the number of graduates opting for MPH programs. FGDs revealed that around three quarters of the graduates were not medical doctors. Few enter public health courses on the recommendation of their senior colleagues. Instead the majority take MPH courses by choice having had an opportunity to work in the health sector after graduation, which then motivated them to pursue further studies in public health. A limited awareness regarding career opportunities for MPH graduates was perceived as a significant hurdle for students to take up MPH courses in India. A participant in FGD stated:

*If students during their undergraduate (courses) know public health is likely to interest them and they will have a chance for a better and satisfying career, there will be more takers for MPH programs.*

**Public health career opportunities in India:** Participants stated that career opportunities in public health are enormous, particularly in India, due to the triple burden of health problems such as communicable and non-communicable diseases and environmental health problems, disasters/calamities. The Working Group at the national consultation recognised two broad areas of career opportunities. Opportunities in academia and research are available at institutions offering MPH or public health courses. Non-academic career opportunities are mostly related to service delivery/program implementation or monitoring and evaluation. Graduates perceived a career in government or the public sector as having a higher level of job security, which included retirement and health benefits. However they also felt that working in the public sector is challenging because of the need to address the public health goals of a community.

The literature search and findings of FGDs and IDIs revealed that MPH graduates have career opportunities in the following broad areas in India:

- Health policy and management (academic, manager, policy advisor/policy analyst etc).
- Disease prevention and control (public health physician, epidemiologist, surveillance officer, monitoring and evaluation coordinator, data manager, statistician etc).
- Health promotion (health educator, counsellor, mass medical coordinator etc).
- Occupational/environment health (environmental scientist, public health/sanitary engineers, factory inspectors etc).
- Reproductive health (HIV/AIDS specialists, public health physicians, sexual/reproductive health counsellor etc).
- Oral health (oral health physician, dental hygienist, researchers - tobacco prevention control etc).
- Population health sciences (demographer, statistician, etc).
- Public health laboratory.
- Public health/community health nurse.
- Entomology (entomologist, vector biologist etc).
- Public health nutrition (food inspector, drug inspector, jobs in food safety etc).
- Pharmaceuticals (pharmacovigilance, drug research etc).
- Global health (public health preparedness, epidemiologist, surveillance, policy adviser etc).
- Health insurance and finance (health economist, health insurance advisor, etc).
- Hospitals (public health specialist, hospital managers, etc).
- Academia and research institutes (research officers, research associates, etc).

## Challenges in choosing public health as a career

Professionals stated that most were not aware of various career opportunities available to them in the health sector and that they also lacked requisite support and skills to search and apply for jobs. A public health professional in IDI noted:

*Public health is an exciting profession that offers numerous options for pursuing a career...but most of them (MPH graduates) didn't know where and how to begin (their career). To work out where to start, one must think about what you are interested in, what you've enjoyed learning about and what you would like to learn about . . . and then selecting a appropriate career in public health.*

As stated by public health professionals and MPH graduates, barriers to entering the public health profession include a lack of transparency in the recruitment process; poor

working and living conditions in rural areas; restricted professional (and personal) development; lack of clarity on transfers and staff deployment policies; lack of competitive salaries, unclear expectations about work roles, work expectations and feedback; job insecurity in not-for-profit and private sectors; lack of clear vision, mission and plans in government and organisations on health workforce issues; and poor linkages between the public health sector and academia. It was also believed that a lack of structured career advancement pathway for MPH graduates, particularly in the private and not-for-profit sector, is a considerable challenge for graduates in taking up public health. Discussion during the national consultation drew attention to the unavailability of pre-structured career programs and the lack of clear policies for promotion, particularly for non-doctor MPH graduates in India. The lack of a public health cadre in India was also viewed as an obstacle for creating public health jobs and structured career pathways in the health sector for MPH graduates.

