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Chapter 12 –

The Emergence of New Kinds of Professional Work within the Health Sector

Susan Brandis; Anneke Fitzgerald; Mark Avery; Ruth McPhail; Ron Fisher and Jessica Booth

Introduction

In this chapter we examine a number of emerging professions within the health industry. Discoveries and research in biomedical and bioscience are impacting on traditional roles and responsibilities in developed and developing health care systems. Advances and availability of technology (technology in its widest sense including biomedical equipment, drug therapies, information technology) and models of service delivery (such as inter-professional team working and tele-health) affect the way care is provided, what skills are required to deliver this safely and what health care options are available to the community.

Health professional groups have proliferated in number and fragmented into numerous speciality groups as the knowledge base has rapidly expanded (Brock, Leblebici, & Muzio, 2014). The result of this is an overly complex system, characterised by numerous craft groups, multi professional teams, specialist tribes (Weller, Boyd, & Cumin, 2014), a variety of regulatory authorities and an ever increasing range of prerequisite education, training and development. Using a number of case examples, we explore emerging roles in health care and

consider the benefits and disadvantages of current work force trends, and the impact on management and human resource roles.

Globally, health care and the health workforce are a high priority for government policy makers. The size and complexity of the health workforce drives the need for clinical effectiveness and efficiency. In Australia, health care and social services employ more people than any other industry. Results from the 2011 Australian Census show 11.6% of Australians are working in health care and community services including doctors, nurses, dentists, child care workers and aged care providers (Australian Bureau of Statistics, 2011).

Additional data from the National Health Workforce data set (Health Workforce Australia, 2013) shows that in 2013, there were 593,188 registered health practitioners. Over half of these (344,190) were nurses or midwives with medical practitioners ranking second in number. The table below lists the diversity of registered health practitioners in Australia. This excludes established non-registered professions such as dietetics, social work, speech pathology and emerging professions for example exercise science and perfusionists.

Registered Professional Group	Registered Professionals as % Total Registered Health Workforce
Nurses and midwives	58.0
Medical practitioners	16.0
Psychologists	5.1
Pharmacists	4.7
Physiotherapists	4.3

Dentists	2.6
Dental hygienists	0.3
Dental prosthetists	0.2
Dental therapists	0.2
Oral health therapists	0.2
Occupational therapists	2.7
Medical radiation practitioners	2.4
Chiropractors	0.8
Optometrists	0.8
Chinese medicine practitioners	0.7
Podiatrists	0.7
Osteopaths	0.3
Aboriginal and Torres Strait Islander health practitioners	0.1
	100%

Table 1: Professions Representing Total Registered Health Practitioners in Australia 2013

Source: Information from National Health Workforce Data Set 2013

Health care places a large demand on resources and this is driving change and new ways of working. Expenditure on Health in Australia was estimated to be \$147.4 billion in 2012-13, 9.67% of gross domestic product (GDP) or \$6,430 per Australian (Biggs, 2013). While health professionals are a large percentage of the total national workforce, they are under considerable pressure. Challenges include increasing demand for services, changing

community expectations, escalating costs, increased prevalence of chronic disease and workforce shortages (Nancarrow, Roots, Grace, Moran, & Vanniekerk-Lyons, 2013). This is supported by Sgrò, (2014) who identify three key drivers of workforce reform as an increasingly health literate public, significant workforce shortages in core health professions and rapidly escalating health care costs.

In the context of demographic data, and workforce projections, the health professions are under increasing pressure to change, and in recent years been the focus of numerous industrial and workforce reforms. Traditional professions such as nursing and medicine have had to adapt, and in the face of significant workforce shortages innovation and pragmatism has led to the evolution of a variety of new health professions.

Change Drivers Impacting on Health Professional Roles and Functions

In 2005 the Productivity Commission published a research report on Australia's Health work force (Productivity Commission, 2005) triggering a decade of health workforce reform in Australia. Industrial relations were used as a pathway for reform and certified agreements became central to bargaining a range of workforce initiatives such as the introduction of new roles, task substitution, flexible hours of service delivery all aimed at increasing productivity (Sgrò, 2014). The underlying belief of these enterprise bargaining agreements is that workforce reform in health is required to meet the ever increasing demands on health services (Harden & Fraher, 2010; Nancarrow et al., 2013). In Australia, national projections show that service and workforce reforms will have the most significant impact on work force numbers (Health Workforce Australia, 2013). Continuing to educate the same numbers of professionals in the same way is no longer an option.

Community expectations have been heightened by the failure of traditional models of service delivery to provide safe and quality care and the publicity surrounding a number of failures in health systems which have been played out in the public domain (Alaszewski, 2002; Allen, Chiarella, & Homer, 2010; Barraclough et al., 2003). The Bristol Inquiry in Great Britain (Alaszewski, 2002) was one of the first major health scandals where the skill and competence of medical specialities came under scrutiny. While this was in relation to paediatric cardiac surgery, there has been an unfortunate sequence of enquiries that have questioned the skill and competence of health professionals. For example, the Inquiry into Obstetrics and Gynaecology Services of King Edward Memorial Hospital (Barraclough et al., 2003), surgical competence at Bundaberg, Queensland (Casali & Day, 2010) and management and nursing standards at Mid Staffordshire (Heyes, 2012). These are examples of health professionals having been placed under significant public pressure and scrutiny. Development of new ways of working in health require a balance between meeting stakeholder expectations (access, equity, quality, safety, economic viability and performance) with clinical outcomes, knowledge available, research and development and the levels of risk and uncertainty in providing health services at the individual patient or client level. There are constant balances with providing contemporary care within the tensions of desires and realistic capability of those working in health.

