PAXTON PARTNERS

INDEPENDENT HOSPITAL PRICING AUTHORITY

DEFINE TEACHING, TRAINING AND RESEARCH AND IDENTIFY ASSOCIATED COST DRIVERS FOR ABF PURPOSES

ENVIRONMENTAL SCAN

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Table of Contents

Glossary of terms

Activity based funding: Activity based funding is a means of funding hospitals for the type and volume of services they provide. It offers a clear link between funding and healthcare delivery, which should improve transparency and strengthen incentives for efficiency in public hospital services delivery.

Acute admitted: refers to patients suffering from rapid onset/ and or short course (acute diseases/symptoms) admission to hospitals.

Allied health: these are health care professions distinct from nursing and medicine.

Block funding: is a sum of money granted by the funder to the recipient of the funding, with only general provisions as to the way it is to be spent.

Casemix: provides a consistent method of classifying types of patients, their treatment and associated costs by assigning a relative value to common diagnosis of related patient cohorts.

Clinical audit: a clinical audit is a quality improvement process that seeks to improve patient care and outcomes through systematic review of care against explicit criteria and the implementation of change.

Clinical craft group: a professional body or association comprised of members practising in a recognised clinical discipline. Examples in a medical context may include cardiologists, orthopaedic surgeons or endocrinologists as separate 'clinical craft' groups.

Clinical service delivery: refers to the provision of direct patient care in a health service as opposed to the non-clinical or corporate (administrative, support, management) services required to support the organisation.

Clinical teaching: is the practical transfer of knowledge in a clinical environment i.e. ward rounds.

Corpus fund: money held by an organisation which, in a health service is largely made up of donated funds with the provision that the principle will not be spent, but the income generated from the principle (or corpus) being used for a specified purpose.

Cost drivers: describe the factors and indicators that will result in the level of costs being higher at one health service, compared to another.

Cost neutral: describes the point where the trainee's contribution to patient care is equivalent to the costs the health service incurs to provide their training.

Costs: describe the financial and other resources that the health service is required to provide during the course of providing teaching and training. Costs may be directly or indirectly related to teaching and training.

Direct costs: are costs that can be completely attributed to the production of specific goods or services. In the case of a health service, these costs are directly attributed to delivering patient related services.

Direct teaching and training activities: which occur outside of an episode of care but are directed towards skills and knowledge development.

Early entry: this applies to individuals who have recently been employed by a health service and mostly relates to their first years of employment.

Embedded costs: are those costs that are inextricably linked to another project/activity/program/process, from which the embedded cost cannot be separated.

Embedded teaching and training: describes where teaching and training occurs in conjunction with patient care.

Environmental scan: an environmental scan is an assessment of the macro environment assessing multiple factors. Environmental scans are not based on reproducing already published statistics and information but draw on contemporary advice from industry participants.

Funding loadings: refers to the relative weightings applied to different levels of funding to provide different types or volumes of activities/services.

Goodwill: in this document, relates to the amount of clinicians' own time and enthusiasm invested in teaching and training, over and above the requirements articulated in their job description – much of which may attract little or no remuneration.

Indirect costs: are costs that are not directly accountable to a cost object (such as a particular project, facility, function or product).

Indirect teaching and training activities: are those 'behind the scenes' activities undertaken by a health service that are essential to facilitate teaching and training, but do not involve either a didactic or experiential skills / knowledge transfer.

Intersection: a set of elements common to all groups.

Literature review: a literature review is a text written by someone to consider the critical points of current knowledge including substantive findings, as well as theoretical and methodological contributions to a particular topic. Literature reviews are secondary sources, and as such, do not report any new or original experimental work.

Moderating factors: describe characteristics of the health service's internal or external environment that may influence (but do not drive) the extent of teaching and training costs (and hence the relative influence of cost drivers).

Non-admitted: refers to services provided to patients who do not undergo a formal admission process and do not occupy a hospital bed.

Non-clinical teaching: is the transfer of knowledge outside of a clinical environment i.e. class room based learning.

Post entry: refers to TT&R once an individual has entered the workforce.

Pre vocational: refers to medical trainees who have completed their internships but not yet chosen or being accepted on a vocational training course.

Pre-entry: refers to medical, nursing and allied health professional groups teaching and training activities that occur through student placements.

Quality assurance: is a process developed to ensure that the requirements around the delivery of any product or service are met.

Quantitative analysis: is the use of numerical techniques to carry out analysis.

Supernumerary: refers to an excess of the usual number or a temporary or additional worker.

Tied funding: refers to funding that is tied to the provision of a specific service or activity, or to the achievement of certain levels of performance.

List of acronyms

ABF	Activity Based Funding
ACT	Australian Capital Territory
ACSQHC	Australian Commission on Safety and Quality in Health Care
AHP	Allied health professional
AHPRA	Australian Health Practitioner Regulation Agency
ARC	Australian Research Council
CI	Chief Investigator
CMO	Career Medical Officer
CPD	Continuing Professional Development
DoHA	Department of Health and Ageing
DSS	Data Set Specification
FTE	Full-Time Equivalent
GHE NMDS	Government health expenditure national minimum data set
HMO	House Medical Officer
HOI	Health Outcomes International
HREC	Human Research Ethics Committee
HWA	Health Workforce Australia
IHPA	Independent Hospital Pricing Authority
IPL	Inter-Professional Learning
IT	Information Technology
MRI	Medical Research Institute
NHCDC	National Hospital Cost Data Collection
NHMRC	National Health and Medical Research Council
NHRA	National Health Reform Agreement
NSW	New South Wales
NWAU	National Weighted Activity Unit
PFRAC	Product-specific Fraction
PHE NMDS	Public hospital establishments national minimum data set
SA	South Australia
SHRAC	State Health Research Advisory Council (SA)
SPO	Student Placements Online database
T&D	Training and Development
TT&R	Teaching, Training and Research
TTRWG	Teaching, Training & Research Working Group
WA	Western Australia

1. Executive summary

1.1. Introduction

In August 2011, the Commonwealth, States and Territories signed The National Health Reform Agreement (NHRA). Among a number of other reforms, the NHRA committed the Commonwealth and State and Territory jurisdictions to implement an Activity Based Funding (ABF) model for public healthcare services. The NHRA also recognised that teaching, training and research (TT&R) were functions provided by public health services which may be more appropriately funded under alternative funding arrangements.

Clause A49 of the NHRA requires the Independent Hospital Pricing Authority (IHPA) to provide advice to the Standing Council on Health on the feasibility of transitioning funding for TT&R from block grants to ABF by 1 July 2018. Paxton Partners have therefore been engaged by IHPA to:

1. **Develop a set of nationally agreed definition(s) of TT&R** for public health services in Australia;
2. **Identify the cost drivers associated with the agreed definitions of TT&R** for ABF purposes; and
3. **Produce a classification development framework** that considers the ways in which the identified cost drivers can be grouped in a meaningful way to explain resource usage.

This document presents the outcomes of consultations with over 350 representatives of jurisdictional health departments, health services, peak bodies and interest groups across Australia. The outcomes of these consultations are intended to inform the development of an updated definition (or definitions) of TT&R, as well as an understanding of TT&R cost drivers that will be tested as part of a quantitative analysis in the next stage of the project.

This environmental scan presents the range of issues identified during consultations, centred around the following:

- Approaches to defining TT&R;
- Perspectives on cost drivers of TT&R;
- The availability of data to support a quantitative analysis of cost drivers; and
- Trends, issues and developments in TT&R.

A key point to note when reviewing this document is that this project focuses primarily on defining TT&R for the purposes of ABF rather than from a theoretical perspective.

1.2. Defining teaching, training and research in public health services

The approaches to defining TT&R invoked a range of views from stakeholders through the consultation process. The environmental scan seeks to distil these views into a small number of key themes. For ease of discussion, issues regarding definitions of teaching and training are separated from those relating to the definition of research.

1.2.1. Existing definition of teaching, training and research

Existing 'draft' definitions of TT&R were developed in 2010 as part of a scoping study undertaken by Health Outcomes International (HOI) for the Commonwealth Department of Health and Ageing (DoHA). These definitions form the starting point for this project, which seeks to determine if the existing definitions should be refined or reconstructed. The HOI draft definitions for TT&R are provided at Appendix A.

1.2.2. Defining teaching and training

Stakeholder discussions were used to inform the refinement of the draft HOI definitions. The key themes to emerge from the discussion of how to define teaching and training are summarised below.

1. Are the HOI draft definitions of TT&R an adequate starting point?

The HOI definitions could provide some basis for defining teaching and training from a policy or theoretical perspective, particularly if teaching and training were required to be separately identified. However, it was recognised that a number of elements of the HOI definitions were either too prescriptive, missing altogether or too difficult to capture in practical terms. Therefore, as they are currently structured, the HOI definitions cannot be used as a direct starting point for ABF purposes and would require refinement to be applicable.

2. Is it possible to practically distinguish between teaching and training activities?

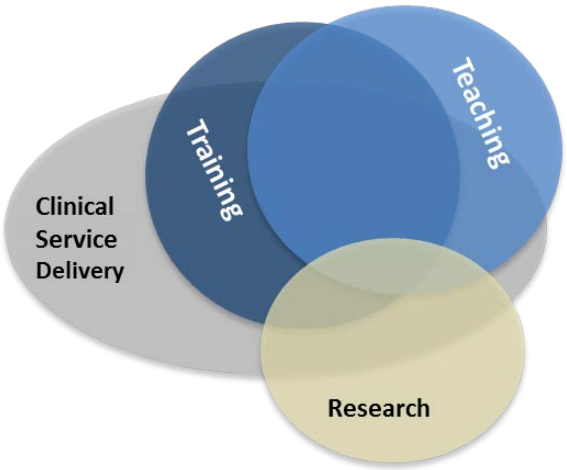
Consistent with the findings from the literature review, the consultation phase of this project revealed no overwhelming desire or requirement to separately define teaching and training for ABF purposes.

A single definition which recognises the combined role of teaching and training will alleviate the potential subjectivity associated with distinguishing them separately and also reduce the burden of administrative, classification and costing effort in separating these interlinked activities for minimal perceived benefit.

3. Is it possible to separate all teaching and training from clinical service delivery (and research)?

Both the literature and feedback from consultation consistently highlighted an intrinsic and often inseparable link between activities which support teaching and training and clinical service delivery. Figure 1 below provides a conceptual representation of the relationships between teaching, training, research and clinical service delivery.

Figure 1 Conceptual relationship between clinical service delivery, teaching, training and research activities



In some cases teaching and training activities can be delineated from clinical service delivery and therefore separately costed. However, the increasing role of experiential learning, which occurs in conjunction with direct clinical service delivery, highlights the need to acknowledge the intrinsic integration of teaching and training and patient care.

It is therefore important to ensure that the definition of teaching and training recognises the intrinsic, embedded nature of teaching and training with clinical service delivery, and does not try to separate teaching and training from patient care. Additionally, the embedded nature of teaching and training with clinical service delivery suggests that the definition should not introduce barriers,

disincentives or behaviours that compromise the quality of either teaching and training or clinical service delivery.

Indirect teaching and training functions

In addition to teaching and training functions being 'embedded' within clinical service delivery, stakeholders also highlighted that health services are required to incur a range of administrative resources, activities and costs to support teaching and training. Stakeholders argued that these costs were necessary supports for teaching and training, but were not directly involved with service delivery in either a didactic or experiential way. In this sense, the term 'indirect' refers to the way in which these activities affect teaching and training costs, rather than the way they are used in the draft HOI definitions – where 'indirect' refers to teaching and training activities occurring in conjunction with patient care. As described above, the environmental scan refers to teaching and training interactions with patient care as being 'embedded'.

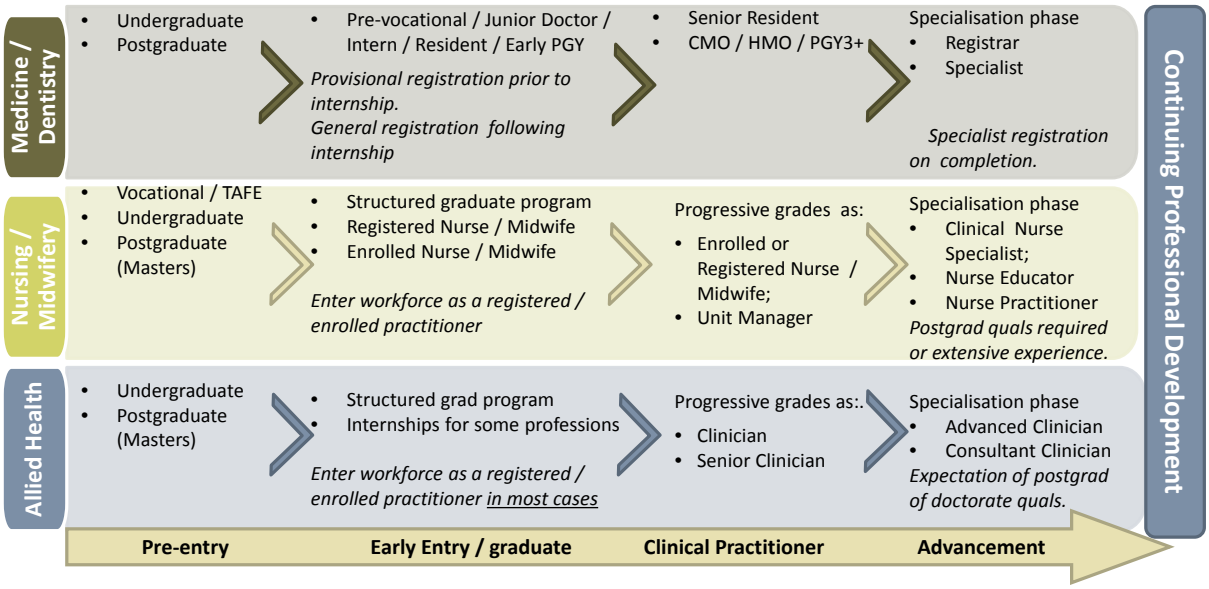
Both the literature review and feedback from consultation identified indirect functions as requisite to supporting teaching and training due to their critical role in:

- facilitating clinical placement program student placements;
- liaising / negotiating with higher education providers;
- facilitating rotations for student placements;
- ensuring compliance requirements are met to support accredited posts for vocational training programs; and
- providing facilities to support work based assessment programs.

4. How do teaching and training activities differ between clinical professional groups?

Each of the three main professional groups require health services to provide different levels of teaching, training and supervision to support the attainment of qualifications and registration requirements. These high-level differences are outlined in Figure 2 below.

Figure 2 Summary of training and teaching continuum by clinical professional group



The differences in teaching and training activities between clinical groups must be taken into account when considering how to define teaching and training across each clinical group. Some professional groups may require trainees to undertake activities that are not mandated in others. This raises a

question about the extent to which these differences can and should be captured within the definition.

5. How broadly should teaching and training be defined?

An issue commonly raised by stakeholders was the need to define the boundaries of teaching and training activities for ABF purposes. To assist in delineating between teaching and training activities that should be covered within the ABF definition and those that should not, a number of common dimensions were identified. These include:

- the professional group to which teaching and training is delivered;
- the level of professional to which the teaching and training is being delivered; and
- the type of teaching and training activity being conducted.

The table below provides a summary of the most common views shared by stakeholders during the consultation, around each of these dimensions of scope.

Table 1: Dimensions of teaching and training considered in and out of scope

Dimensions of scope	Element considered in-scope	Element considered out of scope
Professional group	• Medical; • Nursing and midwifery; • Allied health.	• Corporate and non-clinical professions such as administrators, ward clerks, hotel services staff, etc.
Professional level	• Student placements; • Medical pre-vocational posts (Postgraduate years 1 and 2); • Allied health internship posts; • Basic medical vocational posts.	• Postgraduate advancement that is not a prerequisite for achieving registration (e.g. Masters of Nursing), continuing professional development, retraining, re-entry, refresher courses.
Activity types	• Only those activities that are prerequisites for achieving a qualification or registration to practice in a clinical discipline.	• Clinician training that is not part of a prerequisite qualification or registration requirement; • Mandatory training required for the health service to retain its accreditation; • Training in new skills, technologies, techniques;

This provided a basis for establishing some boundaries around the nature of teaching and training for ABF purposes; specifically, whether activities are prerequisites for achieving a qualification or registration to practice in the clinical professions.

6. How wide should the scope of allied health be defined for ABF purposes?

A wide variety of views regarding the scope of health service-related allied health practice were expressed during consultation. The lack of a nationally accepted definition for 'allied health' means that a consistent approach to establishing the breadth of allied health disciplines that will be captured under the definition of teaching and training for the purposes of ABF must be identified.

A number of existing categorisations may provide a starting point for establishing what is meant by 'allied health' disciplines for the purpose of the definition. These include:

- whether the allied health discipline requires a tertiary-level qualification (thereby excluding allied health assistants);
- whether the discipline is recognised by a national registration and accreditation scheme (i.e. AHPRA);
- those professionals currently identified in Health Workforce Australia (HWA's) list of allied health professionals; and
- healthcare professionals, other than medical or nursing which provide some technical, therapeutic or clinical support role to affect a direct patient/consumer outcome in a public health service.

7. Will teaching and training activities be funded if they're not defined?

A recurring theme throughout stakeholder consultations was a perception that, if all clinical or non-clinical teaching and training activities currently provided by public health services were not specifically recognised in the definition, these activities would not be recognised as an imperative by the public health service and would not be funded or adequately supported.

It was recognised that public health services have a wider responsibility to deliver non-clinical training activities – as part of good practice in maintaining a high-performing, safe workplace – and that the funds to support this endeavour are already included in existing funding pools. It was generally accepted that not all teaching and training activities will be included in the definition for ABF purposes.

1.2.3. The proposed draft definition for teaching and training

All of the key themes above served to inform the development of the following set of principles for defining teaching and training for the purposes of ABF:

1. the definition should be concise and practical;
2. while a technical distinction for teaching and training could be defined, in practical terms any distinction between the two terms is 'artificial' or 'semantic'. Teaching and training are most often delivered in a joint and complimentary way. Therefore one definition should encapsulate the activities under both;
3. the definition should be easily adaptable to the changing nature and emerging trends in how teaching and training is conducted;
4. the definition should relate to medical, nursing, midwifery and allied health professions where the disciplines have a direct patient or consumer relationship in a public health service;
5. the definition should cover those professional levels that require exposure to a clinical environment in order to fulfil the qualification or registration requirements of the discipline in which they wish to practice;
6. the definition should cover those teaching and training activities that contribute to the attainment of a qualification or professional body registration;
7. the definition should only include activities and resources that are provided by or on behalf of public health services which are funded by the states and territories; and
8. the definition should recognise the direct and indirect resources incurred by a public health service required to support teaching and training. The definition should also recognise that some direct teaching and training is embedded in clinical service delivery.

With these considerations in mind, this document proposes that training and teaching is defined as:

The activities provided by a public health service to facilitate the acquisition of knowledge, or practice of skills, that are prerequisites for an individual to gain the necessary qualifications (or recognised professional body registration) to practice in the medicine, nursing, midwifery or allied health professions.

1.2.4. Defining research

Similarly, a number of key themes were identified relating to factors influencing the definition of research for ABF purposes, as summarised below.

1. Is the HOI definition of research an adequate starting point?

Although stakeholders identified that the focus of the HOI definition of research (i.e. knowledge development) is fundamentally correct, most considered that the draft definition did not provide an internally consistent logic for identifying how research is undertaken. Most stakeholders suggested that the definition of research should be substantially re-constructed.

2. Can the nature of research be adequately captured for ABF purposes?

While the definition of research delivered in public health services remains a central point of clarification for this project, of greater importance is to provide an understanding of public health services' commitment to directly and indirectly support research endeavour. In particular, this will relate to identifying the indirect costs incurred by public health services in supporting research.

3. Can the vast breadth of research activities be captured using a single definition?

The wide diversity in terms of the types, scope and resourcing required to support research activities conducted within and across different public health services means that it will be difficult to identify homogenous metrics and indicators which are comparable across organisations.

All public health services provide some form of gateway process for approving research conducted within the organisation that may provide a registry of research activities being conducted. It should be noted that a number of research projects provided within a hospital may be controlled and financed through affiliated organisations rather than through the public health service and thus may not be captured by this approach.

4. How can the definition capture the various health service activities, structures and functions which support research?

Organisational and cost structures established by public health services to support research endeavour vary significantly, ranging from internally managed organisational structures to separate and autonomous business unit entities. Furthermore, the basis upon which the administrative and management functions employed by the public health service to support the research function are either separately funded, recovered from external research project funds or supported by the operating funds (government funds) of the health service, also varies significantly.

5. Should the definition capture the hidden and embedded costs of supporting research?

Public health services will often bear hidden and embedded costs of conducting research that relate to resources required to support research conduct, which are not covered by the specifications of the research grant. The extent to which these resources can be separated from operating funds depends on the diligence of the public health services, systems of accounting or the acceptance of the public health service to provide these resources as a sign of goodwill towards the research endeavour.

With regard to this project, a question remains as to whether these hidden research costs can and should be considered to form part of cost driver analysis and if so, on what basis the impact should be evaluated on a consistent and systematic basis.

6. How can the definition account for only state/territory-funded activities when a range of sources of research funding exist with varying degrees of commitments to cover full costs?

Public health services receive research grant funds from a diversity of sources, ranging from externally funded commercial and competitive grants to internally sourced funds from hospital and community initiatives. Different funding arrangements exist between research grant providers regarding the extent to which infrastructure and administrative costs are able to be acquitted against respective grants. For many grant providers, these costs are specifically excluded from the terms of funding under which the grants are provided. It is therefore assumed that the public health service (states and territories operating funds) are required to support these costs.

The impact of these funding arrangements and the 'assumed' expectation of the public health service to bear the infrastructure and administrative costs will be difficult to evaluate on a consistent and systematic basis.

7. How should the definition account for the connection of public health services to other external bodies involved in research?

The growing role of affiliated research organisations and higher education provider posts, present and involved in managing research activities conducted in public health services, makes it increasingly difficult to quantify the impact and level of resources incurred by the health service to support these activities. The effect on public health service costs will largely be controlled by the individual agreements that are in place between the public health service and the affiliated research organisations to identify and recover the costs of supporting these research activities.

1.2.5. The proposed draft definition of research

All of the key themes above served to inform the development of a set of principles for defining research for the purposes of ABF. The principles include that the definition should:

1. result in an output(s) that generates new knowledge;
2. require that the activities associated with research are undertaken in accordance with a structured, methodical or systematic approach;
3. only capture activity that is approved through an appropriate governance body or ethics committee structure of the health service / jurisdiction;
4. include activities that are conducted within the public health service but that may be instigated and managed by an affiliated organisation;
5. result in an output(s) that have applicability in a wider context than just the organisation conducting the research;
6. allow for a broader range of investigations and applications than just those related to patient care;
7. exclude activities that are part of a public health service's normal course of business to deliver high quality care and safe environments (i.e. clinical audit, quality assurance, continuous improvement);
8. exclude outcomes that are a secondary product of clinical service delivery or a training and teaching curriculum;
9. exclude any direct costs associated with a research activity which were initially intended to be included within the conduct of the research activity. For ABF purposes this would therefore eliminate any costs that were directly related to a research project which has received external or tied funding; and
10. include other impacts which are not directly tied to costs but may also relate to other effects on clinical service delivery (e.g. changes in length of stay, change in normal clinical pathways etc.).

With these considerations in mind, this document proposes that research is defined as:

> ***an activity undertaken in a public health service where the primary aim is the advancement of knowledge that ultimately aims to improve patient health outcomes. The activity must be undertaken in a structured and ethical way, be formally approved by a research governance or ethics body, and have potential for application outside of the health service in which the activity is undertaken.***

For ABF purposes, the definition of research relates to:

> ***the public health service's direct and indirect contribution to research where the cost and resources incurred are not directly tied to an alternative source of research funding.***

1.3. Cost drivers

This section presents a summary of the stakeholder perspectives regarding the cost drivers associated with TT&R. Consistent with our discussion on how to define TT&R, we have approached the identification of teaching and training cost drivers separately from research.

Although stakeholders raised a number of perspectives on the cost drivers of TT&R as part of stakeholder consultation, some of these described costs themselves rather than the factors that are driving those costs. In a similar way, some identified cost drivers included health service characteristics that may potentially provide for a greater volume of TT&R to be conducted, but do not in themselves drive TT&R costs.

In framing the discussion of cost drivers in the environmental scan, a distinction was drawn between costs, cost drivers and other factors that may act to determine (or moderate) the relative impact of cost drivers across health services. These factors are listed in Table 2.

Table 2 Examples of types of costs, cost drivers and moderating factors affecting TT&R

TT&R component	Costs associated with providing TT&R	Identified cost drivers	Factors that moderate the impact of cost drivers
Teaching and Training	• Staff costs (clinical supervision); • Coordination costs; • Opportunity costs (lost productivity); • Consumables; • Increased diagnostic costs; • Infrastructure overheads.	• Volume of trainees (by placement days and level); • Geography (remoteness); • Teaching and training requirements of clinical craft groups; • Number of internationally-trained clinicians.	• The size and type of health service; • Service / staffing mix; • Patient complexity / casemix.
Research	• Research directorate support costs; • Infrastructure overheads; • Consumables; • Ethics committee costs; • Salaries and wages.	• Type of research being conducted; • Number of research projects conducted; • Size (value) of research grants; • Number of patients participating in clinical trials.	• The size and type of health service; • Patient complexity / casemix.

1.3.1. Cost drivers of teaching and training

The key themes to arise from the stakeholder consultation with respect to teaching and training cost drivers, include:

1. A need to differentiate costs of teaching and training from cost drivers;
2. A need to differentiate cost drivers of teaching and training from factors that may facilitate (but not drive) a larger volume of teaching and training;
3. The role of goodwill in supporting teaching and training; and
4. Differences in financial contributions to clinical education between health services and education providers.

After distilling cost drivers from costs and other factors that may moderate the level of costs incurred, we propose that the following factors are likely to represent the primary cost drivers associated with teaching and training that will be subject to further analysis and testing:

1. The volume of trainees;
2. Geography (remoteness);
3. Teaching and training requirements of different registration bodies and colleges; and
4. The number of international medical professionals in training.

1.3.2. Cost drivers of research

There are significant complexities with defining research for ABF purposes, which will in turn affect the ability to identify representative cost drivers for research. For this reason, it may not be necessary, or appropriate, to attempt to capture the activities, resources and drivers of research itself. Rather, it may be more relevant to assess indicators of the volume and type of research being conducted – to use as a proxy for the public health service's contribution to research activities.

It was identified that, broadly, these indicators may relate to either the direct (e.g. direct human resource research time, consumables, assets) or indirect (e.g. administration, ethics and other governance, overheads) costs of supporting research activities.

Notwithstanding the significant limitations with respect to the representativeness of such indicators, the following were identified as a starting point that may start to approximate the combination of drivers of costs of research undertaken in public health services:

- Type of research being conducted;
- The volume of research activities;
- Size of research grants;
- Number of patients participating in clinical research trials; and
- Number of research staff and post graduate students employed by the public health service.

Other proxies identified that provide some explanation of the cost drivers of research include:

- The number of approved (and/or unapproved) grants submitted to a public health service governance unit;
- Number of research staff and post graduate students employed by the public health service;
- Presence of co-located / affiliated Medical Research Institutes and higher education providers;
- Existence of academic professorial posts (either sponsored or employed by the public health service and higher education provider);
- Number of publications, citations, conference papers that have been attributed to a public health services research outcomes; and

- The health service's casemix / acuity.

1.4. Service delivery benefits of TT&R

Consultations with stakeholders identified a broad variation in the perceived service delivery benefits associated with TT&R in a public health service. Stakeholders identified that service delivery benefits resulting from TT&R may be generated directly in primary patient care in the form of:

- Improved quality of care by supplementing the patient experience;
- Improved quality of health information to support medical record keeping and clinical coding; or
- Productivity improvements by enabling senior staff to focus on more productive complex, higher-end clinical work.

Furthermore, a public health service that encourages and promotes a strong TT&R culture is seen to benefit through:

- Stronger organisational prestige and reputation;
- Improved workforce attraction and retention;
- Greater diversification of the health services knowledge and skills mix; and
- Enhanced ability to attract grant funding for research.

The above were identified frequently during the stakeholder consultation and there was a strong assertion that the service delivery benefits of TT&R are 'real' and material. However, there was also a general acceptance that many of the perceived benefits are intangible, may vary significantly depending on professional group and healthcare setting, and are typically difficult to quantify.

1.5. TT&R activity, funding and reporting processes

1.5.1. TT&R funding

The basis for allocating TT&R funds to health services differs substantially across jurisdictions, as does the level of funding provided. Of all States and Territories, Victoria, Queensland (Qld) and South Australia (SA) appeared to articulate their models for funding TT&R most comprehensively. However, some level of information was available for most states.

Based on the information available, the most common aspects of teaching and training activity identified for funding across jurisdictions were:

- Supervision costs;
- Productivity losses / opportunity costs;
- Clinical academic salary costs; and
- Staff time involved in delivering TT&R.