### Public health education and public health career

Participants stated that academic institutions are producing public health graduates without the requisite competencies to work in diverse fields of public health. It was also observed that the current curriculum for MPH programs significantly differs across institutes with varying focus. [6,7] Discussions at the national consultation also point to a gap in the current public health curriculum and public health competencies needed by graduates to deal with the current and emerging health problems. A public health professional observed:

*My role as a public health practitioner is to contribute for a range of things, for example...planning, developing and implementing delivery of public health programs across different sectors and settings; understanding and being able to communicate and to offer specialist advice to clients. If I look back at the MPH degree I undertook, I think, it (MPH program) didn't equip me well with all these necessary public health skills. I learnt all these skills while on the job. Internship would be very useful to learn and practise public health skills in the field.*

### Discussion

Public health is an enormously diverse and dynamic field. The public health mandate has grown from infection prevention to chronic disease, mental health, bioterrorism, demography, environmental health, health financing and policy and so on. To address current and future public health challenges, the health sector needs to invest in

strengthening infrastructure at every level, with a focus on a continual influx of multi-disciplinary, public health professionals. [4,8,9] Significant advances have been made by many countries toward establishing a truly multi-disciplinary team to meet public health goals. [4,10,11] Our study revealed that India requires a similar public health workforce plan that clearly demonstrates systematic and inter-connected public health career opportunities for the entire public health workforce. [12,13]

India is facing challenges in promoting graduates to enter into MPH courses. To some extent the issues may be addressed by developing a public health module for undergraduate courses with an aim to sensitise students to public health issues and to create awareness about public health at an early stage. Another approach would be to create opportunities for undergraduates to work as volunteers in the public health sector. Successful efforts in this regard were taken in the United States in early 2000 by providing public health career and educational exposure, experience and support to school students. [4] Another important strategy is to persuade more students to take up MPH courses and therefore create demand for graduates in the health system.

Regarding career perceptions, this study revealed that there was no clear concurrence on what constitutes a career in public health. Broadly, it was observed that the term 'public health career' is considered to be a salaried employment and career pathway for promotion on a career ladder. This study also identified a lack of awareness and limited skills to search and apply for public health jobs as a significant hurdle to entering into the public health system. Public health institutions need to communicate career opportunities to prospective students through web sites and by forming an alumni and linking it with new public health graduates.

This study explored various opportunities for MPH graduates either in academia or in the health system, at various levels. These opportunities are available within the public or government sector, private health sector, not-for-profit organisations or international organisations. The level and type of position depends upon each organisation, its mandate and projects. Changing trends in public health education in India, with more institutions planning to offer MPH courses in future [5,6] may create increased demand for faculty and research positions. However, each career has its own advantages and limitations. Most of these positions primarily require public health competencies to deliver desired services effectively, however a MPH or public health qualification requirement is not essential.

India has a huge network of not-for-profit organisations working in diverse fields and across wide geographic areas. MPH graduates have immense opportunities in these sectors. The major challenge for jobs in this sector is the lack of stability and unclear structured career progression plans. Not-for-profit sectors, as well as the private sector and international agencies are not uniformly present across all states or regions and areas of work greatly differ as well. Therefore MPH graduates may need support to identify organisations offering opportunities related to their area of specialisation and at their preferred location.

Relevant and competency-based public health education enables graduates to acquire the desired core competencies for delivering essential public health functions. Therefore, promoting public health as a discipline at the national level with greater emphasis on public health development activities and opening up more public health courses, needs immediate consideration. [14] However, issues related to quality education must not be undermined whilst starting new MPH courses. Currently in India, MPH programs are offered in two different modes - the general MPH programs, which equip graduates with core public health competencies and the specialised MPH programs with optional tracts or specialisation. [6,7] MPH programs in India need to define core competencies to guide faculties in delivering modules and producing competent public health professionals.

Career progression pathways are considered as routes people take to achieve career goals. [4] Career progression is an important determinant to seek for jobs in any profession. This study highlights the lack of pre-structured career program plans for MPH graduates and significant barriers for entry into the public health sector. The Public Health Foundation of India, a public-private initiative that was created in 2006 to address workforce issues, and a national consultation by the World Health Organisation on the public health workforce in India in 2009 recommend institutionalising the Public Health Service or Indian Health Service or All India Cadre for Public Health at central, state and district levels to create more positions with clear career progression plans for the entire public health workforce. [12,13]

### Way forward

A multidisciplinary public health workforce can be developed by identifying positions and creating opportunities that link across discipline/sectors in public health. Based on the findings from this study and literature search, we propose

the following framework for developing comprehensive public health career plans in India:

1. Defining generic public health functions and linking these functions to competencies needed by public health professionals and their specific roles and responsibilities at various levels.
2. Placing appropriate/eligible candidates in positions best suited to their qualifications and skills and informing them about possible career progression within and across specialties.
3. Promoting linkages between academia and professional groups and the public health system for career planning.
4. Creating a credentialing mechanism, other than educational background, to ensure that anyone who practises in public health demonstrates professional competence not only in his or her specialty, but also in the core essentials of public health.
5. Creating a consortium of institutes/universities offering public health programs in India. The consortium may create a kind of 'one-stop-shop' for India-wide information on careers and development in public health. It will help to recruit MPH graduates into public health jobs and support the whole public health workforce from volunteers to senior management in developing their careers.

