



PAXTON PARTNERS

INDEPENDENT HOSPITAL PRICING AUTHORITY

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

Literature review

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Executive Summary

Introduction

In addition to payments for services on an activity basis, the National Health Reform Agreement (NHRA) recognises that some aspects to health service delivery and their related operational functions could be more appropriately funded under alternative arrangements, such as specified grants and block funding. Teaching, training and research (TT&R) functions that are provided by public health services are currently included in this category. However, 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 activity based funding (ABF) from 1 July 2018.

The incorporation of hospital and health service-based TT&R into a funding model that is able to reflect the true costs of delivering these services, is a complex undertaking. Not only may the terms 'teaching', 'training' and 'research' mean different things to different people, approaches to costing and recording activity associated with functions that are intrinsically linked to many clinical services will require the development of definitions, systems and processes that do not yet exist.

Paxton Partners have been engaged by IHPA to conduct a review to define TT&R and identify associated cost drivers for ABF purposes. This paper presents the foundation work that will inform consultations with health services, jurisdictional health departments, relevant peak bodies and other interest groups across Australia. These consultations will inform the development of an updated definition (or definitions) of TT&R that can begin to be used as the basis for understanding TT&R cost drivers and building a classification scheme that may inform a nationally consistent funding model for TT&R in the future.

The nature of TT&R

While the literature presented in this document acknowledges a wide spectrum of clinical teaching and training, including nursing and allied health, much of the literature focuses on medical training and research. The literature demonstrates that the type and intensity of teaching and training requirements vary across and within disciplines, and across undergraduate, pre-vocational and vocational levels. This presents complexities in terms of both the scope of how TT&R should be defined, as well as how to capture the varying costs associated with the differences in how TT&R is delivered across disciplines and levels of personnel that operate within public health services.

Health and Medical Research (HMR) has received significant attention across Australia with the recent publication by the Department of Health and Ageing (DoHA) of its Strategic Review of Health and Medical Research¹. The available literature highlights a number of issues in how research undertaken in public health services is understood, funded and tracked. Lack of understanding is reported to manifest in reduced levels of research support

¹ Department of Health and Ageing (2013), Strategic Review of Health and Medical Research

at the health service-level, on the basis that research is seen as an activity that is not 'core business' for public health services.

The range of health services in which TT&R activities are now being conducted has extended beyond traditional teaching hospital settings into a range of regional, rural and remote locations, community, primary and ambulatory care settings. This expansion has been mirrored by significant growth in the number of trainees within the system. The number of medical graduates alone has almost doubled in the last decade. TT&R is therefore becoming more prominent, and is taking place in a broader range of locations and settings. A full and commonly agreed understanding of TT&R is therefore important to ensure that the growing investment in TT&R can be recognised for its critical importance to supporting the future medical workforce, and can be resourced accordingly.

The literature reports that volume of clinical teaching and training, and the modes in which it is delivered have also expanded significantly over the past decade, with a shift away from traditional supervision-based training methods. In the ABF context, the expansion of TT&R into new locations and settings means it will no longer be as simple as providing additional rates and co-payments to tertiary referral hospitals.

For contextual purposes, this report includes broad details regarding the mechanisms by which State and Territory jurisdictions provide funding for TT&R. These mechanisms vary in terms of the approach, scope of services and the levels of personnel for which health services are eligible to receive funding. Although the quantum of funding (as a percentage of the total health budget) appears to be well understood, the basis for funding allocations is less clear in the available literature.

Where details on funding allocations do exist, there appears to be a general intent that the jurisdictional funding is intended to capture the direct and indirect costs of supervision and on-the-job training for students, trainees and employees in the fields of medicine, nursing and allied health. However, the exact scope of eligibility in terms of services, activities and persons varies between jurisdictions.

There is also limited information available that describes funding arrangements for research undertaken in public health services. A recent strategic review of health and medical research² recognises that sources of research funding are poorly understood, are not adequately tracked, and research outputs are not commonly subject to examination.

Internationally, various funding allocation mechanisms for TT&R exist. Much of the available literature focuses on postgraduate (vocational) medical training, with little attention paid to nursing and allied health disciplines. A range of international literature notes the difficulties posed by data constraints in setting appropriate funding arrangements for TT&R. These include:

- In the UK, funding mechanisms vary according to the type and level of trainee;

² Commonwealth Department of Health and Ageing (2013), Strategic Review of Health and Medical Research'.

- In Italy, funding arrangements vary according to regional preferences, although the majority apply a national tariff; and
- In Norway, global health service budgets include a cost component per Diagnosis Related Group (DRG) that is intended to fund research and training.

Defining TT&R

Although a number of definitions have been developed in recent years, no standard national definition of TT&R exists. Currently, TT&R is referred to in various ways across jurisdictions. Some make a distinction between teaching and training; others appear to use the terms interchangeably. Some jurisdictions refer to research using completely different terminology (or do not refer to it at all) in funding documentation.

Work was commissioned by DoHA in 2010 to develop and agree definitions of TT&R. The 'draft' definitions that were developed as part of this work borrow heavily from the definitions included as a part of an independent study on costing and funding of training activities that was conducted in 1996. These draft definitions form the baseline from which revised definitions of TT&R will be developed as part of this project.

Although the draft definitions of TT&R appear to have been adopted for the purpose of developing costing standards and guiding some jurisdictional funding allocations, a number of jurisdictions and independent reports have acknowledged shortcomings in the definitions. These include a need to:^{3,4}

- Include consideration of 'indirect' TT&R products/costs;
- 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 TT&R, and formal/informal TT&R.

The complexity and diversity of views in defining TT&R may require that the eventual TT&R funding model reflects some compromise between the desire for accuracy and the difficulties associated with clearly separating TT&R costs from clinical service delivery in practice.

Cost Drivers of TT&R

The literature generally contends that TT&R functions of health services are associated with additional costs and inefficiencies that are not reflected in current funding models. The literature also contends that these shortcomings in the existing funding models are due to difficulties associated with disentangling patient care and medical education. However, the evidence regarding the impact of TT&R activities on health service costs is mixed. Some

³ Department of Health, State of Western Australia (2011). 'Teaching, Training and Research Costing Guideline'.