Information on how research activities were supported in public health services was more difficult to identify. However, the following elements for funding under research support were identified:

- Direct research costs reported in dedicated cost centres (Qld);
- Research staff, management time (Western Australia (WA)); and
- Infrastructure support for NHMRC-funded projects (SA).

1.5.2. TT&R reporting

The stakeholder consultation process confirmed initial observations that formalised reporting arrangements relating to TT&R activity and costs are not well-advanced in most jurisdictions. This is partly due to most jurisdictions incorporating TT&R within their acute admitted funding models, which may obviate the need for separate TT&R reporting arrangements. Victoria appears to require the most rigorous, but transparent teaching and training activity reporting requirements of any jurisdiction.

Although SA has very well-described funding arrangements for teaching and training, the SA TT&R model relies on higher level workforce data as the basis for funding allocations. As a result, there are no reporting requirements related to teaching and training that health services in South Australia are required to fulfil, in spite of the existence of a detailed TT&R funding model.

With respect to research, no evidence of any systematic jurisdiction or national level reporting of the type and volume of research activities conducted in public health services was identified through the consultation.

1.5.3. TT&R activity

The stakeholder consultation identified a dearth of TT&R activity data available across most jurisdictions. However, the consultation revealed that all jurisdictions do currently hold workforce data that could potentially provide a starting point for drawing quantitative assessments of TT&R cost drivers.

IHPA has recognised the variation in the type and extent of TT&R activity data collection across jurisdictions, and is in the process of developing a TT&R activity Data Set Specification (DSS) to collect related data on a best endeavours basis. Over time, IHPA intends for the TT&R DSS to become a national minimum data set.

1.6. TT&R data availability

There are known variations in the availability, scope and quality of data collected across jurisdictions with respect to TT&R. Notably, there is no single data repository that contains dedicated cost and activity data relating to TT&R. Those data collections that do exist appear to focus primarily on teaching and training costs, with consistent data on research costs being largely unavailable.

Furthermore, the intrinsic integration between TT&R activities and clinical service provision make it difficult to identify reliable data sources that delineate TT&R costs from the costs of clinical service delivery.

Data collections that may be a source of TT&R cost/activity information include:

National datasets and collections:

- National Hospital Cost Data Collection;
- Public hospital establishments national minimum data set;
- Government health expenditure national minimum data set;
- Health Workforce Australia Clinical Placements data set;
- Health Workforce Australia National Health Workforce data set; and
- The National Health and Medical Research Council's annual report form for Human Research Ethics Committees.

Jurisdictional data collections:

- Jurisdictional financial systems;

- Ethics and research governance committee data; and
- Workforce data.

Each of these data sources has its own set of benefits and limitations. As a result, it is likely that data from multiple sources will be required to form a representative picture of the costs of TT&R in public health services.

2. Introduction

This section provides the context to the project, its objectives and the role of the environmental scan in the broader project to define TT&R and identify associated cost drivers for ABF purposes. It also describes the approach to conducting the environmental scan consultation, and outlines how this document is structured to present the findings that have been generated through the consultation process.

2.1. Background and project objectives

In August 2011, the Council of Australian Governments signed the NHRA. Among a number of other reforms, the NHRA committed the Commonwealth and State and Territory jurisdictions to implement an ABF model for public healthcare services. The scope of services eligible for funding on an activity basis began with acute admitted, emergency department and non-admitted services, which were introduced from 1 July 2012. ABF for remaining non-admitted, subacute and mental health services was introduced on 1 July 2013.

In addition to payments for services on an ABF basis, the NHRA recognised that some aspects of health service delivery and related operational functions could be more appropriately funded under alternative arrangements (i.e. specified grants, block funding, etc.). TT&R functions provided by public hospitals[1] were explicitly included in this category. Clause A49 of the NHRA requires IHPA to provide advice to the Standing Council on Health on the feasibility of transitioning funding for TT&R from block grants to ABF by 1 July 2018.

Schedule A, Clause A1 of the NHRA describes the funding to be provided by the Commonwealth Government for TT&R, and in doing so clearly sets the scope parameters within which this project will be undertaken. The relevant sections of Clause A1 state that:

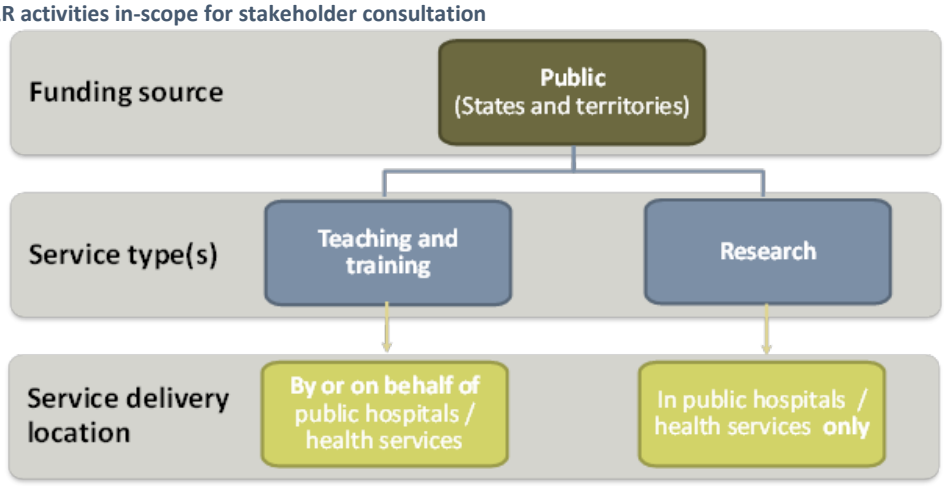
> *…(in addition to a range of other services) "the Commonwealth will fund:*
>
> - *Teaching and training functions **funded by states undertaken in public hospitals or other organisations (such as higher education providers and training providers)**; and*
> - *Research **funded by states undertaken in public hospitals**."*

Clause A1 of the NHRA clarifies the scope of TT&R activities being considered as part of this project, in terms of limiting it to those TT&R activities that are funded by States and Territories**. State/Territory funding is thus the defining element of the services that will be in scope of the project**.

This clause also points out those research activities must be undertaken **in public hospitals** to be eligible for Commonwealth growth funding. An important difference is that **in-scope teaching and training functions do not necessarily need to be delivered within a public hospital, but must be delivered by or on behalf of public hospitals**. So long as teaching and training activities are funded by states and territories, they may be delivered in settings such as higher education providers, vocational training providers and private hospitals. These differences are illustrated in Figure 3.

[1] Throughout this document, references to 'public health services' and 'public hospitals' are used interchangeably.

Figure 3: TT&R activities in-scope for stakeholder consultation



A further point of clarification raised during discussions with stakeholders, involves defining which public health services the scope of the TT&R project relates to. Public hospitals currently recognised for funding under ABF are a subset (albeit a substantial subset) of the total number of public health services funded by States and Territories. A more detailed discussion regarding this issue of scope is discussed in further detail in Section 3.

2.1.1. Key project objectives

Clause A49 of the NHRA requires IHPA to provide advice to the Standing Council on Health on the feasibility of transitioning funding for TT&R from block grants to ABF by 1 July 2018. Paxton Partners have therefore been engaged by IHPA to define TT&R and identify associated cost drivers for ABF purposes:

There are three key project objectives that the environmental scan is intended to inform.

1. To **develop a set of nationally agreed definitions of TT&R** for public health services in Australia;
    - These definitions will use draft definitions developed by Health Outcomes International (HOI) (reproduced in Appendix A) as a starting point, and will seek to review, further develop, refine or reconstruct them;
    - The TT&R definitions will be informed by a literature review, stakeholder consultation and this environmental scan.
2. To **identify the cost drivers associated with the agreed definitions of TT&R** for ABF purposes;
    - Identification of cost drivers will underpin further work on classification, counting and costing processes for TT&R in the future;
    - Our work will consider the extent to which cost drivers of TT&R overlap with other ABF work streams.
3. To **produce a classification development framework** that considers the ways in which the identified cost drivers can be grouped in a meaningful way to explain resource usage.

By addressing these objectives, the project represents the foundation work that will form the basis for assessing the feasibility of transitioning funding for TT&R from block funding to ABF. The outputs that this project will produce will allow IHPA to deliver its requirement under Clause A49 of the NHRA in the following ways:

- **Defining TT&R** will provide the basis for specifying activities and costs associated with TT&R activities;

- **Identifying cost drivers** will inform how TT&R activities can be grouped in meaningful ways according to resource usage; and
- **A classification development framework for TT&R** will inform the development of counting rules, costing approaches and funding loadings that may apply to TT&R activity. These elements are required for ABF to work.

2.2. Project methodology

The key project objectives are being delivered through a methodology which is illustrated in Figure 4. The breadth of issues captured during the environmental scan consultation will directly inform all subsequent stages of the project. They will also provide a basis for validating the conclusions of the literature review.

Figure 4: Project methodology summary

	Key tasks	Key deliverables
Stage 1: Project planning	• Agree scope, tasks, timeframes, reporting requirements, allocation of project tasks; • Identify key stakeholders; • Risk management.	• Agreed Project Plan within one month of contract execution
Stage 2: Develop draft definitions	• Draft literature review; • Draft stakeholder survey; • Draft environmental scan; • Consult with stakeholders; • Develop draft definition(s).	• Literature review; • Survey instruments; • Environmental scan document; • Working definitions of TT&R.
Stage 3: Test draft definitions and consult	• Prepare consultation paper and distribute; • Organise stakeholder workshop; • Run stakeholder workshop.	• Plan for stakeholder consultation; • Stakeholder consultation workshop.
Stage 4: Identify cost drivers of TT&R	• Develop and issue data spec; • Collect data; • Analyse data – cost drivers; • Draft discussion paper on TT&R cost drivers.	• Specification for data extracts; • Identify TT&R cost drivers; • Cost driver analysis discussion paper.
Stage 5: Draft report	• Draft final report and classification development framework; • Present findings and recommendations to IHPA and TTRWG	• Draft final report and classification development framework; • Presentation to IHPA and TTRWG.
Stage 6: Final report	• Revise draft report and classification development framework; • Finalise report following comments from IHPA and TTRWG; • Present to IHPA (if required).	• Final report identifying definition(s) of TT&R, cost drivers and classification development framework submitted to IHPA by 31 March 2014.

The environmental scan follows from a review of domestic and international literature that was undertaken to identify perspectives on existing TT&R definitions, funding approaches, cost drivers and data availability. The key elements of scope presented in this environmental scan include an exploration of:

- Existing TT&R activity, funding and reporting arrangements across Australia;
- The nature of TT&R activities and the ways in which they should be defined;
- The cost drivers associated with TT&R;
- The availability and robustness of data available at the national, jurisdictional and organisational levels to support a quantitative analysis of cost drivers; and
- Perspectives regarding the issues, trends and foreseen developments in TT&R.

As a result, the outcomes of the environmental scan consultation are a major contributor to informing two key project outputs, specifically:

1. The development of draft definitions of TT&R, which will be presented and discussed at two stakeholder consultation workshops to be held in October 2013; and
2. The development of a data request specification(s), which will seek to identify data that can be used in a quantitative analysis of TT&R cost drivers.

The environmental scan will also inform each of the other project deliverables that follow in Stages 3 to 6 of the methodology presented in Figure 4.

2.2.1. Approach to conducting the environmental scan

The environmental scan consultation canvassed input from a diverse range of stakeholder groups across all Australian states and territories. In total, the environmental scan has been informed by consultations with:

- all jurisdictional health departments;
- representatives of 24 health services across all jurisdictions;
- 31 peak bodies and interest groups; and
- over 350 stakeholders in total.

Participants involved in the stakeholder consultation were identified by IHPA and members of IHPA's TT&R Working group (TTRWG). All TTRWG member organisations were involved in consultation and where possible, TTRWG members in each jurisdictional health department assisted with the organisation of consultations with health services and with providing access to relevant jurisdictional contacts. A number of additional interest groups and peak bodies were also identified for inclusion in this phase of the project. A full list of organisations that were consulted is provided in Appendix C.

The stakeholder consultation was guided by a consultation paper that provided stakeholders with information in advance of the meetings relating to:

- The background and policy context to the project;
- Project objectives, governance arrangements and preliminary considerations;
- Approach to the stakeholder consultation program and preliminary discussion points; and
- HOI draft definitions for TT&R.

The stakeholder consultation paper posed a range of discussion points, some of which were common across all stakeholders and some that were targeted to the particular role and function of each

group. Where possible, insights from earlier work and the literature review were presented to stakeholders for discussion, validation or testing.

The consultations to inform the environmental scan purposefully approached the range of issues at a high level with the aim of then narrowing the discussion to focus on the key themes that will influence the identification of definitions and cost drivers for TT&R.

2.3. Purpose of this document

This document presents the outcomes of consultations with jurisdictional health departments, health services and peak bodies across Australia, undertaken over a period of seven weeks during August and September 2013. The outcomes of these consultations are intended to inform the development of an updated definition (or definitions) of TT&R, as well as an understanding of TT&R cost drivers that will be tested as part of a quantitative analysis in a subsequent stage of the project. This environmental scan presents the range of issues identified during consultations in terms of:

- How to define TT&R;
- Perspectives on cost drivers of TT&R;
- The availability of data to support a quantitative analysis of cost drivers; and
- Trends, issues and developments in TT&R.

The outcomes identified through the environmental scan have informed the refinement of draft definitions of TT&R.

This document will be supported by a consultation paper which will summarise the key findings arising from the environmental scan and pose a series of targeted questions that will be used to seek feedback and validation of these findings with key stakeholders.

2.4. Structure of this document

The environmental scan is intended to build upon the findings of the literature review, and the document has accordingly been structured using the same broad framework, as follows:

- Section 1 provides an introduction to the project background, objectives, methodology and the role of the environmental scan;
- Section 2 discusses how TT&R should be defined for ABF purposes;
- Section 3 presents the key cost drivers of TT&R;
- Section 4 discusses the feasibility and materiality of measuring service delivery benefits associated with TT&R;
- Section 5 describes current TT&R activity, funding and reporting processes;
- Section 6 identifies the availability and robustness of TT&R cost and activity data; and
- Section 7 summarises the findings of the environmental scan and presents conclusions and implications for future stages of the project.

3. Defining TT&R

This section describes the feedback received with respect to defining TT&R, and discusses a range of issues that will inform the revised definitions. This section also presents draft definitions of TT&R for ABF purposes and explains the basis upon which the draft definitions have been constructed.

At the outset, it was acknowledged that a number of stakeholders consulted during the environmental scan expressed some concerns with regards to defining TT&R. These concerns typically centred around:

- The potential for diminishing the quality and value of TT&R delivered by public health services by attempting to 'productise' or 'commoditise' them;
- the perceived impracticality and further administrative burden of separating TT&R from patient care activities (and existing consolidated funding pools) for little gain or potentially negative consequences; and
- a common view that if critical TT&R activities were not explicitly recognised in definitions, or classification systems, they would not be funded.

In developing these definitions, the intention has not been to determine boundaries between all TT&R activities conducted by a public health service. Rather, the draft definitions aim to identify the characteristics of TT&R, while recognising that:

- they are often delivered jointly in conjunction with patient care;
- the outcomes from this project should seek to support quality TT&R outcomes; and
- the definitions should not provide incentives for health services to 'game' or otherwise manipulate the system in order to attract additional funding.

The difficulties associated with arriving at a nationally consistent definition of TT&R are well documented, and were reflected in the diversity of opinion received from stakeholders with respect to how the definitions should be constructed. The environmental scan discusses the breadth of these issues, along with the need to resolve a number of areas where a significant diversity of opinion was identified across stakeholders.

For ease of presentation, the themes arising from the feedback related to teaching and training have been presented separately to those related to research.

3.1. Teaching and training

3.1.1. Literature review findings

The literature review revealed that teaching and training activities undertaken in health services are largely understood from a medical perspective. Although there is some discussion in the available literature of specific issues with respect to nursing, allied health and other clinical disciplines, the literature describing the issues associated with teaching and training from the perspective of these professional groups is substantially less than for medicine.

The literature review highlighted clear differences in the duration and intensity of teaching and training requirements across and within professional groups. For medical, nursing, midwifery and allied health professional groups, teaching and training activities may occur through student placements (referred to in this report as being "pre-entry") or at a range of subsequent levels once an individual has entered the workforce ("post-entry"). This may include activities undertaken while working towards achieving registration as a fully qualified professional, to extend an individual's skills or knowledge base, to maintain their professional competence or registration, or to ensure the public health service's organisational compliance with national standards.

The literature review also revealed that there is no standard national definition(s) for teaching and training. As a result, various descriptions of teaching and training have been adopted for the purposes of guiding teaching and training policy across Australia. Some of these definitions do not offer a distinction between 'teaching' and 'training', and instead appear to use the two terms interchangeably.

3.1.2. Key definitional themes arising from consultation regarding teaching and training

The environmental scan consultation highlighted a number of issues that will need to be considered in order for the definitions to be clear and robust. These issues are discussed under the following themes:

1. Are the HOI draft definitions of TT&R an adequate starting point?
2. Is it possible to practically distinguish between teaching and training activities?
3. Is it possible to separate all teaching and training from clinical service delivery (and research)?
4. How do teaching and training activities differ between clinical professional groups?
5. How broadly should teaching and training be defined?
6. How wide should the scope of allied health disciplines be considered for ABF purposes?
7. Will teaching and training activities be funded if they're not defined?

These factors are considered in more detail below. Their potential impact on arriving at a definition is also discussed.

1. Are the HOI draft definitions of TT&R an adequate starting point?

Although the HOI definitions of teaching and training (presented in Appendix A) appear to have been adopted for the purpose of progressing TT&R policy to a limited degree, a number of jurisdictions and independent reports have acknowledged shortcomings in the definitions.

The general feedback received from jurisdictions on the HOI draft definitions at the time that they were developed (2010) related to issues which suggested that definitions should:

- consider 'indirect' teaching and training products / costs as part of the definitions;
- establish a clearer distinction between teaching and training (although others have identified that "training should be defined alongside the concept of teaching");
- identify a schedule of included professions that are considered 'clinical' for the purposes of funding; and
- distinguish between direct and indirect teaching and training, and formal/informal teaching and training.

Follow up discussions during the stakeholder consultation phase revealed similar mixed responses in terms of the extent to which the definitions adequately represented the different characteristics of teaching and training activities delivered by and on behalf of public health services. The following key points were commonly raised:

Need for a clearer understanding of what 'indirect teaching and training' means

Stakeholders expressed varying interpretations of what they believed 'indirect teaching and training' meant, as defined by HOI. Stakeholders considered that it would be more appropriate to use 'indirect teaching and training' to describe the administrative and coordination support functions and processes that a health services provides to facilitate teaching and training, but which do not involve the didactic or experiential teaching and training activities.

Stakeholders generally considered that a better way to refer to the interaction between teaching and training and patient care would be to use the term 'embedded', in recognition of the inextricable connection between these activities.

Can teaching and training be distinguished in a practical sense?

A broader issue was raised as to whether it was possible to discern a difference between 'teaching' and 'training' in practical terms. A range of stakeholders noted that the HOI definitions may be suitable as a theoretical baseline for differentiating between teaching and training, but they do not provide an accurate reflection of the various ways in which teaching and training is delivered within health services in an operational sense.

For example, the HOI definition of 'teaching' specifies that "the primary aim must be to transfer clinical knowledge that will result in qualifications that may meet registration requirements, or other admission to a specified discipline where the right to practice in that discipline requires completion of the program or course". A common response suggested that this definition would presumably exclude teaching and training that is delivered to medical professionals in their prevocational years. Although these professionals are not undertaking any formal program course, a number of stakeholders identified that health services are required to provide a significant amount of teaching and training to support these trainees.

Similarly, the HOI definitions appear to draw a distinction between teaching and training on the basis that teaching is related to **knowledge development** that leads to qualifications or registration requirements for an **individual**, and that training imparts **skills, technique or method** that leads to improvements in **organisational** outcomes, such as staff retention, knowledge of industry trends, and maintaining a safe and healthy workplace. The delineation between teaching and training on this basis raised some significant issues.

Stakeholders considered that in a practical sense, the distinction between teaching and training is not as clear cut as the HOI definitions suggest. For example, both knowledge and skills development is required in order to fulfil the requirements for 'clinical' qualifications and registration requirements. As a result, there is significant overlap between teaching and training as defined by HOI when translated in a practical sense, as both knowledge and skills development is required to achieve qualifications and registration requirements.

A second issue to emerge from HOI's delineation of teaching and training is the extent to which the organisational activities associated with 'training' (as defined by HOI) represent core 'business as usual' requirements that all health services are required to provide, and whether a separate teaching and training funding stream should capture these activities. On this issue, stakeholders held largely divergent views.

Regardless of whether or not these organisational requirements should fall inside or outside of how teaching and training is ultimately defined, stakeholders considered that 'training' cannot solely be confined to either the impartation of skills, technique or method, nor can it be restricted to an organisational context.

While the HOI definitions could provide some basis for defining teaching and training from a policy or theoretical perspective – particularly if teaching and training was required to be separately identified

– for practical purposes, it may be too difficult to separate the direct and indirect / embedded teaching and training activities on this basis.

Use of examples and exclusion criteria in the definitions

Stakeholders generally agreed that the inclusion of specific examples of teaching and training within the definitions served only to create confusion about whether these examples were intended to represent the entire breadth of activities that are in scope of the definitions, or served only to provide examples.

The inclusion of specific examples also raised a number of further definitional issues, about the practical interpretation of terms such as 'specified discipline', 'clinical' and 'professional development'.

Key messages:

- While the HOI definitions could provide a theoretical basis for defining teaching and training they do not reflect how teaching and training is delivered in a practical sense;

Implications for defining teaching and training for ABF purposes :

- The updated definitions of teaching and training should:
    - Investigate and establish whether the best approach to defining teaching and training is through separate definitions for both terms;
    - Provide a more robust way of distinguishing between teaching and training (if separate definitions for teaching and training are the best approach to framing the definitions); and
    - Adopt a principles-based approach that avoids raising further definitional questions about terms contained within the definition.

2. Is it possible to practically distinguish between teaching and training activities?

Discussions regarding the ways to separately define 'teaching' from 'training' activities for ABF purposes drew a range of responses. Discussions regarding similarities and differences between teaching and training largely reflected the difficulties in drawing a reliable distinction between 'teaching' and 'training' that had both practical relevance and was suitable for costing and classification purposes.

The literature review identified a significant overlap in the activities that are considered as 'teaching' and those that are considered as 'training'. This high degree of overlap has often been expressed in the two terms being used interchangeably in both published literature and jurisdictional policy and funding guidelines.

Nonetheless, the consultation revealed a range of views regarding potential points of difference between the terms 'teaching' and 'training', including:

i. That the point of entry into the health service differentiates teaching (pre-entry candidates) from training activities (once employed by the health service);

ii. That teaching involves structured / formalised activities whereas training is largely unstructured / embedded in patient care;

iii. The defining element of teaching should be that clinical knowledge is acquired, whereas training relates to the practice and execution of skills;

iv. The mode of learning may provide a basis for differentiation, such that didactic activities represent teaching and experiential learning should be considered as training; and

v. The basis of teacher interaction – teaching is delivered on a one teacher to many basis, but training is delivered one to one.

These approaches are explained further in Table 3 below.

Table 3: Possible approaches to separately defining teaching from training

Basis for differentiation	Teaching examples	Training examples	Issues / problems with the proposed definitional distinctions
i. Point of entry to the health service	Activities that occur prior to entry as an 'employee' of the health service	Activities that occur after entry as an 'employee' of the health service	• teaching and training activities that occur prior to entry can be similar to or the same as those that occur post-entry. *For example:* • student involvement in ward rounds.
ii. Structured / unstructured	Formal, structured; part of a course	Unstructured / part of clinical service delivery	• Unstructured activities may form part of a course; • Formal, structured teaching and training activities may take place as part of clinical service delivery. *For example:* • graduate nurse programs are often structured but have a large clinical service delivery component.
iii. Knowledge versus skills execution	Activities directed to developing knowledge	Activities directed to the development or execution of skills or techniques	• Knowledge and skills development often occur at the same time. *For example:* • is it possible to delineate when knowledge or skills are being developed while a medical resident is being supervised in a theatre session?
iv. Mode of learning	Didactic	Experiential	• Elements of both didactic and experiential learning exist in many teaching and training activities and may change depending on the nature of trainee. *For example:* • would ward rounds be characterised as didactic or experiential for a student that is purely observing? • would this be the same for a resident that is helping to deliver a ward round?
v. Teacher to learner ratio	One-to-many	One-to-one	• Teacher to learner ratios cannot be applied as 'hard and fast' rules across different teaching and training activities or professional groups. *For example:* • a tutorial may be delivered on a one-to-one or one-to-many basis; • A theatre session may impart knowledge and skills for a number of different professionals concurrently.

However, an overwhelming response from participants was that, for practical purposes, the resources, activities and ultimately costs of teaching and training are too difficult to separate in a consistent and meaningful way. Moreover, the majority of stakeholders considered that the degree of interaction between teaching and training was so close that it is effectively "inseparable" in a practical sense. This led most stakeholders to contend that drawing a distinction between teaching and training was almost "artificial" or "semantic".

For this reason, it was largely suggested that one definition should reflect the range of activities relating to teaching and training.

Terminology used to describe teaching and training

A range of perspectives were discussed regarding the terminology that is currently used by various jurisdictional health departments, health services and peak bodies to reflect the nature of teaching and training provided by and on behalf of public health services.

Much of the terminology currently in use does not distinguish between teaching and training as separate concepts, but considers both activities under the umbrella of a single, related concept. Common words and phrases used to describe these types of activities included:

- Training and development;
- Learning;
- Formation; and
- Education (including 'clinical education').

While the NHRA refers specifically to the terms 'teaching' and 'training', a number of stakeholders suggested that an alternative term be considered to remove the ambiguity and semantic arguments that may result from using the terms 'teaching' and 'training' when they may often occur at the same time.

It is also noteworthy that the three jurisdictions with detailed funding approaches for TT&R each use different terminology to describe their respective grants. Where Victoria uses the term 'Training and Development', South Australia uses the term 'Teaching Grant' and Queensland refers to 'clinical education'. Although the differences may be largely semantic they underline the fact that there is little consistency in the way that the terms 'teaching', 'training' and 'research' are used in funding approaches across jurisdictions, in spite of the existence of separate definitions for each.

Key Messages

- Consistent with the findings from the literature review, the consultation phase of this project has revealed concerns that the functions of teaching and training were too difficult to separate for practical purposes.
- A single definition which recognises the combined role of teaching and training will alleviate the potential subjectivity associated with distinguishing them separately and also reduce the burden of administrative, classification and costing effort in separating these interlinked activities for minimal perceived benefit.

Implications for defining teaching and training for ABF purposes:

- While it will be important to include relevant aspects relating to both teaching and training activities within a definition for ABF purposes, stakeholder consultations suggest that it would be more reflective of current teaching and training practice to encapsulate the collective activities of teaching and training within a single definition.
- To avoid further ambiguity, IHPA may wish to consider using an alternative term to describe the combined activities which relate to teaching and training.

3. Is it possible to separate all teaching and training from clinical service delivery (and research)?

The literature and feedback from consultation consistently highlighted an intrinsic and often inseparable link between activities that support teaching and training and clinical service delivery. It is widely accepted that a core tenet of public health service delivery is to provide an appropriate

environment for teaching and training to take place, with the ultimate aim of developing a competent, well-skilled and sustainable health workforce.

Feedback during consultation highlighted that, in fact, more and more teaching and training is being conducted "on the clinical floor" and directly associated with the conduct of patient care activities.

Figure 5 conceptualises the intersection between teaching, training and research and their relationships to patient care / clinical service delivery. A similar conceptualisation was presented to stakeholders as part of the environmental scan as the basis for testing our understanding of the nature of TT&R and the extent to which each sub-component of TT&R is related to each other, and to patient care.

Figure 5: Conceptual relationship between clinical service delivery, teaching, training and research activities

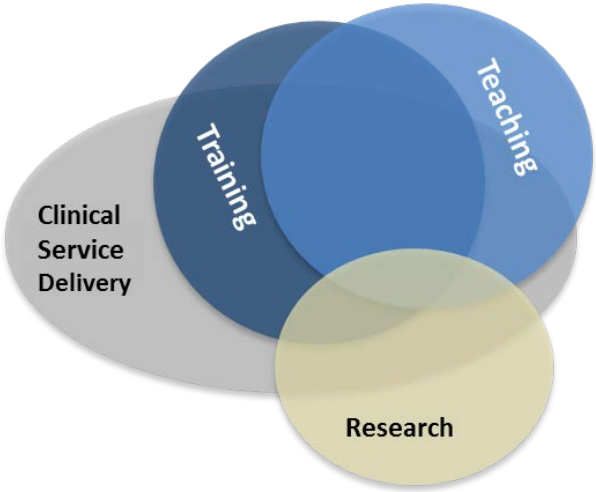


Figure 5 illustrates that all three concepts – teaching, training and research – overlap with each other to varying degrees, and that all three are closely embedded with many elements of clinical service delivery. Although there are some activities that can be attributed to either teaching or training (albeit with differing opinion on which category these activities fall into), there is a substantial overlap between the two activities that some stakeholders considered is perhaps even greater than indicated in the diagram.