In response to this, traditional roles and values in health have been challenged. This has stimulated questioning of health professionals' power differentials, calls for increased training, regulation and accountability and the spawning of a variety of new professionals and skill sets. The role of the patient safety officer (Denham, 2007) morphed in response to concerns raised in relation to failed systems of clinical governance and a desire to improve

the quality and safety of health care. Patient safety officers are trained in human factors analysis, root cause analysis and a variety of investigative techniques developed in the aeronautical and nuclear industry (Reason, 2000). In a health context they have in the last 15 years become the cornerstone of hospital clinical incident and quality management systems.

Parallel to an enhanced focus on quality and safety, the population continues to age and life expectancy is increasing. According to statistics published by WHO (World Health Organisation, 2014) life expectancy has increased such that women in the top 10 countries can expect to live to 84 years or more, with Japanese women having the longest life expectancy in the world at 87 years. The longest life expectancy for men is in Iceland, Switzerland and Australia with men expected to live to beyond 80 years or more in nine countries. Major gains have been attributable to a reduction in infant mortality and advanced life saving technologies. Technology has moved at a furious pace and health has been quick to adopt new ways of doing things. For example, prior to the 80s it was common practice for a gall bladder operation to be done under full anaesthetic, with a major abdominal incision performed and the expectation of many days in hospital and convalescence. Procedures are now predominately done by keyhole surgery (laparoscopically), while enhanced diagnostics and medical imaging, along with improved pharmaceutical and community care means that the operation is now relatively minor requiring very short stays in hospital (Cuesta, Berends, & Veenhof, 2008). The “quicker and sicker” phenomenon has changed the type of skills that required in an acute facility. It has also put pressure on community providers, such as General Practitioners and community nursing, to become skilled in the management of more acute and post-acute patients who were previously cared for in hospital.

While we are living longer, chronic diseases such as diabetes, lifestyle illnesses such as obesity and diseases of the old such as dementia have become more prevalent (Australian Institute of Health and Welfare, 2012). Such demand has been the trigger for the development of niche specialities such as diabetes educators and exercise scientists, neuropsychologists and diversional therapists. While all this has been happening, communities have had to cope with financial uncertainty as precipitated by the global financial crisis. Health is costing more, more people need health care, resources are stretched and the system is under considerable challenge.

Workforce Reform and Job Redesign

Workforce reform and job redesign has been seen as ways to respond to these stressors. A number of new and adapted roles in health have been trialled, some purposely and others evolutionary, to meet these demands (Nancarrow & Borthwick, 2005). Nancarrow and Borthwick (2005) describe workforce transition as diversification, specialisation, and vertical and horizontal substitution. Using this framework, new roles can be classified as: a) generalists, b) specialists, c) expanded scope of practice and d) substitute or delegation models. The next section will describe each of these in turn using specific examples, and then consider another iteration, that of the hybrid clinician manager role.

Generalist Health Professionals

The recent surge in complex chronic and multisystem diseases has increased the need for health professionals that are multi-skilled and trained across a diversity of clinical areas. The traditional role of the general practitioner is being re-invented, and primary health care

viewed as one strategy for meeting increasing community demand (Naccarella, 2014). Generalists are also being appreciated for the benefit they bring to smaller communities, such as rural and remote areas. Enhanced use of telemedicine has enabled the role of the general practitioner to become increasingly responsible for a variety of clinical needs managed some distance from speciality services. The example of nurses in health contact centres has been discussed in depth in a previous chapter of this book.

The expanded use of community based health services and e- health has influenced change across the continuum of health care. There is no sector of health more specialised than the acute hospital environment which relies on a highly specialised work force to deliver care. This specialisation has come under increasing scrutiny as recent failings in standards of health care and increasing costs have been attributed to the proliferation of the specialist model and the subsequent disintegration of a holistic view of the patient. The “Generalist Hospitalist” has been referred to by (Wachter & Bell, 2012) as a renaissance to past models. A “hospitalist” is a general physician who cares for an inpatient across their episode of care. Studies by Wachter and Bell (2012) have shown the model reduces costs, improves safety and significantly decreases length of hospital stay. This model emerged in the late 1990s and is now an accepted model in the UK and USA. While hospitals have become more focused on acute care, the greatest growth is in chronic diseases which require a more generalist approach and integrated models of care across service environments.

Specialist Health Professionals: Clinical Specialisation

Specialists in a health context have expertise in a variety of service settings but have specialised knowledge in a specific area. While many health disciplines have had increasing specialisation, examples in medicine, dentistry and nursing and the impact of technology will be explored.