⁴ Health Outcomes International (2010). 'ABF teaching, Training and Research Workstream Scoping Study: National Workshop Discussion Paper', prepared for the Commonwealth Department of Health and Ageing.

bottom-up costing studies^{5,6} conducted overseas have identified that the costs associated with teaching and training functions are less than the government funding provided to health services for TT&R. Another bottom-up costing study⁷ conducted in Australia has suggested that health services may face significant funding shortfalls compared to the cost of providing teaching and training activities.

Isolating cost drivers associated with TT&R (as opposed to other health service activities) is complicated by the inherent variation in health service characteristics due to factors such as size, location and casemix, which will invariably account for some degree of cost differences across health services.

There is a degree of consensus regarding the factors that are associated with higher TT&R costs, however, the quantitative impact of these factors varies. The lack of reliable data and the difficulty in controlling confounding factors largely explain the limited evidence at this level⁸. The studies that have been undertaken generally place the estimate of additional health service costs associated with TT&R activity at between 8%⁹ to 15%^{10,11} of the global health service budget, compared to health services where TT&R is not undertaken. The few available studies that have examined the specific TT&R activities that drive health service costs generally identify the number of students, trainees or employees as drivers of teaching and training costs, but note the impact of a vast range of other direct and indirect teaching activities.

With regard to research activities, previous studies have rarely provided a true activity-based measure upon which to assess the associated cost drivers within a health service environment. 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. Some studies noted the wide range of research outputs, and the variation in resource usage to produce these different outputs, as contributing to the absence of a broadly accepted basis for determining research effort. Nonetheless, the available literature consistently indicated that the presence of a research capability alone increased teaching hospital costs by up to 15%¹², compared to non-teaching hospitals.

⁵ Spollen, M., Dixon, P. and Hindle, G. et. al. (2003). 'Research on Additional Costs of Teaching in NHS Scotland: Report for Standing Committee on Resource Allocation Sub-Group – Final Report Executive Summary, prepared by Secta Consulting.

⁶ 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'.

⁷ Oates, K. and Goulston, K. (2013), 'The hidden cost of medical student education: an exploratory study', *Australian Health Review*, 2013, 37, 185-188.

⁸ Spollen, M., Dixon, P. and Hindle, G. et. al. (2003). 'Research on Additional Costs of Teaching in NHS Scotland: Report for Standing Committee on Resource Allocation Act Sub-Group', prepared by Secta Consulting.

⁹ Brewerton and Associates (2011), 'Teaching, Training and Research Cost Driver Identification'. Report prepared for Department of Health Victoria.

¹⁰ Linna, M. and Häkkinen, U. (2006). 'Reimbursing for the costs of teaching and research in Finnish Hospitals: a stochastic frontier analysis', *the International Journal of Health care, Finance and Economics*, March 2006; 6(1): 83-97.

¹¹ The Lewin Group (2005). 'Comparing Hospital Costs: Adjusting for Differences in Teaching Status and Other Health service Characteristics', report prepared for Bridges to Excellence.

¹² Mauro, M., Cardamone, E. et. al. (date unknown), 'What do teaching and research cost in teaching hospitals? A survey from Italy'.

TT&R data sources across Australia

A reliable analysis of cost drivers will need to be underpinned by a range of data describing the costs and activities associated with TT&R. The available data collections appear to focus largely on teaching and training costs and activity, with little data available on publicly funded research. The majority of cost driver studies that have been undertaken to date have been based at the health service or jurisdictional level. However, the extent to which data collections at these levels are consistent across jurisdictions is not clear, and it will be important to establish this in order for a national analysis of cost drivers to be robust. No single data repository currently exists to capture both the costs and activities of TT&R on a consistent basis, however, a range of national data collections may hold some promise towards providing a reliable basis for assessing cost drivers associated with TT&R across Australia.

1. Introduction

1.1. National reform context

The establishment of the National Health and Hospital Reform Commission and subsequent review of the Australian health system paved the way for the NHRA. The NHRA was signed between the Commonwealth and State and Territory jurisdictions in August 2011. An important element of the NHRA is its binding commitment for the Commonwealth and jurisdictions to implement ABF models for public healthcare services.

In addition to payments for services on an ABF basis, the NHRA recognised that some aspects to 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 that are provided by public health services were explicitly included in this category. For services funded under block grants for example, the NHRA provides that the Commonwealth Government will fund 45% of the growth in the efficient cost of these services from 1 July 2014, rising to 50% from 1 July 2017. Clause A49 of the NHRA also requires that IHPA provides advice to the Standing Council on Health regarding the feasibility of transitioning funding for TT&R from block grants to ABF from 1 July 2018.

1.2. Background to the issue

The decision to fund some hospital and health service functions on the basis of block grants recognises a number of inherent complexities within the system and at the organisational level that will need to be resolved in order to assess the suitability of TT&R to be funded on an activity basis. These include:

- The absence of a broadly agreed definition(s) of TT&R;
- Difficulties separating some TT&R activity and costs from other ABF funding streams,
- The absence of robust data to support costing of TT&R; and
- A number of other factors as outlined in this report.

By requiring IHPA to assess the 'feasibility' of transitioning funding for TT&R to an activity based model, the NHRA implicitly recognises the complexity associated with funding TT&R on an activity basis, and the potential that the most efficient funding model may not be fully activity based. The relatively long lead time to assess the suitability of TT&R for ABF also recognises the extent of development work that may be required to make a full and proper assessment of this important policy question.

1.3. Purpose of this document

Paxton Partners have been engaged by IHPA to conduct a review to define TT&R and identify associated cost drivers for ABF purposes. The project has a timeframe spanning nine months concluding in March 2014.

This literature review will inform the initial development work being undertaken to assess the suitability of TT&R for ABF, by presenting published evidence and perspectives on how TT&R is defined, funded and delivered, both in Australia and overseas. This paper will also

examine the available literature that describes the potential and identified cost drivers of TT&R, as well as the availability of cost and activity data to support a national analysis of TT&R cost drivers.

Specifically, the objectives of this paper are to:

- Inform the consultations with stakeholders across Australia, which will subsequently feed into an environmental scan of trends, issues, developments and current arrangements for TT&R;
- Inform the development, refinement or reconstruction of definitions for TT&R in an ABF context; and
- Support the development of data request specifications that will aim to assess the cost drivers of TT&R in public health services.