Figure 5 also reflects the degree of overlap between teaching and training, and research. Feedback obtained also indicated that some research activities can be solely related to research i.e. they are distinct from teaching, training and clinical service delivery.

Difficulties capturing embedded teaching and training activities

The nature of the teaching and training environment, particularly as it relates to embedded clinical service delivery, also provides a number of challenges for attempting to identify and potentially separate out the cost and other impacts associated with teaching and training that is delivered in conjunction with patient care.

The key concerns raised by participants in attempting to separate costs of teaching and training from clinical service delivery included:

- The administrative burden of attempting to count and separate costs of teaching and training from clinical service delivery;
- The ability to derive any basis for quantifying the activities and costs of teaching and training in such a way that is representative of teaching and training activities that are comparable over time, across professional groups and between health services; and

- A commonly held view that dissecting the funding envelope between the absolute costs of clinical service delivery and those attributed to teaching and training activities will create ineffective and unworkable barriers, perverse incentives and behaviours which go against the principles under which these embedded activities are delivered.

The difference between direct, indirect and embedded teaching and training

Most stakeholders were clear in their understanding that 'direct' teaching and training relates to those activities that occur away from patient care interactions, such as lectures, tutorials and workshops.

Stakeholders frequently reflected on the delineation between direct and indirect teaching and training identified in the HOI definitions and expressed a degree of confusion about the applicability of the term 'indirect' to describe teaching and training activity that occurs in conjunction with patient care.

All stakeholders unanimously recognised the intrinsic association between teaching and training and clinical service delivery, and identified this as being fundamental to the delivery of high-quality teaching and training to the future health workforce. Many stakeholders contended that this association could be better captured by using the term 'embedded' teaching and training, which more appropriately reflects the nature of the way in which teaching and training is delivered in conjunction with clinical services. In this sense, 'embedded' teaching and training may describe activities such as ward rounds, training during surgical interventions or refinement of other procedural skills such as cannulisation or catheterisation.

Stakeholders also suggested that public health services are required to provide a number of other functions that support the delivery of teaching and training, but which do not represent direct teaching and training activities, nor do they occur within an episode of patient care. These activities may include the coordination of student placements, rotations, educational program development or negotiation with higher education providers.

Stakeholders contended that these activities were necessary for teaching and training, but were not directly involved with delivery in either a didactic or experiential way.

Stakeholders thus identified three separate terms that covered the potential range of different teaching and training activities, which are:

- **Direct teaching and training activities** - which occur outside of an episode of care but is directed towards skills and knowledge development;
- **Indirect teaching and training activities** - which are those 'back office' administrative and coordination activities undertaken by a health service that are essential to facilitate teaching and training, but do not involve either a didactic or experiential skills / knowledge transfer; and
- **Embedded teaching and training** – which describes where teaching and training occurs in conjunction with patient care.

These definitions are subsequently referred to throughout the remainder of this environmental scan.

Key messages:

- Teaching and training is intrinsically embedded within clinical service delivery (and is also embedded in research to some degree). Although some activities can be attributed to either teaching or training, there is a substantial overlap between the two activities which makes it extremely difficult to extricate these functions from one another.
- Teaching and training activities may be most clearly delineated as being either 'direct', 'indirect' or 'embedded'.

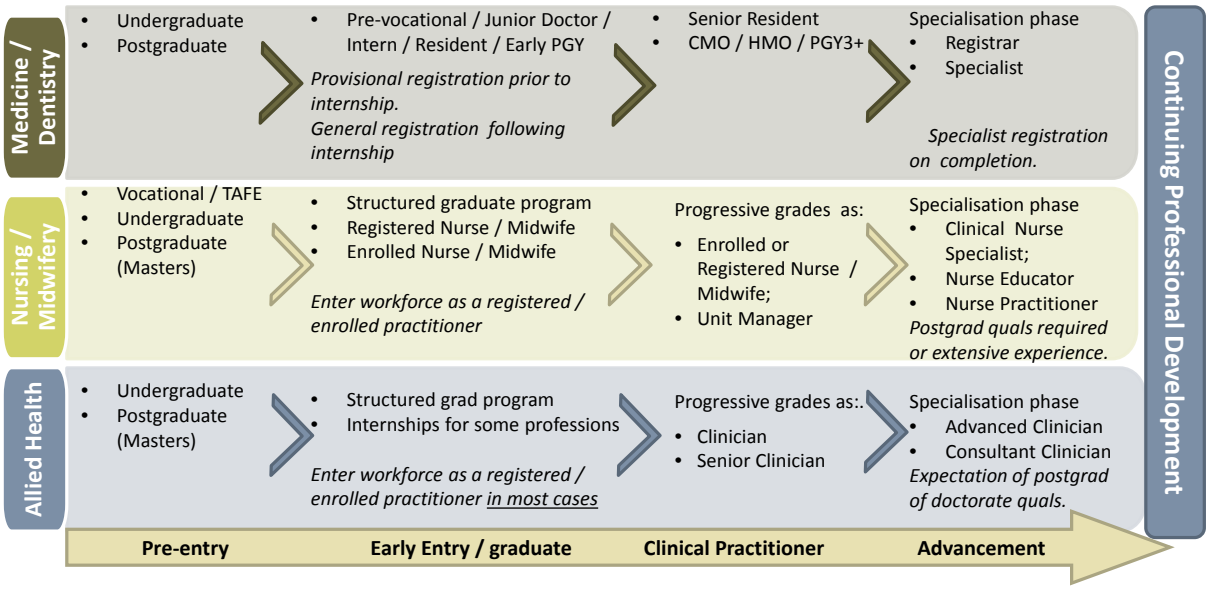
Implications for defining teaching and training for ABF purposes :

- It will be important to ensure that the definition recognises the intrinsic, embedded nature of teaching and training with clinical service delivery, and does not try to separate teaching and training from patient care.
- Additionally, the definition should not introduce barriers, disincentives or behaviours that compromise the quality of either teaching and training or clinical service delivery.
- The definition of training and teaching should include reference to the embedded and indirect resources, activities and costs required to support clinical teaching and training.

4. How do teaching and training activities differ between clinical professional groups?

The nature of teaching and training in a public health service setting is often seen in a broader continuum, where different professional groups receive (and in turn, deliver) varying forms of teaching and training.
Figure 6 illustrates the traditional teaching and training pathways for each major professional group to which clinical teaching and training is delivered in public health services.

Figure 6: Summary of training and teaching continuum by clinical professional group



Medical profession teaching and training pathway

Pre-entry clinical placement

Medical student trainees typically begin their clinical teaching and training pathway as either undergraduate or postgraduate students and require clinical placement in a health service as an integral part of meeting qualification requirements. Medical students will rotate through a number of different health settings (including community and general practice) and clinical speciality departments of health services.

Although the host higher education providers will typically provide some degree of infrastructure and clinical education staffing support to students, clinical supervision, training and exposure to the clinical environment is largely provided by health services. The type, duration and level of support provided to students will vary according to:

- Individual course curriculum requirements (mix of didactic, experiential and assessment requirements);
- Agreed arrangements and agreements determined between the Higher education provider and the health service; and
- Different jurisdictional arrangements in place.

Early entry medical graduates

After graduation from medical school, medical trainees are eligible for provisional registration as a mandatory requirement to enter the medical workforce. Although the terminology tends to differ between jurisdictions, medical trainees enter the workforce as an intern, junior doctor or postgraduate year 1 (PGY1). During this time, medical trainees begin to be exposed to a greater level of clinical responsibility, but are typically supervised closely by more senior clinicians as they are rotated through different departments of the health service. Although interns are not part of a formal course or training program, the Australian Curriculum Framework governs the clinical education requirements of Junior Doctors, which outlines competencies in the areas of clinical management, communication and professionalism.

Pre-vocational years

Upon completing their intern year, medical trainees are eligible for general registration, and may potentially apply for entry into a vocational training program – although further clinical experience is usually required in order to gain admission to these programs. Alternatively, medical trainees may continue to work in a health service as a Resident / Senior Resident / Career Medical Officer / House Medical Officer or other classification if they do not wish to enter vocational training, or while they await admission to a vocational program. As the trainee's experience grows, their clinical responsibility also increases, and the degree of supervision typically decreases. They may also assume a role in the supervision of more junior medical trainees.

Vocational / specialist training pathway

Acceptance to a vocational training program provides registrars with more scope to progressively train in a clinical specialisation, in accordance with medical college training requirements, to obtain fellowship status of the respective college. The college requirements of basic/junior trainees through to advanced trainees differ between colleges as do supervision and training requirements. In most cases, college training requirements will stipulate the level and amount of supervision, clinical practice and procedural requirements and ratio of consultants per trainees required in the health service to accredit the training position. Due to the nature of advanced training, supervision requirements of the trainee are likely to be higher in the early years of the program, compared to the trainee's latter years as an advanced registrar.

Differences in the nature (procedural / non-procedural), length and other requirements of the respective clinical craft groups can mean that specific teaching and training requirements can vary substantially at this end of the teaching and training continuum. Once the trainee successfully completes the requirements of the vocational training program, they are a fully qualified professional and are eligible for full registration to their chosen professional discipline.

Continuing professional development (CPD)

CPD requirements of medical professionals vary according to their chosen discipline, as does the level of support that is provided by the health service or specialist college to maintain their professional competence. While different jurisdictions' industrial award conditions provide for CPD differently, the onus for maintaining CPD requirements rests largely on the individual.

Nursing and midwifery

Pre-entry clinical placement

Although nursing and midwifery trainees' initial entry point to a health service is typically as a student, the timing, curriculum requirement and term for student placement may vary between higher education providers. Higher education provider requirements will influence the type and nature of the health service resources required to support the placement.

Trainees studying to become an Enrolled Nurse may enter to fulfil the requirements of a diploma or advanced diploma level qualification. As part of their training, Enrolled Nurses are required to complete at least 400 hours of clinical placement. Trainees studying to become a Registered Nurse are required to undertake placement to fulfil the requirements of a Bachelor degree in nursing and/or midwifery. Students studying towards a postgraduate nursing or midwifery qualification are also required to undertake placement in a health service.

The nature and duration of clinical supervision can vary substantially in order to fulfil curriculum requirements. As an example, although the minimum clinical placement hours to fulfil the requirements of a Bachelor of Nursing / Midwifery is 800 hours some higher education providers require health services to provide up to 2,000 hours. In contrast to the medical profession, which has varying levels of registration, nurses and midwives are required to be fully registered when they enter the workforce.

Throughout the consultation there was a general acknowledgement that a ratio of up to eight students to one clinical educator (employed by the health service or in some cases by the higher education providers) could be supported within a health service at any one time.

The degree of higher education provider support and subsidy provided by higher education providers to health services to fulfil student placement requirements also differed depending on health service arrangements with higher education providers and in some cases jurisdictional agreements with the higher education sector – in Victoria a standard agreement exists defining the clinical placement fee that can be charged by health services to higher education providers on a per placement day basis.

Early entry nursing and midwifery graduates

Once in the workforce, nurses and midwives may participate in a structured graduate program that is developed and delivered by the health service, although this is not always the case. Graduate nurses and midwives may be mentored or precepted by a more senior professional or in some cases may be expected to be a fully functioning member of the workforce from 'day one' of their employment.

Graduates often rotate through a number of different areas of the health service and may have dedicated orientation / socialisation and education days within each rotation – during which they are essentially supernumerary. Outside of these supernumerary days, graduate nurses are generally considered to be part of the clinical workforce profile, supporting clinical service delivery. Stakeholders acknowledged that there was a gradual 'ramp-up' in graduate nurses clinical service

contribution as they gain more clinical experience and confidence. Anecdotally it was recognised that as graduate nurses complete more rotations, there is a noticeable increase in their level of independence and competence.

Career progression

Throughout the course of their career, nurses and midwives may seek to expand their skills base into an advanced or extended scope of practice, to a specialist nurse role (such as theatre or intensive care), into a nurse unit manager role, Nurse Administrator, Nurse Educator or Nurse Practitioner. In some cases, nurses will opt to develop their skills and knowledge of their own volition; in other cases the health service may invite them to do so and/or sponsor the associated costs. The precise teaching and training requirements to achieve these levels of accreditation vary according to the nature of the role, the health service and training provider. Some (such as Nurse Practitioner and many specialist nurse roles) require the completion of formal, clinically-based postgraduate qualification.

Continuing professional development (CPD)

As is the case in medicine, qualified midwives and nurses (either registered or enrolled) are required to undertake 20 hours of CPD activities in order to maintain their professional competence and practice standards.

Allied health professionals

Allied health teaching and training pathways vary substantially between disciplines. Teaching and training requirements for allied health professionals can vary substantially according to the individual's professional discipline and the training level (e.g. student versus early graduate versus specialist / advanced scope of practice). Nonetheless, there are some common elements across many allied health disciplines, as described below.

Pre-entry clinical placement

Similar to other clinical professionals, the initial entry point to a health service is typically as a student with the timing, curriculum requirement and term for student placement being variable between different disciplines and different higher education provider requirements. The course requirements of various types of higher education providers will influence the type and nature of the health service resources required to support the placement.

In contrast to nursing and midwifery, there was no common relationship between disciplines / courses and the ratio of the number of students that could be supported by clinical education and supervision.

Early entry graduates

Depending on the health service, once in the workforce, allied health professionals (most of whom are already registered to practice when they are employed in a health service) may participate in a structured graduate program developed and delivered by the health service. Graduates may be mentored or precepted by a more senior staff member or in some cases may be expected to be a fully functioning member of the workforce from 'day one' of their employment.

A number of allied health professional bodies require graduates to undertake a period of internship in order to achieve full registration with the professional body. To date, these professions include:

- Pharmacy;
- Medical radiation science;
- Psychology; and
- Dentistry.

Career progression

Allied health professionals (AHP) may have a number of career pathways depending on the discipline, but broadly, the options to progress proceed as follows:

- Many allied health graduates enter the system as registered professionals (for those disciplines where registration is required), and are largely expected to work to their full scope of practice shortly after entry;
- Some other disciplines (pharmacy, psychology and medical radiation science) undertake an 'internship', which may last for one or two years, depending on the nature of the trainee's qualification. Professionals in these disciplines are expected to work to their full scope of practice shortly after registration with their respective professional group;
- After their graduate year, allied health professionals typically move to a clinician role, where they may fulfil their clinical role in addition to providing supervision and support to new graduates, students and allied health assistants. Individuals progress through grade increments, which denote progressive levels of independent clinical practice depending on competency and years of experience;
- Some individuals may wish to specialise to obtain the role of Senior Clinician, which may typically involve broader management responsibilities;
- After specialisation, allied health professionals are typically expected to undertake postgraduate qualifications in order to attain the role of Advanced Clinician;
- Consultant Clinicians represent the highest level in the allied health hierarchy - Further post graduate study (typically doctorate education followed by additional specialisation) provides advanced or extended scopes of practice.

Continuing professional development (CPD)

A range of allied health professional registration bodies require minimum CPD hours per annum and a range of activities of continuing professional development in order to maintain their professional competence and practice standards. The responsibility of meeting and maintaining these registration requirements typically resides with the individual.

Key Messages:

- Public health services play a critical role in providing exposure to clinical teaching and training environments in order to fulfil the curriculum requirements of higher education providers and professional registration bodies. Health services predominately provide this exposure for trainees in the fields of medicine, nursing, midwifery and allied health.
- Each clinical professional group requires a different type and level of teaching, training and health service supervision as they move through the teaching and training continuum.
- Requirements to achieve full registration to practice differ substantially between professional groups. Most nurses, midwives and allied health professionals must be registered prior to their first year of practice. Full (specialist) registration as a medical professional takes substantially longer to achieve, with a greater associated duration of teaching and training.
- Following a clinical professionals' attainment of full registration, all remaining educational requirements to maintain registration or enhance qualification remains the primary responsibility of the individual.

- Health service roles and responsibilities to support teaching and training therefore principally rest on requirements to supervise and assist individuals to attain higher education and full registration requirements.

5. How broadly should teaching and training be defined?

An issue commonly raised by stakeholders was the need to define the boundaries of teaching and training activities for ABF purposes. Consultations highlighted that a core requirement of public health services is to provide clinical professionals with exposure to clinical environments in which to develop their knowledge and skills towards achieving qualifications or registration. However, the range of teaching and training activities undertaken in health services extend well beyond those delivered to support clinical competencies.

The potential breadth of public health service teaching and training activities has been described across a range of categories including:

i. Supervision and support for undergraduate / pre-entry clinical student placements;

ii. Teaching and training provided to pre-vocational medical and (some) allied health employees;

iii. Advanced / specialist / vocational training requirements of medical personnel;

iv. Health service-initiated training programs, which may promote occupational health and safety, patient safety, hand hygiene and quality care;

v. Retraining of clinicians returning to the health workforce;

vi. Training to achieve recognition as an advanced / specialist practitioner (for non-medical professions);

vii. Continuing professional development activities required for professionals to maintain registration and professional competence;

viii. Externally mandated training required to meet hospital accreditation standards (particularly with the recent introduction by Australian Commission on Safety and Quality in Health Care (ACSQHC) of the National Safety and Quality Health Service standards);

ix. Clinical knowledge and skills training to enable the use of new equipment, technologies, techniques and therapies in the clinical practice; and

x. Corporate, management and leadership training of clinical and non-clinical leaders.

Table 4 considers each of these categories of teaching and training activities and identifies examples.

Table 4: Spectrum of public health service teaching and training activities

Spectrum of teaching and training activity in a health service	Characteristics / examples	Recipients
i. Pre-entry student placement	*Requirement of the **health service** to provide clinical placement to enable the attainment of a higher education qualification:* • Lectures / tutorials / grand rounds; • Provision of clinical educators; • Clinical unit supervision; • Ward rounds / clinics; • Assessment (including Work-Based Assessment).	• Undergraduate, diploma, certificate and postgraduate students on clinical placement (Medical, nursing, midwifery and allied health).

Spectrum of teaching and training activity in a health service	Characteristics / examples	Recipients
ii. Intern and pre-vocational training programs	*Requirement of the **health service** to provide employed graduates with clinical support and supervision in their initial phase of employment:* • Lectures / tutorials / grand rounds; • Ward rounds / clinics; • Dedicated education day and study leave; • Clinical unit supervision; • Assessment.	• **Medical** interns and residents; • **Allied health** interns (selected disciplines only).
iii. Vocational medical training programs	*Requirement of the **health service** to provide vocational trainees with education, supervision, resources, clinical practice to attain specialist college registration:* • Clinical practice; • Dedicated education day and study leaves; • Clinical speciality supervision; • Work based assessment.	• Medical registrars.
iv. Health service initiated training	*Programs delivered by the **organisation** to further organisational standards of safety and quality care* • Early entry graduate programs; • Orientation / induction; • Occupational Health and Safety (OH&S) training; • Security awareness.	• **Nursing, midwifery and allied health** – graduates; • All staff employed within a health service.
v. Retraining of clinicians returning to the health workforce	*Clinically qualified individual has left employment in their designated field and seeks re-employment.* **Refresh** – individuals still registered but require retraining to re-enter the health service workforce; **Retrain** – individuals seeking retraining where their registration has lapsed.	• All medical, nursing and midwifery and allied health professionals.
vi. Training to achieve recognition as an advanced / specialist professional	*E**mployee** elects to advance their qualifications which may or may not meet an employment requirement of the health service:* • Advanced or extended scopes of practice; • Masters–level or above.	• **Nursing and midwifery** – Clinical Nurse Specialists and Nurse Practitioners; • **Allied Health** – specialist training.
vii. Continuing professional development	*Requirement of the individual **employee** to continually meet necessary skills to maintain registration requirements and professional competence:* • Continuing Professional Development (CPD) hours; • Refresh courses; • Clinical practice competence; • Conferences.	• All medical, nursing & midwifery and allied health professionals.

Spectrum of teaching and training activity in a health service	Characteristics / examples	Recipients
viii. Externally mandated training	*Requirement of the **organisation** to continually meet standards of safety and quality care specified by external bodies.* • Australian Commission on Safety and Quality in Health Care (ACSQHC) National safety and quality standards: o Infection control, Medication safety, Patient identification and matching, Clinical handover, Blood products, Pressure injuries, Responding to clinical deterioration – Life support, Falls prevention. • Australian Council on Healthcare Standards (ACHS) hospital accreditation standards.	• All medical, nursing & midwifery and allied health professionals; • Technicians.
ix. Clinical knowledge and skills training	*Requirement of the **organisation** to provide the necessary skills and training to ensure new technologies are implemented and inducted into the organisation, effectively and optimally in line with their intended use or application.* • Skills training to support new purchase of diagnostic equipment; • Education for introducing new drug on formulary; • Introduction of new procedure techniques.	• All medical, nursing & midwifery and allied health clinicians; • Technicians.
x. Corporate, management and leadership training	***Organisational development activities** to provide administrators and managers with sufficient skills and knowledge to lead the organisation in an effective manner* • Business management training for Nurse Unit Managers; • Clinician leadership training.	• Non-clinical staff; • Candidates for clinical supervision roles.

As a result of the broad range of activities, there needs to be a clear and justifiable basis for delineating between those teaching and training activities that should be covered within the definition and those that should not.

The broad dimensions of the teaching and training continuum articulated in Table 4 provided a consistent basis for discussion regarding potential bases for 'drawing the line'. Those dimensions include:

- the professional group to which teaching and training is delivered;
- the level of professional to which the teaching and training is being delivered; and
- the type of teaching and training activity being conducted.

Although a broad range of views were expressed, some general consensus emerged. The dimensions, rationale, and implications for the breadth of activities covered as part of the definitions are summarised in Table 5.

If the criteria articulated in Table 5 were applied, then the teaching and training elements which would fall within the scope of the definition for ABF purposes would include items i. through iii in Table 4.

Table 5: Dimensions relevant to how broadly teaching and training should be defined

Area of scope	Element considered in-scope	Rationale	Element considered out of scope	Rationale
Professional group	• Medical; • Nursing; • Midwifery; and • Allied health.	Only those disciplines with a **direct relationship to the delivery of clinical services to consumers** should be included.	Corporate and non-clinical professions such as administrators, ward clerks, hotel services staff, etc.	These roles may support the delivery of clinical services to patients but **do not involve the provision of direct clinical care**.
Professional level	• Student placements; • Pre-vocational training; and • Vocational medical training programs	**Public health services are responsible for facilitating the knowledge and skills development for these professionals through exposure to a clinical environment**. Clinical exposure is essential to fulfil qualification and registration requirements for these professions. In doing so, **health services must provide extensive supervision and support for professionals in these roles** in order to support their knowledge and skills development. The additional costs required to provide this support are material and should be reflected in funding received by the health service.	• Retraining of clinicians returning to the health workforce; • Training to achieve recognition as an advanced / specialist professional; and • Continuing professional development.	**Individuals are considered responsible** for maintaining their professional competence, advancing their own career or extending / advancing their desired scope of practice after they are registered to practice. As a result, health services should not be reimbursed for their role in supporting teaching and training requirements that are the result of individuals after they are fully qualified and / or registered (if required) to practice.
Activity types	Only those activities that are prerequisites for achieving a qualification or registration to practice in a clinical discipline.	Same as for 'professional level' above.	• Externally-mandated training; • Health service-mandated training; • Clinical knowledge and skills training; and • Corporate, management and leadership training.	These activities are not required for the health service to develop the future medical workforce. Rather **they are business decisions** that are required for the health service to maintain its accreditation, or to expand its service mix.

Key messages:

- The spectrum of teaching and training delivered in health service settings goes considerably beyond the provision of teaching and training activities to assist clinical professions attain the knowledge, skills and practice to meet qualification or registration requirements;
- Distilling what components of the teaching and training spectrum should be captured by the definition drew a vast range of divergent responses. Determining 'where the line should be drawn' is thus a complex issue that will require careful consideration;
- To guide the development of a logical and consistent basis for delineating the breadth of TT&R activities that should be included within the definition, some defining elements of the teaching and training continuum may be useful. These dimensions include:
    - The range of professional disciplines;
    - The level of professionals; and
    - The types of teaching and training activities.

Implications for defining teaching and training for ABF purposes :

- Applying the criteria derived from the elements of the teaching and training continuum, stakeholders suggested that the definition of teaching and training should be worded in such a way that it captures:
    - Only those **professional disciplines with a direct relationship to the delivery of clinical services** to consumers;
    - Only those **professional levels that require exposure to a clinical environment in order to fulfil the qualification or registration requirements** of the discipline in which they are employed; and
    - Only those teaching and training activities that contribute to the fulfilment of qualifications or registration to practice in a clinical discipline (medical, nursing, midwifery or allied health).

6. How wide should the scope of allied health disciplines be considered for ABF purposes?

A key issue raised by stakeholders related not only to the scope of teaching and training activities required to support allied health professionals, but what disciplines should be included within the context of an 'allied health' professional for the purposes and scope of this project? Contrary to medicine, nursing and midwifery, where disciplines within these professional groups must typically be registered in order to practice, there is significant variation in the qualification and registration requirements of allied health professionals. There is thus no clear and consistent basis for 'drawing a line' on what is allied health and what isn't.

Given the significant variations across jurisdictions, the professional groups considered within the umbrella of allied health will also need to be established on a nationally consistent basis if allied health is to be used as a parameter in the definition of teaching and training.

Various peak bodies, jurisdictions and health services all held different views on the range of professions and disciplines that fall under the umbrella of 'allied health'. Drawing upon these sources and discussions with stakeholders, the table presented in Appendix B highlights up to 67 potentially different disciplines that may broadly be considered an allied health discipline.

Stakeholders also provided the following as potential criteria by which to define the scope of allied health practices for the purposes of ABF:

- whether the allied health discipline requires a tertiary-level qualification (thereby excluding allied health assistants);

- whether the discipline is recognised by a national registration and accreditation scheme (i.e. AHPRA);
- those disciplines currently identified in Health Workforce Australia (HWA's) list of allied health professionals; and
- healthcare professionals, other than medical, nursing or midwifery which provide some technical, therapeutic or clinical support role to affect a direct patient/consumer outcome in a public health service.

Drawing from the feedback provided during consultations and taking into account the suggested criteria outlined above, an attempt has been made to identify the most commonly referred allied health disciplines employed in a public health service. Table 6 provides a synthesised list of the professions outlined in Appendix B based on:

- National allied health professional bodies recognised by AHPRA;
- HWA workforce statistics reports;
- Existing national classifications such as the Tier 2 Non-admitted Services classification; and
- Disciplines commonly identified in documentation provided by States and Territory health departments.

It is important to note that the purpose of providing this list is not to attempt to propose the list of applicable allied health disciplines but rather to provide a starting point to assess the types of professions that apply if the criteria referred to above was used.

Table 6 Indicative list of commonly referred Allied Health professions

Roles / Disciplines	AHPRA recognised national Boards	Selected occupations identified in HWA workforce statistics	Disciplines identified in as allied health in Tier 2 classification	Occasions identified by State and Territory health departments
ATSI health worker	**Y**	**Y**	**Y**	**1**
Audiology		**Y**	**Y**	**7**
Dentistry *(requires internship year)* / Oral health professionals	**Y**	**Y**		**4**
Dietetics		**Y**	**Y**	**8**
Exercise physiology		**Y**		**4**
Medical Laboratory Science		**Y**		**2**
Occupational therapy	**Y**	**Y**	**Y**	**8**
Optometry	**Y**	**Y**	**Y**	**3**
Orthoptics		**Y**	**Y**	**5**
Orthotics - Prosthetics		**Y**	**Y**	**8**
Pharmacy *(requires internship year)*	**Y**	**Y**	**Y**	**7**
Physiotherapy	**Y**	**Y**	**Y**	**8**
Podiatry	**Y**	**Y**	**Y**	**7**
Psychology *(requires internship year)*	**Y**	**Y**	**Y**	**8**
Radiation Science and Medical Dosimetry	**Y**	**Y**		**4**
Radiography/Medical imaging (*Requires internship year)*	**Y**	**Y**		**7**
Social Work		**Y**	**Y**	**8**
Sonography		**Y**		**6**
Speech pathology		**Y**	**Y**	**8**

Key Messages

- The wide variety of views regarding the scope of allied health practice and the lack of a nationally accepted definition has meant some clarity will be required to define the breadth of allied health disciplines that will be captured under the definition of teaching and training.
- A number of possible approaches may be useful for establishing a nationally consistent scope of allied health disciplines for the definition of teaching and training. Some possible approaches may include that the list of professions be informed by:
    - Those that are regulated by national boards (e.g. AHPRA);
    - Those that have been included in HWA's classification of allied health professionals;
    - Those that are already in use within existing classifications, such as in the Tier 2 Non-admitted Services classification; or
    - Those professions that have been most commonly referred in the available State and Territory health department documentation.

Implications for defining teaching and training for ABF purposes :

- The proposed definition has not stipulated a list of disciplines that are considered as 'allied health'.
- Some further resolution may be required to define the principles by which certain allied health professions are included (or excluded) from the definition of teaching and training.