Medicine has a rich history of specialisation that dates back to the ancient Greeks. It was not until the 19th century that specialisation as we know it today emerged in Europe with the development of obstetrics in Paris and ophthalmology in London (Pescosolido, 2008). Specialisation of medicine picked up pace following the world wars of the 20th century with surgical subspecialties such as orthopaedics, rehabilitation and anaesthetics responding to community needs and public health discoveries hastening the expansion of the range of physicians. In the last century there has been a proliferation of medical speciality groups requiring more intensive training as the scientific body of knowledge has expanded into pharmacology, organ transplants, reproductive medicine and genomics.

In 2014 the Medical Board of Australia listed 23 medical specialities and an additional 63 sub-specialities requiring registration in Australia. Criticism of medical specialisation centres included fragmentation of care and training, and the existence a numerous elite, self-regulated crafted groups adding to the escalation of health costs and the reinforcement of professional boundaries and silos (Cassel & Reuben, 2011). Mention must be made of the “Specialist Generalist” where knowledge cuts across a number of speciality and sub-speciality areas. Examples of these include palliative care, geriatric medicine and sleep medicine.

A similar pattern of development has occurred in dentistry with an increasing number of speciality areas such as prosthetics, periodontics, endodontics, orthodontists and oral

surgeons. In addition to the traditional dentistry, tertiary training is available for oral hygienists, dental therapists, oral health promotion officers and dental technicians. An economical appraisal from Norway (Grytten & Skau, 2009) identified that many of these specialists compete with general dentists, whereas orthodontists and oral surgeons had exclusivity to practice. Using regression analysis, Grytten and Skau (2009) reported a significant relationship between exclusivity and income. They found that a lack of market competition had led to monopolies and increased costs to the consumer. Importantly this market power impacts on the geographical location of these specialities. This is consistent with one of the conclusions of the Health Workforce Australia Annual report (Health Workforce Australia, 2013) which found the issue of medical specialists not so much being a problem of shortages, but rather issues of misdistribution.

The Clinical Nurse Specialist (CNS) is defined in terms of patient population, type of problem, setting, type of care and disease (Fulton and Baldwin, 2004). Hence specialisation in nursing is divided along logical lines which allow greater flexibility in responding to emerging health needs. For example diabetes educators, wound nurses and infectious disease practitioners may provide both services and advice across the continuum of care from acute hospitals, outpatients and community based settings (Pearson & Peels, 2002).

Health work needs both specialist and generalist skills for both the comprehensive and holistic nature of care delivery but also the practicalities of providing care in different settings affected by community, geography and system sustainability.

Specialisation and Technology

Specialisation has not only impacted on clinical roles, but also on non-clinical ancillary roles. Whereas once a competent doctor or nurse may have required an understanding of diseases such as polio and tuberculosis, the digital world demands competencies regarding computer use, information management and complex integrated knowledge systems and electronic medical records (Hovenga, 2013). This has created a generation of new non clinical professions such as health informatics and clinical coders, and influenced traditional professions such as medical records administrators and health librarians. For example health librarians have emerged as a highly trained speciality group with unique knowledge and skill in library techniques to support evidence based practice and assist clinicians with health and medical research activity (Vasanthakumar, 2013). The World Wide Web has had a major influence on the skills that health librarians require, and systematic reviews of the literature have become core to good clinical practice.

Technological advances have transformed the traditional roles of medical imaging and bio-medical engineering. Historically, these workers were trained using a technical trade's apprenticeship model. Now a minimum bachelor's degree is mandated for entry into these professions, followed by an ever-increasing array of specialised courses to meet the needs of new approaches to diagnosis and intervention. Whereas once a radiographer was a technician who took x-rays and looked after the machinery, the contemporary medical imaging professional may be trained in ultrasound, magnetic resonance imaging, computed tomography, breast screening and nuclear medicine (Scatliff & Morris, 2014). Glass plates were replaced by film in the 1920s and the digital era has transformed this profession by the advent of picture archiving and communication systems.

The most recent technological advance which is already having an impact on the health professions is the invention of three dimensional printing. While in its infancy, it is predicted that this advance in medical technology will spawn a whole new industry in printing replacement body parts and require new professions to manage this innovative application (Hayhurst, 2014). It is understandable, then, that employment opportunities for bio-medical engineers are increasing at a rate much faster than other professions and require more specialised and highly trained staff (Athanasίου, 2012).

Expanded Scope of Practice

Expanded scope of practice or advanced practice is engaged in by nurses and allied health professionals who are already at the specialist level of practice but are skilled to provide services beyond that normally expected for a clinician in their discipline fraternity (Pearson & Peels, 2002). Expansion may incorporate roles that are new or vacant, or alternately assume roles traditionally claimed by other professions. Four iterations of this will be used to demonstrate expanded scope of practice in nursing, dietetics, physiotherapy and podiatry.