1.4. Methodology

Our aim in producing this literature review has been to provide a robust understanding of the nature of TT&R and how it has been defined, and to detail the identified cost drivers, trends, issues and developments. We will apply this understanding to facilitate consultations with jurisdictional health departments, health services, and peak bodies/interest groups across Australia as part of the environmental scan phase of the project. The environmental scan findings will inform the refinement of draft TT&R definitions, and will also support the development of data request specifications for the purposes of high level quantitative analysis of TT&R cost drivers.

This document has primarily been informed by a search of publicly available domestic and international literature, either provided by IHPA directly or sourced by Paxton Partners. The search included published reports, policy and funding documents, position papers, journal articles, presentations and responses to IHPA consultation papers. Our literature search focussed on identifying relevant documentation that included consideration of both definitions and cost drivers of TT&R specifically where it is delivered in the context of public health services and their direct TT&R partners, such as universities, professional and specialist training colleges and relevant research peak body groups.

Of the documentation provided by IHPA, a number of the sources were received from members of IHPA's Teaching, Training and Research Working Group (TTRWG), who submitted a range of literature to IHPA that may not otherwise be publicly available. This documentation has been of great value in conducting the review and has been treated sensitively where necessary. We wish to acknowledge the assistance of both IHPA and the TTRWG in this regard.

In total, we have obtained and reviewed over 200 documents as part of this literature review. We have referenced 80 documents in this report. Notwithstanding the breadth of documentation obtained, it has been clear from an early stage that TT&R may be described by a range of terms, both within Australia and internationally. This broad variation means that this review may not have captured all the literature that is relevant to TT&R.

1.5. Structure of this document

This document seeks to present a comprehensive background to, and analysis of the available domestic and international literature, with a specific focus on literature that describes the existing/previous definitions of TT&R, the identified cost drivers of TT&R and the availability of cost and activity data that will support a national analysis of TT&R cost drivers.

- **Chapter 1** presents the context, background, purpose, methodology and structure of this document;
- **Chapter 2** discusses the nature of TT&R, along with trends and issues that have been observed in Australia;
- **Chapter 3** discusses definitions of TT&R identified during the literature search;
- **Chapter 4** discusses potential and identified cost drivers in Australia and overseas; and
- **Chapter 5** identifies sources of activity and cost data that may be useful to inform the definitions and cost drivers of TT&R; and
- **Chapter 6** discusses the conclusions that we have drawn from the literature search and their implications for stakeholder consultation.

2. The nature of TT&R

This section provides some context to the diverse range of TT&R activities undertaken in health services in Australia. This information is presented as the basis for understanding the potential scope of services and activities that may foreseeably fall within the scope for TT&R funding.

It is clear from the available literature that TT&R is understood predominately through a medical lens. Although literature does acknowledge the role of other clinical teaching and training, including nursing and allied health, the availability of literature that describes and analyses these professions in relation to TT&R is considerably less than medically-focused papers.

Key points – The nature of TT&R

- Although literature describes TT&R relating to medical, nursing and allied health, the majority of literature focusses on TT&R in a medical context;
- Within medical, nursing and allied health professions, teaching and training may be delivered at a range of levels prior to registration, including while studying towards a recognised qualification, and at pre-vocational or vocational levels. Additionally, registered practitioners are most often required to undertake some form of teaching or training to maintain registration;
- The duration and intensity of teaching and training requirements vary significantly across and within professional groups;
- A recent review has acknowledged that sources of Health and Medical Research (HMR) funding remain poorly understood. The review has found that the resources allocated for research in health services are not adequately tracked and nor are the outputs from HMR usually audited;
- The range of locations and settings in which TT&R activities are being conducted is broader than ever before, and TT&R activity has undergone a significant expansion in the last decade;
- Significant differences exist in the scope of activities that are currently funded across jurisdictions. It will be important for all jurisdictions to have a common understanding of the activities that will be in-scope for TT&R funding, and to be able to quantify these activities.

2.1. Medical teaching and training

While the literature presented in this document acknowledges a wide spectrum of clinical teaching and training, including nursing and allied health, much of the literature focuses on medical training and research. The Medical Training Review Panel¹³ identifies the process to

¹³ Australian Government Department of Health and Ageing (2012). Medical Training Review Panel Fifteenth Report, Canberra.

become fully accredited to practice as a medical practitioner in Australia as consisting of three stages, leading to fellowship:

1. **University medical education** – which may comprise a five or six year undergraduate degree, or alternatively a four year postgraduate course. The early years of university education are typically provided on-campus, mostly through theoretical lecture and tutorial-based teaching, although some clinical placement may occur. Towards the latter stages of university education, this didactic learning gives way to a greater degree of experiential learning, which is delivered in an active health service environment;
2. **Pre-vocational medical training** – sometimes referred to as ‘internship’ and ‘residency’ years, is characterised by paid medical practice following graduation from an approved university medical course. Prevocational training requires a basic trainee to undertake a series of rotations between urban, regional and rural health services to expose them to a range of clinical situations and service environments. Prevocational training is jurisdictionally based and is overseen, in the case of the Australian States and Territories, by Postgraduate Medical Councils¹⁴. Pre-vocational training is usually undertaken over two years, but may in some cases be conducted in a single year; and
3. **Vocational medical training** - follows completion of university medical education and involves registration to practice in a recognised specialist or general practice training program that is overseen by a medical college. States and territories have different arrangements for managing vocational training, and the curricula and range of activities varies considerably according to the training program in which an advanced trainee registers. The duration required to complete vocational training programs varies by training college, and may range from three to seven years of full-time study. Successful completion of vocational training leads to registration as a fellow of a specialist or general practice college, indicating acceptance as a fully qualified medical practitioner.

Continuing professional development is typically required by medical colleges once practitioners are registered, to ensure that their knowledge remains at the forefront of best practice.

2.2. Nursing teaching and training

Health Workforce Australia¹⁵ (HWA) provides workforce demographics for the two levels of regulated nurses in Australia –Registered Nurses (RNs) and Enrolled Nurses (ENs). RNs complete, as a minimum, a three-year bachelor degree and undertake further training to become registered with the Nursing and Midwifery Board of Australia (NMBA). RNs practise independently and interdependently, assuming accountability and responsibility for their own actions and delegation of care to ENs and other healthcare workers.

ENs usually work with RNs to provide patients with basic nursing care, doing less complex procedures than RNs. ENs must complete a Certificate IV or Diploma of Nursing from a vocational education and training provider, and are also registered with the NMBA. All

¹⁴ Royal Australasian College of Surgeons (year unknown). ‘Medical Education in Australia and New Zealand – an overview’.

