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Human Capital Alliance

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PROPOSED STUDY OF THE HEALTH INFORMATION WORKFORCE

Scoping study undertaken for Health Workforce Australia to establish the best approach to studying an emerging health workforce and to estimate with some degree of precision a required budget to support the study effort

Contents

Background

Introduction

Over the last decade or so stakeholders in the area of '**health informatics**[1]' have been undertaking work on their own behalf (sometimes with government funding support) and lobbying government at various jurisdictional levels in the cause of obtaining a more secure workforce supply for current and future demand[2].

There is widespread and seemingly uniform apprehension within this stakeholder group that available health informatics competencies are currently inadequate for the requirements of a modern health system, a situation likely to get worse. In recent times a range of independent (at least of professional association interest groups) studies have been undertaken of parts of the 'health informatics' workforce, the results of which generally validate stakeholder concerns[3].

Formal requests have been made to Health Workforce Australia (HWA) to investigate the 'health informatics' workforce comprehensively in order to better understand and quantify the problems and lend support accordingly to a range of proposed education and training solutions.

Workforce overview

Most of the stakeholders consulted during this scoping exercise emphasised the broadness of the workforce and the requirement for very widespread possession of 'health informatics' competencies. In this regard the 'health informatics' workforce is very similar to the public health workforce where most observers have noted the obligation of many in the health care workforce to contribute to public health outcomes, but only a small number to 'specialise' and to focus only on public health work[4].

[1] This term to describe the workforce being proposed for study is used quite widely within the literature. It is incorporated in the title of arguably one of the two most important relevant professional associations, viz. the Health Informatics Society of Australia (HISA). And yet the term is not without controversy. Some stakeholders consulted during the scoping study objected strongly to the term 'health informatics' believing it overemphasises the "technical" element of the workforce. The use of this term is debated later in this paper.

[2] For example, see AHIEC (2010) Briefing Paper for Health Workforce Australia, September; NEHTA (2010) Draft Briefing Paper for Review. Attachment C, September.

[3] For example Workforce Design & Liaison Unit (2010) *Queensland Health HIM and Clinical Coder Workforce Project*. Clinical Workforce Planning & Development Branch, Queensland Health, February ; AIHW (2010) *The Coding Workforce Shortfall*. Cat No. HWL 46, November; Shepheard, J. (2010) Health information management and clinical coding issues. *Health Information Management Journal:* 39 (3) 37-41.

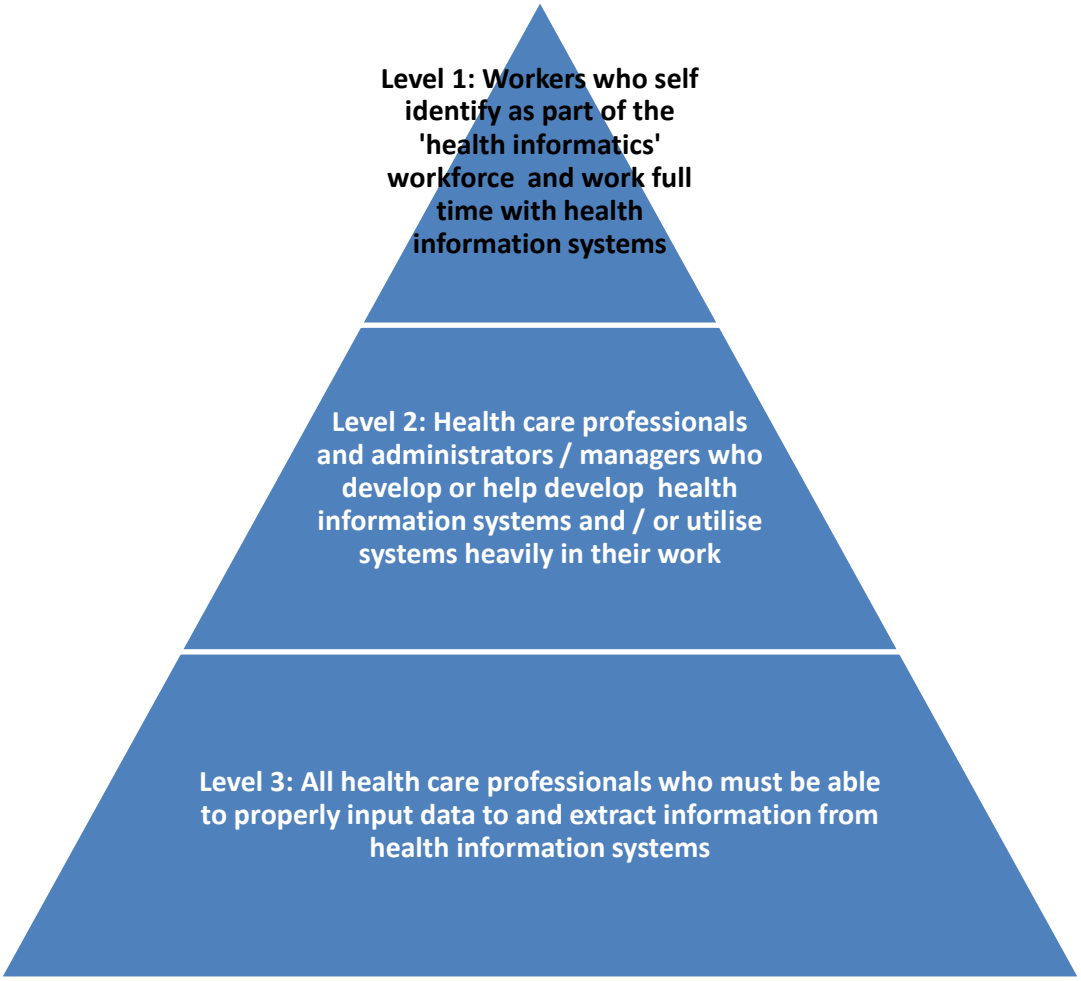
[4] See for instance Ridoutt, L, Cook, K, Gadiel, D, Wise, M (2004) *Calculating demand for an effective public health workforce*. Final Report for the National Public Health Partnership, July 2004, National Public Health Partnership

The Australian Health Informatics Education Council (2010)[5] distinguishes three separate types of 'health informatics' workforce, each with clearly differentiated competency requirements:

> *" … [there is] need for a core of health informatics knowledge amongst all health care practitioners (clinical, IT and administrative) to support the implementation of the national e-health initiatives and to work safely in an e-enabled healthcare environment. There are then specific general health informatics skills required of all professionals working with health computing. This indicates the need for those qualified in IT to gain specific skills to work safely in healthcare just as much as it requires clinicians and other professionals to gain additional skills to function in health IT projects. Then there are detailed additional or higher level skills required to perform specific tasks (shown inside the grid of specialisations and skill level) or to be considered a specialist in a given area of health informatics."*

This conceptualisation of the workforce is summarised diagrammatically in Appendix B, but is hopefully more graphically and lucidly represented in Figure 1.