While the nurse practitioner role has been in place in North America for several decades, it was not trialled in Australia until the early 2000s. Introduction of the nurse practitioner role has been challenged by lack of role clarity, professional boundary issues and absence of recognised training programs (Quinn & Hudson, 2014). Similar experiences were found by researchers in British Columbia (Quinn & Hudson, 2014; Sangster-Gormley, Martin-Misener, & Burge, 2013) who reported the complexities of introducing new roles and the challenges of acceptance and integration into existing workplace structures. The nurse practitioner has advanced skills and expanded scope of practice with legal authority to order tests and

prescribe medications. They utilise a medical approach and can be an economical substitute for a medical practitioner, which has resulted in some opposition from the medical fraternity (Pearson & Peels, 2002).

Case studies of extended dietetics roles have received more favourable acceptance. Stanley & Borthwick, (2013) report on the extension of the dietitian to provide community home enteral tube feeding. Using a qualitative research methodology, they identified five main themes that enhanced acceptance of the role. These were 1) staff shortages and role vacancy, 2) benefits to patients, 3) raising the profile of the profession, 4) negotiation of role boundaries, and 5) managing role conflict.

Expanded roles in physiotherapy have been implemented in musculoskeletal conditions and specifically in emergency departments and orthopaedic screening clinics (Morris et al., 2014). The benefits have been shown to include faster response times and reduced waiting times enabling medical skills in short supply to be better utilised in areas of high need. A critical consideration is ensuring safety and quality of care at least equal to traditional models of care.

Perhaps one of the most evolved professions is that of podiatry, which was known as chiropody until the 1990s (Maher, 2013). In the last twenty five years this discipline has emerged as a well-regarded allied health profession which has expanded scope from being “toe nail cutters” to now being trained as podiatric surgeons. The podiatric surgeon is an example of an emerging health profession that has specialised and expanded vertically to become established as a viable, safe and cost effective alternative to previous models of foot surgery (Maher, 2013). They have been persistently opposed by traditional orthopaedic

surgeons who see this as a dilution of skill and knowledge, and as a challenge to existing market controls.

Substitution and Delegation Models.

Depending on your point of view, delegation models may also be seen as extended scope of practice. Skilled workforce shortages and inadequate professional to patient ratios has stimulated work place reform in a number of areas. Technician and assistant roles are one way of enabling clinicians to spend more time on clinical activities. The delegation of tasks, (or substitution of a clinician) from a regulated health practitioner to another worker has been reported in a number of disciplines. Examples include physician assistants, pharmacy technicians and therapy assistants.

Physician assistants work predominantly in family medicine in a primary health care setting where they undertake physical examinations, investigations, diagnosis and treatment within an agreed scope of practice under the supervision of a doctor (Halter et al., 2013). While the physician assistant role has been in place in the USA since the 1960s, it has only been explored in the last ten years in other countries such as Scotland, Canada and Australia (Frossard, Liebich, Hooker, Brooks, & Robinson, 2008). While attempts have been made to comprehensively implement this role outside the USA, a systematic review by Halter et al., (2013) yielded little evidence of effectiveness with studies reporting mixed results of cost effectiveness. This review concluded that the need for medical supervision increased the workloads of doctors which negated any economic benefits.

The impact of expanded pharmacy technician roles on pharmacist's productivity demonstrates more positive outcomes (Elliott et al., 2014). Using a mixed methodology, Elliott et al., (2014) found that the proportion of pharmacists' time spent on clinical tasks was significant ($p < 0.0001$) increasing from 58% to 73.9%. They also note a corresponding decrease in unpaid pharmacist overtime. In this study the pharmacy technician's role was expanded (as the pharmacist delegated) to assist patients with medication supplies, screening charts and helping with medication reconciliation. This Australian study showed that by providing extended support to pharmacists, services benefited and both staff and patient satisfaction improved.

Using a range of functional outcome measures Cox, Mills, Fleming, & Nalder, (2014) found no difference when comparing patients receiving group programs in a rehabilitation setting led by occupational therapists and those led by an advanced occupational therapy assistant. They concluded that the introduction of an advanced occupational therapy assistant role to replace an occupational therapist did not result in any decline in patient outcomes such as function and length of stay and that the use of assistants is a cost efficient model in a rehabilitation setting. It is this finding that makes many professional groups feel uncomfortable. The transformation of health institutions has precipitated many professional groups to redefine their boundaries and exert their professional independence. A historical view shows that the role of contemporary medical social workers was seeded early last century as "charitable visitors" and occupational therapy borne out of engaging the disabled in craft activities in sheltered workshops and psychiatric institutions (Prud'homme, 2011). Having reached the status and respect that is synonymous with being a professional, it is understandable why industrial levers may be required to institute change.

Pressure from Dual Responsibilities

The challenges that health professionals are facing is not limited to clinical task performance and professional competence. There is an ever increasing expectation that contemporary clinicians possess a level of managerial and business acumen in addition to their core scope of clinical practice (Clark, Spurgeon, & Hamilton, 2008). Consequently, clinicians have expressed resentment towards managers because they perceive that health managers drive structural and operational healthcare reforms more so than reforms as a result of a clinical need (Kippist & Fitzgerald, 2013). This theme is evident across all health professional groups, including medicine, nursing and allied health across the full spectrum of the health system.