7. Will teaching and training activities be funded if they're not defined?

A recurring theme throughout stakeholder consultations was a perception that, if all clinical or non-clinical teaching and training activities currently provided by public health services were not specifically recognised in the definition, these activities would not be recognised as an imperative by the public health service and would not be funded or adequately supported.

It was recognised that public health services have a wider responsibility to deliver non-clinical training activities – as part of good practice in maintaining a high-performing, safe workplace – and that the funds to support this endeavour are already included in existing funding pools. It was generally accepted that not all teaching and training activities will be included in the definition for ABF purposes.

Key Messages

- Some stakeholders raised concerns that some core 'business as usual' teaching or training activities of health services (such as fire training, OH&S and manual handling) may not be funded if they are not explicitly included within the updated draft definition.
- However, public health services have a wider responsibility to deliver non-clinical training activities – as part of good practice in maintaining a high-performing, safe workplace – and that the funds to support this endeavour are already included in existing funding pools.

Implications for defining teaching and training for ABF purposes:

- The definition of teaching and training for ABF purposes will focus on those activities that support the development of knowledge and skills for clinical disciplines, and will not capture broader teaching and training activities that are a part of the organisation's 'business as usual' functions.

3.1.3. Emerging trends and developments in teaching and training

Throughout stakeholder consultations, it was recognised that the nature of teaching and training continues to change in order to meet the growing demands placed on clinical professions with respect to teaching and training. This is particularly the case as:

- the number of trainees continue to increase;

- tertiary education and professional body curriculum requirements become more diversified; and
- health services continue to face demands to become more efficient in clinical service delivery.

The stakeholder consultation definition and cost driver analysis regarding teaching and training for ABF purposes will need to recognise the following emerging trends in teaching and training:

1. Increased numbers of clinical graduates leading to increased demand for teaching and training;
2. The expansion of teaching and training into a broader range of settings;
3. Increased use of information technology and online and web based training aids;
4. Use of simulation training facilities and techniques; and
5. Greater acceptance and use of inter-professional learning (IPL).

1. Increased numbers of clinical graduates leading to increased demand for teaching and training

Stakeholders consistently highlighted that the recent expansion in the number of health graduates in all disciplines (but particularly medicine) has had a direct impact on placement and training capacity demands on health services. The number of medical schools has grown from eight in the 1970s to 18 today, and with it, the number of commencing medical students has more than doubled between 2000 and 2010. Table 7 illustrates the magnitude of the increase across pre-vocational and vocational medical training places.

Table 7: Growth in medical training requirements - 2006 to 2011

Trainee group	2007	2008	2009	2010	2011	2012	Increase 2007 – 2012 (%)
PGY1 (interns)	1,776	2,030	2,243	2,394	2,723	2,950	66.1
PGY2 (residents)	1,586	1,422	2,352	2,313	2,521	3,101	95.5
Basic training positions	3,267	4,087	4,502	5,040	5,264	5,744	75.8
Advanced training positions	6,833	7,324	8,249	9,432	10,214	10,996	60.9

Source: Adapted by Paxton Partners from Commonwealth Government Medical Training Review Panel Fifteenth and Sixteenth Reports.

Stakeholders consistently noted that this significant growth in demand for training places is causing a range of impacts, including:

- Changes in the way that teaching and training is delivered – some stakeholders noted that a lower teacher to trainee ratio is leading to less one-to-one teaching and training and more being undertaken in small groups. The effect on quality (if any) of this change has not yet been established;
- A greater cost burden on health services in terms of the staff supervision that is required to support the increased number of trainees. This was noted to cause downstream impacts in terms of productivity impairments, infrastructure overheads and other costs required to support teaching and training;
- Expansion of teaching and training activity into a broader range of settings, including, primary / community care, general practice, aged care and private hospitals;
- Some degree of 'squeezing out' of internationally-trained clinicians as a result of the emerging glut in domestic graduates; and
- Difficulties in some medical residents being able to attain admission to a vocational training program, resulting in an increased number of Career Medical Officers, House Medical Officers and equivalent.

Some stakeholders noted that these impacts materialise in different ways across different jurisdictions, and are not uniformly impacting the nature of teaching and training on a national level.

2. The expansion of teaching and training into a broader range of settings

As highlighted in the discussion of the increased demand for teaching and training above, it is widely acknowledged that teaching and training is increasingly being conducted across a broader range of health service settings and providers – many of which were often connected to, but not directly part of, public health services. These type of health settings included:

- Small block-funded hospitals many of which form part of health services and Local Health Districts;
- General practice and aged care settings;
- Community care and ambulatory care settings; and
- Private and not-for-profit hospitals.

What is emerging is the increasing scope and scale of teaching and training being conducted in these settings.

The increased provision of training places is necessitating that the range of settings in which clinical teaching and training is delivered is far broader than it has been historically. It was recognised that the traditional notion of 'teaching' hospitals is becoming less relevant – teaching and training is increasingly extending beyond large tertiary referral centres located in metropolitan areas, to regional and rural health services, private hospitals, and community / general practice settings. The challenges and cost structures of these services will subsequently impact the costs of delivering teaching and training, as well as the models that are employed to do so.

*Teaching and training in private and not for profit hospital settings*Table 8 presents the number of clinical placement hours provided nationally in the public, private and non-government organisation (NGO) sectors. The table clearly highlights the important role of the private and NGO sectors in supporting clinical placement requirements, as approximately one-quarter of all clinical placements were provided in the private sector.Table 8 also highlights that the private sector is particularly important in terms of the support that it provides for the allied health, nursing and midwifery professions. In 2012, approximately 25% of clinical placements for nursing and midwifery, approximately 32% of allied health placements, but only 15% of medical placements were delivered in the private sector.

In spite of the recognised increase in the role of private hospitals and not-for-profit hospitals delivering teaching and training to clinical professionals, many stakeholders noted that these facilities rarely attract external sources of funding to support teaching and training. The rationale for providing greater levels of teaching and training ranges from:

- Seeking to invest in the junior clinical workforce for the purposes of future attraction and retention strategies;
- For philanthropic reasons in supporting the greater health system; and
- As part of contracted arrangements with public health services to support elements of a junior clinician's training rotation.

Table 8: Clinical placement hours in the public, NGO and private sectors, 2011 and 2012

Professional group	Public		NGO		Private	
	2011	2012	2011	2012	2011	2012
Medicine	9,717,539	10,344,895	-	52,464	1,638,809	1,869,662
Nursing	7,014,525	7,630,725	-	85,655	2,632,474	2,606,637
Midwifery	806,069	963,631	-	238	214,302	210,766
Allied health (incl. Dental)	5,095,865	6,771,177	-	599,233	3,353,176	3,353,176
Total	**22,633,997**	**25,710,427**	**-**	**737,590**	**8,677,606**	**8,040,241**

Source: Health Workforce Australia Clinical Placements Dataset
Note: The NGO category was only introduced in 2012 and was not reported prior. Two per cent of training hours attracted this classification in 2012, some of which would have fallen into the public or private classification in 2011. Some of the movement in public and private training providers may be due to the reclassification of providers to this new category.

Considering the significant increase in trainee numbers identified in point 2 above, the role of the private and NGO sectors may need to increase to meet the increased demand for clinical training. However, as noted by a number of stakeholders, the private sector in particular is not compelled to deliver teaching and training in the same way as the public sector.

3. Increased use of information technology and online and web based training aids

Ongoing development of online computer training, disruptive technologies and tele-health capabilities is starting to provide high quality, more pervasive and accessible clinical learning capabilities to environments which have been previously limited from obtaining teaching and training support. While it has been accepted that this form of technology will not replace 'real life' learning, development in these technologies will continue to provide complementary and additive learning.

4. Use of simulation training facilities and techniques

The value of simulation facilities to promote clinical and inter-professional learning has been widely supported by health services. Simulation provides opportunities for safe clinical practicing facilities, which are gradually becoming accepted by registration bodies.

Investment in simulation facilities and equipment has become more prevalent across health services however feedback on their role and value in training and teaching varies between health services. One common response is the understatement of the recurrent costs that has been required to maintain the facilities.

5. Greater acceptance and use of inter-professional learning (IPL)

Activities whereby the leaders of one profession supervise the training of the junior workforce of another profession (e.g. Nurse Managers overseeing and supporting medical interns) have been common practice in public health services. However, IPL (whereby junior clinicians from multiple disciplines collectively learn and draw from respective strengths to actively engage in patient diagnosis, assessment and treatment) has not traditionally been formally recognised as a key tenet of the pre-entry and early entry hospital-initiated graduate programs. Consultations suggested that the value of IPL is gaining recognition as a useful and sometimes cost-effective means of developing the skills and knowledge of the future medical workforce. Indeed, with the expansion in training places and limited number of senior professionals available to supervise junior staff, some stakeholders considered that IPL may help to alleviate some of the emerging training pressures that the system is already experiencing.

Where 'lower-cost' professionals such as midwives can provide teaching and training experiences that are able to substitute for 'higher cost providers (such as obstetricians), the increasing emergence of IPL may help to reduce the extent of teaching and training costs a health service incurs. This may also provide further productivity dividends where these activities free up 'higher cost' professionals to deliver a greater caseload, or to focus on training higher-level trainees such as registrars. While the form and content of

higher education curricula are still developing, health services are starting to promote inter-professional learning environments across ambulatory, outpatient and inpatient ward settings.

3.1.4. Suggested definition of teaching and training

Drawing from the findings of the literature review, the existing HOI definitions and the feedback from consultation, a number of key principles have been identified to provide a basis for proposing a definition for teaching and training. These principles include that:

1. the definition should be concise and practical;
2. while a technical distinction for teaching and training could be defined, in practical terms the distinction between the two terms is 'artificial' or 'semantic'. Teaching and training are most often delivered in a joint and complimentary way. Therefore one definition should encapsulate the activities under both;
3. the definition should be easily adaptable to the changing nature and emerging trends in how teaching and training is conducted;
4. the definition should relate to medical, nursing, midwifery and allied health professions where the disciplines have a direct patient or consumer relationship in a public health service;
5. the definition should cover those professional levels that require exposure to a clinical environment in order to fulfil the qualification or registration requirements of the discipline in which they wish to practice;
6. the definition should cover those teaching and training activities that contribute to the attainment of a qualification or professional body registration;
7. the definition should only include activities and resources that are provided by or on behalf of public health services which are funded by the states and territories; and
8. the definition should recognise the direct and indirect resources incurred by a public health service required to support training and teaching. The definition should also recognise that some direct teaching and training is embedded in clinical service delivery.

Taking these considerations into account, we propose that the definition described below is taken

forward as the basis for further discussion and refinement with relevant stakeholders.

For ABF purposes, training and teaching is defined in its component parts as:

- ***the activities provided by a public health service;***
- ***to facilitate the acquisition of knowledge or practice of skills;***
- ***that are prerequisites for an individual to gain the necessary qualifications (or recognised professional body registration);***
- ***to practice in the medicine, nursing, midwifery or allied health professions.***

Expressed again as a whole:

- ***The activities provided by a public health service to facilitate the acquisition of knowledge, or practice of skills, that are prerequisites for an individual to gain the necessary qualifications (or recognised professional body registration) to practice in the medicine, nursing, midwifery or allied health professions.***

3.2. Research

3.2.1. Literature review findings

The literature review identified that the sources of health and medical research funding remain poorly understood, and that the resources allocated for research in health services are not adequately tracked, nor are research outputs regularly audited. The available literature also recognises the significant breadth of research activities that occur, the number of different organisations that may be involved in its delivery and notes the difficulties associated with identifying the type of research that is supported by public health services.

Although there appears to be recognition that some health and medical research is funded directly and supported by states and territories, there was no explicit recognition of what the term 'research' actually means for the purpose of funding, aside from the definition developed by HOI in 2010.

3.2.2. Key definitional themes arising from consultation regarding research

The environmental scan consultation provided further insights into the diversity of research endeavour in public health services and differences between public health services in sourcing, classifying and accounting for research grants. In a similar way to teaching and training, a number of stakeholders identified various dimensions upon which the activities associated with research may vary, along with some significant ambiguity in whether certain activities should be characterised as directly or indirectly research related (as opposed to teaching and training, clinical audit, continuous improvement, quality improvement).

The major contributing factors and themes emerging from stakeholder consultations related to:

1. Is the HOI definition of research an adequate starting point?
2. Can the nature of research be adequately captured for ABF purposes?
3. Can the vast breadth of research activities be captured using a single definition?
4. How can the definition capture the various health service activities, structures and functions which support research?
5. Should the definition capture the hidden and embedded costs of supporting research?
6. How can the definition account for only state/territory-funded activities when a range of sources of research funding exist with varying degrees of commitments to cover full costs?
7. How should the definition account for the connection of public health services to other external bodies involved in research?

Each of these factors are explored in further detail along with their potential impact on defining research for the ABF purposes

1. Is the HOI definition of research an adequate starting point?

The HOI draft definition of research (presented in Appendix A) received mixed feedback from stakeholders across all jurisdictions. Although some believed that the definition captured the essence of research, others contended that it is not suitable as a starting point for understanding the nature of research delivered in public health services.

Similar to the feedback received with respect to teaching and training, stakeholders noted that the HOI definitions may be suitable as a theoretical baseline for defining research, but they do not provide an accurate reflection of the conduct of research in a practical sense.

Notwithstanding this view, most stakeholders agreed that the fundamental aim of research was captured correctly by HOI – that is, the advancement of knowledge. Other elements of the definitions that were perceived to be of less value and which require revision included:

- the listing of specific types or examples of research activity, which were not perceived to be representative of the full range of research activities conducted in public health services;

- perceived contradiction in the definition's internal logic that research included "investigations or applications related to patient care" but at the same time excluded indirect or by-product care, which was considered under the definition to represent "normal patient care";
- ambiguity in the meaning of some terms such as "curriculum-based research", "by-product research";
- perceived exclusion of the many research activities that do not concurrently interact with patient care; and
- contention regarding whether "health service capacity building" activities should be considered as research or part of a health service's core business.

These considerations have directly informed the development of a revised draft definition for research.

Key Messages

- A majority of stakeholders believe that the HOI definition of research should be reconsidered as it does not provide an adequate starting point for describing the nature of research as it is undertaken in public health services.
- The definition's emphasis on "advancement of knowledge" was generally accepted as a fundamental element of research that should be retained.

Implications for defining research for ABF purposes:

- "Advancement of knowledge" will be retained as fundamental to the definition of research.
- Patient care will be acknowledged as potentially being associated with research, but the revised definition will recognise that research activity can also occur away from the bedside.
- The revised definition will clearly articulate that research should have application outside of the health service in which it is based, rather than being grounded in the health service's internal core business operations.

2. Can the nature of research be adequately captured for ABF purposes?

The consultation phase of the project highlighted the nature, diversity and value of research endeavour delivered in public health services and its integral role in these hospital and health service settings.

Stakeholders consistently recognised that most research conducted and supported by public health services had either an external or tied source of funding. However, the extent to which research costs and activities were being delivered through state and territory-funded operating grants was often difficult to articulate for the purposes of defining research for ABF purposes.

The factors differentiating research for ABF purposes became difficult to conceptualise other than to suggest that:

- It was not the research projects themselves that are important to define; and
- Instead, it is important to capture the types of research support functions and indirect resources that are inherently funded by states and territories.

For this reason, the identification of a public health service's commitment (either directly or indirectly) to supporting research endeavour in the public health service setting is as essential as the definition of research itself.

Key Messages

- While clarifying the definition of research remains a central point for this project, a clearer understanding of the nature of public health services' commitment to supporting research endeavour is of greater importance.

Implications for defining research for ABF purposes:

- The definition of research will focus on the public health service's inherent role in supporting research activities conducted within the organisation.

3. Can the vast breadth of research activities be captured using a single definition?

A high level summary of the types and descriptions of research conducted in public health service settings has been described in Table 9:

Table 9: Types of research conducted in public health services

Research activity	Description
Clinical health service research	• Focusing on the diagnosis and treatment of disease and injury to improve the health outcomes of individuals. This largely relates to research on, or for, the treatment of patients.
Biomedical / scientific research / pre-clinical	• Understanding human functioning at the molecular, cellular, organ system and whole body levels. • Largely undertaken in laboratory settings in the development and discovery of new clinical therapies up to the point of testing on humans.
Translational research / bench to bedside	• Process of applying scientific research discoveries towards the development of trials and studies in humans.
Clinical trial research	• Activities and processes conducted by a public health service to collect information regarding the positive and negative effects and efficacy of therapies, treatments, techniques and technologies on patient and consumer outcomes. • Different phases of trials will determine the purpose and scope of patient and consumer interaction.
Epidemiological / public health research	• Studying the patterns, causes, and effects of health and disease conditions in defined populations through the design, collection and statistical analysis of data, and interpretation and dissemination of results (including peer review and occasional systematic review).

Within each of these categories, both the types of activities and level of resources incurred by the health service to deliver the research outputs may vary substantially. These differences raise a question whether a single research definition can adequately encapsulate the nature of research.

In response, stakeholders suggested that a principles-based approach would be most appropriate to deal with the significant variability in the nature of research activities. A principles-based approach would provide sufficient breadth to ensure that the range of activities relevant to research can be captured within the definition, and would avoid the likelihood of the definition getting caught up in specific examples of what research is and is not, which was identified as a shortcoming of the HOI draft definition. The most common, unifying elements to emerge from stakeholder discussion that may provide a basis for developing a revised definition of research, included requirements that research is:

- intended to improve patient / consumer health outcomes;
- should be undertaken in a structured and ethical way;
- formally approved by a relevant governing body; and
- disseminated to a broader audience than just the health service itself.

These principles have accordingly framed the refinement of the draft definition.

Research should improve patient or consumer health outcomes

In order to focus the definition on research that is relevant to a health service setting, rather than other types of research that may be conducted, stakeholders considered that the focus of research should be directed towards the fundamental mission of health services more broadly – that is to improve the health outcomes of patients / consumers.

Research should be undertaken in a structured and ethical way

This principle espouses two different, but related elements. Firstly, for an activity to be considered as 'research', it should be undertaken according to a structured, systematic way. This stemmed from a number of stakeholder perspectives to the effect that "if it's not systematic, then it's not research". Research should therefore be undertaken in accordance with a documented methodology that may (but not always) attempt to answer some hypothesis or question.

The second element to this principle relates to the requirement that the methodology employed to conduct research upholds contemporary standards of ethical practice in its dealings with humans, animals and other issues.

Research should be formally approved by a relevant governing body

Importantly, one of the unifying characteristics that stakeholders considered was common to all types of research included a requirement that research is only recognised if it is formally approved through:

- a public health service governance unit / structure which may approve low or negligible risk research; and/or
- an ethics committee recognised by the NHMRC for human, animal or biosafety approval.

These bodies provide a gateway process for authorising research on the basis of merit of the research objective, any ethical considerations and acceptability of project funding and resourcing requirements.

Research should be able to be disseminated to a broader audience beyond the health service in which it is generated

Consultations raised a large degree of debate about whether research that is conducted for the purposes of advancing the health service's own internal policies, processes and efficiency should be captured within the definition of research, or if these activities should be considered as 'business as usual' functions of the organisation.

A number of processes and activities conducted by public health services were raised in discussions (and also identified in the HOI definitions) which, while related and sometimes included as part of a research project methodology, as a standalone activity were not considered to constitute 'research' for the purposes of this project. These include:

- Clinical audit and root cause analysis activities, conducted either routinely or ad-hoc;
- By-product research which is conducted in a non-formalised way where it is derived as secondary to the primary action of clinical service delivery or training and teaching activities;
- Quality assurance, continuous improvement and health service evaluation practices.

In the majority, these activities were seen to form part of the normal course of business of a public health service to provide safe and high quality environment for patients, consumers and staff.

On balance, the discussion suggested that 'real research' is intended for consumption of a broader audience that just the health service itself. Accordingly, the outputs of research (whether they be journal publications, other reports, conference presentations, new equipment, new processes, drugs or something else) should be disseminated to others outside of the health service.

Key Messages

- The wide diversity of types, scope and resourcing required to support research activities conducted within public health services means that it will be difficult to identify homogenous metrics and indicators which are comparable across organisations.

Implications for defining research for ABF purposes:

- A principles-based approach to constructing a revised definition of research will be the best approach to deal with the significant diversity in research activities and outputs.
- The definition of research will be guided by the following principles:
  - Research should improve patient or consumer health outcomes;
  - Research should be undertaken in a structured and ethical way;
  - Research should be formally approved by a relevant governing body; and
  - Research should be disseminated to a broader audience beyond the health service in which it is generated.

4. How can the definition capture the various health service activities, structures and functions which support research?

Apart from activities which are generally attributed to the direct conduct of research, discussions raised a number of points regarding the nature of support provided by public health service towards research activities. These support activities, which are supplementary to the specific research activities themselves, vary between health services and generally include the provision of:

- A governance unit, research directorate or administrative office which supports the coordination, registration and submission of research projects and related grants;
- Ethics and advisory committees (Human, Animal and Biosafety) including salaries for members, administrative supports and infrastructure;
- Research forum activities, events and publications including Grand Rounds, research weeks, research reports;
- Support for affiliated academic and professional higher education provider posts employed by the health service to support research activities;
- Development and maintenance of data repository and bioinformatics systems to collect, analyse and manage research data.

There was seen to be no direct correlation between the size, nature and function that a public health service provides for these activities and the nature of the research activities themselves. It is largely an individual health service issue and is dependent on the emphasis, past success and traditions of the health service's approach to research.

Key Messages

- Public health services were predominately seen as 'facilitators of research', by providing the facilities, governance, administrative and labour resources for research to take place.
- The structures employed by public health services to provide these support functions will differ significantly from one organisation to the next.

Implications for defining research for ABF purposes:

- It may be difficult to concisely frame a definition of research in such a way that it will be applicable to all health services that conduct research. The definition may need to incorporate some degree of generalisation towards those health services with a high research output in order to capture the majority of research activity that takes place.

5. Should the definition capture the hidden and embedded costs of supporting research?

Stakeholder discussions highlighted the extent to which non-direct costs of research are often excluded from the provisions of research grants themselves. Like teaching and training, some research activities are

seen as having an inextricable link to clinical service delivery (and teaching and training). With clinical research and trial methods often needing to be conducted on the clinical floor, the impact on patient costs and service delivery efficiencies is often difficult to separate. The overlap between research, clinical service delivery and teaching and training is presented in section 3.1.2.

Examples of the type of activities where this overlap occurs and the impact that it may cause on clinical service delivery, include:

- Additional time taken to assess and treat patients outside of their normal clinical care pathways in order to facilitate the complimentary research activities.
- Additional pathology, imaging, pharmacy and possibly procedural interventions incurred to support the research activities which are often outside the normal course of assessment or treatment. If these activities and associated costs are not separately captured and recovered, the added cost of the patient episode could exceed the standard level of funding provided under ABF.
- Additional documentation, record keeping and data capture requirements to support the research activities.

The varying nature of these embedded costs make it difficult to individually identify and separate the resources, costs and time involved outside of "normal" clinical treatment.

Key Messages

- Public health services will often bear hidden and embedded costs of conducting research. These hidden and embedded costs often relate to resources required to support the conduct of the research project and are not covered by the specifications of the research grant.
- The extent to which these resources can be separated from operating funds depends on the diligence of the public health services, systems, accounting policies or its willingness to provide these resources on the basis of goodwill towards the research endeavour.

Implications for defining research for ABF purposes:

- Hidden and embedded costs which are not directly compensated by external research grants should be recognised in the definition of research for ABF purposes.

6. How can the definition account for only state/territory-funded activities when a range of sources of research funding exist with varying degrees of commitments to cover full costs?

Different sources of research grants differentially cover the costs of research activities. The extent to which grants cover research project costs will depend largely on the arrangements tendered between the provider and the public health service.

Table 10 below describes the key sources of medical research funding, typically accessed by medical researchers in Australian health services.

Table 10: Description of key sources of research funding

Source of Funds	Description
Competitive grants	• Sourced from either the Australian Research Council (ARC), National Health & Medical Research Council (NHMRC), Government departments, peak bodies, Research Foundations or private organisations. • The extent to which funding covers the direct and indirect costs of research are largely dependent on policies and tendering arrangements. • It is widely recognised that many of these competitive grants only cover the direct costs of the research. In particular, submissions from public health services (i.e. organisations other than a higher education provider or designated Medical Research Institutes), do not attract infrastructure and administrative support funding thereby leaving these to the public health service to cover. The rationale for excluding these costs from public health service funds is not clear, although it is perceived by many stakeholders consulted that this reflects the historical component of the state and territory funding contribution to research. • Public health services also individually determine the basis, if any, for charging infrastructure, administrative and other indirect costs back to the research fund.
Clinical trials	• Extent of funding coverage to support the direct trial costs as well as relevant infrastructure, administrative and indirect costs will depend on the contractual and other arrangements agreed between the health service and provider of the trial funding.
State and territory initiative research grants	• Nature, approach and policy directives of State and Territory research funding differs. • Some provide tied and specified grants for specific research projects, other states only provide a notional Research grant to assist with the support costs of research, while others remain relatively silent on the nature of research funding and inherent support being provided within existing funding pools.
Internally sourced research – trust funds / foundations / bequests	• Research endeavour developed and driven internally by the organisation is mostly sourced through specified funding sources of donated funds, bequests or fund raising activities. • Affiliated Research Foundations also provide for corpus funds, scholarships and fellowships to encourage research.
Research conducted from health service operating funds	• The use of health service operating funds as a source of research funding is diminishing with the increasing focus on fiscal sustainability and financial efficiency at the local level.

Research bodies and funders set different contractual arrangements regarding the degree to which direct and indirect costs are covered within the terms of research projects. It was recognised in the discussions that that the full cost of conducting the research activities (in some cases even direct costs of research) will exceed the grants received and that health services largely accepted some cross subsidisation from other research funds, and in some cases operating funds, to support these activities.

A further complication for the management of research funds, and their relationship to costs, related to timing considerations. Research grants are often provided in advance, with a number of projects crossing multiple financial years. The implication of such a scenario is that further controls are often necessary to ensure funding and costs are appropriately accounted and acquitted.

Key Messages

- Public health services receive research grant funds from a diversity of sources, ranging from externally funded commercial and competitive grants to internally sourced funds from hospital and community initiatives.
- Different funding arrangements exist between research grant providers regarding the extent to which infrastructure and administrative costs can be acquitted against respective grants. For many grant providers, these costs are specifically excluded from the terms of funding under which the grants are provided. It is therefore assumed that the public health service (i.e. state and territory operating funds) are required to support these costs.
- The impact of these funding arrangements and the 'assumed' expectation of the public health service to bear the infrastructure and administrative costs will be difficult to draw out on a consistent and systematic basis.

Implications for defining research for ABF purposes:

- The definition of research for ABF purposes should recognise the impact of infrastructure and administrative costs which are often excluded from grants issued to public health services.
- However, it should be noted that not all external and competitive research grants include or exclude infrastructure and administrative costs in the same way.

7. How should the definition account for the connection of public health services to other external bodies involved in research?

The direct and indirect relationships that a public health service holds with affiliated organisations, such as higher education providers and Medical Research Institutes (MRI), can have a significant bearing on the nature, size, approach and strategy taken by the wider research precinct.

Apart from the clear benefits for sharing expertise, technology and reputations, the trend towards affiliated and co-located research precincts has also been partly driven by the differential approach to research funding between grants assigned to public health services (often precluding them from receiving infrastructure funding elements) compared to higher education providers and MRI's. This has also meant that clinical research submissions are more likely to be submitted on a consortium, multi-site basis and are often instigated by an organisation other than the public health service – even though the clinical research component will most likely be conducted within the public health service. Furthermore, to attract research infrastructure grants, which are often not granted to public health services and medical research institutes, anecdotal feedback suggests that a larger proportion of medical research grant submissions are being tendered by higher education providers even where the research is primarily conducted within public health services.

Consortium and multi-site research projects also require greater levels of control and accounting to ensure costs and charges are appropriately attributed against the relevant research grants. Again, this will often be dependent on the level of diligence of the health service or, alternatively, the level of goodwill between parties to 'subsidise' certain direct and indirect costs that would otherwise be attributable to the research projects.

Key Messages

- The growing role of affiliated research organisations and university posts makes it difficult to quantify the impact and level of resources incurred by the health service to support these activities. The effect on public health service costs will largely be controlled by the individual agreements that are in place to identify and recover the costs of supporting these research activities.

Implications for defining research for ABF purposes:

- The definition should recognise the costs of supporting and coordinating research activities conducted within public health services that have originated from affiliated organisations.

3.2.3. Emerging trends and developments in research

In assessing the landscape of research activity conducted across Australian public health services, it was noted that the size and nature of research, the impact of technological advancements, the number of participating organisations and the level of collaboration is continually changing and developing. Any approach to defining and capturing research for ABF purposes will need to ensure that there is flexibility in the way in which it is classified to be able to incorporate these changes. The following provides an overview of these and other trends in research:

1. Increasing accreditation, ethics and compliance requirements;
2. Growth in nursing, midwifery and allied health-led research;
3. Comparative effectiveness research; and
4. Increasing number and breadth of public health services participating in research activities.