Figure 1: The broad segments or levels of the 'health informatics' workforce



[5] Ibid

Clearly the largest workforce number, as Figure 1 illustrates, is in the base level, which consists of nurses and GPs, allied health personnel, medical pathology scientists, radiographers, administrators, researchers, etc. all of whom must currently have certain competencies to be able to generate and use health information safely. It is problematic though to call this workforce a segment of the 'health informatics' workforce just as it would be problematic to call a GP who understands and practices preventive health care principles a 'public health worker' or a clinician who contributes to the learning of novice practitioners a 'human resources practitioner'. Health care workers and administrators / managers are expected to understand and use a range of tools to perform their work well — a health information system is one of the tools. The training of this segment of the workforce is essentially an in-service training exercise, or incorporated within professional preparation courses.

At the second level of the workforce pyramid are a wide range of workers at the core of whose work lays interaction with a health information system. This may be because they are involved in developing systems, setting the parameters of systems, collecting and inputting data through research, relying on health information systems to perform their work. They may be creating and using stand alone or linked data bases. And yet, while they may have higher order 'health informatics' competencies, that might even be the equivalent of attending a relevant postgraduate course (say a graduate certificate), they will probably still not identify as part of the 'health informatics' workforce. They will self identify as epidemiologists, health economists, policy analysts, heath service managers, medical administrators, medical researchers, GPs mining practice data … in essence their foundation profession. Labelling this part of the workforce as 'health informatics' is less problematic than for the base level workforce, but still problematic.

Finally there is the segment of the workforce that identify as part of the 'health informatics' workforce, or a correspondingly labelled entity. Their work roles require them to only work **directly** with and on health information systems. This part of the workforce population is unequivocally in the 'health informatics' workforce. Their competencies will likely have been derived from a specialist educational preparation (undergraduate degree or equivalent).

Key message: The focus of any 'health informatics workforce' study should be on the top layer of workforce in Figure 1.

It would be helpful to study as well the second workforce, even if only to undertake descriptive analysis, since this workforce directly impacts on demand for (potentially reduces) or supply of (supplements available competence) the 'specialist' workforce. A focus on this segment of the workforce would only be considered if resource requirements for study of the 'specialist' workforce were adequate.

The 'specialist' workforce boundaries

If the focus is on the 'specialist' component of the workforce, there has been, as noted previously, a recent rash of studies undertaken into the 'health informatics'

workforce at the national and state level (at least three published in 2010 and another soon to be released). These research efforts beg the question as to why HWA need to become involved in anything more than a literature review to meta-analyse existing study results. The justification lies in choosing to define workforce boundaries for the 'health informatics workforce' that extend ***significantly beyond*** the boundaries of the workforce that is the subject of current and recently completed studies.

That is, the focus of the Australian Institute of Health & Welfare (AIHW), Queensland Health and Victorian Department of Health studies[6] is the **health information management** (HIM) and **clinical coding** workforce. These are two separate but intimately linked workforces, and make up arguably the core and most easily recognisable (and describable) elements of the 'health informatics' workforce. Both workforces have distinct Australian and New Zealand Standard Classification of Occupation (ANZSCO) codes (see Appendix A for ANZSCO descriptions), unlike any other component of the 'health informatics' workforce, and as a consequence have workforce size estimates and workforce descriptions from the last three Population Census'. Moreover they have clearly related, discernable and recognised job titles, clear education and training pathways, and have been continuously represented by a professional association for over 60 years (Health Information Management Association of Australia; HIMAA). The two workforces are clearly the main (possibly even sole) concern of employers currently because of a high proportion of difficult to fill vacancies. This component of the 'health informatics' workforce is comparatively easy to study.

Most stakeholders (even HIMAA) consider the ANZSCO coded occupations to be an integral but incomplete account of the workforce needed to be studied, the workforce most commonly (but not universally) referred to as the 'health informatics' workforce. While acknowledging that the HIM / coder workforce should not be considered in isolation, HIMAA have nevertheless indicated discomfort in the use of the term 'health informatics' to designate the broader workforce. They prefer to talk not in generalities about the workforce but rather about specific components, and in this context relegate 'health informatics' to the status of labelling *one component* of the larger workforce, one which is separate to but overlaps with the HIM component. HIMAA do not offer an alternative term to 'health informatics' to denote the broader workforce[7].

Not only is there controversy about the naming of the workforce but also some debate as to the work it performs. A reasonably well accepted statement though of the work is that offered by the Health Informatics Society of Australia (HISA), reported in Michael Legg and Associates (2009) [8]:

> " ***… the collection, storage, retrieval, communication and optimal use of health related information, data and knowledge in health***."

The Australian Health Informatics Education Council (AHIEC) has attempted to broadly map all the types of workforce components that perform the work defined

[6] See footnote (3)

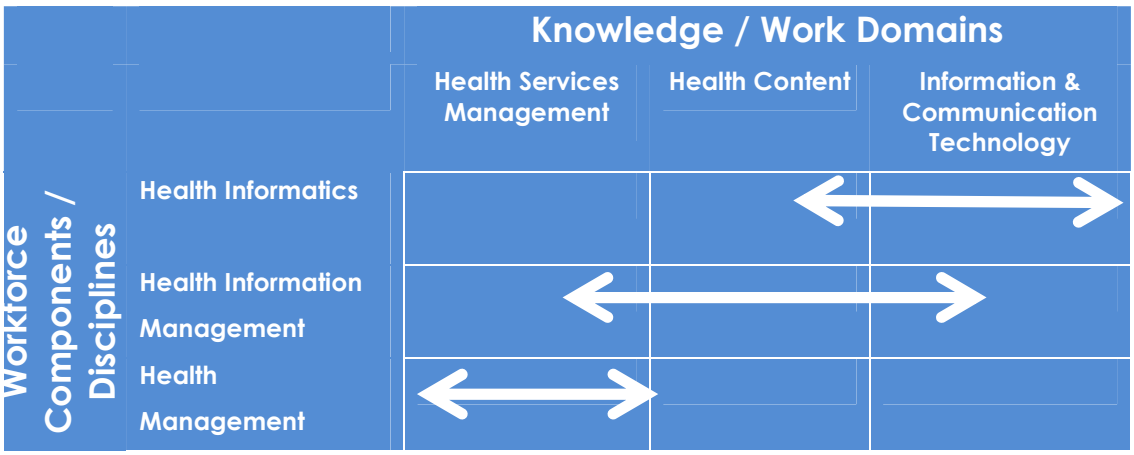
[7] Note that depending on how this broader workforce is defined and estimates of its size calculated, the HIM and coding workforce is believed to contribute between one quarter and one third of the total broader workforce size.