To conclude, the MPH program prepares students to work as public health professionals capable of addressing global, national and local public health challenges through multidisciplinary approaches that apply the latest scientific knowledge. Therefore, the health sector in India urgently needs to respond by offering more career opportunities for MPH graduates with structured career pathways, plans and policies.

### Competing interests

The authors declare that they have no competing interests.

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[www.aihw.gov.au/publication-detail/?id=60129542746](http://www.aihw.gov.au/publication-detail/?id=60129542746)

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Jaynelle F. Stichler DNSc, RN, EDAC, NEA-BC, FACHE, FAAN,

*HERD Health Environments Research & Design Journal* 2013

Winter Vol 6(2) pp7-11

## E-HEALTH

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Moorhead SA et al 2013

*Journal of Medical Internet Research*

Vol 15(4) e85

<http://www.jmir.org/2013/4/e85/>

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Taitsman, J and Others

*N Engl J Med* 27

February 2013

How confident are US hospitals, nursing homes, and physicians' offices that their staff would appropriately deny patient information to an unknown caller?

[www.nejm.org/doi/full/10.1056/NEJMp1215258?query=health-policy-and-reform](http://www.nejm.org/doi/full/10.1056/NEJMp1215258?query=health-policy-and-reform)

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Great Boards Spring 2013

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[www.fraserinstitute.org/research-news/display.aspx?id=19380](http://www.fraserinstitute.org/research-news/display.aspx?id=19380)

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This updated guidance provides information on how to approach a new build or redesign an A&E department.

[www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/191964/Accident\\_\\_\\_emergency\\_departments\\_Planning\\_and\\_design\\_guidance.pdf](http://www.gov.uk/government/uploads/system/uploads/attachment_data/file/191964/Accident___emergency_departments_Planning_and_design_guidance.pdf)

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Stempniak, Marty.

*H&HN: Hospitals & Health Networks*

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The article reports on challenges that many hospitals face when attempting to develop an information technology plan and reports on the results of the 2013 Healthcare Information and Management Systems Society's survey of 302 hospital information technology professionals at ACHSM.

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AHRQ March 2013

This article from the U.S. Agency for Healthcare Research and Quality examines issues regarding the interpretation and use of effectiveness evidence about care delivery and policy innovations, and outlines an alternative approach to thinking about the information required when making decisions about the adoption of such innovations.

[www.innovations.ahrq.gov/content.aspx?id=3837](http://www.innovations.ahrq.gov/content.aspx?id=3837)

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Vol 32(2) pp193-200, April/June 2013.

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Rozenblum, R et al

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**PATIENT SAFETY****Making Health Care Safer: A Critical Review of Evidence Supporting Strategies to Improve Patient Safety**

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Susan A Nancarrow, Andrew Booth, Steven Ariss, Tony Smith, Pam Enderby and Alison Roots

*Human Resources for Health* 2013

Vol 11:19 doi:10.1186/1478-4491-11-19

Ten characteristics underpinning effective interdisciplinary team work were identified.

[www.human-resources-health.com/content/pdf/1478-4491-11-19](http://www.human-resources-health.com/content/pdf/1478-4491-11-19).

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Information about authorship should not appear on the title page. It should appear in the covering letter.

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3. **Abbreviations** – these should be kept to a minimum and any essential abbreviations should be defined (eg PHO – Primary Health Organisation).

#### Main manuscript

The structure of the body of the manuscript will vary according to the type of manuscript (eg a research article or note would typically be expected to contain Introduction, Methods, Results and Discussion – IMRAD, while a commentary on current management practice may use a less structured approach). In all instances consideration should be given to assisting the reader to quickly grasp the flow and content of the article.

For further details about the expected structure of the body of the manuscript, see below - *Types of Manuscript – some general guidelines*.