¹⁵ Health Workforce Australia (2013). ‘Australia’s Health Workforce Series – Nurses in Focus’.

nurses are required to maintain registration by completing a 'recency of practice' standard, along with continuing professional development standards set by the NMBA.

The nature, duration and intensity of teaching and training requirements vary according to the level of nurse and training institution, but typically include a period of practical clinical placement in addition to coursework/theory.

2.3. Allied health teaching and training

Documentation obtained from New South Wales¹⁶ identifies 23 different allied health professions. This reflects the diversity of the range of allied health professions, and the potential differences in the nature and intensity of teaching and training. Allied health professionals are generally required to be tertiary qualified, and hold relevant registration, licence or accreditation to practice¹⁷. In July 2010, national registration for some allied health professions replaced state registration. Pharmacists, physiotherapists, podiatrists, psychologists and (from July 2012) occupational therapists and medical radiation scientists are the exceptions to this, and must comply with the requirements of their respective boards to achieve general registration.

The duration of university teaching and training, as well as the activities associated with clinical placement activity, the settings in which training is delivered, and the intensity of clinically-based accreditation required to obtain registration varies markedly according to the type of allied health profession being considered. Registered allied health practitioners are also required to undertake continuing professional development training to maintain their entitlement to practice once registered.

2.4. Research

HMR has received significant attention across Australia with the recent publication by DoHA of its Strategic Review of Health and Medical Research in 2013¹⁸. The report recognises the need to leverage and extend previous reforms dating back to 1998¹⁹ which initially provided the impetus to increase investment, focus on competitive research grants and improve the quality of research undertaken across the sector. The 2013 strategic review delivered a wide spectrum of recommendations to deliver its vision for "better health through research", and a number of key outcomes of the review are relevant in the context of this project.

The strategic review recognises that sources of HMR funding remain poorly understood and, with particular regard to investment in HMR by the public health service and health system:

- The current allocation for research conducted in health services is largely block funded and makes up 3.68% of the total Australian Government funding pool;
- There is an acknowledgement by the Australian Government that 'funding pressures in public health services have often resulted in limited funding for non-consumer

¹⁶ Health Education and Training Institute 2012, 'The superguide: a handbook for supervising allied health professionals', HETI, Sydney

¹⁷ Health Education and Training Institute (2012), 'Allied Health Professions in NSW Health', accessed from <http://www.heti.nsw.gov.au/programs/allied-health/allied-health-professions-in-nsw-health/>

¹⁸ Commonwealth Department of Health and Ageing (2013), 'Strategic Review of Health and Medical Research'.

¹⁹ Health and Medical Research Strategic Review Committee (1998) 'The Virtuous Cycle Working together for health and medical research - Health and Medical Research Strategic Review'

services such as research and training, which are essential to building the specialist workforce for the future and retaining expertise within the public health service system²⁰;

- The resources allocated for research in health services are not adequately tracked, nor are the outputs from HMR usually audited. This makes it difficult to accurately determine the investment in HMR in health and health service settings;
- Concerns have been raised suggesting that some funding streams which are initially earmarked for research in health services was instead “typically” used to cross-subsidise other health service activity;
- There is an ongoing risk of continued reductions in investment in research activity by health services as it was often seen as a source of discretionary activity;
- The type of research conducted in health services is not easy to define and the indicators of research outputs may not necessarily always correlate with the volume of published papers;
- A suggested measure of research was to consider counting the inputs (time and infrastructure) expended in pursuing those outputs (papers, guidelines or change in clinical practice);
- A suggested allocation of Australian Government funding in research would be to establish an agreed formula on the basis of the ratio of inputs to outputs similar to that achieved by NHMRC grant funding or more simply by the matching of funding to actual spending; and
- Over the longer term, the research funding model was recommended to be adjusted to provide a better account of quantity and quality of research outputs.

The report also emphasises the role and importance of the clinical trials sector. Although not specific to trials conducted in public health services, the report states that “the value of the clinical trials sector in Australia is estimated at around \$1bn p.a., with approximately 600 new trials reported by the Therapeutic Goods Administration (TGA) in 2011.” The total number of new clinical trials has been stagnant to declining over the last five years, driven by increasing competitive pressures from lower-cost countries.

2.5. Trends in TT&R in Australia

The range of health services in which TT&R activities are now being conducted are significantly broader than they ever have been²¹, and include in a range of regional, rural and remote locations. Today, these activities occur not only in large tertiary referral hospitals, but also in community, primary and ambulatory care settings²². Differences in the nature of teaching and training across locations has been noted by some studies²³, which contend that student placements in primary care and general practices are for a longer duration, with a focus on generalism and continuity, as opposed to the relatively shorter-term but more intensive training one may experience in a large tertiary hospital setting.

²⁰ National Health and Hospitals Network, ‘A National Health and Hospitals Network for Australia's Future’, 2010.

²¹ Egar, K. (2010). ABF Information Series No. 7, Centre for Health Service Development, University of Wollongong.

²² Ash, J and Walters, K. et. al. (2012). ‘The context of clinical teaching and learning in Australia’, Medical Journal of Australia 196 (7).

²³ *ibid.*

HWA has noted that medical teaching and training has undergone a significant expansion in the last decade, with the number of commencing medical students almost doubling from 1,889 in 2003 to 3,686 in 2012.²⁴ Similar developments have been observed with respect to the allied health workforce.²⁵ There is also evidence of a movement away from traditional methods of (one to one) supervision which are increasingly being replaced with alternative supervision methods. This expansion holds significant implications for the level of teaching and training activity that is funded in Australia's public health services.

One paper²⁶ reflected on both the nature and implications of this growth, and noted that "the nature of both research and training is changing. The traditional model of a small number of teaching hospitals linked to long-established medical schools no longer applies, as the number of medical schools has grown considerably over the last decade and many are in suburban and regional areas. TT&R is being increasingly undertaken outside 'teaching hospitals' and is now routinely occurring in other health services, community health centres and GP rooms. In the ABF context, the changing nature of TT&R means that it will not be sufficient to simply set a higher price for tertiary referral hospitals. To do so would disadvantage, for example, the larger regional hospitals ('country base' hospitals) that, as part of a rural workforce development strategy, are increasingly undertaking both training and research".²⁷

2.6. Understanding the nature of funding arrangements for TT&R in Australia

To understand the issues and drivers for delivering TT&R in Australian public health services, we reviewed publicly-available State and Territory funding guidelines relating to TT&R. Although funding issues are not a specific area of focus for this review, it has provided a basis for understanding differences in the nature and scope of TT&R across jurisdictions.