[8] Micheal Legg & Associates (2009) *A Review of the Australian Health Informatics Workforce*. Report to the Department of Health & Ageing, Health Informatics Society of Australia September

above (see Appendix B). It is a seemingly complex matrix of competencies, areas of work and occupational titles, but it effectively narrows the workforce components down to health informaticians (technical, specialist and clinical), health information managers, terminologists and educators. Since the last two groups are very small in number and likely to derive from the other two larger groups, effectively the workforce consists according to this model of health informatics people and health information management people.

This categorisation of the workforce seems to be largely supported by HIMAA who promoted to this study a model presented by Karen Gibson from the National E-Health Transition Authority (NEHTA) at the AIHW Workforce Workshop[9]. The model is outlined in Figure 2, and identifies a 'health informatics' workforce component which largely brings technology knowledge and competence, a 'health information management' workforce which largely contributes to the content of health information systems, and a 'health management' workforce which largely has knowledge and skill to utilise health information.

Figure 2: Possible model of the health information systems development, management & utilisation workforce



Source: Adapted from HIMAA documentation

The last of these three workforce components seem to be the most contentious in regard to inclusion within the boundaries of a broadly understood health information workforce. This part of the workforce seems to equate best with the second level of the workforce outlined in Figure 1. Michael Legg and Associates (2009) in their survey found a significant proportion of workers who use health information systems (for a range of purposes) prefer to be considered as part of the clinical or public health workforce, that is as a nurse, medical practitioner, pharmacist, medical administrator, epidemiologist, health promotion worker, etc. rather than as part of a 'health information' workforce[10]. Health service / care managers similarly seem to prefer to be considered as managers, not as part of the 'health information' workforce. In other words, boundaries around the workforce that allow for workers that perform health information system **development and management** work

[9] Reported in HIMAA Comments on 'A Review of the Australian Health Informatics Workforce', an unpublished document made available to this scoping study.

[10] Legg and Associates (2009) found only 59% of approximately 1,300 'health informatics' professionals surveyed actually identified with that generic title.

(including preparing information for utilisation), but not work associated with utilisation of information (to make decisions), would be acceptable.

This way of defining the workforce boundaries effectively narrows a potential workforce study to three components, IT engineering and science professionals, health information managers (including clinical coders), and health informaticians. Such an approach appears to be supported by Michael Legg and Associates (2009) who divide the entire health information workforce into workers doing one (or both) of two types of work, *viz*.:

- work 'in the system'; and
- work 'on the system'.

Details of what comprises work 'in' and 'on' the system are provided in Appendix C.

Key message: As in all workforce studies the definition of boundaries are critical. Methodologically, the clearest boundaries would be those determined by relevant ANZSCO codes. This path does not appear to be politically acceptable to all (perhaps a majority) of stakeholders. A broader but still manageable definition of the workforce boundary could include health information managers / coders, health information systems developers, health informatics workers (overlaps with the first two).

Both Figures 1 and 2 refer only to workforces active in the delivery of health care services. Stakeholders and some authors like to include a range of workers outside the health system in the 'health informatics' workforce, for instance from the IT support industry (e.g. software developers and vendors). Including this workforce seems problematic, since the vast majority (if not all) of these workers would not identify as part of the 'health informatics' workforce. Including them in any study makes the study immeasurably harder.

Issues of demand

Over the last 20 years the collection and storage of health related data in health information systems has exponentially grown, especially in hospital services and most especially in those states and territories where activity based funding arrangements have been introduced. While the move to electronic methods of data collection and storage would have initially offset demands on workforce of increased data collection requirements, in more recent years the complexity of data collections and the increasing comprehensive nature of collections is driving growth in workforce demand. The AHIEC (2010) notes significant committed and promised state and federal government investment in electronic health information systems and identify the following key drivers underpinning the investment resolve:

- manage the increasing costs of healthcare (for a country with an aging population;
- reduce medical errors and duplication of tests through improved communication and computer based decision support for clinicians (estimated cost to Australia: more than $3 billion yearly);
- improve the ability of the health care workforce to cope with a reduced workforce and increasing demand by using technology to gain efficiencies of

information processing, availability and management and increase patient partnership in healthcare; and
- improve the quality of state and national data collections to support clinical, administrative, policy and public health decision making.

Investment in the private health sector has been growing for many years, driven by market forces. In the pathology services area in particular effectively shrinking Medicare rebates for services in the Pathology schedule in real dollar terms (the Australian Association of Pathology Practices claims rebates are now lower than they were in 1985[11]) have been managed through *e-health* efficiency gains in the ordering and reporting of tests. NEHTA see these types of 'market' driven changes in health system transactions, for instance in discharge processes from acute and aged care, electronic referral and e-pharmacy, as well as in pathology and other diagnostic services, as being the building blocks for change.

Little quantitative information is yet available on demand for the health information workforce, yet this has not deterred stakeholders from suggesting a significant unmet demand is already manifest, and that this will only grow as more parts of the health system are forced to adopt activity based funding (for instance outpatient activity, aged care, community based services) and move to electronic health information systems.

Issues of supply

At the same time as stakeholders are arguing demand for workforce is growing, they are claiming workforce supply is declining at least in certain components of the workforce. This is as a result of recent closures of relevant health information management undergraduate courses that were preceded by a gradual decline in course enrolments and as a consequence graduate supply. This is illustrated in Figure 3, the data for which comes from HIMAA.