#### Major and secondary headings

Major and secondary headings should be left justified in lower case and in bold.

#### Figures, tables and illustrations

Figures, tables and illustrations should be:

- of high quality;
- meet the 'stand-alone' test;
- inserted in the preferred location;
- numbered consecutively; and
- appropriately titled.

#### Copyright

For any figures, tables, illustrations that are subject to copyright, a letter of permission from the copyright holder for use of the image needs to be supplied by the author when submitting the manuscript.

#### Ethical approval

All submitted articles reporting studies involving human/ or animal subjects should indicate in the text whether the procedures covered were in accordance with National Health and Medical Research Council ethical standards or other appropriate institutional or national ethics committee. Where approval has been obtained from a relevant research ethics committee, the name of the ethics committee must be stated in the Methods section. Participant anonymity must be preserved and any identifying information should not be published. If, for example, an author wishes to publish a photograph, a signed statement from the participant(s) giving his/her/their approval for publication should be provided.



## References

References should be typed on a separate page and be accurate and complete.

The Vancouver style of referencing is the style recommended for publication in the APJHM. References should be numbered within the text sequentially using Arabic numbers in square brackets. [1] These numbers should appear after the punctuation and correspond with the number given to a respective reference in your list of references at the end of your article.

Journal titles should be abbreviated according to the abbreviations used by PubMed. These can be found at: <http://www.ncbi.nih.gov/entrez/query.fcgi>. Once you have accessed this site, click on 'Journals database' and then enter the full journal title to view its abbreviation (eg the abbreviation for the 'Australian Health Review' is 'Aust Health Rev'). Examples of how to list your references are provided below:

### Books and Monographs

1. Australia Institute of Health and Welfare (AIHW). Australia's health 2004. Canberra: AIHW; 2004.
2. New B, Le Grand J. Rationing in the NHS. London: King's Fund; 1996.

### Chapters published in books

3. Mickan SM, Boyce RA. Organisational change and adaptation in health care. In: Harris MG and Associates. Managing health services: concepts and practice. Sydney: Elsevier; 2006.

### Journal articles

4. North N. Reforming New Zealand's health care system. Intl J Public Adm. 1999; 22:525-558.
5. Turrell G, Mathers C. Socioeconomic inequalities in all-cause and specific-cause mortality in Australia: 1985-1987 and 1995-1997. Int J Epidemiol. 2001;30(2):231-239.

### References from the World Wide Web

6. Perneger TV, Hudelson PM. Writing a research article: advice to beginners. Int Journal for Quality in Health Care. 2004;191-192. Available: <<http://intqhc.oxfordjournals.org/cgi/content/full/16/3/191>>(Accessed 1/03/06)

Further information about the Vancouver referencing style can be found at <http://www.bma.org.uk/ap.nsf/content/LIBReferenceStyles#Vancouver>

## Types of Manuscript - some general guidelines

### 1. Analysis of management practice (eg, case study)

#### Content

Management practice papers are practitioner oriented with a view to reporting lessons from current management practice.

#### Abstract

Structured appropriately and include aim, approach, context, main findings, conclusions.

Word count: 200 words.

#### Main text

Structured appropriately. A suitable structure would include:

- Introduction (statement of problem/issue);
- Approach to analysing problem/issue;
- Management interventions/approaches to address problem/issue;
- Discussion of outcomes including implications for management practice and strengths and weaknesses of the findings; and
- Conclusions.

Word count: general guide - 2,000 words.

References: maximum 25.

### 2. Research article (empirical and/or theoretical)

#### Content

An article reporting original quantitative or qualitative research relevant to the advancement of the management of health and aged care services organisations.

#### Abstract

Structured (Objective, Design, Setting, Main Outcome Measures, Results, Conclusions).

Word count: maximum of 300 words.

#### Main text

Structured (Introduction, Methods, Results, Discussion and Conclusions).

The discussion section should address the issues listed below:

- Statement of principal findings;
- Strengths and weaknesses of the study in relation to other studies, discussing particularly any differences in findings;
- Meaning of the study (eg implications for health and aged care services managers or policy makers); and
- Unanswered questions and future research.

Two experienced reviewers of research papers (viz, Doherty and Smith 1999) proposed the above structure for the discussion section of research articles. [2]

Word count: general guide 3,000 words.