1. Increasing accreditation, ethics and compliance requirements

A greater onus is being placed on public hospital services to provide administrative support to manage research processes and ensure patient participation is conducted in an effective and informed way. Stakeholders also consistently highlighted the extent to which processes associated with obtaining various types of accreditation, ethical approvals and meeting compliance requirements are consuming an increasing amount of time, cost and labour resources.

2. Growth in nursing, midwifery and allied health-led research

Whilst much research has traditionally been medically driven, there is growth in the level of nursing, midwifery and allied health led research being supported and embraced by public health services. This means the overall scope and volume of research undertaken in public health services is likely to expand in terms of the nature and purpose for which the research is conducted. Research activities are likely to focus not only on professional knowledge development grounds but also in areas aimed at furthering multi-disciplinary research – particularly in assisting and supporting chronic illness. Increasingly, academic linkages and appointments in nursing, midwifery and allied health professorial positions are aimed at promoting research in these areas.

3. Comparative effectiveness research

An emerging form of health services research relates to comparative effectiveness research which is aimed at assessing the value of different approaches and modalities for treating groups of patients, to determine the most effective and efficient outcomes along with policies for delivering them across the system.

4. Increasing number and breadth of public health services participating in research activities

A growing number of public health services are now participating in research activities, such as such as regional and rural health settings. In doing so, there is a level of fixed costs that are required to establish, promote and succeed in winning competitive research grants. While the costs required to invest in research endeavour are seen as barriers to entry, public health services still recognise the requirement to become more active in research for employee attraction, reputational and strategic purposes.

These emerging trends will influence the ways in which research is conducted into the future. As a result, they have been factored into the revised definition of research to ensure that the definition is able to capture these emerging developments.

3.2.4. Suggested definition of research

As noted above, the issues regarding the definition of research and the ways in which the definition can be framed for ABF purposes, was often difficult to conceptualise. Notwithstanding the difficulties posed by the varied nature of research, stakeholder consultations revealed a range of principles that may be taken forward as the basis for constructing a revised definition.

Another important issue stemming from the various structures and funding sources that support research is how the definition can capture only those activities that are funded by states and territories. The myriad of structures and funding arrangements in place across Australia will require that the definition has specific regard to the nature of research related support activities that a public health service provides from the funding it receives from the jurisdiction in which it is based.

These considerations have been taken forward in the proposed revised definition of research for ABF purposes.

Principles that should underpin the definition of research

A number of principles have been proposed for constructing the definition for the purpose of this project. It was broadly recognised that the definition should:

1. result in an output(s) that generates new knowledge;
2. require that the activities associated with research are undertaken in accordance with a structured, methodical or systematic approach;
3. only capture activity that is approved through an appropriate governance body or ethics committee structure of the health service / jurisdiction;
4. include activities that are conducted within the public health service but that may be instigated and managed by an affiliated organisation;
5. result in an output(s) that have applicability in a wider context than just the organisation conducting the research;
6. allow for a broader range of investigations and applications than just those related to patient care;
7. exclude activities that are part of a public health service's normal course of business to deliver high quality care and safe environments (i.e. clinical audit, quality assurance, continuous improvement);
8. exclude outcomes that are a secondary product of clinical service delivery or a training and teaching curriculum;
9. exclude any direct costs associated with a research activity which were initially intended to be included within the conduct of the research activity. For ABF purposes this would therefore eliminate any costs that were directly related to a research project which has received external or tied funding; and
10. include other impacts which are not directly tied to costs but may also relate to other effects on clinical service delivery (e.g. changes in length of stay, change in normal clinical pathways etc.).

Based on the outcomes of stakeholder consultations, an alternative approach for defining the ABF-related activities associated with research has therefore been presented as follows (broken down by key elements):

Research is defined as:

- ***an activity undertaken in a public health service;***
- ***where the primary aim is the advancement of knowledge;***
- ***that ultimately aims to improve patient health outcomes;***
- ***The activity must be undertaken in a structured and ethical way;***
- ***be formally approved by a research governance or ethics body;***
- ***and have potential for application outside of the health service in which the activity is undertaken.***

For ABF purposes, the definition of research relates to:

- ***the public health service's direct and indirect contribution to research;***
- ***where the cost and resources incurred are not directly tied to an alternative source of research funding.***

Expressed again as a whole:

> ***Research is defined as an activity undertaken in a public health service where the primary aim is the advancement of knowledge that ultimately aims to improve patient health outcomes. The activity must be undertaken in a structured and ethical way, be formally approved by a research governance or ethics body, and have potential for application outside of the health service in which the activity is undertaken.***
>
> ***For ABF purposes, the definition of research relates to the public health service's direct and indirect contribution to research where the cost and resources incurred are not directly tied to an alternative source of research funding.***

4. Cost drivers of TT&R

This section presents stakeholder perspectives regarding the cost drivers associated with TT&R. Consistent with our approach to defining TT&R, we have considered the cost drivers of teaching and training cost drivers separately from research.

The cost drivers identified in this section are likely to form the basis for quantitative analyses that will be conducted in the next stage of the project to test and validate cost drivers, and provide the basis for constructing a TT&R classification development framework.

4.1. Cost drivers of teaching and training

As discussed in Section 3.1.2, a significant component of teaching and training activity is intrinsically linked to clinical service delivery. As a result, it will be difficult to identify the extent to which teaching and training cost drivers can be differentiated from the cost drivers that are associated with patient care activities. Nonetheless, stakeholders provided a number of perspectives on the cost drivers associated with teaching and training that may focus the quantitative analysis that will follow in the next stage of this project.

4.1.1. Literature review findings

The literature generally acknowledges that health services that perform teaching and training functions have higher costs compared to health services of a similar type where teaching and training activities are not being undertaken. Much of the available literature acknowledges that these additional costs are often not reflected in funding models due to difficulties associated with disentangling patient care and teaching and training activity.

Identifying cost drivers associated with teaching and training (as opposed to other health service characteristics) is complicated by the heterogeneity in health service characteristics, which may account for cost variations to some degree. In recognition of the complexity associated with separating patient care and teaching and training cost drivers, some studies identified casemix as the most appropriate proxy for teaching and training costs, on the basis that a complex casemix either requires or facilitates a greater volume of teaching and training. The causal relationship between patient complexity and teaching and training is debated in the literature, along with whether other factors outside of casemix act to influence teaching and training costs in a significant way.

Notwithstanding these complexities, the literature is generally consistent with respect to identifying potential cost drivers of TT&R in general terms. Determinants of teaching and training demand, such as the number of graduates, rotations and professional development placements were commonly identified as cost drivers in the available literature. Supply-side factors, such as clinician profiles are thought to provide an indication of the level of teaching and training capacity that exists, but this may not adequately predict the teaching and training activity that is delivered.

However, the available literature does not adequately provide a definitive response to the types of cost drivers associated with teaching and training, and in many cases raises more questions than answers. The consultation undertaken in this project aims to address some of these questions, while recognising the significant complexities associated with disentangling the cost drivers of teaching and training from the myriad of other factors that impact upon health service costs.

4.1.2. Key themes regarding teaching and training cost drivers

Stakeholder consultations commonly reflected that the range of variables affecting teaching and training costs is varied and that the cost drivers affecting teaching and training provision are not necessarily directly aligned to the cost drivers of clinical service delivery.

The key themes to arise from the stakeholder consultation with respect to cost drivers include:

1. Differentiating teaching and training costs, cost drivers and other factors;
2. The role of goodwill in supporting teaching and training; and
3. Differences in financial contributions to clinical education between health services and education providers.

1. Differentiating teaching and training costs, cost drivers and other factors

During the course of consultation, it was important to ensure stakeholders distinguished between

- **costs** associated with the provision of teaching and training;
- **cost drivers** of teaching and training; and
- **other factors** that may modify the impact of cost drivers (and hence, the costs).

Although the distinction between these terms may be small, it is important to accurately distil the factors that are **driving** teaching and training costs, as opposed to merely describing the type of costs being incurred. With this in mind, our view of the distinction between these three terms is as follows:

Costs: describe the financial and other resources that the health service is required to provide during the course of providing teaching and training. Costs may be directly or indirectly related to teaching and training;

Cost drivers: describe the factors and indicators that will result in the level of costs being higher at one health service, compared to another; and

Moderating factors: describe characteristics of the health service's internal or external environment that may influence (but do not drive) the extent of teaching and training costs (and hence the relative influence of cost drivers).

Our identification of proposed cost drivers maps the relationship of these three factors for each identified cost driver.

Factors that moderate the impact of cost drivers

The consultation highlighted that a number of (typically supply-side) factors may potentially provide for a greater volume of teaching and training to be conducted, but do not in themselves drive teaching and training costs. Some of these factors were identified as potential cost drivers as part of the literature review, and were also raised as cost drivers by some stakeholders during consultations. For this reason, we believe it is necessary to establish the basis upon which they should be distinguished from cost drivers themselves. These moderating factors include:

i. Facility size and type;
ii. Service / staffing mix; and
iii. Patient complexity / casemix.

i. Facility type / size (measured in volume of patient activity)

Although the size of a health service does not drive training and teaching costs, it may play an important role in facilitating teaching and training by supporting a broader service mix, range of knowledge and expertise, as well as access to technology. These factors may allow a greater quantum of teaching and training activities to be conducted.

However, the existence of a more 'complete' workforce at larger facilities, along with the availability of technology and other factors may make the delivery of teaching and training relatively more economical per unit of teaching and training 'output' (however defined) by providing economies of scale and scope that are unlikely to exist in smaller facilities where the cost per training output is likely to be comparatively higher than in larger, metropolitan public health services.

By contrast, the relationship between hospital size and teaching and training costs does not hold true for some facilities due to the nature of the services that they provide. Some large, specialist hospitals may in fact deliver a lower level of teaching and training 'output' than many other smaller, non-specialist facilities. For example, the specialist paediatric health services consulted as part of the environmental scan stated that they do not typically take medical students or interns. Instead, their most junior level of medical staff are typically PGY2 or above, where the trainee's knowledge and skills are more advanced and supervision requirements are much lower than for interns. The rationale for exempting specialist paediatric facilities from having to train junior medical staff was expressed in terms of the heightened sensitivity associated with having inexperienced staff provide care to paediatric patients. However, other (non-specialist) health services acknowledged that students and junior doctors regularly rotate through their paediatric wards as part of their teaching and training requirements. In this way, it appears that specialist paediatric hospitals are the exception to the rule, insofar as their size bears no direct relationship to the amount of teaching and training that is delivered.

ii. Range / mix of services / staffing mix

The service mix (and hence, the staffing mix) of a health service is a factor that is often related to the size and type of a health service facility. Larger facilities, with a greater range of patient case-mix often provide a more diverse mix of services, which provides a greater range of opportunities for teaching and training to take place, compared to smaller facilities.

Where a larger volume and range of services mix exists, the staffing profile of a facility will subsequently be larger and more diverse, thereby offering greater opportunities for trainees to be supervised and for a greater number of training posts to be accredited.

However, while the existence of a diverse service mix may potentially allow more teaching and training to be conducted, this may not correlate with the amount of teaching and training conducted. Other factors may determine the overall amount of teaching and training that is conducted, such as:

- the commitment of the health service to deliver teaching and training; or
- the nature of the facility (e.g. specialist paediatric hospitals that do not provide teaching and training for pre-vocational medical graduates despite running a broad range of specialty and sub-specialty services).

iii. Patient complexity / casemix

In recognition of the intrinsic overlap between teaching and training and clinical service delivery, a number of views suggested patient complexity as an appropriate driver of teaching and training costs. This appears to be reflected in the current approaches to TT&R funding across some jurisdictions, which include loadings for the cost of TT&R within the price paid per unit of inpatient activity.

A number of stakeholders suggested that casemix may influence health service costs in a number of ways, including that:

- a more complex casemix requires the health service to employ a workforce with more specialised skills, which is likely to cost more than a more 'generalised' workforce. If these staff are involved in teaching and training their time is relatively more costly;
- a higher acuity casemix can be associated with greater opportunity costs associated with teaching and training, on the basis that productivity impairments associated with teaching and training cost relatively more in health services with more complex patients;
- patient complexity is typically associated with a greater degree of complex procedural interventions, which are more resource-intensive in terms of the supervision, operating and opportunity costs that are associated with teaching and training in these environments.

However, feedback from consultation also revealed a range of contra views, including that:

- a number of other factors have a more direct role in determining the costs of teaching and training. For example, two health services with the same casemix may be in a position to support

vastly different levels of teaching and training as a result of factors such as location, local patient populations, status as a principal referral hospital (or not), co-location with a higher education provider or clinical school or medical research institute;

- casemix alone is not sufficient to reflect the scale of teaching and training activities that are provided in public health services, nor is the link between casemix and procedural volumes robust. For instance, a health service that provides a range of complex mental health services but very little procedural interventions may have a similar casemix to a tertiary referral hospital that conducts a broad range of complex procedures.

The range of views with respect to the influence casemix has on teaching and training costs are therefore mixed. On balance, stakeholders considered that patient complexity is more likely to contribute to teaching and training costs, rather than drive them. However, the divergence in views will require that the influence of casemix on teaching and training costs is specifically investigated as part of the cost driver analysis that will following the next stage of this project.

Key messages:

- Consultations highlighted the need to distinguish between costs, cost drivers and other factors that may moderate the impact of potential cost drivers;
- Potential factors that may moderate the influence of cost drivers included:
    - Facility size and type;
    - Range / mix of services / staffing mix; and
    - Patient complexity / casemix.

2. The role of goodwill in supporting teaching and training

During discussions about cost drivers, a consistent theme of the consultation related to the significant role of 'goodwill' in clinical teaching and training. 'Goodwill' in this sense relates to the amount of clinicians' own time and enthusiasm invested in teaching and training, over and above the requirements articulated in their job description – much of which may attract little or no remuneration. This may mean that the full cost of providing teaching and training may be difficult to capture in absolute terms.

A related perspective noted that not all clinicians consistently apply equivalent time and effort to supporting clinical service delivery, teaching and training activities. It is typical that some clinicians will have a more natural inclination to support teaching and training compared to others. Therefore, while the teaching and training requirements may be fulfilled, the distribution of effort towards clinical service delivery, teaching and training will not always be spread evenly across the clinical workforce. Finally, the attitude, culture and goodwill of different public health services will also play a significant part in driving the extent to which teaching and training is supported and delivered.

Although there has been, and continues to be, a strong element of goodwill underpinning teaching and training, some stakeholders questioned whether ideological differences across generations are beginning to erode this. Stakeholders noted changing attitudes to work-life balance as potentially reducing clinicians' personal investment in the health service over and above their contracted hours. Others noted an increasing tendency for junior doctors to charge overtime for their role in supporting teaching and training.

If these observations are true, the cost impacts associated with supervision requirements of the future health workforce are likely to be significantly greater than they are at the present time.

Key messages:

- Goodwill plays an important part in teaching and training, however some stakeholders observed some degree of erosion in goodwill as it applies to teaching and training.

- If goodwill is being eroded, it may have significant cost impacts for teaching and training. Specifically, the cost impacts associated with supervision requirements of the future health workforce are likely to be significantly greater than they are at the present time.

3. Differences in financial contributions to clinical education between education providers and health services

One of the more significant findings to arise from the consultation was the degree of variation in the contributions of education providers to clinical education and support. These variations may result from a number of factors including traditional alliances between health services and higher education providers, co-location of health service and educational facilities, access to resources or simply sheer commercial acumen and bargaining power. The practical effect of these arrangements is that some costs that are met by the state / territory in one health service may be heavily subsidised by education providers in another. The ability to distinguish the cost drivers associated with funding provided by states and territories is therefore even more difficult.

Service-level agreements between education providers (typically higher education providers) and health services were noted to include provisions for the education provider to cover varying levels of the direct costs associated with teaching and training, including:

- Student transport and accommodation;
- Operating costs of clinical schools;
- Clinical supervisors, academics and educators; and
- Dedicated staff to coordinate and manage student placements and rotations.

Additional variations in support provided across professional disciplines were consistently noted by stakeholders in all jurisdictions. In particular, the provision of dedicated resources to support the coordination and management of student and graduate programs is typically restricted to medicine, nursing and midwifery. Allied health professionals were reported to absorb these functions within their day-to-day role, thereby affecting their capacity to support day to day patient care requirements.

Although not related to the range of teaching and training activities considered in-scope of the definition, stakeholders consistently noted that both direct financial support and leave allowances for continuing professional development of medical professionals is significantly more generous than for nursing, midwifery or allied health.

Although inequities in funding support provided to different professional groups through industrial award agreements were consistently noted by stakeholders, the various arrangements for in-kind and direct financial support between education providers are the issue of most relevance to this project. These arrangements cannot be distinguished on any consistent basis, are not openly reported and may potentially confound any quantitative cost driver analysis.

Key messages:

- Stakeholders noted a significant degree of variation in the contributions of higher education providers to clinical education and support. These variations may result from a number of factors and make it difficult to isolate the impacts of differences in teaching and training that are attributable to state / territory funding allocations.

4.1.3. Proposed cost drivers of teaching and training

As described above, the consultation that has informed the environmental scan has revealed a number of perspectives on the cost drivers associated with teaching and training. These factors will provide the basis for further quantitative analysis in the next stage of the project.

After distilling cost drivers from costs and moderating factors, we consider that the following factors likely represent the primary cost drivers associated with TT&R:

1. The volume of trainees;
2. Geography (remoteness);
3. Teaching and training requirements of different registration bodies and colleges; and
4. The number of international medical professionals in training.

1. Trainee volumes (pre-entry and post-entry)

The volumes of trainees receiving teaching and training in each professional group represented the most significant and frequently raised cost driver that stakeholders associated with teaching and training. If all other factors are held constant, a greater volume of trainees will require a greater number of supervisors, a greater infrastructure requirement to support the trainees, and will also influence the extent of overall productivity impairment and opportunity costs associated with teaching and training. However, due to differences in how teaching and training is delivered at different levels of the teaching and training continuum, stakeholders consistently drew a distinction between how trainee volumes should be measured between students (pre-entry) and those receiving teaching and training while in the workplace (post-entry).

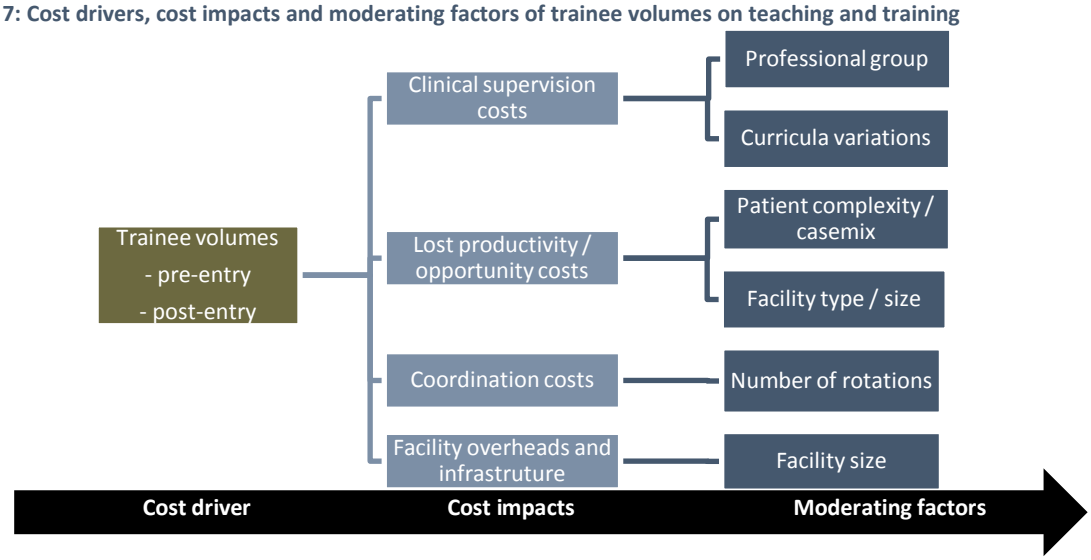
Specifically, stakeholders identified that **the main cost driver associated with pre-entry student placements is the number of placement days for each professional group** (medicine, dentistry, nursing, midwifery, allied health), rather the actual volume of students. Pre-entry teaching and training requirements can vary according to factors such as the curriculum of the education provider with which the student is studying, and the year and level of the student (e.g. undergraduate or postgraduate).

Using placement days as the volume driver rather than the overall number of placements avoids under-estimating the resource intensity associated with placements that occur for a longer period of time, such as for medicine and social work students. Given that pre-entry trainees are required to be supervised during their placements, and that the costs of supervision vary for different professional groups, stakeholders considered that it was logical to stratify the volume of placement days according to professional group.

Once students enter the health service as interns or graduates, they are typically employed on a full-time basis. As discussed in Section 3.1.2, some nursing, midwifery and allied health graduates *may* participate in a graduate program at the discretion of the health service, however, graduate programs are not uniformly required, nor are they mandated. Additionally, most nurses, midwives and allied health professionals are expected to be almost fully functional employees from very early in their employment. In spite of these observations (and the subsequent exclusion of early nursing, midwifery and allied health graduates from the scope of the updated draft definition), **many stakeholders identified the number of full-time equivalent (FTE) of post-entry trainees in all clinical disciplines (including medicine, nursing, midwifery and allied health) as a cost driver**. This was proposed on the basis that these early employees require a degree of supervision and support and may be associated with a high degree of productivity impairments for the health service.

The proposed exclusion of graduate nurses, midwives and allied health professionals from the definition of teaching and training, while at the same time including these groups as potential cost drivers, is a point divergence identified during stakeholder consultations – since the cost drivers of teaching and training should logically be captured within the definition. It will be important to resolve this issue to ensure a logical consistency between the definition of teaching and training and the list of potential teaching and training cost drivers.

Figure 7: Cost drivers, cost impacts and moderating factors of trainee volumes on teaching and training



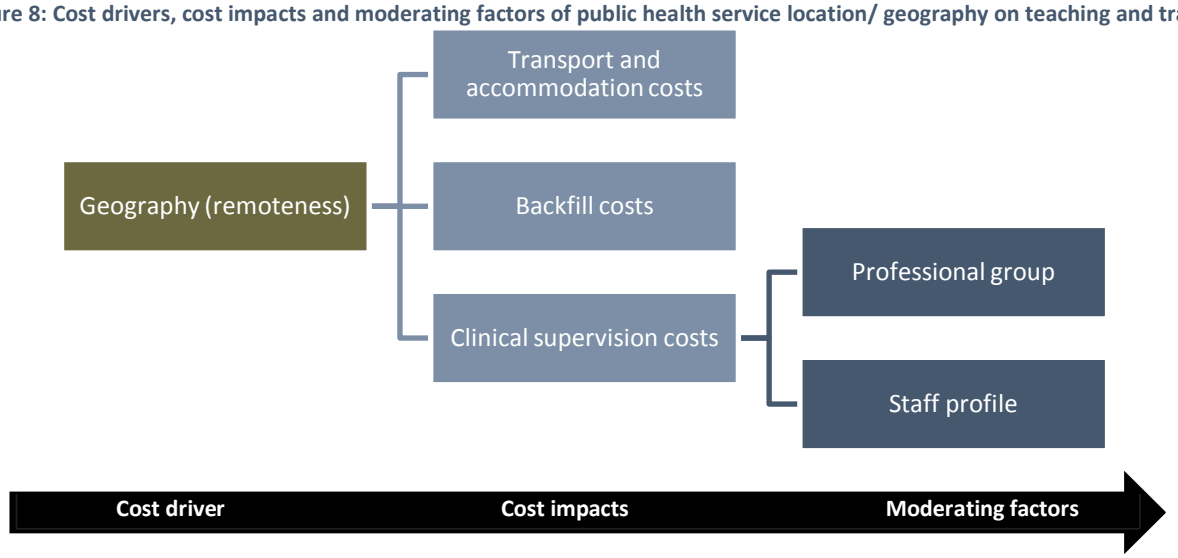
2. Geography (remoteness)

Geography (or remoteness) is known to influence the cost base of health services and is currently included as a loading factor in existing funding models for ABF workstreams. However, stakeholders considered that there are a range of additional cost imposts associated with remoteness that are specific to the conduct of teaching and training in rural and remote settings. These additional imposts therefore warrant consideration as teaching and training cost drivers.

Transport and accommodation costs for trainees may be supported by the health service in rural and remote areas as inducements to attract students or trainees to these areas. Some rural health services described that they own or rent local housing stock for the use of trainees on rotation, which is provided at a nominal charge or no cost at all to the trainee. In a similar way, health services will sometimes pay for, or subsidise the transport costs of trainees and educators, although the specific provisions vary substantially from one health service to another.

Stakeholders in rural health services also identified that the conduct of teaching and training can be relatively more expensive in more remote sites due to the absence of a 'middle tier' workforce that are able to support the teaching and training needs of students and graduates. This effect was reported to be particularly relevant in relation to the medical workforce, where rural and remote health services may not have sufficient patient throughput or salaried staff to support college training program requirements for registrars. Although some teaching and training may be delivered by residents and House Medical Officers (HMOs) at these sites, stakeholders considered that 'the buck often stops with the consultant or visiting medical officer' in rural or remote settings. This is in contrast to facilities in metropolitan and regional areas, which have a larger medical workforce profile able to complement teaching and training requirements. The relative costs of supervising staff in rural and remote areas is therefore likely to be greater than in regional or metropolitan areas, where residents or registrars may be able to relieve the teaching and training burden of consultant medical specialists.

Figure 8: Cost drivers, cost impacts and moderating factors of public health service location/ geography on teaching and training



3. Teaching and training requirements of different professional bodies and colleges

As noted in Section 3, clinical professional registration bodies and colleges will each mandate different accreditation and teaching and training prerequisites for achieving registration requirements. These prerequisites will in turn influence the resources required to support teaching and training, including:

- the level of direct and indirect clinical supervision for each trainee (eg. number of clinical and/or mentoring hours per week);
- the extent of clinical practicum required (e.g. procedural volumes);
- the mode for teaching and training (e.g. experiential, procedural, didactic, online modules)
- the acceptable providers of supervision or training (consultant-led versus hierarchical versus interdisciplinary); and
- modes of assessment (e.g. work-based assessment).

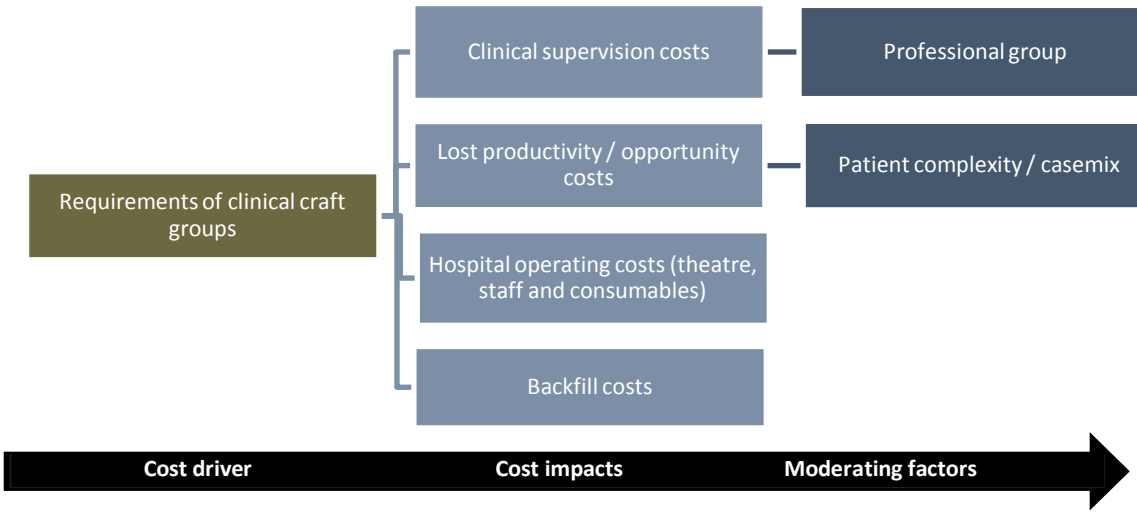
It was noted that variations in the nature of training requirements were most prominent for the vocational training programs of specialist medical colleges – where there are a range of assessment requirements to achieve registration. Although variations exist within nursing, midwifery and allied health disciplines, these professions are typically fully registered prior to entering the workforce so any differences in registration requirements will be reflected in the requirements for clinical supervision during student placements and largely captured as part of the cost driver relating to student placement days.

Although stakeholders were not able to identify precise differences across the range of medical specialties, a number did identify a clear difference in the resource costs between procedural and non-procedural specialties. Specifically, training requirements of procedural specialties included more resource-intensive factors that are likely to drive training resources and costs to a greater extent than for non-procedural specialties. These factors include:

- the significant costs associated with providing theatre sessions for trainees to meet log book requirements – this often extends beyond the normal time required by a surgical consultant to complete the equivalent case load; and
- the duration of the vocational training program.

As a result, some stakeholders contended that health services with a high number of trainees in procedural specialties are likely to incur greater teaching and training costs than health services whose service mix is oriented towards non-procedural medicine. This may, in turn, create barriers on the accepted number of specialist trainees. These findings suggest that stratifying trainees in the vocational years into procedural and non-procedural may explain some additional variation in costs over and above student volumes alone.