In truth, the actual supply of the health information workforce, apart from the ANZSCO coded component, is completely unknown and only very crude estimates have been attempted. Indeed the situation prompted Michael Legg and Associates (2009) to state:

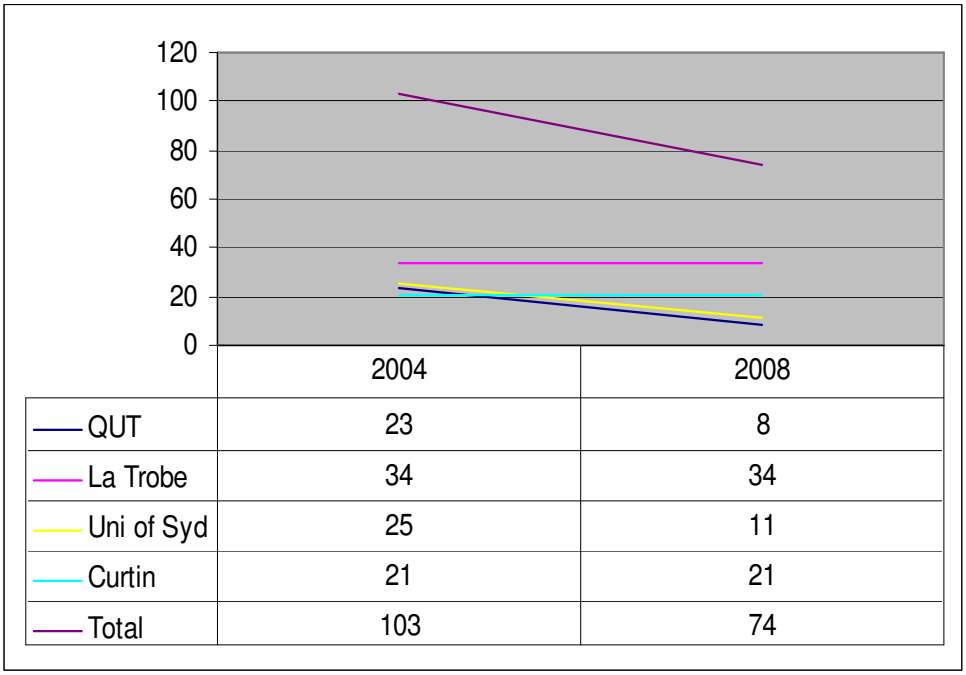
> *"Too little is known about the health informatics workforce – we know neither how many we have now, nor how many we need, and there is no indication that it is yet part of any national health workforce strategy …"*

Workforce shortages

Without even a reasonable estimate of workforce demand or supply, it is not possible currently to be definitive about the state of the labour market. However, as noted previously, significant vacancies are now being reported for some workforce categories (notably clinical coders and health information managers) indicating at least part of the health information workforce is in shortage.

[11] AAPP (2009) Pathology in Australia.

Figure 3: Trend in graduate supply from HIM courses



	2004	2008
QUT	23	8
La Trobe	34	34
Uni of Syd	25	11
Curtin	21	21
Total	103	74

Richardson (2005)[12] offered a taxonomy for categorising workforce shortages as follows:

1. Level 1 shortage:
   i. There is a shortage of trained health care workers; however
   ii. There is a long training time to develop the skills; and/or
   iii. There are limits to the capacity of training organisations
2. Level 2 shortage
   i. There is a shortage of trained health care workers; however
   ii. There is a short training time to develop the skills; and
   iii. The capacity of training organisations can be readily expanded
3. Level 3 shortage: Skills mismatch

   There are a sufficient number of trained health care workers who are not already employed, but they are not willing to apply for the vacancies under current conditions.

4. Level 4 shortage: Quality gap

   There are a sufficient number of trained health care workers who are not already employed, but who lack some qualities that employers think are important.

On the limited evidence available the shortage in the health information workforce is more likely to be classified as a Level 2 or Level 4 shortage. Small sections of the workforce could potentially be classified as a Level 1 shortage and therefore requiring longer term solutions.

[12] Richardson, S. (2005) *What is a skill shortage*? Draft paper prepared for NCVER by the National Institute of Labour Studies

Purpose and objectives

The stakeholder consultations revealed a wide ranging wish list for the outcomes of a study of the health information workforce. This included (in no particular order of attached importance):

- a better understanding of the demand, especially what employers are willing and able to employ in the short and long term. What are the key drivers of demand?
- implications of demand for labour of current and projected government investment in health information systems, information communication and electronic health records;
- a comparison with international workforce models, especially how other countries have approached determining the nature and size of demand and how they have attempted to satisfy demand. Are there appropriate benchmarks — for instance the health information competencies required by a benchmark organisation like Kaiser Permanente?
- assessment of current supply of different types of workforce;
- identify priority areas of labour need (assess and classify areas of shortage) and provide advice on best workforce investment pathways. Several stakeholders seemed happy (perhaps happier) to obtain an understanding of any workforce shortage in terms of competencies rather than occupations or job titles;
- exploration of career frameworks and suggestions as to how components of the health information workforce might relate and career pathways be constructed; and
- examination of existing work organisation approaches and the extent to which teams / team work are currently employed or could be used.

Stakeholders also had some desire for the study to deliver solutions in a short time frame so that more immediate actions could be instigated. Given that they also want a comprehensive examination, the suggestion was to deliver an interim report that possibly targeted action in "low hanging fruit" areas and then a later report that was more strategic in orientation. All stakeholders appreciated the opportunity for maximum collaboration during any proposed study between key stakeholders and the research resources.

Based on the expressed wishes of the stakeholders and rudimentary analysis of available documentation (see 'Background' above) the proposed project objectives are to:

- Identify and assign some level of importance the main drivers of demand for health information workforce now and in the future;
- examine and quantify as much as is possible[13] the current and future (5-10 years) demand for health information system workforce in Australia based on current requirements and predictions of growth. Demand estimates will be

[13] It would be ideal, and highly appreciated by most stakeholders. to satisfy the objectives of a classical workforce planning study. It is worthwhile it seems setting such an objective, but not insisting on achieving this objective if the estimates for supply and demand prove to be based on data that is too thinly supported by evidence and represents too much of a guesstimate and not enough of a reasonable prediction.

developed using competence and / or functions as the primary unit of analysis, from which labour unit requirements can be extrapolated;
- examine and quantify existing supply of competence of health information system workforce and estimate future growth in supply (5 – 10 years);
- describe how supply of the health information system workforce is currently made available (what pathways to health information roles have incumbents travelled) and the way/s the work is currently organised and allocated to this workforce; and
- assess the magnitude of any current and future gaps between demand and supply of the health information system workforce and categorise the nature of the gaps, allowing for the possibility that different types of shortages might apply to different workforce segments or in different sectors of the health industry.