From the clinicians' perspective, it is the managers who have limited the clinician's autonomy and control over their clinical practice (Fulop and Day 2010; Spurgeon, Clarke and Ham 2011). In contrast, health managers feel the change is warranted based on the social, political, historical and economical needs of the environment within which they are operating. The rationale behind the development of a hybrid clinician manager role has been two-fold. First, clinicians use more resources than any other group within a health care organisation and, second, clinicians have classically been the most powerful decision-making group within healthcare organisations exercising their professional authority, autonomy and sovereignty (Freidson, 1988) Braithwaite, 2004; L. Fitzgerald & Dufour, 1998; L. Fitzgerald &

Ferlie, 2000;). Managers depend on clinical buy-in for their management strategies to succeed. Consequently, developing a hybrid clinician manager role would mean, at least in theory, that managers, who are also clinicians, would be able to engage clinicians more effectively (Kippist & Fitzgerald, 2009).

The enactment of a dual role has the potential to create tensions and conflict for the occupier of the role as a result of the hybrid clinician manager’s clinical frame of reference. Firstly they see themselves as clinicians and secondly as managers, causing inconsistent implementation of managerial decisions. In addition, the dual role may cause tensions with clinical colleagues, when in the clinicians’ view unfavourable decisions are being made. Hybrid clinician managers constantly have to navigate their clinical and managerial allegiances. This is what Kippist and Fitzgerald (2013) refer to as “paradox” of the hybrid clinician manager role. More than 20 hybrid clinician managers were interviewed and juxtaposed their dual role identities, resulting in Table 2.

Clinical Role	Managerial Role
Clinician	Manager
Professional language	Management language
Medical career	Management position
Clinical values	Management objectives
Individuality	Collaboration
Clinical colleague	Clinician manager
Clearly defined role	Lack of role clarity and structure
Clinical qualifications	Lack of management education
Full/part-time position	Part-time position

Medical community	Management community
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Table 2: Paradoxes of the Hybrid Clinician Manager Role.

When examining Table 2, it is not difficult to conclude that the hybrid clinical manager role is a very difficult one. On the one hand, a need for such a role is clear: there is a great need to engage clinicians with managerial decision making. On the other hand, the enactment of the role is extremely challenging: there is a lack of positional clarity, a lack of induction and ongoing management/leadership education and a lack of support for the recruitment, retention, training and development, and a lack of succession planning. The dual role is poorly defined and poorly supported. The dual role is not an enviable one and attracting clinicians to the role is difficult (Kippist and Fitzgerald 2013).

Hybrid roles are an example of expanded scope of practice with expansion and skill growth into non-clinical areas. For new roles such as expanded roles or hybrid clinician manager roles to be successful and continuing, healthcare organisations must ensure the role becomes one that can be part of a health professional's career pathway. For this to occur, the human resources department has the responsibility for clearly defined job descriptions with role responsibilities and accountabilities clearly outlined.

In summary, many new roles in health have evolved or been introduced. Some in response to population needs, others driven to anchor the managerial decision-making in clinical practice, and to encourage clinician engagement and buy-in on the way. While these may be locally lead innovations such as many of the workforce reforms triggered by jurisdictional industrial drivers, the global environment also has made an indelible impression.

Systems Reform, Models of Service Delivery and Knowledge Management

Increasingly, health care systems throughout the world are affected by globalisation influences. Historically, health systems were nationally developed with influence brought about by local population needs, politics and health economics. A number of key systems issues have stimulated reform and have changed traditional health professional roles. These include drivers include workforce demands; consumer expectations for access and equity; multiple service and support organisations globally; technology expansion and transfer; and cross-system adoption and adaption of models of care.

Health care systems are progressively engaging with patients, clients and consumers for the shaping of services and their responsiveness as well as in relation to stronger accountability and community engagement in decision-making and priority setting for health (Mockford, 2012, Brett, 2014). Access and equity, as well as risk, safety and quality, are driving greater listening and engagement with consumers in relation to their health system. Similarly, the broader framework of personalised healthcare will have a stronger impact on the approach to health care delivery over the coming decades. Personalised healthcare involves a stronger engagement and reliance on community members across the full spectrum of health (preventative, curative and rehabilitation) and also incorporates the study and impact of genetics and genomics.

Development, integration and governance of the risk, safety and quality agenda continues as an essential set of drivers related to effectiveness of health service delivery as well as the value of health service intervention for the community. Routine monitoring will be an essential factor in the large and complex healthcare systems, across both developed and developing countries, in order to ensure effective outcomes for consumers. In addition informatics, integrated care, and human resource management are strategic areas that provide opportunity for change and reform as well as support the potential for the future growth and development of health care systems.

Clinical Informatics Roles

The information revolution that is rapidly and progressively moving across health, aged care and social service sectors is bringing significant opportunities for new discoveries, new ways of providing care and significant improvements in health outcomes to individuals and communities. Health services and systems are data rich. Progressively this data is being interrogated and turned into information that enables specific and systemic decision-making. The analytical and business intelligence capabilities that are being applied to big data in health care organisations and systems will provide significant change in efficiency, clinical problem solving, effectiveness and economy (Chen, 2012, McAfee, 2012, Waterson, 2014).