References: maximum of 30.

NB: Authors of research articles submitted to the APJHM are advised to consult 'Writing a research article: advice to beginners' by Perneger and Hudelson (2004) and available at: <<http://intqhc.oxfordjournals.org/cgi/content/full/16/3/191>> This article contains two very useful tables: 1) 'Typical structure of a research paper' and 2) 'Common mistakes seen in manuscripts submitted to this journal'. [3]

### **3. Research note**

#### **Content**

Shorter than a research article, a research note may report the outcomes of a pilot study or the first stages of a large complex study or address a theoretical or methodological issue etc. In all instances it is expected to make a substantive contribution to health management knowledge.

#### **Abstract**

Structured (Objective, Design, Setting, Main Outcome Measures, Results, Conclusions).

Word count: maximum 200 words.

#### **Main text**

Structured (Introduction, Methods, Findings, Discussion and Conclusions).

Word count: general guide 2,000 words.

As with a longer research article the discussion section should address:

- A brief statement of principal findings;
- Strengths and weaknesses of the study in relation to other studies, discussing particularly any differences in findings;
- Meaning of the study (eg implications for health and aged care services managers or policy makers); and
- Unanswered questions and future research.

References: maximum of 25.

NB: Authors of research notes submitted to the APJHM are advised to consult 'Writing a research article: advice to beginners' by Perneger and Hudelson (2004) and available at: <<http://intqhc.oxfordjournals.org/cgi/content/full/16/3/191>> This article contains two very useful tables: 1) 'Typical structure of a research paper' and 2) 'Common mistakes seen in manuscripts submitted to this journal'. [3]

### **4. Review article (eg policy review, trends, meta-analysis of management research)**

#### **Content**

A careful analysis of a management or policy issue of current interest to managers of health and aged care service organisations.

#### **Abstract**

Structured appropriately.

Word count: maximum of 300 words.

#### **Main text**

Structured appropriately and include information about data sources, inclusion criteria, and data synthesis.

Word count: general guide 3,000 words.

References: maximum of 50

### **5. Viewpoints, interviews, commentaries**

#### **Content**

A practitioner oriented viewpoint/commentary about a topical and/or controversial health management issue with a view to encouraging discussion and debate among readers.

#### **Abstract**

Structured appropriately.

Word count: maximum of 200 words.

#### **Main text**

Structured appropriately.

Word count: general guide 2,000 words.

References: maximum of 20.

### **6. Book review**

Book reviews are organised by the Book Review editors. Please send books for review to: Book Review Editors, APJHM, ACHSM, PO Box 341, NORTH RYDE, NSW 1670. Australia.

### **Covering Letter and Declarations**

The following documents should be submitted separately from your main manuscript:

#### **Covering letter**

All submitted manuscripts should have a covering letter with the following information:

- Author/s information, Name(s), Title(s), full contact details and institutional affiliation(s) of each author;
- Reasons for choosing to publish your manuscript in the APJHM;
- Confirmation that the content of the manuscript is original. That is, it has not been published elsewhere or submitted concurrently to another/other journal(s).

## Declarations

### 1. Authorship responsibility statement

Authors are asked to sign an 'Authorship responsibility statement'. This document will be forwarded to the corresponding author by ACHSM on acceptance of the manuscript for publication in the APJHM. This document should be completed and signed by all listed authors and then faxed to: The Editor, APJHM, ACHSM (02 9878 2272).

Criteria for authorship include substantial participation in the conception, design and execution of the work, the contribution of methodological expertise and the analysis and interpretation of the data. All listed authors should approve the final version of the paper, including the order in which multiple authors' names will appear. [4]

### 2. Acknowledgements

Acknowledgements should be brief (ie not more than 70 words) and include funding sources and individuals who have made a valuable contribution to the project but who do not meet the criteria for authorship as outlined above. The principal author is responsible for obtaining permission to acknowledge individuals.

Acknowledgement should be made if an article has been posted on a Website (eg, author's Website) prior to submission to the Asia Pacific Journal of Health Management.

### 3. Conflicts of interest

Contributing authors to the APJHM (of all types of manuscripts) are responsible for disclosing any financial or personal relationships that might have biased their work. The corresponding author of an accepted manuscript is requested to sign a 'Conflict of interest disclosure statement'. This document will be forwarded to the corresponding author by ACHSM on acceptance of the manuscript for publication in the APJHM. This document should be completed and signed and then faxed to: The Editor, APJHM, ACHSM (02 9878 2272).