Proposed methodology

Overview of research activities

Most major workforce planning projects piece together a robust understanding of current and future demand much like a jig saw puzzle drawing on a comprehensive range of inquiry approaches to gather the necessary information. The inquiry approaches planned for this study are:

A. A literature / document review — building on the list of documents already gathered by searching especially for reports from overseas contexts and aimed primarily at identifying major influences on labour demand and understanding the impact of these various factors including different levels and types of government and private sector investment. The standard literature review may need to be supplemented by personal communication with selected overseas stakeholders, for instance Jennifer Zelmer in relation to future directions for SNOMED;
B. Secondary data analysis — that is analysis of existing data sources where the data has been collected for general use (e.g. Population Census data) for purposes other than workforce planning (for instance data collected for activity based funding or education and training purposes);
C. Interviews with selected key informants —subjects from various stakeholder organisations and interest groups to be interviewed to seek opinion on the main influencing factors upon which to focus;
D. A set of case studies — where carefully selected areas / sites that include primary health care, acute care aged care and specialist care will be studied to examine current workforce practices, work requirements (within and between care sectors), adequacy of workforce for estimated work, future influences on demand, future strategies for supply;
E. A search conference — at which the future of health information services can be explored and several possible scenarios developed for each of which the labour implications can be considered;

The diagram shows how these various approaches to information gathering and analysis relate to and act to satisfy the proposed study objectives — that is how the jig saw fits together to provide a complete picture.

Figure 4: Matrix identifying satisfaction of proposed objectives by process of inquiry

Study objectives	Methods of inquiry				
	A	B	C	D	E
Identify, and assign some level of importance to the main drivers of demand for health information workforce now and in the future		✓	✓	✓	✓
Examine and quantify the current and future (5-10 years) demand for health information system workforce in Australia based on current requirements and predictions of growth.	✓	✓	✓	✓	✓
Examine and quantify existing supply of competence of health information system workforce and estimate future growth in supply (5 – 10 years).	✓	✓		✓	
Describe how supply of the health information system workforce is currently made available and the way/s the work is currently organised and allocated to this workforce	✓		✓	✓	
Assess the magnitude of any current and future gaps between demand and supply of the health information system workforce and categorise the nature of the gaps.		✓		✓	

Key to methods of inquiry

A. A literature / document review
B. Secondary data analysis
C. Interviews with selected key informants
D. Set of case studies
E. Search conference

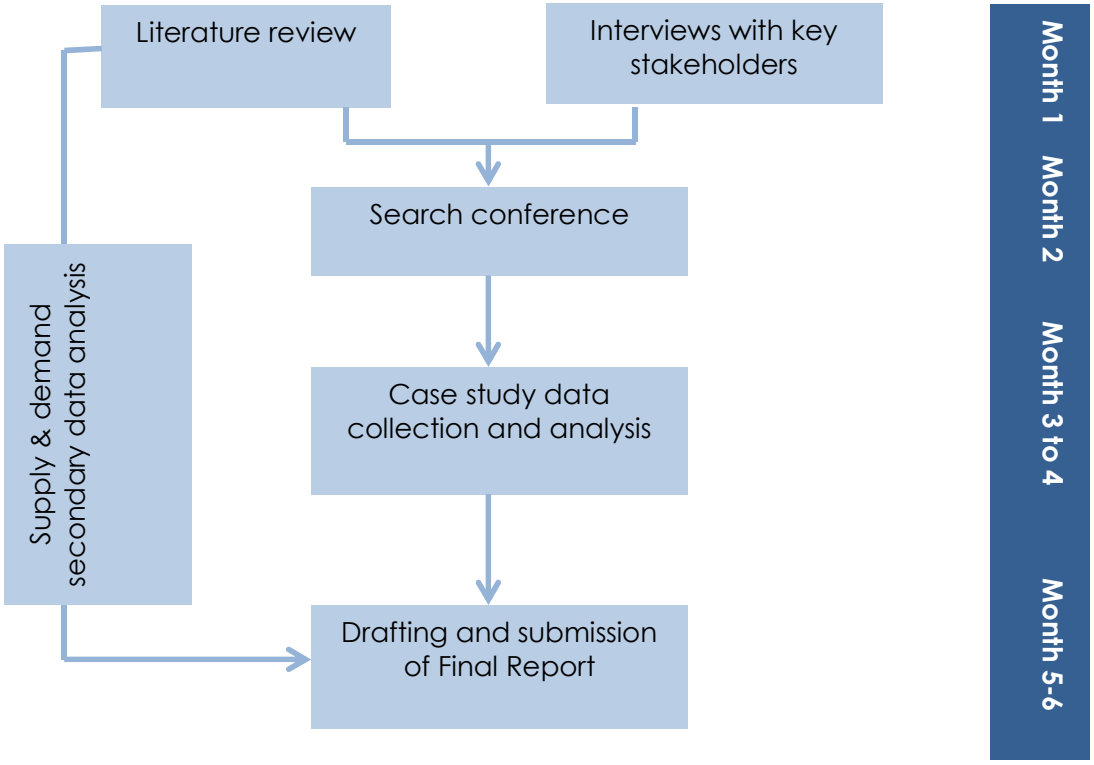
The study is proposed to be completed within six months. A tentative and very rudimentary timeline for the completion of the study is illustrated in Figure 5.

In the following sections some of the detail of important method aspects is described.

Case study approach

In crafting a methodology for the health information workforce the major problem considered was that the bulk of past workforce studies had focused on the acute care sector because this is historically where most is known about demand for health information services and where measuring workforce supply is easiest. The extent of health information systems effort outside of the acute care sector is largely unquantified. Information systems that capture and allow use of patient data in primary health care, aged care, diagnostic services, community care and link this to acute care has been identified as the area of greatest potential growth in demand for workforce.