Several professional groups are emerging to deal with the growing importance of data and information in the health system. The role of the health information manager is a critical contribution to the information management work that affects and impacts on most health organisations irrespective of their complexity, nature or type of service. Specialist informatics roles are emerging to handle big data sets related to biomedical data generated from bio-

pathology analysis, digitisation of cellular structures and computational outputs from primary data capture and analysis. Table 3 demonstrates the continuum from informatics management to information and knowledge translation.

Information Governance				
Information Management				Information Translation Management
Data Collection and Processing – medical records; business records; research results and records	Ethics Confidentiality Protection of records	Information Use	Information Asset Improvement – enhancement of the source and application of the records	Disease Case Management and problem solving – application of knowledge to the whole needs of individuals and communities

Table 3: Continuation of the Information Management Work Functions to Information and Translational and Utilisation in Care Management and Clinical/Quality of Life Management

Applied bio-informatics is an emerging area of knowledge management and requires new skills, learning and developmental abilities to understand and harness both information and opportunity. Large amounts of captured data and information may not be able to be realised in current times as both analytical capacity and discovery around what the information obtained means is lagging behind the availability of the information. An example of this is the ability to carry out gene sequencing and the progressive development of understanding of the meaning of the findings from this information to combine data in a meaningful way and to support clinical decision making (Biesecker, 2012, Biesecker, 2014, Libersky, 2014).

The expansion of bio information and deriving a stronger understanding of the capabilities of the associated infrastructure progressively being developed to use it, will create important work roles in the management and curator roles but also in the development of clinical information managers who support treating clinicians. In this area of work the development of roles that have the ability to understand the management of this information and also the application into the clinical work setting will enable significant translation and application skill to both individual care and understanding of disease and illness management and prevention.

Integrated Care Professionals

Healthcare and aged care systems comprise a range of direct and indirect prevention, treatment, care, research and organisational parts and organisations. Increased specialisation in any parts of these systems and the complexity of managing entry and support across a continuum of care is a critical aspect ensuring quality outcomes to the individual.

The changing nature of roles and functions and expansion of new working in the health professions brings on a range of system, strategic and operational management. Development and transition will require effective leadership and management for emerging new professional work and workers. The health system is a highly political environment and transformation of the workforce to these new ways of working requires careful planning and engagement at all levels.

The ability to link and integrate the appropriate and critical parts of the health system's providers and experts becomes critical in ensuring the efficiency and efficacy of the services. Development and expansion in knowledge management are needed to support evidence based practices (Pentland, 2014). Many developed countries' populations are ageing and the ability for health systems to effectively manage both health care episodes and enhance disability-free years for populations are important development and work areas in health (Bankston-White, 2015).

Within service areas, significant achievements have been made through case management in health settings where cross discipline and cross service co-ordination of care is required. There have been significant improvements in quality of care and outcomes of care within specialised services through case management approaches (Gravelle et al., 2007). The integration of care, particularly for chronic health issues and the inter-face between different parts of the health system (clinical handover) in patients, clients and consumers care will be a significant work agenda in the coming decade (Dusheiko, Gravelle, Martin, Rice, & Smith, 2011; Tummers, Schrijvers, & Visser-Meily, 2012). The extension of work roles that provide interface and interagency working to maintain effective and efficient patient care pathways

across and through several parts of the health system will be important. Considerable development of payee managed care systems (Kongstvedt, 2012) has achieved changes in economies and effectiveness of health systems. The development of interdisciplinary health professionals, teams and organisations to achieve effective care management outcomes will be important developments in future years. Practitioners and managers who will work across professional, agency, sectorial boundaries and functioning in different ways, aligned with the client need and the health setting, will be important to health status, quality and health care costs (Ham, York, Sutch, & Shaw, 2003).

Pressures for the Health Human Resources (HR) Manager in Supporting Health Professionals and Managing the Work Environment in new ways.

The complexity, diversity and importance of the health workforce requires skilled human resource management (HRM). The role that professional HR services have in health systems and how internal problems can be overcome through the proper implementation of management practices is increasingly being recognised (Hongoro & McPake, 2004; Kabene, Orchard, Howard, Soriano, & Leduc, 2006). The role of HRM in health has been described as an emerging role. McBride & Mustchin, (2013) investigated why the role of HR in health has struggled to carve out a role for itself in an industry where many actors are involved in the way work is managed. The results suggest clinicians are commonly the key drivers of change, as HR managers were perceived to be separate from “immediate operational concerns that tended to drive these changes” (McBride & Mustchin, 2013, p. 3142). They argue that there are many challenges facing the HR manager in becoming a key actor in changing work practices and suggest that the process of changing work practices in hospitals was often undertaken in a coping mechanism fashion, driven by economic and resource pressures rather than by strategic HR functions driven by long term goals. This mirrors much

of the changes in the health professions. The obstacles HR managers face in their attempt to manage and support health workers in delivering high-quality health care are also similar. Some of these constraints include budgets, lack of congruence between different stakeholders' values, absenteeism, high rates of turnover and the low morale of health personnel (Kabene et al., 2006, p. 3). Managing a 'healthy organisation' is critical in the health services sector and it should involve addressing symptoms such as the high levels of stress and work overload found in health service organisations (Kabene et al., 2006).