It is immediately clear from reviewing the available guidelines that there is a sizable variation in the extent to which TT&R is described in funding documentation, as well as the mechanisms by which TT&R is funded across jurisdictions. The available literature demonstrates that jurisdictions refer to TT&R using a wide range of terminology, which reflects the absence of a nationally consistent definition, and has resulted in a broad range of different types of TT&R being funded through states and territories. It is important to acknowledge the diversity in these funding arrangements as it will apply to the potential complexity associated with defining TT&R.

The NHRA articulates that the scope of TT&R funding to be provided by the Commonwealth is restricted to:²⁸

- Teaching and training functions funded by states and territories undertaken in public hospitals or other organisations (such as universities and training providers); and
- Research funded by states and territories undertaken in public hospitals.

²⁴ Health Workforce Australia (2013). 'Australia's Health Workforce Series: Health Workforce by Numbers, Issue 1 – February 2013'.

²⁵ ACT Health (2007). 'Discussion paper: Allied Health Clinical Education Placements in ACT Health.'

²⁶ Egar, K. (2010). ABF Information Series No. 7, Centre for Health Service Development, University of Wollongong

²⁷ *ibid.*

²⁸ Independent Hospital Pricing Authority (2013), '2014-15 TTR DSS consultation paper'.

The direction provided by the NHRA also reflects the intended scope that will inform the definitions and cost drivers to be identified through the course of this project. The imperative of this project will therefore be to obtain a common understanding of the activities that will be in-scope for TT&R funding, and to be able to identify and quantify these activities.

Appendix A provides a high level description of the publicly-available literature with respect to TT&R funding models across Australian States and Territory jurisdictions as well as describing a range of international funding models for TT&R. It should be noted that the details provided in Appendix A reflect the publicly available literature, some of which is known to be out dated, but that nonetheless provides an indication of the diversity in how TT&R is understood and funded across jurisdictions.

2.7. Timeframes for delivering a national approach to TT&R funding

In response to the perceived funding shortfalls for TT&R services, a number of stakeholders^{29,30} have argued that the development work for TT&R cannot afford to wait until 2018 to be resolved, and that work towards a dedicated funding stream for TT&R should be progressed as soon as possible.

Although these stakeholders acknowledge the need to undertake “legitimate preparatory work”, they have highlighted that delaying the implementation of a new funding model for TT&R will put at risk the achievement of both medical training and research required to support the sustainability of the Australian health system into the future, and also that TT&R will come to be viewed as “a second-order priority”. This view is shared by at least one jurisdiction, which commented that “the development of a sound methodology must be made a priority and must commence immediately”.³¹

A contrasting view was presented by another jurisdiction which suggested that development of TT&R be staged, with the initial phase seeking to develop an empirical model based on high level data³², in order to produce a funding model that is as reliable as possible.

The tension between quality and timeliness in the development of a TT&R funding model is therefore a significant issue. Current work to define TT&R and identify its associated cost drivers will be important to set the future scope and direction of further development work in this area.

²⁹ Medical Deans Australia and New Zealand (2012). ‘Medical Deans ANZ submission to the IHPA Draft 2012-13 Pricing Framework’.

³⁰ Australian Medical Association (2012). ‘Australian Medical Association submission to the IHPA Draft 2013-14 Pricing Framework’.

³¹ Western Australia Department of Health (2012). ‘Western Australia Department of Health submission to the IHPA Draft 2013-14 Pricing Framework’.

³² South Australia Department of Health (2012). ‘South Australia Department of Health submission to the IHPA Draft 2013-14 Pricing Framework’.

3. Defining TT&R

This section explores how TT&R has been defined in Australia and overseas. This section has been based on a review of available jurisdictional policy documents and funding guidelines, published literature and the findings of independent reports, which date back to 1996. This section also describes how definitions of TT&R have been refined over time in Australia, and discusses the draft definitions that form the baseline for this project.

Key points – Defining TT&R

- There is no standard national definition for TT&R. Various descriptions of TT&R have been adopted for the purposes of guiding TT&R policy across Australia. Some of these definitions do not offer a distinction between ‘teaching’ and ‘training’. This raises a question of the materiality of distinguishing teaching and training from one another, and the basis upon which any distinction should be made;
- The draft definitions for TT&R developed by Health Outcomes International (HOI) appear to align with definitions first articulated in an independent report completed in 1996;
- Although the HOI definitions of TT&R appear to have been adopted for the purpose of progressing TT&R policy to some degree, a number of jurisdictions and independent reports have acknowledged shortcomings in the definitions. These include a need to:
 - Include consideration of ‘indirect’ TT&R products/costs;
 - 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 TT&R, and formal/informal TT&R.
- The available international literature that provides formal definitions for TT&R is scarce. The literature that is available appears to use ‘teaching’ or ‘education’ as a proxy for both teaching and training. Research funding appears to form a part of most international funding models.

3.1. The nature of TT&R as a joint product

A number of stakeholders have identified a need for TT&R funding models to robustly and transparently identify the true costs of providing TT&R services, and to price these costs into the funding model. However, the extent to which this is possible, and the methods for ‘unbundling’ costs have been subject to extensive debate over the nature of many TT&R

services as a ‘joint product’ that is often provided simultaneously with clinical service delivery³³.

Joint delivery of TT&R activity in conjunction with other clinical content is common (e.g. ward rounds, operating theatre, clinic time), and there has long been a recognition that the provision of patient care and medical education is a joint and complementary process that is not straightforward to disentangle.³⁴

Given the inherent nature of TT&R as a joint product (in some, but not all situations), and considering the absence of classification, costing and counting frameworks, TT&R as potentially a separate funding component is likely to require building ‘from the ground-up’ - insofar as cost drivers can only be properly understood once the activities included in-scope of TT&R are clearly defined. Medical Deans Australia and New Zealand have noted that unbundling and pricing of TT&R is technically very complex, will raise concern amongst senior clinicians, and will trigger difficult debates about medical education, and the boundary between clinical practice and clinical teaching.³⁵

Debates about the delineation of TT&R and clinical service delivery are also likely to have implications for existing work-streams that are ABF funded in Australia. If funding models for acute admitted, emergency department, outpatient and sub-acute services currently include some loading or component that is related to TT&R, these elements will need to be unpicked from these models to avoid double-counting (and hence, double-funding) of activity in these funding streams.