Figure 5: Tentative timeline for the proposed study

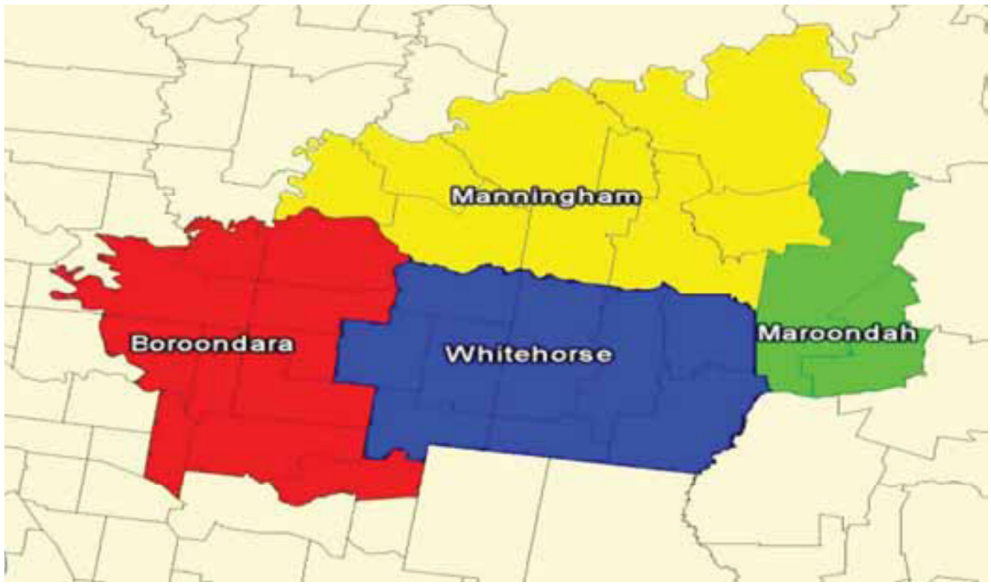


The proposed **case studies are at the heart of the methodology**. They conceptually address the above problem in coming to understand and especially quantify important workforce supply and demand variables while still providing for a manageable approach. Attempting to examine the whole health system would be prohibitively costly.

Three case study sites or areas are proposed[14]. In choosing sites several possible environments would ideally be covered; urban / rural, public / private sector service delivery, large teaching / smaller district hospitals. The sites suggested below have been chosen first because they satisfy the various environment contexts above, and second because work has already, or will be soon, undertaken (for instance by NEHTA in their PCEHR Lead Sites) in these areas that would provide useful background [demand] information and valuable (and probably willing) contacts to help with further data collection. The three proposed sites are:

- The area covered by the **Melbourne East General Practice Network**, which stretches from Fitzroy to Croydon and includes approximately 145 general practices, a large number of pharmacies and aged care facilities, several major public and private sector hospitals. It caters for a population of approximately 540,000 people. The LGAs covered are shown in the map below. This is a proposed PCEHR Lead Site.

[14] The number of three studies is entirely arbitrary. One could argue in favour of a small number of case studies but with much more intensive data collection in each (as proposed here) or a less intensive examination of a larger number of cases studies.



- The area bounded by the **Hunter Urban Medicare Local** (currently very similar to the Hunter Urban Division of General Practice) which covers all the suburbs of Newcastle. The population of the area is approximately 460,000 and has 430 GPs. There are several public and private sector hospitals including a major teaching hospital. This is a proposed PCEHR Lead Site.
- The **Far West Local Health Network**, a new local health network in NSW formed as part of the implementation of the National Health Reforms. It includes the most remote towns of NSW (see map below), thus presenting a real challenge to health information systems implementation. The area was a case study for the AIHW workforce study.

In each case study area data will be collected in the following ways:

- Consultations with stakeholders in the case study area who have insight into health information systems and health information workforce within primary care, acute care, aged care and community services. Within the non acute care sectors, some guidance will be provided to the search effort by focusing on the 'E-building block' areas established by NEHTA of ePathology, eDischarge, eReferral and eMedications. The number of interviews required in each case study will vary depending on the level of system integration. Interview subjects will be identified with the help of industry partners[15]. Interviews will help set up later data collection processes, help construct a description of the health information workforce, identify major drivers of current and future health information work;
- A survey administered to all identified managers of health information services and workforce, identified as persons managing one or more agreed health information functions. The survey (likely to be conducted by phone) will quantify and describe the current health information workforce, assess immediate workforce adequacy, understand work organisation (and career frameworks), and gain insight to micro level current demand and demand growth;
- Managers will be asked to either identify workers for the research team or distribute a survey direct to workers. The survey will attempt to better understand the workforce in terms of gender, age, grade, workforce intentions, functions performed, competencies possessed, competencies utilised. Career pathways (that is the history of how and why health information workers got into their current jobs) may also be the subject of investigation, although this is typically not suited to a 'mailed' questionnaire survey approach since pathways are generally so idiosyncratic. An alternative approach used by HCA in the past was through telephone interviews[16]. A compromise might be to telephone interview a sample of the survey respondent population. The outcome of this part of the study would be to better understand the diagram shown in Appendix D taken from a recent NEHTA Briefing Paper (14 May, 2010).

An extension of the work associated with each case study to that outlined above could be to go further than the 'specialist' health information workforce and attempt to explore the closely related workforce segment (second level) identified and discussed in Figure 1. This workforce would be near impossible to capture completely, even within the comparatively controllable confines of a case study area, however a sample could be generated through (1) health information specialist informants (who do you deal with? Who uses health information systems most? Who helps with systems development projects?) and, (2) snowball techniques where each survey / interview subject is asked for more colleague referrals.

From each case study, a complex and comprehensive picture will be gathered that will provide a much better indicator than present of workforce demand and supply,

[15] It is envisaged that this project will require and benefit from a tight relationship with a body of key stakeholders made up of representatives of professional associations, industry groups and government. See section on 'Project governance'.

[16] Gadiel, D., Ridoutt, L., Cook, K. and Barrett, E. (1998) *A Study of the Issues Surrounding Female Participation in the Australian Medical Workforce*. AMWAC, February

particularly what can be expected in terms of rate of growth generally and in specific health service sectors. A quantitative assessment of 'gaps' between demand and supply [by health area or sector], will be possible, and this can be used to extrapolate to the total Australian workforce.

Macro level analysis

The literature and document review and analysis of secondary data will allow a broad, national perspective to be developed on health information workforce demand and supply variables, both current and future. As such, these proposed study components offer a counterpoint view to the more fine grained but geographically specific case study findings. Together the three components form **the foundation** of the study. The other two components, (C) interviews with selected key informants and (E) the search conference, can be considered as options, if not undertaken may deliver less insight from the study conclusions, but will not leave the objectives listed above in Figure 3 unsatisfied.

A key outcome of secondary data analysis is invariably the calculation of **key supply variables**. The main variables are outlined in Figure 4 below. Variables to be calculated generally include both the numbers inside the boxes ('stock') and the value of the arrows which are generally considered as rates of change ('flow'). Hence the most common approach to estimating and projecting workforce supply is called a 'stock and flow' model. Gaining secondary data for all of the health information workforce, for all of the variables in Figure 5, will be difficult.

Figure 6: Workforce supply variables framework

This will make undertaking a classic workforce planning / labour market analysis quite difficult, as will be discussed later.

Commonly accessed secondary data sources for supply variables include:

- Population Census — Australian Bureau of Statistics (ABS);
- Higher Education Student Collection — Department of Education, Employment and Workplace Relations (DEEWR);
- HIMAA course completions statistics;
- VET Course Completion Statistics and Student Outcome Survey — National Centre for Vocational Education Research (NCVER);
- Retirement & Death / Disability statistics — ABS
- Graduate Destinations Survey — Graduate Careers Australia (GCA).