Given the dynamic nature of healthcare "...transformational leadership, job satisfaction, organisational commitment and organisational trust" is increasingly important (Top, Akdere, & Tarcan, 2014, p. 2). HR managers need to foster work environments through the operationalization of HRM policies, planning and practices that are targeted to improve leadership, commitment, trust and satisfaction (Top et al., 2014). In turn, positive effects such as creativity, motivation and cooperation among employees consequently leading to increased organisational effectiveness and performance are created (Top et al., 2014). Therefore approaches to work need to be facilitated and nurtured. The role of the HR professional becomes important in maximising opportunity with complex work environments.

The health workforce exists in a unique demand driven market where demand for health services, (and health professionals) outstrips supply. The nature of the service, in terms of being private or public, cultivates a competitive labour market placing additional pressure on HR professionals in health. Work place cultural differences between private and public sectors add to these challenges. Based on a review of the literature McBride & Mustchin,

(2013) deduced that the public sector is the most challenging in which to put policy into practice and this disconnect arises from a variance between managerial intentions and employee responses and outcomes. Their study found that the function of HRM in health is impacted by issues of “...overlapping sites of regulation and competing agendas”, numerous actors, and restricted resources available to aid the HRM function (McBride & Mustchin, 2013, p. 3141).

Research by Top et al., (2014) studied relationships among transformational leadership, organisational commitment, organisational trust and job satisfaction from a sample of Turkish public servants and private healthcare employees. This study found differences between the perceptions held by private and public employees working in the healthcare industry. For instance, the public servants’ group perceived two dimensions of job satisfaction (operating predictors and communication) and these along with organisational trust were found to be predictors of organisational commitment (Top et al., 2014). In contrast, for private sector employees the two dimensions of leadership (individualised support and fostering the support), in addition to the two dimensions of job satisfaction (promotion and contingent rewards) as well as organisational trust were found to be significant predictors of organisational commitment (Top et al., 2014).

Training

A key challenge faced by both public and private systems is ensuring there is an adequate supply of staff and that these practitioners are sufficiently skilled and knowledgeable to practice “effectively and efficiently” (Kabene et al., 2006). Implementing a training strategy in healthcare is challenged by the time involved to upskill staff with recognised qualifications

particularly when there is a shortage of staff. Hongoro & McPake, (2004, p. 1453) explain that training staff for an immediate start requires a long-term view: “for example, it takes a least 5 years to train a doctor and 3 years to produce a nurse”. Workforce planning is therefore becoming an additional pressure Health HR professionals face as the general population both ages and grows.

Some researchers argue that the training provided to health care professionals needs to be accelerated to meet the growing needs of staff but also the evolving requirements of their position (Lehmann, 2008). Others have explored workforce redesign, and the use of substitution and delegation models (Nancarrow et al., 2013). Concerns have been raised about the effectiveness of training of auxiliary staff and the need for compulsory training that is monitored regularly (Lehmann, 2008). Similarly, it has been noted that these support staff who often do not have internationally recognised qualifications help to “keep the system running in a number of countries” and this calls for more research to help understand the role they play, and the training alternatives (Hongoro & McPake, 2004, p. 1455). Another area of workforce planning is the issue of migration.

The migration of health care professionals to urban areas has received much attention in the literature. HRM in low to middle income countries’ health care systems faces special challenges where a shortage of funds, skilled professionals and training is present ((Hongoro & McPake, 2004). Strategies that are effective in solving these issues, such as investment in additional training systems are a challenge in health when this option would have limited effectiveness in the short term and would not be cost effective in the long term. A potential solution proposed by Hongoro & McPake, (2004, p. 1453) is that “sufficient funding on the

international level would have to support these strategies to induce developed world institutions to play a substantial part, and such funding has high opportunity costs in developing countries themselves”.

It has been suggested that younger workers (particularly women) are choosing a career in nursing. This has contributed to the decreasing average rate of return after investing in training and education, compounded by the improved expansion of opportunities in traditionally male dominated professions which yield higher rates of return. The under-representation of women in managerial and decision-making positions may lead to less attention to, and a poorer understanding of, the problems specific to women (Dussault, 1999, cited in Zurn et al, 2004, p.10). The challenge of supplying the ever-increasing demands of a skilled and competent workforce is therefore compounded by this shift of women out of areas of dominance, such as nursing, into more non-traditional and male domains of work. However, it is evident that women are still under-represented in managerial positions and still tend to dominate lower-level health care positions in some countries (Zurn, Dal Poz, Stilwell, & Adams, 2004). Similarly, educational opportunities have increased the number (and ratios) of women completing health professional qualifications should result in a correction of workforce numbers for women who have family and carer commitments during careers. These situations offer strength and the need for strategic human resource management. The opportunity to enhance skills and capability in the work force through changes in role and specialisation are important to the health sector. Changes that could weaken workforce availability and community (given long time spans in educating and qualifying health workers) need to be strategically managed.