The International Committee of Medical Journal Editors (2006) maintains that the credibility of a journal and its peer review process may be seriously damaged unless 'conflict of interest' is managed well during writing, peer review and editorial decision making. This committee also states:

'A conflict of interest exists when an author (or author's institution), reviewer, or editor has a financial or personal relationships that inappropriately influence (bias) his or her actions (such relationships are also known as dual commitments, competing interests, or competing loyalties).

The potential for conflict of interest can exist whether or not an individual believes that the relationship affects his or scientific judgment.

Financial relationships (such as employment, consultancies, stock ownership, honoraria, paid expenses and testimony) are the most easily identifiable conflicts of interest and those most likely to undermine the credibility of the journal, authors, and science itself...' [4]

## Criteria for Acceptance of Manuscript

The APJHM invites the submission of research and conceptual manuscripts that are consistent with the mission of the APJHM and that facilitate communication and discussion of topical issues among practicing managers, academics and policy makers.

Of particular interest are research and review papers that are rigorous in design, and provide new data to contribute to the health manager's understanding of an issue or management problem. Practice papers that aim to enhance the conceptual and/or coalface skills of managers will also be preferred.

Only original contributions are accepted (ie the manuscript has not been simultaneously submitted or accepted for publication by another peer reviewed journal – including an E-journal).

Decisions on publishing or otherwise rest with the Editor following the APJHM peer review process. The Editor is supported by an Editorial Advisory Board and an Editorial Committee.

## Peer Review Process

All submitted research articles and notes, review articles, viewpoints and analysis of management practice articles go through the standard APJHM peer review process.

The process involves:

1. Manuscript received and read by Editor APJHM;
2. Editor with the assistance of the Editorial Committee assigns at least two reviewers. All submitted articles are blind reviewed (ie the review process is independent). Reviewers are requested by the Editor to provide quick, specific and constructive feedback that identifies strengths and weaknesses of the article;
3. Upon receipt of reports from the reviewers, the Editor provides feedback to the author(s) indicating the reviewers' recommendations as to whether it should be published in the Journal and any suggested changes to improve its quality.

For further information about the peer review process see Guidelines for Reviewers available from the ACHSM website at [www.achse.org.au](http://www.achse.org.au).

### Submission Process

All contributions should include a covering letter (see above for details) addressed to the Editor APJHM and be submitted either:

(Preferred approach)

1) Email soft copy (Microsoft word compatible) to [journal@achse.org.au](mailto:journal@achse.org.au)

Or

2) in hard copy with an electronic version (Microsoft Word compatible) enclosed and addressed to: The Editor, ACHSM APJHM, PO Box 341, North Ryde NSW 1670;

All submitted manuscripts are acknowledged by email.

### NB

All contributors are requested to comply with the above guidelines. Manuscripts that do not meet the APJHM guidelines for manuscript preparation (eg word limit, structure of abstract and main body of the article) and require extensive editorial work will be returned for modification.

### References

1. Hayles, J. Citing references: medicine and dentistry, 2003;3-4. Available: <<http://www.library.qmul.ac.uk/leaflets/june/citmed.doc>> (Accessed 28/02/06)
2. Doherty M, Smith R. The case for structuring the discussion of scientific papers. *BMJ*. 1999;318:1224-1225.
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4. International Committee of Medical Journal Editors. Uniform requirements for manuscripts submitted to biomedical journals. *ICMJE*. 2006. Available: <<http://www.icmje.org/>> (Accessed 28/02/06).

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The Medical Journal of Australia. Advice to authors submitting manuscripts. Available: <<http://www.mja.com.au/public/information.instruc.html>> (Accessed 28/02/06)

Further information about the Asia Pacific Journal of Health Management can be accessed at: [www.achse.org.au](http://www.achse.org.au).

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ACHSM (formerly Australian College of Health Service Executives) was established in 1945 to represent the interests of health service managers and to develop their expertise and professionalism. Today, the college is the leadership and learning network for health professionals in management across the full range of health and aged care service delivery systems in Australia and New Zealand and the Asia Pacific with some 3,000 members from both public and private sector organisations and non-government and not-for-profit organisations.

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