Macro level **workforce demand estimates** are developed for most health service occupations through constructing a suitable relationship between a unit of labour and some measure of service delivery (e.g. pharmacists and prescribed medications dispensed, general practitioners and GP Medicare claims, nurses and inpatient beddays, etc.). The relationship of the health information workforce with service delivery is more nebulous, less direct. Still, with the help of the industry partners, relationships hopefully can be conceptualised and explored. For instance, a relationship might be developed for inpatient separations (each of which will generate a minimum level of data collection, storage and analysis, regardless of length of stay). Secondary data sources that might be useful for understanding health information workforce demand include:

- Hospital inpatient collections;
- Discharge statistics;
- Any activity based funding system data (inpatient and outpatient);
- Medicare data on occasions of service, ordering of pathology and diagnostic imaging, and specialist referrals;
- PBS statistics on dispensed medications.

As noted previously, an important driver of growth in demand for health information workforce will be government investment in implementation of health information systems and infrastructure. The macro level impact of these interventions can be estimated using available documentation and by creating relationships between units of investment and implied labour requirements.

Estimating workforce demand from secondary data sources would benefit from the input of industry partners as noted but also from the observations of a health economist.

Search conference

In past workforce studies where future uncertainty is high, especially around the demand context, HCA have employed a 'search conference' approach to try to draw some consensus from key stakeholders and decision makers on what are the

future possibilities. A conference generally accommodates 20-30 participants, thought leaders in their fields of expertise.

The process stages of a search conference normally are:

- An initial task of identifying at least two major influences from the natural environment which might shape the world [of health information systems];
- Then to identify the top ten major business environment influencers which might shape the future world in which Australian health services are provided. The influences are located within one of the five areas of society, politics, economics, culture and technology;
- Assessing the likely impact of these influencers in terms of the likely *level of impact* and the perceived *level of certainty* of its occurrence;
- participant groups are then required to create individual alternative futures (scenarios) based on six randomly selected influences (including one from the natural influences) and one each selected from the above key identified economic, technological, societal, political and cultural influences. Alternative futures can then be fashioned into a plausible 'world';
- The final conference task looks at the implications in each of the created future 'worlds' [for health information systems and the associated workforce].

Anticipated deliverables

Ideally, in order to satisfy the full expectations of all the stakeholders interested in this project, the outcomes from a classical workforce planning study would be desirable. This would deliver an understanding of the current labour market and predictions of future demand and supply growth, with an estimate of labour market balance at some point in the future.

The reality is that the current knowledge of the 'specialist' health information workforce (excluding the HIM component) is scratchy, and that basic data requirements for a workforce study are sufficiently deficient as to likely make any attempts at workforce projections to be even more speculative than normal. Nevertheless, it is important that this study makes as much progress as possible to support further decision making about training and education, work organisation, immigration policy, career frameworks / models and of course levels of investment — there may not be opportunities in the near future to study this workforce again.

Therefore a realistic set of deliverables should include:

- A more precise analytical description of the health information workforce, and who comprises this workforce in terms of roles / job titles, gender and age composition, types of competencies, and work being performed. This description will be most illuminating in non traditional health information areas;
- An understanding of the current workforce supply, its total competence, and from where it was derived (on-the-job training, specific education and training

preparation, planned / ad hoc, etc.), and where it is currently deployed in terms of health system segments and geographic locations;

- An insight into the current conditions under which requirements for health information workforce are generated, calculated and translated into jobs establishments and recruitment efforts;
- A listing and understanding of the drivers of demand for health information workforce into the future and a ranking of them in terms of level of likely influence or priority for investment and action. If possible, a quantitative estimate of future workforce demand to be prepared;
- An assessment (at least qualitative but hopefully with some quantitative support) of any gap between workforce supply and demand, and an indication, if a gap implies a shortfall, of what type of shortage is likely to be manifested.

Project governance

It is clear that HWA will need to be the leader in this research project and form an advisory group to help its efforts. It is important that all the stakeholders invited to be part of the governance structure — a Project Reference Group (PRG) — are considered to be on an equal footing. The PRG could, indeed should be a very active advisory group but at an operational support rather than policy development level. Possible invitees for the PRG include:

- HISA
- HIMAA
- Australian College of Health Informatics (ACHI)
- Australian Health and Research Data Managers Association (AHRDMA)
- Australian Computer Society (ACS)
- Medical Software Industry Association (MSIA)
- NEHTA
- Department of Health & Ageing

Conclusion

In truth, health informatics will be a difficult workforce to study since it has poorly defined and quite porous boundaries. It is similar to the public health workforce in that it has a 'direct' or 'specialist' component of the workforce, and an 'indirect' component, with a great number of health workers adding health informatics to their 'day job'. Within the workforce boundaries there are many skill levels.

The workforce methodology HCA has pioneered with public health based on competencies rather than qualifications is appropriate to this workforce also[17], although current competencies development is still rudimentary. Similar to the public health workforce, a methodology that attempts to understand workforce demand through detailed examination of work and workforce organisation processes on the ground is recommended. Drawing boundaries around the workforce that seek a compromise between what is optimally desirable and what is practical and feasible is recommended.

[17] See Gadiel, D, Ridoutt, L, Lin, V, Shilton, T, Wise, M and Bagnulo, J (2010) *Audit of the Preventive Health Workforce in Australia*. Human Capital Alliance, Sydney

Appendix A: ANZSCO Descriptors

Unit group 2242 archivists, curators and records managers

ARCHIVISTS, CURATORS AND RECORDS MANAGERS develop, maintain, implement and deliver systems for keeping, updating, accessing and preserving records, files, information, historical documents and artefacts.

Most occupations in this unit group have a level of skill commensurate with a bachelor degree or higher qualification. At least five years of relevant experience may substitute for the formal qualification. In some instances relevant experience and/or on-the-job training may be required in addition to the formal qualification (ANZSCO Skill Level 1).

Tasks Include:

- evaluating and preserving records for administrative, historical, legal, evidential and other purposes
- preparing record-keeping systems, indexes, guides and procedures for archival research and for the retention and destruction of records
- identifying and classifying specimens and objects, and arranging restoration work
- examining items and arranging examinations to determine condition and authenticity
- designing and revising medical record forms
- managing organisations' central records systems
- analysing the record-keeping needs of organisations, and translating these needs into record management systems
- maintaining computerised and other record management systems and record forms, and advising on their usage
- controlling access to confidential information, and recommending codes of practice and procedures for accessing records
- developing record cataloguing, coding and classification systems, and monitoring their use

Occupations:

224211 Archivist

224212 Gallery or Museum Curator

224213 Health Information Manager

224214 Records Manager

224213 HEALTH INFORMATION MANAGER

Alternative Title: Medical Records Administrator

Plans, develops, implements and manages health information services, such as patient information systems, and clinical and administrative data, to meet the medical, legal, ethical and administrative requirements of health care delivery.