Although the importance of having funding for TT&R directly linked to output has been widely recognised³⁶, the complexity and diversity of this area may mean that the eventual TT&R funding model reflects some compromise between the desire for accuracy and the difficulties associated with clearly separating TT&R costs from clinical service delivery in practice.

3.2. Definitions of TT&R across Australia

The development and understanding of definitions for TT&R in Australia appears to differ across jurisdictions. Various descriptions of TT&R have been adopted for the purposes of guiding TT&R policy with some of these definitions not offering a distinction between ‘teaching’ and ‘training’. Some jurisdictions do not refer to research at all in the publicly available policy and funding guidelines.

Current Victorian government policy documents identify a Training and Development (T&D) Grant that is intended to “recognise the additional costs inherent in teaching, training and research”.³⁷ In the Victorian context, ‘training’ appears to be used as a proxy for both ‘teaching’ and ‘training’, and ‘development’ is used as a proxy categorisation for ‘research’.

³³ Mauro, M., Cardamone, E. et. al. (date unknown), ‘What do teaching and research cost in teaching hospitals? A survey from Italy’.

³⁴ Street, A., Schelle-Kreinsen, D., Geissler, A and Busse, R. Determinants of health service costs and performance variation: Methods, models and variables for the EuroDRG project. Working Papers in Health Policy and Management, Vol.3 May: Berlin: Universitätsverlag der TU Berlin.

³⁵ Medical Deans Australia and New Zealand (2012), ‘Medical Deans ANZ submission to the IHPA Draft 2012-13 Pricing Framework’.

³⁶ Commonwealth Department of Health and Ageing (2012). Commonwealth submission to the IHPA Draft 2013-14 Pricing Framework’.

³⁷ Victoria Department of Health (2012). ‘Victorian health policy and funding guidelines 2012-13 – Part two: Health operations.’

New South Wales definitions of TT&R

The current South Australian casemix funding manual³⁸ and past New South Wales (NSW) Health Policy and Funding Guidelines³⁹ only distinguish between ‘teaching’ and ‘research’. The 2004-05 New South Wales definitions⁴⁰ are shown, below.

Teaching comprises activities directed at enhancing the ability of clinical staff to provide patient care and leading to a recognised clinical/tertiary professional qualification

Research comprises activities directed at improving methods of health care provision. It covers both clinical and non-clinical methods. It involves the development of new knowledge, rather than the application of existing knowledge

Although no definition was provided, a more recent NSW policy document⁴¹ maintained the distinction between teaching and research, and did not include any explicit treatment of ‘training’.

The comparison between Victoria on one hand, and South Australia and New South Wales on the other, illustrates the potential variation in the understanding of TT&R across jurisdictions and how it has been defined. In the Victorian context, ‘training’ has been used as a proxy for both teaching and training, whereas in NSW ‘teaching’ has been adopted as the proxy for teaching and training. Although the intent of the definitions appears to be similar in terms of funding policy, it is possible that the semantic differences in the definitions may mean different things to different persons, and could trigger debate about whether there is any practical distinction between ‘teaching’ and ‘training’. This raises a question of the materiality of distinguishing teaching and training from one another, and the basis upon which any distinction should be made.

Draft definitions of TT&R developed by Health Outcomes International⁴²

Much of the recent policy development and funding of TT&R in Australia has been based upon draft definitions that were developed in 2010 for the Commonwealth Government Department of Health and Ageing by Health Outcomes International (HOI). All Australian states and territories were consulted during the process to develop the draft definitions. Although Table 1 indicates that some jurisdictions were generally supportive of the HOI definitions, a scan of jurisdictional literature indicates that Western Australia (WA)⁴³ is the only jurisdiction to reference these definitions in their policy documents. The Australian Hospital Patient Costing Standards (AHPCS)⁴⁴ also adopt the definitions developed by HOI, with some additions. The HOI definitions are as follows.

³⁸ South Australia Department of Health and Ageing (2012). ‘Casemix Funding for Hospitals: Methodology 2012-13’.

³⁹ New South Wales Health (2005). ‘Resource Distribution Formula Technical Paper – 2005 Revision.’

⁴⁰ *ibid.*

⁴¹ New South Wales Health (2008). ‘Policy Directive PD2008_063: Episode Funding Policy 2008/09.’

⁴² Health Outcomes International (2010). ‘ABF teaching, Training and Research Workstream Scoping Study: National Workshop Discussion Paper’, prepared for the Commonwealth Department of Health and Ageing.

⁴³ Department of Health, State of Western Australia (2011). ‘Teaching, Training and Research Costing Guideline’.

⁴⁴ Australian Government Department of Health and Ageing (2011), ‘Australian Health Service Patient Costing Standards version 2.0’.

Teaching is 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 practise 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.

Training is 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 is 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
- 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.

Although these definitions appear to have been adopted for the purpose of progressing TT&R policy, a range of jurisdictions acknowledged that further development is required in order to progress the definitions to a point where they can underpin the development of a classification scheme for TT&R.

Notwithstanding their use in WA, a proposed costing methodology document for TT&R developed by WA Health has noted a range of shortcomings of the definitions, including that

the definitions are “narrow and do not make allowance for indirect or by-product teaching or research”⁴⁵.

Much of the initial feedback received on the draft definitions by HOI related to the need to include consideration of indirect TT&R products, providing a clearer delineation between teaching and research, and further development with regard to the definition of research. Specific feedback provided by each jurisdiction at the time the definitions were developed is shown in Table 1⁴⁶. Members of IHPA’s TTRWG have also provided initial feedback on the draft definitions, which will be explored further during consultations with stakeholders across Australia.