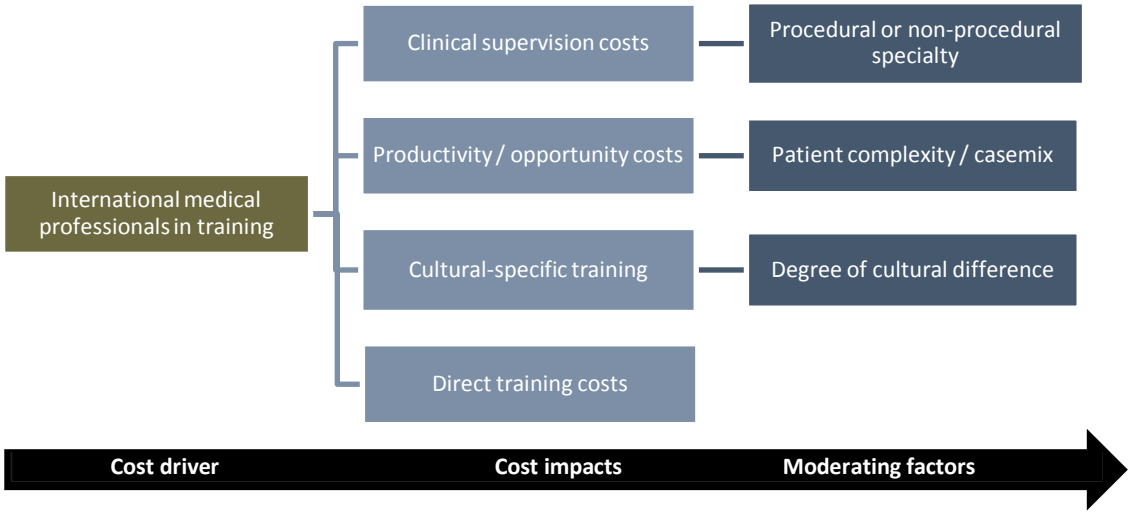
Figure 9: Cost drivers, cost impacts and moderating factors of clinical craft groups on teaching and training



4. International medical professionals in training

Stakeholders consistently identified that the presence of international medical professionals in training can drive associated teaching and training costs. Although cost impacts are expected to be far less pronounced for doctors from predominately English speaking origins (e.g. United Kingdom, United States of America, Canada, South Africa and New Zealand), the clinical competencies and cultural preparedness of international medical trainees from culturally distinct countries can necessitate significant additional support in supervision and formal training to bring trainees up to required standards of practice.

Figure 10: Cost drivers, cost impacts and moderating factors of international medical professionals in training on teaching and training



Key messages:

- The proposed cost drivers of teaching and training include:
    - Trainee volumes;
    - Geography (remoteness);
    - The teaching and training requirements of different professional bodies and clinical craft groups; and
    - International medical professionals in training.

4.2. Cost drivers of research

As noted earlier, there are significant complexities with defining research for ABF purposes which will affect the ability to identify representative cost drivers for research. The breadth of research activities that may be conducted within a public health service, and variations in the resource intensity associated with those activities, may mean that cost drivers cannot be reliably generalised. For this reason it may not be necessary, or appropriate, to attempt to capture the activities, resources and drivers of research itself. Rather, it may be more relevant to assess indicators of the volume and type of research being conducted – to be used as a proxy for the public health service's contribution to research activities.

4.2.1. Literature review findings

The available literature rarely provided a true activity-based measure upon which to assess the cost drivers of research. In many cases, the proxy used for research 'activity' related to the available research budget, or simply the existence or absence of a research capability at a health service. Literature noted that various research outputs, such as the number of papers published or research protocols applying for Human Research Ethics Committee approval, at best correlate only loosely with research costs.

4.2.2. Key themes regarding research cost drivers

In arriving at a set of cost drivers for research, the following key issues emerged from discussions with stakeholders which may influence the approach taken to determining appropriate cost drivers:

1. The embedded nature of TT&R and clinical service delivery;
2. Absence of a clear relationship between input costs and research outputs;
3. The role of personal commitment as a determinant of research activity;
4. Difficulties establishing the true costs of research that are funded by states and territories; and
5. Differences between research costs and associated cost drivers.

1. The embedded nature of TT&R and clinical service delivery

Like teaching and training, many research activities are seen as having an inextricable link to clinical service delivery. This impacts directly on the ability to draw out the true costs that are associated with research, where it occurs in parallel with patient care.

Additionally, many stakeholders recognised that research components exist within the curricula of a number of higher education provider medical schools. As a result, the existence of trainees will also be associated with the health service needing to directly or indirectly support some degree of research endeavour as a component of teaching and training.

Although many stakeholders considered that research is perhaps embedded to a lesser degree with clinical service delivery than teaching and training, many reflected on the materiality of additional research costs where activities occur in conjunction with patient care, and pointed out the difficulties associated with identifying these costs for the purpose of cost driver analysis.

Some proxy measures that may not strictly be cost drivers (but which nonetheless influence research costs) may therefore need to be considered as part of cost driver analysis.

Key messages:

- Like teaching and training, many research activities are seen as having an inextricable link to clinical service delivery. This impacts directly on the ability to draw out the true costs that are associated with research, where it occurs in parallel with patient care.

2. Absence of a clear relationship between input costs and research outputs

Cost driver analysis primarily attempts to determine a relationship between the volume of outputs that are generated from some process and the costs that go into producing those outputs. If the relationship between input costs and outputs cannot be clearly defined, then cost driver analysis may be problematic.

Table 9 in Section 3.2.2 highlighted the extensive diversity in the range of research activities that may be conducted in a public health service. Within each of these types of research activity, the nature and intensity of resources required to produce research outputs may vary substantially.

For example, some public health research may draw together a range of existing data sets relatively expediently, at little cost, low ethical risk and administrative expense. However, other projects may involve extensive primary data collection that occurs over a large longitudinal time span, is ethically challenging and involves a range of complex analyses. Although both types of project described above are related to the same broad research activity type and may produce a similar type of output (eg. a publication), the resources that have gone into each are substantially different. Similar examples were cited by stakeholders across a number of other types of research.

As a result, stakeholders identified that a clear relationship between research outputs and input costs will be difficult to establish. The task of identifying research cost drivers will therefore need to be informed by careful consideration of the nature of research, and should ideally be underpinned by some unifying measure(s) of research costs and output.

Unfortunately, stakeholders were unable to articulate a universal measure that can reliably be used as a measure of activity across all research types. Some stakeholders suggested HREC applications or approvals, however, these bear no relationship to resource costs – as they may encompass both very low-risk, routine types of research and highly complex, large-scale projects. Other stakeholders suggested publications as the most common type of research output, but this indicator may be subject to the same shortcoming. A staffing-related measure may be the most appropriate proxy in the absence of an indicator that is able to capture the broad spectrum of research activities, although these measures are also subject to a range of shortcomings, as discussed in point 3, below.

Key messages:

- The nature and intensity of resources required to produce research outputs may vary substantially. As a result, a clear relationship between research outputs and input costs will be difficult to establish.

3. The role of personal commitment as a determinant of research activity

Just as clinicians' vary in their commitment to teaching and training, so do they vary their commitment to research. Although almost all clinicians have some element of research written into their contracts, it is practically impossible to enforce this fraction of their time into research activity. This can work both ways – some clinicians may prefer to focus on patient care or teaching and training and do very little research; others may devote a significant amount more time to research than other activities for which they are contracted.

Although stakeholders persistently noted personal commitments as a determinant of research activity, it is impossible to capture or record for the purpose of cost driver analysis. Similarly, for clinicians, their contracted fraction of research time is not collected. As a result, staffing-based measures of research activity are unlikely to accurately capture the amount of research 'activity' that is conducted.

Key messages:

- The role of personal commitment / investment is a significant determinant of the amount of research 'output' an individual is able to produce, however, this is impossible to capture or quantify. Although important, it will be extremely difficult to capture the influence of 'personal commitment' in driving research output.

4. Difficulties establishing the true costs of research that are funded by states and territories

As discussed in Section 3.2.2, the sources of funding / financing to support the administrative and infrastructure activities associated with research will differ considerably between health services. The range of funding sources to support these activities includes:

- forming part of the public health services' operating accounts (state and territory funded activities and therefore accounted as part of government funded operating accounts);
- untied bequests, donations and community related philanthropic initiatives often sponsored by the hospital's foundation organisation; and
- predetermined charging arrangements established by the health service on the research grants through levies. The charging arrangements often differ between a set percentage rate according the value of the research grant, and specific charges for the use of the health service's ethics committees, governance units or inclusion in research publications.

In addition to the variations in research funding sources, stakeholder discussions highlighted the extent to which other costs of research are often excluded from research grants themselves. Some specific exclusions noted are as follows:

- Overheads / infrastructure of the public health service to support the staff and facilities provided to research programs. This may in fact go beyond supporting the researchers and project staff employed by the public health service. In many situations, the public health service may be required to support research programs granted to affiliate organisations engaged in using the facilities and patients of the health service; and
- Contributions by other staff and departments in supporting the research project. While a research project will often stipulate the methods and project resources required to fulfil the outcomes of the program, an issue commonly raised relates to the clinical and non-clinical resource demand incurred by public health services which are often not accounted for within the research grant funds. Examples of these types of activities included:
    - Clinician (direct and indirect) involvement in research projects and trials required for assisting in the conduct of the project at the patient level. The clinical protocols employed by the research activity will often have an effect on the efficient normal clinical practice compared to the clinical pathway required to support the clinical research activity;
    - Additional / extraneous diagnostic requests and other interventions required to fulfil the research protocol or trial which is often not charged back to the clinical trial;
    - Use of data collection and medical records teams to extract and report on relevant research patient cohort information; and
    - Other costs and consumables directly tied to the research activity but not charged back to the relevant cost centre which is tied to the project grant.
- Costs of capital (capital, rental, depreciation) and IT (hardware, software, data collection) provided and funded by health services and used by research programs (particularly where those research projects do not support the procurement of infrastructure, equipment and IT).

The extent to which these costs are identified and charged back to the research project is dependent on the diligence of the public health services' systems and governance arrangements or the acceptance of the public health service to provide for these additional resources and activities as a sign of goodwill towards

the research endeavour. For this reason, it may be difficult to arrive at a view that can be seen as representative or standard in the way in which these activities and costs consistently affect ABF-related activities.

Key messages:

- The sources of funding/ financing to support the administrative and infrastructure activities associated with research will differ considerably between health services. Stakeholder discussions also highlighted the extent to which other costs of research are often excluded from research grants themselves.
- These factors may make it difficult to isolate the element of state / territory funding that supports research activities in public health services.

5. Differences between research costs and associated cost drivers

Similar to the responses regarding cost drivers for teaching and training, the discussions regarding research cost drivers often reflected responses of the types of costs to conduct research. In general terms, the costs of conducting research activity often reflect the following key items:

Direct costs of research

- Time spent by staff on research (researchers, technicians, clinicians and other support staff involved in delivering research activities);
- Clinical consumables, drugs and implants;
- Directly attributable pathology, imaging, theatre and other patient-related clinical services;
- Directly attributable clinical and diagnostic equipment incurred for the research project which is often not factored into the research grant submissions; and
- Information technology (IT) hardware and software.

Indirect costs of research

- Staffing and administration support for governance units and research directorates;
- Maintenance and support for ethics committees (Human, Animal, Biosafety);
- General facilities, communications and infrastructure costs (occupancy costs, other equipment leases, IT support, telecommunications);
- Corporate support services provided by the health service (i.e. information technology services, finance, payroll, legal, compliance, accreditation, corporate and commercial services and executive support costs);
- Public relations, promotional and publication costs; and
- Percentage of academic staff (FTE) effort devoted to research.

As discussed earlier in this section, the task of accurately identifying and attributing these costs to research outputs is a complex one that will be subject to a wide range of confounding factors. In order to attribute these costs to research activity, a 'best available' measure may need to be determined that represents the most reliable proxy for research output.

Additionally, the same issue regarding 'modifying factors' reflected in Section 4.1.2 is equally applicable to the discussion of research cost drivers, and will invariably influence the extent to which the cost impacts of research differ across health services.

Key messages:

- In a similar way to teaching and training, a distinction needs to be drawn between the costs of research and cost drivers. Although the two concepts are similar, they are important to distil for the purposes of cost driver analysis.

4.2.3. Proposed cost drivers of research

Identifying research-related cost drivers which have universal application, or are reasonably representative of the medical and health research conducted across Australian public health services, was recognised by stakeholders as one of the more significant challenges within the scope of this project.

The range of challenges discussed during consultations are summarised as follows:

- There is no standard basis upon which research is conducted. Even by type of research conducted (i.e. scientific research, clinical research / trials and public health research) the methods, testing regime and impacts on health service resources can differ significantly;
- There is variation between different public health services' focus on the types of research, structures employed within the organisation and their emphasis towards research endeavour. (e.g. organisations with the same relative size, structure and acuity may have contrasting views and emphasis towards supporting research activity);
- Data relating to the volume of research activities conducted are not necessarily reflective of the size, timeframes and complexity of the research project;
- The source and size of the research grants may also not be reflective of the scale of the research that is being supported by the health service. For example:
    - Some research project grants are required to cover costs that fall outside the organisation or do not reflect the amount of support and infrastructure that that health service is expected to support;
    - Some research grants are instigated by organisations and bodies outside the health service even if the research is being conducted within it.
- The approach and processes used by a public health service for counting and accounting for direct and indirect research activities will also differ; and
- There is limited capability for systematic data collection beyond sourcing the information directly from health services. Currently there are no central organisations which collect details of the nature, type and volume of research being conducted across public health services.

Notwithstanding the range of challenges, stakeholders recognised the need to identify a 'best available' suite of research cost drivers to better understand the nature of research. Although in a number of cases, the cost drivers identified below are similar to the 'moderating factors' identified with respect to teaching and training in Section 4.1.2, these appear to be the best measures available considering the range of complexities associated with research.

Accordingly, the main cost drivers of research that could be potentially captured at a public health service level were identified as follows:

1. Type of research being conducted;
2. The number of dedicated research staff;
3. The volume of approved research projects;
4. The size of research grants in dollar terms; and
5. The number of patients participating in clinical research trials.

1. Type of research being conducted

Notwithstanding the aforementioned issues, some correlation exists between the type of research and the costs incurred to support it. For example,

- Scientific research is largely driven by diagnostic laboratory based activities which are often, but not always, combined within the hospitals existing diagnostic laboratories;

- Clinical research is largely driven by patient level interventions, drug therapies and test cycles; and
- Epidemiological / public health research is governed by use of bio-informatics and large new or existing data sources to evaluate public health or epidemiological trends.

2. The number of dedicated research staff

A logical starting point for establishing a relationship between research activity and costs is the number of personnel dedicated to research that are employed within a health service. If all other things are held equal, it would be logical to assume that a greater number of research staff will be required to support a greater level of research endeavour;

3. The volume of approved research projects

The comparative volume of research activity undertaken by a public health service could be informed by the volume of approved research projects activities being conducted across the health service. The greater the number of research projects approved by a public health service governance or ethics committee, the larger the structures that may be required to support research;

4. Size of research grants –

The financial size of research projects, whether sourced competitively or through other sources, may provide some basis for differentiating the level of public health service resourcing that is required to support its research activities; and

5. Number of patients participating in clinical research trials

Public health service governance units are likely to have data repositories of the number of patients involved in clinical research trials and their respective intervention cycles. Although clinical trials will not be relevant to a large number of health services that do not have the staff mix and infrastructure to support clinical trials, it may present an additional explanatory factor for those health services that arguably produce the greatest level of research 'outputs'.

Other proxies for research cost drivers

While they are not necessarily cost drivers, a number of other factors are likely to provide some explanation of the cost drivers of research (and therefore research costs) supported by a public health service. They include:

- The number of approved (and/or unapproved) grants submitted to a public health service governance unit;
- Presence of co-located / affiliated Medical Research Institute and higher education provider;
- Existence of academic professorial posts (either sponsored or employed by the public health service and higher education provider);
- Number of publications, citations, conference papers that have been attributed to a public health service; and
- The size, volume and acuity of a public health service – the larger, more complex, the greater the size of the research activity – particularly where it relates to specialist, high end tertiary and quaternary services.

Key messages:

- Stakeholder consultations have highlighted the following list of potential cost drivers of research:
    - Type of research being conducted;
    - The number of dedicated research staff;
    - The volume of approved research projects;
    - Size of research grants; and

  - Number of patients participating in clinical research trials.

- Other proxy measures of research costs may also influence the extent to which the potential cost drivers will influence research costs.

5. Service delivery benefits associated with TT&R

Although a health service's role in providing TT&R is sometimes seen as an additional burden to its ability to deliver clinical services efficiently, the provision of TT&R is universally recognised as an equally important tenet of public health service delivery and arguably provides a range of significant benefits that go beyond potential productivity factors.

This section focuses the discussion on TT&R as a whole (rather than TT&R separately) to examine the benefits that are associated with the provision of TT&R, and the extent to which they are both material and measurable. This section considers benefits that are delivered through the process of trainees providing patient care, as well as those complementary benefits that accrue to health services more generally as an adjunct to clinical service delivery.

5.1. Literature review findings

Although it is broadly recognised that the provision of TT&R activities in public health services commonly result in additional net costs, the literature also acknowledges that TT&R activity can provide a range of direct and indirect benefits.

The literature suggests that the direct and indirect benefits associated with TT&R are indeed material and that 'benefit drivers' may also need to be considered in a TT&R funding model, in addition to 'cost drivers'.

However, the feasibility of incorporating benefit drivers is complicated by the difficulties in quantifying the benefits associated with TT&R; many of which may be intangible, reputational or anecdotal. The literature notes that "this (the relationship between TT&R and service delivery benefits) is an extremely complex cost/benefit relationship to quantify in the context of a consultant delivered service…and consequently, no attempt should be made to reflect it in resource allocation mechanisms at this time"[2]. This quote speaks to the complexity associated with quantifying service delivery benefits and the need for careful consideration if a 'benefit offset' for TT&R costs is to be considered as a part of a future funding model.

5.2. Key themes arising from consultation

Consultations with stakeholders revealed a broad variation in the service delivery benefits associated with TT&R in a public health service. Stakeholders identified that service delivery benefits resulting from TT&R may be generated directly through primary patient care in the form of:

- Improved quality of care by supplementing the patient experience;
- Improved quality of health information to support medical record keeping and clinical coding; or
- Productivity improvements by enabling senior staff to focus on more productive complex, higher-end clinical work.

A public health service that encourages and promotes a strong TT&R culture is seen to benefit through:

- Stronger organisational prestige and reputation;
- Improved workforce attraction and retention;
- Greater diversification of the health services knowledge and skills mix; and
- Enhanced ability to attract grant funding for research.

The discussion in this section focuses on the direct contributions to service delivery for the health service that act to defray the costs of providing TT&R to some extent, and which occur as a result of the interaction between TT&R and direct patient care. Although stakeholders acknowledged a significant range of benefits that may accrue for the health system more generally through TT&R (particularly those that arise from new

[2] Northern Ireland Departments of Health and Department of Health and Social Services and Public Safety (2006). 'Research into Costs Associated with Acute Hospital Provision in Northern Ireland'.

research developments), the focus of this section is the delivery of benefits associated with direct patient care.

The main themes to emerge from the stakeholder consultations in this context included:

- Significant variations exist in the service delivery benefits provided by professionals across and within professional groups;
- A strong view that service delivery benefits are 'real' and 'material'; and
- Although the benefits are 'real', it is extremely difficult and impractical to quantify them in a detailed way. Expert opinion or approximation of benefits may be the most appropriate way of estimating them.

5.2.1. Variations in service delivery benefits provided by different professional groups

Stakeholders generally suggested that all personnel involved in clinical service delivery provide some benefits as part of the intrinsic association between patient care and TT&R. Additionally, as individuals become more experienced, their ability to provide benefits through clinical service delivery often increases as a result of their increased capacity to assume a clinical caseload while concurrently being taught and/or trained. Different stakeholders conceptualised the learning / service mix in slightly different ways, but the overall principles were broadly similar and were typically focussed on the proportion of time each type of trainee is able to spend delivering service, as opposed to learning.

Although a number of stakeholders acknowledged that it is impossible in reality to distinguish between 'service time' and 'learning time', there is possibly no better method of estimating a trainee's contribution to service delivery available at this point in time.

1. Service delivery benefits associated with medical teaching and training

Figure 11 illustrates the conceptualised learning / service mix of medical professionals as they progress through different stages of the teaching and training continuum. Although stakeholders expressed a diverse range of perspectives with respect to the contribution of medical students, the general consensus was that medical students are largely supernumerary, do little more than observe, and provide a small contribution to service.

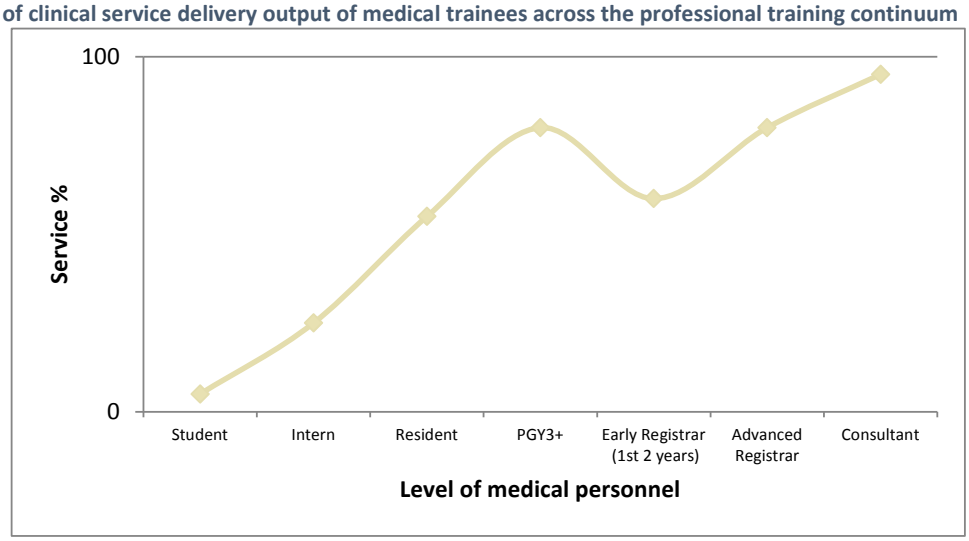
When medical graduates enter the workforce as interns, they provide an increasing contribution to patient service, but still require a significant amount of supervision. Most stakeholders considered that a medical trainee's service contribution becomes 'cost neutral' once they have been in the workforce for two or three years. In this sense 'cost neutral' describes the point where the trainee's contribution to patient care is equivalent to the costs the health service incurs to provide their training.

If the trainee is not immediately able to obtain admission to a vocational training program, their service contribution may be close to 100% – although some of their time will invariably be allocated to learning, regardless of whether they wish to pursue entry into a vocational training program or if they opt to remain employed as a HMO, Career Medical Officer (CMO) or equivalent.

If the trainee is successful in gaining admission to a vocational training program, most stakeholders considered that their service contribution initially drops to some degree to take account of the additional learning and supervision that will be required in the early stages of a specialised training program. Once basic vocational training is complete, stakeholders generally expected that the trainee will be a highly functioning member of the medical workforce and will provide a significant contribution to service, while also undertaking some degree of learning in the final stages of their specialist training.

Once fully qualified as a specialist medical consultant, medical professionals are functioning to their full scope of practice, and are supporting a number of other staff in their professional learning and development. However, the consultation highlighted that learning does not end here. Stakeholders universally recognised that some component of medical professional time will be spent on continuing professional development activities in order to maintain their professional competence and knowledge of contemporary technologies and practices.

Figure 11: level of clinical service delivery output of medical trainees across the professional training continuum



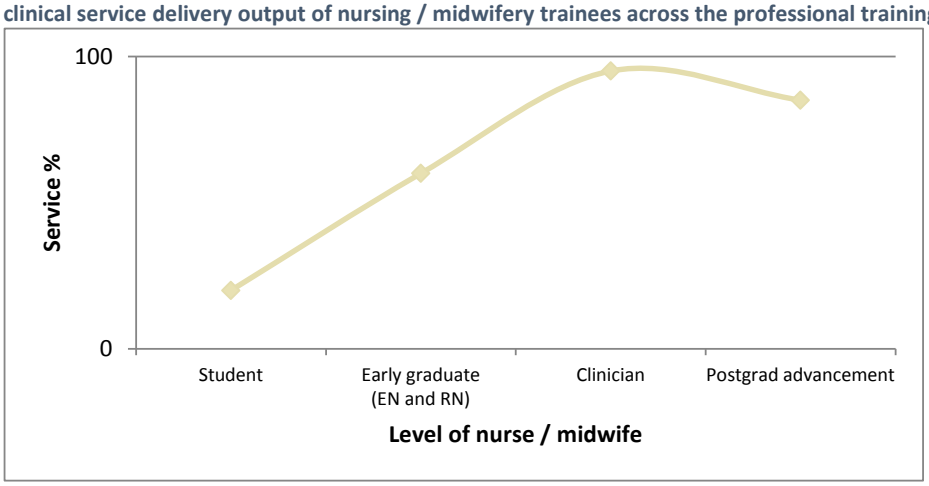
2. Service delivery benefits associated with nurse / midwife teaching and training

Figure 12 illustrates the conceptualised learning / service mix of nursing and midwifery professionals as they progress through different stages of the teaching and training continuum. In contrast to medical students, which are mostly supernumerary, many stakeholders considered that nursing and midwifery students make some meaningful contribution to service – although the extent of the contribution depends on the capability of the individual.

A graduate nurse or midwife's service contribution is also likely to be relatively greater than a new medical graduate. However, stakeholders expressed a range of perspectives on their contribution, ranging from relatively small, right up to being a fully functional member of the workforce from day one of their graduate placement. Stakeholders identified a number of factors as determinants of a graduate nurse's contribution to service as opposed to learning, including their own individual aptitude and capability, the type and duration of the graduate program (if any) that they are participating in, and the nature and geographic location of their post (more rural / remote graduates were generally expected to make a greater contribution to service). Most stakeholders considered that a nurse or midwife is generally a fully functional member of the workforce after about six months, following a rapid ramp-up in knowledge and clinical exposure as part of their early graduate program. This full service contribution continues as a practicing clinician, in conjunction with a small amount of continuing professional development, which is typically around 20 hours per year.

Nurses and midwives that seek to expand their range of knowledge and skills through specialisation or admission to a nurse practitioner program will continue to be highly functional in their roles, and will undertake some degree of supervised clinical practice as they progress towards fulfilment of their advanced qualification.

Figure 12: level of clinical service delivery output of nursing / midwifery trainees across the professional training continuum



3. Service delivery benefits provided by allied health professionals

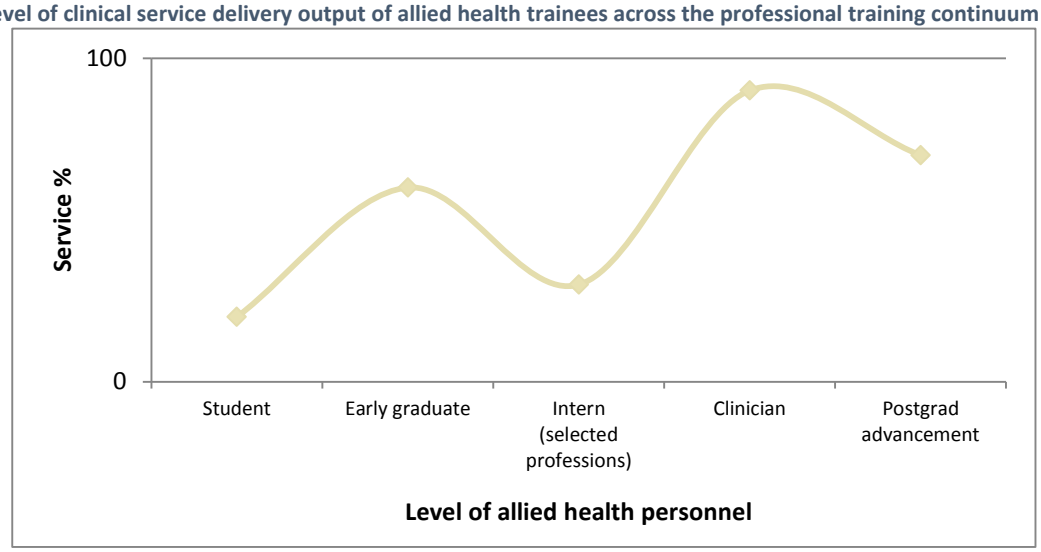
Figure 13 illustrates the conceptualised learning / service mix of allied health professionals as they progress through different stages of the teaching and training continuum. Most stakeholders considered that allied health professionals' contribution to service is largely similar to that of nurses in both the student and early graduate years, although some stakeholders articulated perhaps a greater expectation for allied health professionals to be fully functional in their roles from an early stage in their career. A number of factors may influence the actual service contribution, including the individual's aptitude and capability, type of allied health professional discipline and the existence (and structure) of an allied health graduate program.