Specialisations include Casemix Coordinator, Clinical Trial Data Manager, Health Data Administrator

Unit group 5999 other miscellaneous clerical and administrative workers

This unit group covers Clerical and Administrative Workers not elsewhere classified. It includes Production Assistants (Film, Television, Radio or Stage), Proof Readers, Radio Despatchers, ***Clinical Coders*** and Facilities Administrators.

Indicative Skill Level:

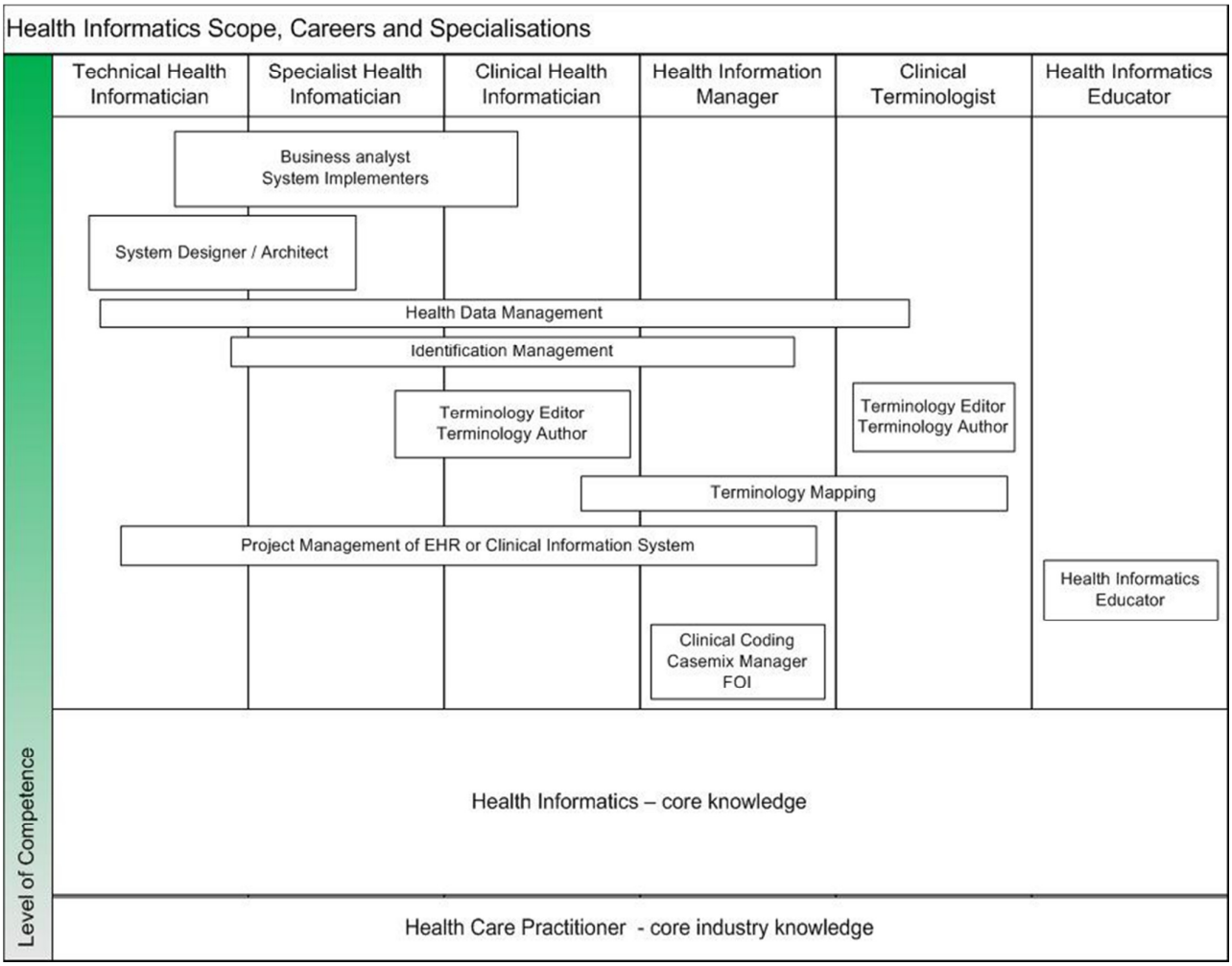
The occupation Clinical Coder has a level of skill commensurate with AQF Certificate III including at least two years of on-the-job training, or AQF Certificate IV (ANZSCO Skill Level 3)

At least three years of relevant experience may substitute for the formal qualifications listed above. In some instances relevant experience and/or on-the-job training may be required in addition to the formal qualification.

599915 CLINICAL CODER

Assigns codes to narrative descriptions of patients' diseases, operations and procedures in accordance with recognised classification systems to allow for easy storage, retrieval and analysis of health data.

Appendix B: Example career framework



Appendix C: Areas of work

Health information systems major areas of work, classified as to whether they represent working 'in' or 'on' the system.

In the system

- Records - Capturing information about a consumer and their interactions with the healthcare system and managing that information.
- Analysis - Information analysis for care, retrieving and analysing information for direct patient care or population health
- Direct - Direct care using information science and technology for the direct provision of healthcare for example the reconstruction of images, the delivery of psychiatric therapy or the use electronic games for rehabilitation
- Decision - Decision support gaining access to knowledge, helping with workflow and automating processes such as provision of clinical alerts and warnings
- Communications - Meaningful exchange of health information between clinicians and clinical systems within a practice or facility and with others outside the facility including consumers and other health services.
- Training - Direct vocational training for purposes such as changing work practices

On the system

- Systems - The development, implementation and management of information and organisational systems
- Infostructure - Policy development, terminology, structured information, architecture and standards development
- Improvement - Retrieving and analysing information to improve processes at every level; from care of the individual consumer through to public health and health policy
- Education - eLearning from knowledge presentation and assessment, through to simulation training for both consumers and workers
- Research - Including biomedical, informatics and management research
- Administration - Of the business of healthcare including logistics, human resources, planning and finance

Appendix D: High Level View of Career Pathways in Health Informatics