In contrast to nursing, the medical profession has become increasingly feminised. Whereas once the female medical student was a very small minority, 50 – 60% of medical students are now female. This has been referred to as the “feminization of medicine” (Phillips & Austin, 2009) and brings new challenges to the HR manager in health. The introduction of “family friendly” policies, parental leave entitlements and flexible work arrangements has altered the social structure of the health and medical workforce. This creates a tension between implementing contemporary HR practices in a service that requires staff to be rostered to provide the care that consumers expect 24 hours a day, 7 days a week. The situation is further magnified by an aging workforce and personal life style choices (Adams, 2010).

Recruitment, Employment and Retention

Internationally, employment types and contracts within healthcare settings are becoming more complicated (Graddy and Ye, 2008 in Top et al., 2014). As Governments continue to look to outsourcing to minimize labor costs and diversify workplaces, HRM managers need to be equipped to deal with challenges that may arise (Top et al., 2014). The integration of various employment contracts within an organisation may impact on the way HR managers in health deal with employees’ perceptions. (Top et al., 2014) suggest that such diversity of employment contracts may impact on employees’ perceived justice, equality, loyalty as well as their job performance and attitudes.

Various strategies of health reform and policy have been introduced worldwide with varying degrees of success. For example, in Canada cost-containment measures were introduced to control expenses however some strategies reduced performance. An example is threshold reductions which were introduced to cap physician billing which resulted in a reduction of

physicians' income. Some responded by taking a leave of absence rather than accepting a payment which they perceived to be inadequate compensation, placing the already limited workforce under even greater pressure (Zurn et al., 2004).

Staff in developed countries are commonly recruited and retained using a variety of economic benefits which include “tuition reimbursement, flexible hours and signing bonuses” however a survey of hospitals in the United States revealed the most common benefits were health insurance and vacation time (Zurn et al., 2004, p. 5). The retention of health care professionals in poorer/developing nations is challenged by the fact many are “under paid, poorly motivated and very dissatisfied” (Kabene et al., 2006). To retain health workers in developing countries improved pay and working conditions are needed (Zurn et al., 2004). Kabene et al., (2006) suggest the recruitment of a health system workforce is challenged by a country's health care workforce capacity which is often reflected by its size, distribution and composition. Challenges in recruitment and retention are visible signs of issues in the work environment and whilst it is recognised that external factors do contribute, HRM can try to overcome them through improving the internal work environment (Lowe, 2002). Health improvement strategies (Lowe, 2002) include encouraging multidisciplinary thinking through the organisation and adopting a long-term view on the management of the workforce. In addition HR planning should extend beyond issues such as recruiting and succession planning to devote attention on improving the development and utilisation of existing personnel.

Health Labour Supply

Zurn et al., (2004) developed a typology of health workforce imbalances which included; profession/speciality imbalances, geographical imbalances, institutional and services imbalances, and gender imbalances. Healthcare personnel imbalances are impacted by health policies (both health care and non-health orientated) as well “... global factors such as economic, socio-demographic, political, geographical and cultural factors are included” (Zurn et al., 2004, p. 2). The age distribution of a nation impacts on the human resource management of health care systems particularly on the demand and delivery of services in the future (Kabene et al., 2006). For example, a health care system operating in a nation with an aging population will experience greater demand for health care services and greater training of younger workers will be needed to fill the positions of aging personnel (Kabene et al., 2006).

The issue of an aging profession is a global challenge. A study of the South African Health system found the health workforce is significantly weaker than it was in the 1990s, with fewer doctors and nurses, despite a growing population (Lehmann, 2008). It has been reported that there has been a nursing shortage internationally for years and one (Zurn et al., 2004) critical review highlighted that there is still an imbalance present in various facets such as an inadequate number of qualified persons, shortage of skilled persons and estimating healthcare needs (demand) solely based on population numbers (Zurn et al., 2004).

Conclusion

A range of developments, changes and reforms will affect the nature and type of work undertaken by almost all professionals working in the health sector. The demographics of populations and shifts in the economics of health care delivery will impact on the numbers of

health professional needed in public, private and third sector health organisations and across the primary, secondary, tertiary and research and development sectors. Change drivers are creating new professional working in health and the size, complexity and long term investment and roll-out of qualified and experience health professionals requires strategic balance and manoeuvring.

This chapter has presented a variety of new and emerging roles in an attempt to demonstrate how historical, industrial, demographic and scientific factors have influenced the health professions. In the context of the increasing complexity of roles and medical technology, professional management and leadership will be necessary to optimise the opportunities and impacts that are occurring for work in the health sector. New roles, such as hybrid clinical managers and specialist roles such as clinical informatics specialists will be required to manage this demand and opportunity. The diversity and multi-professional nature of health necessitates human resource managers to take on a growing strategic role and responsibility for future workforce planning. While health care continues to absorb a large percentage of community budgets the need for a well skilled, resilient and flexible workforce will continue.

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