Similar to medical interns, those allied health professions that require completion of an intern year are typically less productive than for other disciplines as they complete the higher degree of supervised learning that is required to gain admission to practice.

As a clinician that is operating to their full scope of practice, allied health professionals are likely to continue to undertake continuing professional development activities, although the requirements for completing these can vary substantially from one allied health discipline to the next.

In a similar way to nurses and midwives, those allied health professionals that wish to undertake further study to expand their scope of practice or specialise, typically remain as highly functioning members of the workforce while completing their postgraduate qualification to attain recognition as an advanced or specialist professional. Some degree of supervision from a more senior professional is required as part of the advancement process, which is usually conducted on a one-to-one basis. Once allied health professionals reach the level of advanced or consultant clinician (or equivalent), they will have a significant role in delivering learning outcomes for other staff due to their level of specialised expertise, and in doing so much of the 'service' component of their role is associated with the delivery of learning and education to the remaining clinical workforce, which may occur as inter-professional learning.

Figure 13: level of clinical service delivery output of allied health trainees across the professional training continuum



Key messages

The extent of service delivery benefits provided by trainees varies according to the type of professional group and the level of professional within the teaching and training continuum. Although the degree of service delivery benefits has been conceptualised in this section, in reality service benefits are influenced by a broader range of factors, and are often determined by characteristics of the individual trainee.

In a general sense, as trainees assume a greater responsibility for delivering services (rather than being engaged in teaching or training activity), their service contribution will increase. Considering the relatively higher levels of supervision required of medical trainees, they usually take longer to produce a level of service delivery benefit that is sufficient to 'offset' the costs of their teaching / training, compared to a nursing, midwifery or allied health trainee.

4. Service delivery benefits associated with research

Stakeholders acknowledged a wide range of (predominately intangible) benefits associated with research. These benefits were recognised most often as general, indirect benefits accruing to the health service's reputation, ability to attract high-calibre staff, infrastructure investment and research funding, rather than being realised immediately at the point of service delivery. However indirect, it may be argued that the presence of a high-quality research capability may provide service delivery benefits by providing access to eminent clinicians, services and technologies, thereby enhancing the level of patient care.

Research may also produce tangible benefits where research outputs can be commercialised, resulting in direct income generation for a health service. In most cases research income may be restricted to those health services that possess the infrastructure, expertise and patient characteristics to support clinical trials, tissue banking or new / advanced procedural interventions. Once commercialised, these research applications quite often have extensive benefits to patients both domestically and abroad, and are an important component of the continued advancement of knowledge and expertise. As noted by the McKeon Review, "commercialisation is a necessary part of the process of delivering the benefits of research to the community"[3]. As a result, it may be inappropriate to introduce a 'benefit offset' for any commercialisation income received by a health service, as this may discourage health services from supporting these important developments.

Although research can be applied to effect significant improvements in patient care (both within and outside of a clinical setting), any service delivery benefits typically take a long time to materialise, commercialise or be reflected in patient outcomes. Additionally, the benefits of research were recognised

[3] Commonwealth Department of Health and Ageing (2013), 'Strategic review of Health and Medical Research'

by stakeholders as being 'real' and significant, but they are not of a nature that would allow the health service itself to realise some type of productivity dividend as a result of its delivery. Indeed, the benefits of research as defined in Section 3.2.4 require that the value-add generated through research is intended to be disseminated to a broader population outside of the health service itself. This is in contrast to teaching and training, where the interaction of trainees with patients provides some degree of benefit to the health service's capacity to discharge its core service delivery function. This is certainly not to say that the existence of a research capability does not provide some benefit to the health service.

Instead, it may be more appropriate to focus discussion of 'benefit drivers' towards ensuring that the public health system does not 'pay twice' for service outcomes that may eventually be supported by both a dedicated TT&R funding stream and another activity-based funding stream (acute admitted, outpatient, emergency, sub-acute, mental health).

Key messages

A majority of benefits associated with research are intangible, cannot be practically quantified and accrue to the health service's reputation, ability to attract high-calibre staff, infrastructure investment and research funding, rather than being realised immediately at the point of service delivery.

Nonetheless, tangible benefits of research activity may arise through commercialisation of outputs, which often provide extensive benefits to a range of patient populations. Although commercialisation income can be easily quantified and is perhaps the most tangible benefit associated with TT&R, it may not be appropriate to reflect commercialisation income as a 'benefit offset' in TT&R funding models.

5.2.2. The feasibility and materiality of measuring service delivery benefits

As shown in Figures 11 through 13, the materiality of service delivery benefits provided by health professionals in training is highly variable, and can be dependent on a number of factors. However, regardless of the professional group or level of trainee, most stakeholders generally considered that the benefits provided by health professionals in training:

- are both 'real' and 'material';
- generally become greater as trainees move through the learning / education continuum into more senior roles, with a proportionately greater level of service delivery responsibility; and
- generally become more tangible over time, as the greater level of service responsibility subsequently results in a higher level of patient interaction and hence, a clearer link between the professional in training and service delivery outputs.

The potential feasibility of measuring service delivery benefits thus improves as trainees assume a greater responsibility for delivering direct patient care. However, notwithstanding the much clearer link between a more experienced trainee and service delivery output, the basis for quantifying the benefits remains an area of significant uncertainty, which most stakeholders considered is 'impossible', on the basis of the complex and varied level of interaction that occurs between a patient and various professional groups in any episode of care.

Stakeholders consistently highlighted that, in reality, unpicking the patient care episode to quantify the service delivery benefits provided by medical, nursing, midwifery and allied health professionals would be a highly complex task. For example, within a single episode of patient care, the patient may receive care from several medical personnel, dozens of nurses and a range of allied health professionals – some of whom will be in training, and others that are not. The significant question raised was "How can the relative contribution of each to the patient care episode be quantified as the basis for measuring service delivery benefits?"

Most stakeholders considered that the only way to reliably measure service delivery benefits across professional groups would be to conduct a range of 'time in motion' studies for various patient episodes.

However, the administrative burden of doing so across the spectrum of patient care episodes would be prohibitively expensive and time-consuming.

A fractional approach to estimating service delivery benefits across various professional types may thus be the most sensible and economical method of quantifying service benefits for professionals in training. In a broad sense, the Queensland approach to funding TT&R follows a fractional approach, by using expert opinion to estimate the proportion of time various professional types (and levels) spend in training as opposed to being engaged in direct service delivery. The Queensland model then provides a subsidy for that proportion of the trainee's salary that is spent in learning or educational activities as opposed to service. A similar model is in place in Victoria, although the basis for Victoria's allocation of learning versus service is not articulated in the available documentation. These models tend to rely on broad assumptions about the time spent in learning or education activities rather than actual service delivery benefits provided, and therefore represent an indirect approximation of benefits at best.

Quantifying service delivery benefits in a meaningful way therefore represents a significant challenge that will be difficult, if not impossible to do accurately. Although stakeholders recognised that the teaching and training process provides a range of benefits, that become more significant and tangible as a trainee progresses in their training pathway, the best available method for approximating these benefits is likely to be based upon high-level assumptions and expert opinion (rather than detailed studies which may quickly become irrelevant as models of care, scopes of practice and training delivery continue to evolve).

Key messages

A majority of stakeholders considered that the service delivery benefits associated with TT&R are both 'real' and 'material'. The extent to which service delivery benefits can be feasibly measured tends to improve as trainees assume a greater responsibility for delivering patient care.

However, there are significant challenges associated with quantifying service delivery benefits in a practical sense that will be difficult, if not impossible to do accurately. The best available method for approximating these benefits is likely to be based upon high-level assumptions and expert opinion rather than detailed studies which may quickly become irrelevant as models of care, scopes of practice and training delivery continue to evolve.

6. Jurisdictional TT&R activity, funding and reporting processes

This section provides a summary of TT&R activity, funding and reporting processes in place across Australian States and Territories. The information obtained from the stakeholder consultation has been combined with the findings arising from previous work documented in the literature review.

6.1. Literature review findings

The literature review highlighted that the ways in which jurisdictions allocate funds for TT&R is not well described in the publicly available literature. Only two jurisdictions, Victoria and South Australia have provided details of their approach to funding TT&R in public health services. Between these two jurisdictions, approaches to allocating TT&R funding differ according to various factors including:

- the types of costs that TT&R funding is intended to supplement (e.g. productivity losses, direct supervision costs, direct course costs);
- the levels of trainees for which funding is provided (e.g. one jurisdiction provides funding to cover the costs of postgraduate nurse education, whereas the other jurisdiction does not);
- the types of professional groups for which funding is provided (e.g. TT&R funding is provided for Health Information Managers in one jurisdiction); and
- the research components that are supported by funding (e.g. capital versus operating costs associated with research).

The literature review did not reveal significant detail regarding reporting and acquittal requirements of health services to support the TT&R funding allocation. Victoria was the only jurisdiction that articulates the reporting requirements of health services in its policy and funding guidelines.

In the absence of TT&R reporting processes and metrics, there remains limited data and information regarding the nature and purpose of TT&R funding and associated activities that are funded by States and Territories.

6.2. TT&R funding

Table 11[4,5,6] on page 86 presents a summary of existing funding arrangements for TT&R that are in place across Australia, by jurisdiction, professional group and trainee level. The basis for allocating TT&R funds to health services differs substantially across jurisdictions, as does the level of funding provided.

Funding approaches and relative rates

Victoria

The Victorian TT&R funding model is perhaps the most detailed and reflective of a supportive funding approach that has been aligned to a long standing ABF model framework. The model is aimed at providing funding to health services for TT&R on a per-student and per-graduate basis under its 'Training and Development (T&D) Grant'[7]. For student placements, the Victorian model pays health services based upon their proportion of total weighted clinical placement activity for students enrolled in medicine, nursing / midwifery (registered and enrolled) and allied health. Payments for early graduate/pre-vocational positions are based upon a historically-derived estimation of the costs of supervision and training for each group, with payments being made for the first graduate year for nursing, midwifery and allied health, and the first two years for medical graduates. Negotiated agreements between the health service and the Victorian

[4] Department of Health Victoria (2013). 'Victorian Health Policy and Funding Guidelines 2013-14', Department of Health, Melbourne.
[5] Queensland Department of Health (date unknown). 'Clinical Education and Research Components of Queensland's Activity Based Funding Model'
[6] South Australia Department of Health and Ageing (2012), 'Casemix Funding for Hospitals: Methodology 2012-13'.
[7] Department of Health Victoria (2013). 'Victorian Health Policy and Funding Guidelines 2013-14', Department of Health, Melbourne.

Department of Health determine the number of placements that will be funded through the program at each site. However the health service may appoint placement numbers which exceed the agreed number, with the associated costs to be met by the health service's general operating funds rather than the TT&R funding stream specifically.

Funding for early nursing and midwifery graduates in Victoria is conditional on health services providing a detailed reconciliation of FTE activity volumes in funded program places, along with actual numbers of FTE commencing in the upcoming year, details of any rotations to another health service, as well as details of other early graduate and postgraduate activity that does not attract funding under the T&D Grant. Funding for early graduates in allied health requires health services to report on the numbers and FTE of new graduates in the twelve allied health disciplines[8] in-scope for funding under the T&D grant.

Beyond the early graduate years, the Victorian model only provides funding for the clinical and professional supervision required to attain a postgraduate qualification (graduate certificate or higher) in the fields of nursing or midwifery. Similar to the funding allocation for student placements, postgraduate nursing and midwifery funding under the T&D Grant is allocated based upon a pre-agreed number of trainees for each public health service with the amount of funding being predetermined by the Department of Health.

In addition to the professions listed in Table 11, Victoria's T&D Grant also provides funding for pharmacy interns, medical radiation interns, medical biophysics placements and medical laboratory science placements in a similar way to the medical, nursing and midwifery early graduate payments. The full range of professionals for which funding is provided in Victoria are shown in Table 13.

Although the T&D Grant documentation identifies research as being supported under the Victorian funding model, the basis of the support provided by this component of the grant and methods for allocating it are not documented.

Queensland

In Queensland, the funding approach for TT&R is based on budget allocations to health services for 'clinical education' of medicine, nursing, midwifery, 'health practitioner' and dental students. Allocations to health services are based upon defined dollar amounts per student week. The funding levels for medical and dental student placements take into account enterprise bargaining-based wages growth experienced since a cost estimate of $241.00 was established by the Casemix Steering Committee in March 1998. The funding levels for undergraduate health practitioner and nursing / midwifery placements have been set to enable parity with the rates payable under current enterprise bargaining agreements. Funding allocations for the notional clinical education costs of both early graduates/pre-vocational and vocational trainees are based upon a percentage of salary costs for the relevant FTEs at each hospital included in the Queensland ABF model. The documentation made available by Queensland Health provides a detailed listing of the subsidy percentage rates for different professional types and levels, which have been determined following consultations with internal expert groups in each professional discipline. Interestingly, Queensland is the only jurisdiction across Australia that supports clinical education of medical professionals in vocational training, with a gradual 'step-down' in the subsidy available as medical registrars progress.

Funding for research costs in Queensland are based on the amounts reported via dedicated state research cost centres in addition to the research funding provided by commercial and non-commercial entities. Research funding is not part of the ABF model.[9]'

[8] The allied health disciplines funded under Victoria's T&D grant are physiotherapy, occupational therapy, speech therapy, podiatry, clinical psychology, dietetics, social work, orthoptics, audiology, optometry, exercise physiology and orthotics / prosthetics.

[9] Queensland Department of Health (date unknown). 'Clinical Education and Research Components of Queensland's Activity Based Funding Model'

South Australia

The South Australian model operates through a 'Teaching Grant' for nursing, medicine and 'other health professionals'. Although the nursing component of the grant does not pay health services for costs associated with student placements, it does provide funding for graduate nurses, with the maximum level of nurses undergoing such programs being set at 12% of the total nursing headcount.[10]' One component of the South Australian model that is unique across Australia is that it contributes between $4,000 to $6,000 for nurses "in an approved course" or for "critical care, neonatal intensive care, cardiothoracic, emergency, aged care, child and adolescent mental health and midwifery refresher courses for participants from rural health units.[11]" Grants for medical personnel under the South Australian Teaching Grant are calculated on the basis of a percentage of each training medical officer's base salary "to compensate for their reduced clinical productivity", along with a supervisory component for the time of supervising medical officers (applied to the number of Training Medical Officer FTE that are supervised). A further supervision allowance for medical undergraduates is paid at 10% of the total hospital medical salaries and wages payments.

The contribution to research within the South Australian model is based upon a co-contribution of 15.73 cents for every dollar supported by NHMRC grants.

Other jurisdictions

Other jurisdictional funding models include an allocation for TT&R within the price per weighted acute separation or some other component of their existing casemix formula.

[10] South Australia Department of Health and Ageing (2012), 'Casemix Funding for Hospitals: Methodology 2012-13'.

[11] South Australia Department of Health and Ageing (2012), 'Casemix Funding for Hospitals: Methodology 2012-13'.

Table 11: TT&R funding arrangements summary, by jurisdiction

State / Territory	Medicine Students	Medicine Pre vocational	Medicine Vocational	Medicine Prof devt / CPD	Nursing Students	Nursing Early graduate	Nursing Up-skilling / course	Nursing Prof devt / CPD	Allied Health Students	Allied Health Early graduate	Allied Health Up-skilling / course	Allied Health Prof devt / CPD	Research
NSW	Refer to note (a)	Refer to note (a)	Refer to note (a)	Refer to note (a)	Refer to note (a)	Refer to note (a)	Refer to note (a)	Refer to note (a)	Refer to note (a)	Refer to note (a)	Refer to note (a)	Refer to note (a)	Not specified
Vic	Statewide weighted activity percentage	$34,437 to $37,669 p.a. per trainee	-	-	Statewide weighted activity percentage	$17,455 p.a. per trainee	-	$17,455 p.a. per trainee	Statewide weighted activity percentage	Variable depending on demand	-	-	Not specified
Qld	Costs per student week	Clinical Education percentage	Clinical Education percentage	-	Costs per student week	Clinical Education percentages	-	-	Costs per student week	Clinical Education percentage	-	-	Varies depending on reported amounts in research cost centres
WA	Refer to note (b)	Refer to note (b)	Refer to note (b)	Refer to note (b)	Refer to note (b)	Refer to note (b)	Refer to note (b)	Refer to note (b)	Refer to note (b)	Refer to note (b)	Refer to note (b)	Refer to note (b)	Specific SHRAC* grants
SA	Percentage of total wages	Percentage of trainee and trainer's salaries	-	-		$11,000 p.a. per trainee	$4,000 to $6,000 p.a. per trainee	-	-	5% of total wages	5% of total wages	-	15.73c per NHMRC dollar
Tas	Estimated direct cost – PFRAC*	Estimated direct cost - PFRAC*	-	-	Estimated direct cost - PFRAC*	Estimated direct cost - PFRAC*	-	-	Estimated direct cost - PFRAC*	Estimated direct cost - PFRAC*	-	-	Not specified
ACT	Refer to note (c)	Refer to note (c)	Refer to note (c)	Refer to note (c)	Refer to note (c)	Refer to note (c)	Refer to note (c)	Refer to note (c)	Refer to note (c)	Refer to note (c)	Refer to note (c)	Refer to note (c)	Not specified
NT	Refer to note (b)	Refer to note (b)	Refer to note (b)	Refer to note (b)	Refer to note (b)	Refer to note (b)	Refer to note (b)	Refer to note (b)	Refer to note (b)	Refer to note (b)	Refer to note (b)	Refer to note (b)	Not specified

Note: Other professional types (such as dental) fall outside the scope of the medical, nursing, midwifery and allied health professional group classifications. For simplicity and materiality reasons, the funding arrangements applying to these groups have not been presented in this table, but have been considered as part of the broader Environmental Scan.
'Prof devt' refers to professional development; 'CPD' refers to Continuing Professional Development; 'PFRAC' refers to Product-specific fraction; 'SHRAC' refers to SA's State Health Research Advisory Council;
(a) Direct TT&R costs in New South Wales are based on 'expected' expenditure. Indirect TT&R costs included in price per National Weighted Activity Unit
(b) Funding for all groups in both Western Australia and the Australian Capital Territory are implicit within price per weighted acute separation
(c) Funded at program level – based on cost centres

Allocative basis of jurisdictional TT&R funding

Table 12 describes the types of costs that each jurisdiction's TT&R funding model is intended to fund.

Table 12: Types of costs for which TT&R funding is provided

Jurisdiction	Medical	Nursing / midwifery	Allied Health	Research
NSW	Not specifically identified	Not specifically identified	Not specifically identified	Not specifically identified
Vic	Supervision / on-the-job training	Supervision / on-the-job training	Supervision / on-the-job training	Not specifically identified
Qld	• Productivity losses / opportunity cost • Supervision costs • Clinical academic salary costs	• Productivity losses / opportunity cost • Supervision costs	• Productivity losses / opportunity cost • Supervision costs	• Direct research costs reported in dedicated cost centres
WA	Not specifically identified	Not specifically identified	Not specifically identified	• Research staff time • Management time
SA	• Productivity losses / opportunity cost • Supervision costs	Supervision and training costs	Supervision and training costs	Infrastructure support for NHMRC-funded projects
Tas	Estimated direct costs of TT&R	Estimated direct costs of TT&R	Estimated direct costs of TT&R	Not specifically identified
ACT	Not specifically identified	Not specifically identified	Not specifically identified	Not specifically identified
NT	Staff time involved in delivering TT&R	Staff time involved in delivering TT&R	Staff time involved in delivering TT&R	Not specifically identified

Table 12 shows that the Victorian, Queensland and South Australian models are relatively consistent in funding the direct costs of supervision and on-the-job teaching/training. Although each model estimates these costs in a different way, all three models intend to compensate health services for the time that different professional types spend supervising trainees.

In addition to the direct costs of supervision, the Queensland and South Australian funding models (medical only) aim to recognise the productivity impairments that are associated with teaching and training, which have been documented in various domestic and international literature.

Funding approaches for research across jurisdictions are far more varied. Whereas the Queensland funding model aims to reimburse health services for direct research costs reported in dedicated cost

centres, the WA model intends to capture "all time spent on actual research activities, including where treatment is involved. This includes time spent managing research, preparing publications, reports and other similar activities.[12] The focus of the South Australian model for funding research is different again, and focuses on "infrastructure funding for program and project research grants supported by the NHMRC."[13]

Jurisdictional teaching and training funding by professional groups and classifications

Table 13 shows the various professional types for which TT&R funding is provided under each jurisdiction's model. Although most jurisdictions do not specify the type or level of professionals that are covered under their TT&R funding model, there is generally a level of consistency across the jurisdictions (where information was made available). Nonetheless, a few exceptions are notable, as discussed below.

Table 13: Professional levels at which teaching and training funding support is provided by jurisdictions

Jurisdiction	Medical	Nursing / midwifery	Allied Health / Other
NSW	No specific professional levels identified	No specific professional levels identified	No specific professional levels identified
Vic	Student placement Pre-vocational (Intern →PGY2)	Student placement Early graduate (year 1) Postgraduate (to Masters level)	Physiotherapy, Occupational Therapy, Speech Therapy, Podiatry, Clinical Psychology, Dietetics, Social Work, Orthoptics, Audiology, Optometry, Exercise Physiology and Orthotics / Prosthetics; Pharmacy interns; Medical radiation interns; Medical Biophysics placements; Medical Lab Scientist placements; Health Information Managers.
Qld	Student placement Pre-vocational (Intern →PHO4) Vocational (up to year 6) Clinical academic salary costs	Student placement EN Grade 3 RN Grade 5 (incl re-entry) PS Grade 5	Student placement Early graduate (Health Pract L3) Pharmacy trainees Dental student placements
WA	No specific professional levels identified	No specific professional levels identified	No specific professional levels identified
SA	Student placement Training Medical Officers (not defined)	Early graduate (year 1) Nurses in approved hosp courses Rural nurses in specialist refresher courses	Staff at all levels (not students)
Tas	No specific professional levels identified	No specific professional levels identified	No specific professional levels identified
ACT	Dependent on cost centres	Dependent on cost centres	Dependent on cost centres
NT	No specific professional levels identified	No specific professional levels identified	No specific professional levels identified

[12] Western Australia Department of Health (2011), 'Teaching, Training and Research Costing Guideline'.

[13] South Australia Department of Health and Ageing (2012), 'Casemix Funding for Hospitals: Methodology 2012-13'.

Medical trainees

For medical trainees, the scope of the Queensland model provides subsidies which extend into advanced registrar years, although the level of subsidy gradually reduces depending on the level or experience of of the registrar. In contrast, Victoria does not provide for medical trainees beyond their PGY2 year. The South Australian model provides subsidies for 'Training Medical Officers'. Although Training Medical Officers are not defined in the available funding documentation, South Australian Medical Education and Training defines a Trainee Medical Officer as a "trainee that is in PGY2 and above[14]."

Nursing and midwifery

There is a similar level of diversity with respect to the range of nursing professionals for which funding is provided across jurisdictions. Although costs associated with supporting postgraduate nursing study are funded in Victoria, postgraduate nursing funding in South Australia is restricted to nurses that are undertaking "approved hospital courses" and those that are "from rural health units which are undertaking specialist refresher courses in specific disciplines". Although the Victorian model does not appear to fund re-entry courses for nurses, the Queensland and South Australian funding model does appear to provide some contribution to education costs for re-entry / refresh.

Allied Health

Victoria, Queensland and South Australia appear to provide funding for student placements and early graduates in allied health, although the details relating to the level and type of professionals varies. Victorian documentation around allied health funding includes a detailed description of allied health professionals as well as assistants in allied health. The Queensland funding model appears to fund any allied health professional up to the 'Health Practitioner L3' classification, along with pharmacy trainees. The South Australian model uses a flat estimate of 5% of the total salaries and wages of all allied health, dental, scientific and technical staff as a proxy for the teaching and training provided to this professional group, and does not appear to identify specific staff classification levels to which the model applies.

The available policy and funding documentation identifies that some jurisdictions also provide funding for other professional groups in addition to medical, nursing / midwifery and allied health professionals. Table 13 shows that Victoria provides funding for the greatest number of professionals outside of the three main professional groups, including pharmacy trainees, health information management trainees, medical radiation interns and placements for medical biophysics and laboratory science placements. These groups have been included on the basis of specific supervision requirements as part of the placement or position. Dental interns and student placements are not included in the Victorian model, but are captured by the Queensland and South Australian models.

[14] South Australian Medical Education and Training (date unknown), accessed from http://www.saimet.org.au/index.php/junior-doctors/trainee-medical-officers

6.3. TT&R reporting

The stakeholder consultation process confirmed initial observations that formalised reporting arrangements relating to TT&R activity and costs are not well-advanced in most jurisdictions. This is partly due to most jurisdictions incorporating TT&R within their acute admitted funding models, which may obviate the need for separate TT&R reporting arrangements. Victoria appears to provide the most extensive and transparent teaching and training activity reporting requirements of any jurisdiction.

Reporting requirements for teaching and training

Victoria

Victoria's teaching and training reporting arrangements have been in place for some time and are very well-developed, recognising the state's longstanding application of ABF. The Victorian Department of Health sets detailed expectations of health services, with respect to the teaching and training data that they are required to report against the various sub-components of Victoria's T&D Grant (described in Section 6.2).

Clinical placement activity data are currently provided retrospectively by health services through an annual census. However, from 2014–15 the allocation of the T&D Grant for professional-entry student placements will be based on the activity reports generated directly from viCPlace, the information system used to assist the planning and administration of clinical placements in Victoria (described in further detail in Section 7.2.2).

New South Wales

Outside of clinical placement data, NSW does not appear to require any other formalised TT&R reporting arrangements. Consultations with the NSW Ministry of Health indicated that funding allocations to health services for TT&R are little more than a "balancing item", with no real formula or science underpinning these allocations other than historical arrangements that have been subject to indexation. As a result, there appears to be little in the way of reporting that can inform the determination of TT&R funding allocations under the NSW approach.

Other jurisdictions

In spite of the existence of a detailed TT&R funding model in SA, no health service reporting requirements related to teaching and training were identified.

Although Queensland does not routinely collect data on TT&R activity in terms of student placements, each Hospital and Health Service in Queensland reports monthly on workforce data (i.e. the Minimum Obligatory Human Resource Information) through the Workforce Analysis and Collection Application.

Reporting requirements for research

No evidence of any systematic jurisdiction-level reporting of the type and volume of research activities conducted in public health services was identified throughout the consultation.

Jurisdictions reported maintaining registers of research projects that have sought endorsement from ethics and governance committees. However, this information is not publicly available, nor were the reporting requirements for these activities articulated during the environmental scan consultations.

6.4. TT&R activity

As described more fully in Section 7, no single source of national or jurisdictional data regarding TT&R activity and costing exists. The dearth of TT&R activity data available across most jurisdictions may be reflective of the limited amount of reporting around TT&R that is currently mandated (discussed in section 6.3).

As a high-level proxy for teaching and training activity, an overview of the distribution of clinical placement hours for calendar year 2012, by professional group and jurisdiction is presented in Table 14, sourced from the HWA Clinical Placement Data Set.

Table 14: Health Workforce Australia - Clinical placement hours by profession by state and territory

Profession	New South Wales	Victoria	Queensland	Western Australia	South Australia	Tasmania	Northern Territory	Australian Capital Territory	Total
Medical	3,404,775	3,352,531	2,737,779	1,083,712	1,026,355	287,958	222,301	151,610	12,267,020
Nursing & Midwifery	3,074,950	3,165,200	2,416,225	1,074,698	1,167,315	299,280	87,678	212,306	11,497,652
Allied Health*	2,420,244	2,510,824	2,171,499	1,250,886	963,672	176,088	72,277	170,707	9,736,196
Dentistry	378,327	298,368	303,956	1,951	115,199	9,296	3,570	1,736	1,112,403
Total hours	**9,278,296**	**9,326,923**	**7,629,459**	**3,411,247**	**3,272,541**	**772,622**	**385,826**	**536,358**	**34,613,271**
% of Total hours	**27%**	**27%**	**22%**	**10%**	**9%**	**2%**	**1%**	**2%**	**100%**

Source - Health workforce Australia 2012 clinical placement data
Note: * 'Allied Health', as considered by HWA comprises the professions of Aboriginal and Torres-Strait Islander Health Worker, Audiology, Chiropractic, Dietetics, Exercise Physiology, Medical Laboratory Science, Occupational Therapy, Optometry, Oral Health, Orthoptics, Orthotics and Prosthetics, Osteopathy, Paramedicine, Pharmacy, Physiotherapy, Podiatry, Psychology, Radiation Science, Social Work, Sonography, Speech Pathology.

Table 14 shows that there is a relatively even distribution between clinical placement hours provided for medical (35%) and nursing and midwifery (33%), with allied health professions making up the majority of the rest of the clinical placement hours (28%), and dental placements representing the balance (4%).

Across jurisdictions, New South Wales (27%), Victoria (27%) and Queensland (22%) delivered over three-quarters of the clinical placement hours across Australia in 2012.

Although the data presented in Table 14 should be interpreted with some caution, particularly since it includes data on clinical placements that fall outside of the scope of this project, we consider that it provides the best currently-available indication of TT&R activity across jurisdictions at a pre-entry level.