Table 1: Jurisdictional views on HOI draft definitions of TT&R

Jurisdiction	Supported HOI definitions?	Feedback on HOI definitions of TT&R
New South Wales	In principle	<ul style="list-style-type: none"> Need to define indirect TT&R and development products.
Victoria	Yes, with additions	<ul style="list-style-type: none"> Need to define indirect TT&R products where they can be costed and counted.
Queensland	No	<ul style="list-style-type: none"> Teaching and training definitions are too similar; Research definition needs wider consultation; and The inclusion of indirect costs needs to be explored.
Western Australia	Yes, with additions	<ul style="list-style-type: none"> Need to define indirect TT&R and development products.
South Australia	No	<ul style="list-style-type: none"> The exclusion of indirect teaching and training (such as ward rounds) will under-fund teaching hospitals. Research should include the associated infrastructure costs
Tasmania	Not indicated	<ul style="list-style-type: none"> Indirect costs of training and teaching need to be defined and included in the definition; The differences between teaching and training could be more clearly defined.
Australian Capital Territory	Not indicated	<ul style="list-style-type: none"> Questioned whether the definition of research would cover externally funded research accounted for through “trust accounts”.
Northern Territory	Not indicated	<ul style="list-style-type: none"> Indirect teaching exclusion will need a more detailed definition.

⁴⁵ Department of Health, State of Western Australia (2011). ‘Teaching, Training and Research Costing Guideline’.

⁴⁶ Health Outcomes International (2010). ‘ABF teaching, Training and Research Workstream Scoping Study: National Workshop Discussion Paper’, prepared for the Commonwealth Department of Health and Ageing.

Definitions adopted by KPMG in 1996

Our literature search has shown that the HOI definitions appear to align with definitions first articulated in an independent report completed in 1996 to a consortium of Australian States and Territories.⁴⁷ The definitions of TT&R adopted by KPMG⁴⁸ are provided below.

Teaching is any activity where the aim is to transfer clinical knowledge via a teacher or mentor to a student or candidate in a recognised program/course which will either result in qualifications which may meet registration requirements, or other admission to a specialised discipline where the right to practice in that discipline requires satisfactory completion of the program or course.

This includes automated/self-directed learning where the teaching component is electronically provided, preparation and delivery of content and supervision/participation in curriculum-based research.

Training is any activity where the aim is to transfer clinical skills or techniques via a teacher/instructor to a student or candidate in a recognised program/course which will either result in qualifications which may meet registration requirements, or other admission to a specialised discipline where the right to practice in that discipline requires satisfactory completion of the program or course.

This includes automated/self-directed learning where the teaching component is electronically provided, preparation and delivery of content and supervision/participation in curriculum-based research.

Research is activities not elsewhere described where the primary aim is the advancement of knowledge. Research excludes curriculum-based research projects, but includes advancement of knowledge arising from observation, data analysis and interpretation or other means which are secondary to the primary purpose of providing patient care, along with activities associated with patient care where additional components or tasks exist (e.g. the addition of a control group in a cohort study).

A separate independent report⁴⁹ prepared for HWA in 2012 has also identified that “there is no standard national definition for clinical teaching and training”, and also identifies the HOI definitions as incomplete. The report goes on to express a range of normative recommendations to improve the robustness of the HOI definitions, which include:

- ‘training’ should be defined alongside the concept of ‘teaching’;
- The right to practice is not applicable to all teaching and training (specifically medical interns and post profession entry), and should be re-phrased to encompass these;
- A need to identify a schedule of included professions that are considered ‘clinical’ for the purposes of funding; and

⁴⁷ KPMG Pty Ltd (1996). ‘Consultancy Report on Costing and Funding of teaching and training activities in Australian public hospitals’, prepared for a consortium of Australian States and the Commonwealth.

⁴⁸ *ibid.*

⁴⁹ Health Policy Analysis (2012). ‘Towards an activity based funding model for clinical teaching and training’, Health Workforce Australia, Adelaide.

- The need to recognise the role of vocational education and training providers.

Although the report does not identify a particular definition per se, it does contend that “at the core, the definition of teaching and training is the process of attainment, by the recipients, of eligibility to practice within a profession or specialisation”. It will be important to test the applicability of this contention, and the shortcomings identified in the existing definitions, during stakeholder consultations to inform a nationally consistent definition of TT&R.

Definitions of direct and indirect teaching as posed by a 2003 Victorian study

Another 2003 study of costs to establish a clinical school in a regional Victorian health service also proposed a definition of teaching that distinguished between ‘direct’ and ‘indirect’ teaching, as presented below⁵⁰. This definition highlights the differences in the ways in which teaching may take place (that is, direct and indirect), and in doing so appears to be consistent with the view of many jurisdictions to incorporate indirect TT&R activities within the funding model. This study did not propose definitions of training or research.

Direct teaching is defined as ‘face to face’ teaching where teaching is the primary activity with no associated clinical activity.

Indirect teaching activity is defined as when teaching is a secondary activity and the teacher is primarily engaged in clinical work.

Definitions of TT&R proposed by the Allied Health Casemix Committee in 2001

The National Allied Health Casemix Committee (AHCC) also provided separate definitions of ‘teaching and training’ and ‘research’ in a 2001 document⁵¹ that described the activities of health professionals. These definitions emphasise formal teaching and training, but do not define ‘informal’ teaching or training.

The definition of teaching and training includes a footnote that states “It is important to avoid confusion between supervision and formal instruction. The definition is inclusive of interactions with training institutions and students and the preparation for and delivery of structured activities such as inservices, lectures, presentations and tutorials. It does not include one-to-one staff supervision, informal ad hoc sessions with staff or professional development”. The definitions presented by the AHCC are provided below.

Formal teaching or training activities which relate to the imparting of knowledge, skills and clinical competency to undergraduate and post graduate students, practitioners in own discipline, and other practitioners as part of a structured program.

⁵⁰ Bendigo Health Care Group (2003). ‘Preliminary Cost Analysis of the Impact of the Bendigo Regional Clinical School on Bendigo Health Care Group’.

⁵¹ Allied Health Casemix Committee (2001). ‘Health Activity Hierarchy version 1.1 – An Australian standard describing the range of activities provided by health professionals’.

Research activities are undertaken to advance the knowledge of the delivery of care to an individual, group or community. Research is limited to activities that lead to and follow formal approval of the project by a research committee or equivalent body.

The AHCC definitions include some elements that merit further discussion. These include explicit recognition that teaching and training may be delivered to both undergraduate and postgraduate students, as well as other practitioners. The definition of teaching and training also includes specific recognition that the transfer of knowledge, skills and clinical competency are in-scope.

The AHCC definitions also emphasise that in-scope research activities must lead to, and follow formal approval by a research committee or equivalent body.