With respect to research activity, the number and value of NHMRC grants was suggested by stakeholders to potentially provide a high level proxy for the volume of major research activity being undertaken in Australian health services. However, an analysis (not shown) of NHMRC grants, awarded over the last ten years and administered by Chief Investigators (CIs) based within Australian hospitals, revealed what was assumed to be a significant under-estimation of the true volume of research activities. This is likely due to the fact that the analysis was unable to determine the proportion of grants administered by CIs based in other research settings (e.g. MRI and University), but that may be partly undertaken in public hospitals.

No reliable data sources for research activity across jurisdictions could be identified for the purposes of estimating research activity for this report.

7. TT&R data availability

The cost drivers and factors identified in Section 4 provide a starting point for developing models that will test the relative influence of each factor on health service costs. However, known variations in the scope and quality of data collected across jurisdictions will require that the nature and veracity of the available data is well understood in order for the analysis to be as robust as possible.

This section details the possible data sources that we may be able to draw from at the national, jurisdictional and local levels to procure cost and activity data that is high quality, consistent and suitable to inform the analysis of TT&R cost drivers that will follow in the next stage of this project.

7.1. Literature review findings

The literature review revealed that available data collections appear to focus largely on teaching and training costs and activity, with little data available regarding publicly funded research.

There is no single data repository that contains dedicated cost and activity data relating to TT&R. Although cost and activity data may exist within systems at the individual health service or jurisdictional level, the extent to which this data is consistent across health services / jurisdictions is unknown.

As a result of the identified variations in data collections, the literature review highlighted the importance of ascertaining the availability, reliability and consistency of data within health services, jurisdictions and other peak bodies that may support an analysis of TT&R cost drivers.

This section refines the data sources identified in the literature review, to identify those at the national, jurisdictional and organisational levels that are likely to be of most relevance in the TT&R cost driver data analysis.

7.2. Outcomes of environmental scan consultation

The environmental scan consultation tested the veracity of the various data sources identified in the literature review. It also managed to uncover some additional sources that exist across most jurisdictions which may be useful in informing a TT&R cost driver analysis – such as governance / ethics committee approvals.

The consultation focused on discussing both cost and activity data that may be of use in cost driver analyses. The term ‘activity data’ as it is used in this section, describes potential measures (or proxy measures) of TT&R activity that provide an indication of the demand for, or supply of TT&R within any given health service.

The consultation feedback confirmed the findings of the literature review, that no single data source at the national, jurisdictional or organisational level is capable of supporting a TT&R cost driver analysis on its own. Rather, the analysis will require that data is brought together from the various data collections that exist to develop a set of relevant measures.

7.2.1. National data collections

Table 15 and Table 16 identifies the most relevant sources of cost and activity data availability (respectively) at the national level that may support an analysis of TT&R cost drivers, along with their strengths and potential shortcomings.

Table 15: Potential national sources of TT&R cost data collection

Cost data source	Description	Strengths	Potential shortcomings
National Hospital Cost Data Collection (NHCDC)	Collects cost and descriptive data for all public and private hospitals, excluding private day only facilities, with more than 200 acute separations in the financial year. Collected on financial year basis.	• Comprehensive, collects data on a wide range of variables that may be of interest in cost driver analysis; • Relatively recent (2011-12 data available); • Detailed, collected at episode level and can be rolled up to health service or jurisdiction level if required; • Includes some private hospitals.	• Known variations in approach to costing TT&R – low reliability of direct TT&R costs across jurisdictions; • Gaps exist. Some health services do not provide data.
Public hospital establishments national minimum data set (PHE NMDS)	Collects data regarding costs and FTE aggregated at the health service level. Collected on financial year basis.	• Provides cost and FTE for various staff categories (incl. student and trainee nurses, ENs); • Includes flag for teaching status / higher education provider affiliation; • Includes high-level health service descriptive information (bed numbers) and activity; • Excellent coverage of health services;	• Salary and FTE detail does not extend to all staff categories (i.e. unlike nurses, PHE NMDS provides no further breakdown of medical and allied health professionals); • Does not always reconcile to hospital financial systems or NHCDC.
Government health expenditure national minimum data set (GHE NMDS)	Collects direct government and government-funded expenditure on health and health–related goods and services. Collected on financial year basis.	• Collected at organisation-level; • Focuses on revenue and expenditure; • Includes revenue received from state / territory health departments, NHMRC grants and a range of other sources.	• Limited data items collected – high-level focus.

Table 16: Potential national sources of TT&R activity data collection

Activity data source	Description	Strengths	Potential shortcomings
Health Workforce Australia (HWA) clinical placements dataset	Collects clinical training placements from higher education providers for professional-entry students in the medical, nursing, midwifery, dentistry and (selected) allied health disciplines. Collected on calendar year basis.	• Directly relevant to demand for professional entry teaching and training (identified as a potential cost driver); • Includes split by public / private; • Data currently available for 2009 to 2012.	• Unsure if data can be made available at the facility level; • Does not capture teaching and training activity that occurs post-entry to the workforce.
Health Workforce Australia (HWA) National Health Workforce Dataset	Collects demographic and employment information for registered health professionals. Collected on calendar year basis	• Mostly comprehensive & reliable; • Includes both public and private sector health workforce.	• May not provide access to data at health service level; • Scope only covers registered health professionals; • Does not provide split of professionals by level of trainee, but does provide years worked as a proxy; • Data currently only available for 2010 and 2011.

Activity data source	Description	Strengths	Potential shortcomings
Medical Training Review Panel	Collects descriptive information on medical training in Australia. Most data collected on financial year basis, but some is collected on calendar year.	• Detailed data by level (higher education provider training, prevocational, vocational); • Includes data on the number of international supply of medical professionals	• Focus on medical training only – not nursing, midwifery or allied health; • Collected at aggregate level. Need to check with contributing bodies to determine whether data is available at health service level.

Both the descriptive and cost data available from the NHCDC is likely to form a fundamental component of the cost driver analysis, or at least a means by which the expenditure data held in the PHE NMDS and GHE NMDS can be validated and reconciled. Although the NHCDC is intended to capture direct teaching and research costs, discussions across jurisdictions highlighted the extensive differences in jurisdictional approaches to capturing these costs. As a result, it is unlikely that the direct TT&R data held within the NHCDC will be useful for the purpose of cost driver analysis, and more aggregated financial and payroll data held at a health service level may be required to correlate activities and costs.

A notable gap in the national data collections relates to research. With the exception of individual data items such as NHMRC revenue (in the GHE NMDS), there is a dearth of data available to inform an analysis of research activity at the national level

IHPA has recognised the variation in the type and extent of TT&R activity data collection across jurisdictions, and is in the process of developing a TT&R activity Data Set Specification (DSS). Initially, the data set will be based upon a 'best efforts' approach to data collection of national activity data from 1 July 2014. It is recognised that some health services may not yet have the data or necessary infrastructure, staff or training to be able to deliver the full scope of data requirements. However, over time, IHPA intends for the TT&R DSS to become a national minimum data set.

Notwithstanding the absence of dedicated TT&R data capture across jurisdictions, publicly available clinical training activity data does exist for specific groups through bodies such as HWA, the Commonwealth Department of Health's Medical Training Review Panel, the Australian Institute of Health and Welfare, selected clinical craft groups and other peak bodies such as Medical Deans Australia and New Zealand. However, these data sources typically only capture a subset of the full range of TT&R activity that occurs across Australia, and would need to be pieced together to be able to inform funding for TT&R.

7.2.2. Jurisdictional data collections

Table 17 and Table 17 show that the range of jurisdictional data collections that may be relevant to inform the TT&R cost driver analysis is typically limited to consolidated health service financial data, governance/ethics committee approvals and health workforce data.

Table 17: Potential state level sources of TT&R cost data collection

Cost data source	Description	Strengths	Potential shortcomings
Jurisdictional financial systems	• Broad range of data at a range of levels (can be cost centre, episode, organisation-level) from health service financial systems. Data is often fed up to various national data	• Good coverage - jurisdictional data should include all health services within each state / territory; • May provide more granular breakdown by	• Significant variation across jurisdictions in approaches to costing – has not been through additional validation and checking processes that national data has.

Cost data source	Description	Strengths	Potential shortcomings
	collections. • Typically collected on financial year basis.	TT&R cost centres (if used / available across jurisdictions) than national data.	

Table 18: Potential state level sources of TT&R activity data collection

Activity data source	Description	Strengths	Potential shortcomings
Ethics and research governance committee data	• Collects data regarding research projects that have been submitted for approval to ethics and governance committees. • Collection schedule varies by jurisdiction.	• Reported to comprise a listing of all projects submitted for ethics approval and various characteristics of those projects; • Identified as a sound proxy for the 'amount' of research activity.	• The extent and coverage of ethics and governance data is likely to vary by jurisdiction; • May not cover some approval processes that are relevant to research (eg. animal ethics).
Workforce data	• Collection of workforce profiles by pay classification at each health service.	• All jurisdictions reported that this data is held within their current systems; • Some systems may be able to identify professionals undertaking learning / education activities (e.g. postgrad qualifications).	• May be some variation across jurisdictions in the basis upon which workforce data is collected (calendar / financial year); • Various arrangements for recording joint education provider and health service appointments; • Variations in professional classification schemes across jurisdictions may require extensive mapping to obtain national consistency.

Although data may be available from jurisdictions at a cost centre level, differences in cost centre structures and cost allocation processes across jurisdictions may present difficulties when attempting to compare direct TT&R costs held in these cost centres on a consistent basis across jurisdictions.

Another type and source of jurisdictional data collection may relate to descriptors of the health workforce. A number of jurisdictions indicated that they were confident that they could provide full-time equivalent or headcount data by clinical professional group and pay classification. Such data may provide useful information by which to identify the number of trainees at different levels of an organisation, and to identify the number of staff involved in research. Both of these may be suitable proxy measures of the amount of TT&R activity, and may help to provide a more granular level of detail regarding staff mix than can be obtained from the PHE NMDS. However, the classifications used to group staff categories are known to vary substantially, and may require a significant time commitment to consistently map the various staff classifications on a nationally consistent basis.

IT systems for teaching and training data

The sophistication of systems available to collect teaching and training activity data varies across jurisdictions. Larger jurisdictions, such as New South Wales and Victoria have already implemented web-

based information systems designed to manage clinical placements and reported significant enhancements to the ability to plan and coordinate these placements during consultations. Other jurisdictions such as Tasmania and Western Australia appear to have recognised the value in these online information systems and are in the process of developing their own. Some jurisdictions have indicated that the best source of clinical placement data may be universities, and that medical vocational training data may be best sourced directly from each respective specialist college. The availability of clinical placement data, by jurisdiction, is described in Table 19.

Table 19: Clinical placement information systems, by jurisdiction

Jurisdiction	System availability	Scope of current clinical placement data collection				Trainee level	
		Med	Nurs / Midwif	Allied Health	Other	VET	Tertiary
New South Wales	Operational (ClinConnect)	✔	✔	✔	✔	✔	✔
Victoria	Operational (VicPlace)	✔	✔	✔	✔	✔	✔
Queensland	None identified.	-	-	-	-	-	-
Western Australia	Foreshadowed. In planning	-	-	-	-	-	-
South Australia	None identified.	-	-	-	-	-	-
Tasmania	Currently manual. System in development (due 2014)	✔	✔	✔	?	✔	✔
Northern Territory	None identified.	-	-	-	-	-	-
Australian Capital Territory	Operational (Student Placements Online)	✔	✔	✔	-	✔	✔

A short description of each of the operational systems described in Table 19 is provided below.

NSW - ClinConnect

ClinConnect has been operating since July 2012 as the information system in place within NSW that governs the booking of clinical placements for medicine, nursing, midwifery, dental, oral health and allied health disciplines. ClinConnect operates discipline-specific booking cycles, which are agreed on an annual basis between health services and education providers.

Health services and education providers have each appointed or nominated a ClinConnect Coordinator to provide a key centralised contact for their organisation. The Coordinator is the single point of governance, communication and leadership for clinical placements across all disciplines for their organisation in relation to ClinConnect.

Victoria - viCPlace

viCPlace is a secure, web-based information system that has been in place since 2012, and which helps Victorian clinical placement providers plan and administer clinical placements with partnered education providers. viCPlace is designed to align with the normal workflow of clinical placement planning,

coordination and delivery and supports data accuracy and streamlined communication between a clinical placement provider and education provider.[15]

In the interests of reducing the reporting burden on health services, the allocation of the 'Professional-Entry Student Clinical Placements Subsidy' component of the Victorian Department of Health's T&D Grant will be based upon activity reports generated directly from viCPlace from 2014-15 onwards, replacing the requirement for an annual clinical placement data collection.

The Victorian Department of Health oversees ongoing development activities for viCPlace that aim to provide specific advice about the functionality and usability of viCPlace processes.

ACT Student Placements online

The ACT Government Health Directorate manages the placement of students and trainees undertaking health and health related courses through an online information system titled 'Student Placements Online' (SPO). Through SPO, education providers must notify ACT Health of their requirements for clinical placements three months prior to the commencement of a placement, including:

- The number of students in a proposed placement;
- Type or specialty area of a proposed placement;
- Proposed dates;
- Objectives of the placement;
- Resources to be provided to support clinical supervision; and
- Amount and type of supervision required for the placement.

SPO therefore may provide a potentially rich source of clinical placement data for medicine, nursing, midwifery and allied health trainees in the ACT.

Other jurisdictions

Both Tasmania and Western Australia are currently developing systems to capture and coordinate clinical placement activity on a unified, statewide basis. Tasmania's system is due to be rolled out sometime in 2014. Western Australia has recently completed a scoping study to determine the requirements to implement a statewide clinical placement system for undergraduate, postgraduate and VET sector students in both the public and private sectors.

Research data availability

In terms of data that could potentially be sourced to reflect the size, nature and impact of research activity conducted by a health service, governance units were understood to be the main conduit of this information (recognising also that there are no jurisdictions or centralised bodies that hold registers of data regarding the level of research being conducted within public health services).

Jurisdictional listings of projects that have been subject to research ethics and governance committee approval processes were consistently raised during consultations as an area where jurisdictional data collections will add value to a TT&R cost driver analysis. Although research ethics and governance directorates may exist at the organisational level, most jurisdictions stated that details of the research projects that they oversee are consolidated at the jurisdictional level. As a result, this may provide some proxy for the amount of research activity that occurs across health services. Although the exact data available within ethics and governance committee data collections may vary from one jurisdiction to the next, most health departments were confident that they may contain some descriptive data that could

[15] Department of Health Victoria (2012). 'Well Placed. Well prepared. Clinical placements in Victoria', Department of Health Victoria, Melbourne.

be useful to segment and filter research projects according to whether they fall within the parameters of the research definition proposed in Section 3.2.4. The development of a National Ethics Application Form, as is being proposed by a number of jurisdictions and health services, may help to standardise the collection of data supporting Human Research Ethics Committee applications into the future.

Based on the feedback received through the consultation, the types of data which could potentially be captured by public health service governance units include:

- the number of clinical research projects sought for approval and achieving approval from the governance unit or relevant ethics committee;
- the number of clinical research projects subsequently receiving grant approval status by the research grant provider;
- the number of research projects which went on to publication or citation in medical and peer review journals;
- the total value of research grants received by the public health service; and
- with regards to clinical trials, the number of health service patients involved in clinical research activities and possibly the number of intervention cycles of trials conducted per patient.

A number, but not all, of these data points do relate back to the notional cost drivers for research discussed in Section 4.

However, in each of the cases above, if the research projects were instigated by other affiliated organisations (even for research activities which were conducted on public health service patients or within their facilities), this data was less likely to be available.

8. Summary and conclusions

This Environmental Scan distils the findings from a large amount of stakeholder consultation (over 350 individuals) and a comprehensive review of the publicly available literature with respect to TT&R in Australian public health services. It has identified commonly-held views and opinions on a range of issues with respect to defining TT&R. In addition, it has identified an array of considerations that add significant complexity to the task of defining these terms and identifying and quantifying the cost drivers for each, for the purposes of ABF.

The findings of the project to date have informed the development of a set of draft definitions:

For ABF purposes, training and teaching is defined as:

> ***The activities provided by a public health service to facilitate the acquisition of knowledge, or practice of skills, that are prerequisites for an individual to gain the necessary qualifications (or recognised professional body registration) to practice in the medicine, nursing & midwifery or allied health professions.***

Research is defined as:

> ***An activity undertaken in a public health service where the primary aim is the advancement of knowledge that ultimately aims to improve patient health outcomes. The activity must be undertaken in a structured and ethical way, be formally approved by a research governance or ethics body, and have potential for application outside of the health service in which the activity is undertaken.***

For ABF purposes, the definition of research relates to:

> ***the public health service's direct and indirect contribution to research where the cost and resources incurred are not directly tied to an alternative source of research funding.***

These definitions will serve as a starting point and will be refined during subsequent project activities.

In some cases it was not possible to arrive at a consensus view regarding the considerations identified during the Environmental Scan. In addition, a number of additional questions were raised through the environmental scan consultation process. As such, the consultation workshops that are to be conducted on 18 and 24 October 2013 will provide an opportunity to validate the findings of the Environmental Scan and receive guidance regarding the outstanding questions that the Environmental Scan has raised.

Gaining feedback at the workshops on the Environmental Scan findings will assist in solidifying the draft definitions of teaching, training and research and provide the basis upon which to undertake an analysis of the cost drivers for teaching, training and research in public health services.

Appendix A: HOI draft definitions for TT&R

The draft definitions for TT&R as presented by HOI have been determined as follows:

Teaching

Any activity where the primary aim is to transfer clinical knowledge of ongoing professional development via a teacher or mentor to a student or candidate in a recognised program/course that will result in either:

- qualifications that may meet registration requirements; or
- other admission to a specified discipline where the right to practice in that discipline requires completion of the program or course.

Teaching activities may include:

- automated/self-directed learning where the teaching component is electronically provided;
- presentation and development of content; and
- supervision/participation in curriculum based research.

Secondary benefits of teaching may include:

- improved health service recruitment and retention rates (through, for example, a successful student placement experience).

This excludes product teaching and indirect teaching.

Training

The planned and organised activity to impart skills, techniques and method to employers and their employees to assist them in:

- supporting staff retention through career pathways;
- professional development activities;
- establishing and maintaining employment and a place of employment which is safe and healthy;
- improving health knowledge through keeping staff up to date with health industry trends and new technologies; and
- reducing health costs through improved ways of working.

Research

An activity where the primary aim is the advancement of knowledge through:

- observation, data analysis and interpretation, or other means that are secondary to the primary purpose of providing patient care;
- activities associated with patient care where additional components or tasks exist (e.g. the addition of control group in a cohort study); and/or
- investigations or applications related to patient care.

Research is an activity which provides:

- evidence as to whether or not new knowledge is being transformed into effective clinical practice for the consumer;
- reports about the importance, worth and meaning (of their health) to consumers;

- recommendations and guidelines for future health investment; and
- a contribution to health service capacity building through undertaking useful planning work such as reviews, evaluations and needs studies.

This excludes curriculum-based research projects, by-product research, quality assurance, evaluation and clinical audit activity.

Appendix B – Allied health professional disciplines

Table 20: Health Professional Graduates listed under HWA

Roles / Disciplines	AHPRA recognised national Boards	Selected occupations identified in HWA workforce statistics	Professions identified in Tier 2 non admitted classification	Occasions identified by Health Depts	Roles identified by State and Territory Health Depts							
					Tas	VIC	NSW	QLD	SA	WA	NT	ACT
Aboriginal and Torres Strait Island Health Worker	1	1	1	0	✔							
Audiology		1	1	0	✔	✔	✔	✔	✔	✔	✔	
Dentistry, Dental Therapists, Dental Assistants and Oral Health Therapists	1	1		0	✔	✔					✔	✔
Dietetics		1	1	0	✔	✔	✔	✔	✔	✔	✔	✔
Exercise Physiology		1		0		✔	✔	✔				✔
Medical Laboratory Science		1		0	✔	✔						
Occupational Therapy	1	1	1	0	✔	✔	✔	✔	✔	✔	✔	✔
Optometry	1	1	1	0	✔	✔		✔				
Orthoptics		1	1	0	✔	✔	✔		✔	✔		
Orthotics - Prosthetics - Pedorthics		1	1	0	✔	✔	✔	✔	✔	✔	✔	✔
Pharmacy (requires internship year)	1	1	1	0	✔	✔	✔	✔	✔	✔	✔	
Physiotherapy	1	1	1	0	✔	✔	✔	✔	✔	✔	✔	✔
Podiatry	1	1	1	0	✔	✔	✔	✔	✔	✔		✔

Roles / Disciplines	AHPRA recognised national Boards	Selected occupations identified in HWA workforce statistics	Professions identified in Tier 2 non admitted classification	Occasions identified by Health Depts	Roles identified by State and Territory Health Depts							
					Tas	VIC	NSW	QLD	SA	WA	NT	ACT
Psychology (requires internship year)	1	1	1	0	✔	✔	✔	✔	✔	✔	✔	✔
Radiation Science and Medical Dosimetry	1	1		0	✔	✔	✔	✔				
Radiography / Medical imaging (Requires internship year)	1			0	✔	✔	✔	✔	✔	✔	✔	
Social Work		1	1	0	✔	✔	✔	✔	✔	✔	✔	✔
Sonography		1		0	✔	✔	✔	✔	✔	✔		
Speech pathology		1	1	0	✔	✔	✔	✔	✔	✔	✔	✔
Chinese medicine (Acupuncturists, Chinese Herbal Medicine professionals) (non-hospital)	1			0		✔	✔					
Chiropractic (non-hospital)	1	1		0								
Osteopathy (non-hospital)	1	1		0								
Paramedicine (non-hospital)		1		0								

Table 21: Other allied health roles listed under HWA

Roles / Disciplines	AHPRA recognised national Boards	Selected occupations identified in HWA workforce statistics	Professions identified in Tier 2 non admitted classification	Occasions identified by Health Depts	Roles identified by State and Territory Health Depts							
					Tas	VIC	NSW	QLD	SA	WA	NT	ACT
Aged Care Assistants				0		✔			✔		✔	✔
Art therapy				0		✔	✔	✔	✔			
Alcohol & Drug worker				0		✔	✔					✔
Allied Health Assistants				0	✔		✔	✔				
Assistants in Nursing				0	✔		✔					
Behavioral health (counseling, marriage and family therapy)				0	✔						✔	
Biomedical Science				0	✔					✔		
Case manager				0	✔	✔						
Clinical measurement science				0		✔	✔					
Community Health Workers				0	✔							
Diabetes Education				0	✔							
Diversional Therapy				0		✔						
Electrocardiogram technician				0		✔						
Environmental Health				0	✔							
Epidemiology				0					✔			
Exercise physiology				0					✔			
Genetic Counselling				0					✔			
Health Information Management - Clinical Coding				0	✔							

Notes: 21 Allied Health professions are listed by Health Workforce Australia as requiring graduation from a course and attainment of a qualification to practice as a health professional in Australia;
11 of the above 21 require formal registration with a professional board regulated by AHPRA.
Only 7 of the 21 allied health professions listed by HWA were recognized by all eight states and territories as such (Dietetics, Occupational Therapy, Orthotics/Prosthetics, Physiotherapy, Psychology Social Work and Speech Pathology).
A further three were recognised by seven out of eight states as allied health professions (Audiology, Pharmacy, Sonography)

Appendix C – List of stakeholders participating in consultations

Australian Capital Territory

Type	TTRWG member?	Organisation	Consultation mode	Date consulted
Jurisdiction	Y	Commonwealth Department of Health and Ageing	Site visit	22-Aug
Jurisdiction	Y	ACT Health	Group visit	11-Sep
Health Service		Canberra Hospital	Group visit	11-Sep
Peak body	Y	Australian Medical Association	Group visit	22-Aug
Peak body	Y	Australian Medical Association Doctors in Training	Group visit	22-Aug
Peak body	Y	National Health and Medical Research Council	Site visit	22-Aug
Peak body	Y	Australian Rural Health Education Network	Teleconference	2-Sep
Peak body	Y	Catholic Health Australia	Group visit	9-Sep
Peak body	Y	Australian Private Hospital Association	Group visit	9-Sep
Interest Group		Services for Rural and Remote Allied Health	Site visit	9-Sep
Peak body		Australian Healthcare & Hospitals Association	Site visit	9-Sep
Interest Group	Y	Federation of Rural Australian Medical Educators	Teleconference	16-Sep
Peak body		Consumers Health Forum	Teleconference	24-Sep

New South Wales

Type	TTRWG member?	Organisation	Consultation mode	Date consulted
Jurisdiction	Y	NSW Ministry of Health / HETI	Site visit	26-Aug
Health Service		Liverpool Hospital	Site visit	26-Aug
Health Service		Sydney Childrens Hospital	Site visit	27-Aug
Health Service		St Vincents Hospital	Site visit	27-Aug
Health Service		Sydney LHD	Site visit	28-Aug
Health Service		Sutherland Hospital	Site visit	28-Aug

Type	TTRWG member?	Organisation	Consultation mode	Date consulted
Health Service		Westmead Hospital	Site visit	29-Aug
Health Service		Hunter New England LHD	Site visit	29-Aug
Peak body	Y	Committee of Presidents of Medical Colleges	Site visit	28-Aug
Peak body	Y	Medical Deans Australia and New Zealand	Site visit	29-Aug
Peak body		Universities Australia	Teleconference	29-Aug
Interest Group		University of Sydney	Site visit	29-Aug
Jurisdiction		NSW Ministry of Health / HETI	Site visit	26-Aug

Northern Territory

Type	TTRWG member?	Organisation	Consultation mode	Date consulted
Jurisdiction	Y	Department of Health Northern Territory	Site visit	4-Sep
Health Service		Royal Darwin Hospital	Site visit	5-Sep
Health Service		Alice Springs Hospital	Site visit	6-Sep

Queensland

Type	TTRWG member?	Organisation	Consultation mode	Date consulted
Jurisdiction	Y	Queensland Health	Site visit	6-Aug
Health service		Group of Regional Hospitals (Cairns, Cape York, Mackay, Townsville)	Group visit (Cairns)	5-Aug
Health service		Metro North HHS - Princess Alexandra Hospital	Site visit	7-Aug
Health service		Metro South HHS - Royal Brisbane Hospital	Site visit	7-Aug
Peak body	Y	Australian Council of Pro Vice -Chancellors and Deans of Health Sciences	Site visit	5-Aug
Interest Group		Allied Health Advisors Committee	Site visit	6-Aug

South Australia

Type	TTRWG member?	Organisation	Consultation mode	Date consulted
Jurisdiction	Y	SA Health	Site visit	15-Aug
Health service		South East Health (Mt Gambier)	Videoconference	15-Aug
Health service		Flinders Medical Centre	Site visit	16-Aug
Health service		Repatriation General Hospital	Site visit	16-Aug
Peak body	Y	Health Workforce Australia - Clinical Training Reform	Teleconference	8-Aug
Peak body	Y	Health Workforce Australia - Workforce Innovation & Reform	Teleconference	12-Aug

Tasmania

Type	TTRWG member?	Organisation	Consultation mode	Date consulted
Jurisdiction	Y	Department of Health and Human Services	Site visit	14-Aug
Health service		Royal Hobart Hospital	Site visit	14-Aug

Victoria

Type	TTRWG member?	Organisation	Consultation mode	Date consulted
Jurisdiction	Y	Victorian Department of Health	Site visit	23-Aug
Health service		Austin Health	Site visit	13-Aug
Health service		Peninsula Health	Site visit	23-Aug
Health service		Bendigo Health	Video	12-Aug
Interest Group		Royal Australasian College of Physicians	Site visit / Teleconf	12-Aug
Peak body	Y	Association of Australian Medical Research Institutes	Group visit	12-Aug
Peak body		Research Australia	Group visit	13-Aug
Peak body	Y	Council of Deans of Nursing and Midwifery	Teleconference	13-Aug
Peak body	Y	Allied Health Professionals Australia	Site visit	30-Aug

Type	TTRWG member?	Organisation	Consultation mode	Date consulted
Peak body	Y	Confederation of Postgraduate Medical Councils	Videoconference	30-Aug
Peak body	Y	TAFE Directors Australia	Site visit	30-Aug
Interest Group		Australasian College for Emergency Medicine	Site visit	2-Sep
Interest Group		Royal Australasian College of Surgeons	Site visit	3-Sep
Interest Group		Clinical Trials Group (Peter Macallum Cancer Institute)	Site visit	10-Sep
Interest Group		Royal Australasian College of Medical Administrators	Site visit	13-Sep
Peak body	Y	Australian College of Nursing	Site visit	17-Sep
Interest Group		Royal Australian and New Zealand College of Psychiatrists	Site visit	19-Sep

Western Australia

Type	TTRWG member?	Organisation	Consultation mode	Date consulted
Jurisdiction	Y	WA Health	Site visit	19-Aug
Health service		Princess Margaret Hospital	Site visit	19-Aug
Health service		Sir Charles Gardiner Hospital	Site visit	20-Aug
Health service		Western Australia Country Health Service	Site visit / Teleconf	20-Aug
Health service		Armadale Health Service	Site visit	21-Aug