3.3. Direct and indirect costs of TT&R

It is important to note the distinction between direct/indirect teaching, and separately to the use of the term direct/indirect costs which are frequently mentioned throughout this paper.

Direct/indirect teaching describes the ways in which teaching is conducted. The AHPCS version 2.0 defines direct teaching as instances “where the clinical student and the teacher have some contact. In this case the principal resource being consumed is staff time”. AHPCS further outlines that “indirect teaching and indirect research are considered as normal patient care”⁵².

Direct/indirect costs refer to the accounting method by which all types of costs can be identified and allocated to health service outputs. AHPCS defines direct costs as those that are passed directly to cost centres from the general ledger. Indirect costs refer to ‘overheads’, which have an incidental rather than a direct relationship to a specific episode of patient care. Overheads will usually involve a service that is provided to parts of the health service rather than to individual patients e.g. administration and housekeeping.⁵³

The distinction between these categories is important from a definitional perspective, as well as to identify cost drivers of TT&R. The feedback obtained from jurisdictions in response to the draft definitions developed by HOI highlights the importance of considering both direct and indirect TT&R products and implies both should be understood and incorporated into analyses of TT&R cost drivers. The extent to which the indirect component of TT&R activities can be accurately captured will be a key consideration in the assessment of TT&R cost drivers. It will also be important to investigate the influence of indirect costs in the context of research activity.

⁵² Australian Government Department of Health and Ageing (2011). Australian Health service Patient Costing Standards version 2.0.

⁵³ *ibid.*

3.4. How TT&R is defined and understood internationally

There is limited available international literature that provides formal definitions for TT&R. Although there are a number of papers that discuss health service-based TT&R and its cost implications, few actually articulate definitions for TT&R. This was also observed in a recent study conducted in Victoria, which noted that “most papers spend very little time on trying to define these (TT&R) functions”.⁵⁴

The ways in which different countries refer to TT&R appear to be similar to Australia, insofar as there is no consistent terminology used to describe these activities. The majority of documents from countries we reviewed, appear to use ‘teaching’ or ‘education’ as a proxy for both teaching and training. Research funding appears to form a part of most international funding models, and is generally considered to be associated with an advancement of knowledge in some respect.

Definition of clinical training adopted by New Zealand in 1993

In spite of the limited international literature, Health Workforce New Zealand has provided two definitions of clinical training. The first, developed in 1993, is:⁵⁵

Clinical training is the component of education and training which necessarily occurs in the presence of consumers of health care or of activities directly relating to the health care of clients.

Clinical training does not include the formal or classroom components of health professional education or, for the purposes of this exercise, activities associated with staff development or continuing education.

This definition separates ‘training’ from ‘education’, which may be analogous to teaching in the Australian context.

IAIA definition of training

Although not specifically defined with reference to a health service context, the International Association for Impact Assessment (IAIA) has posed a definition of training, which is:⁵⁶

Training is most usually associated with the world of work... Training can be defined as "the procedure whereby knowledge is transmitted with an instrumental and operational vision of the learning process and of its expected results" or as "a planned and systematic sequence of instruction under supervision, designed to impart skills, knowledge, information and attitudes".

⁵⁴ Brewerton and Associates (2011), ‘Teaching, Training and Research Cost Driver Identification’. Report prepared for Department of Health Victoria.

⁵⁵ New Zealand Nurses Organisation (2010). ‘Towards improving health outcomes in New Zealand’.

⁵⁶ International Agency for Impact Assessment (2009). ‘Education and Training’, accessed from <http://www.iaia.org/iaia/wiki/Print.aspx?Page=edtrain>.

This definition suggests that training may encompass a broad range of activities that may extend from practical skills development, to activities that also impart knowledge, information and attitudes.

The IAIA goes on to note that “training has itself a vast array of meanings. Traditionally it has been associated with apprenticeship...but the differences between education and training have always been exaggerated and the most reputable training programs are education as much as training”.⁵⁷ This again raises the question of the basis upon which training should be segregated from other educational activities such as teaching.

The literature search revealed a range of international definitions of research, which are generally applied consistently to refer to the advancement of knowledge.

Research definitions posed by Canada Health

The Canada Health Online Dictionary describes four types of research; all of which may foreseeably fall within the scope of research conducted in Australian health services. These definitions are as follows.⁵⁸

Biomedical research has the goal of understanding normal and abnormal human functioning, at the molecular, cellular, organ system and whole body levels, including development of tools and techniques to be applied for this purpose; developing new therapies or devices that improve health or the quality of life of individuals, up to the point where they are tested on human subjects. This may include studies on human subjects that do not have a diagnostic or therapeutic orientation.

Clinical research has the goal of improving the diagnosis, and treatment (including rehabilitation and palliation), of disease and injury; and improving the health and quality of life of individuals as they pass through normal life stages. This may include research on, or for the treatment of, patients.

Health services research has the goal of improving the efficiency and effectiveness of health professionals and the health care system, through changes to practice and policy. Health services research is a multidisciplinary field of scientific investigation that studies how social factors, financing systems, organizational structures, processes, health technologies, and personal behaviours affect access to health care, the quality and cost of care, and ultimately, Canadians' health and well-being.

Social, cultural, environmental and population health research aims to improve the health of the Canadian population, or of defined sub-populations, through a better understanding of the ways in which social, cultural, environmental, occupational and economic factors determine health status.

⁵⁷ International Agency for Impact Assessment (2009). 'Education and Training', accessed from <http://www.iaia.org/iaia/wiki/Print.aspx?Page=edtrain>

⁵⁸ Canadian Institutes of Health Research (date unknown). Canada Health Online Dictionary, accessed from <http://www.cihr-irsc.gc.ca/e/34190.html>

OECD definition of research

A less specific research definition has been proposed by the Organisation for Economic Co-operation and Development (OECD), as follows:⁵⁹

Research comprises of creative work undertaken on a systematic basis in order to increase the stock of knowledge, including knowledge of humanity, culture and society, and the use of this stock of knowledge to devise new applications.

This definition of research encompasses pure and strategic basic research, applied research and experimental development. Applied research is original investigation undertaken to acquire new knowledge but directed towards a specific, practical aim or objective

The available definitions of research suggest some common factors that may be taken forward as the basis for progressing the development of a standard definition across Australia.

These results highlight the difficulties associated with identifying a precise definition of any component of TT&R from the available international literature. Nonetheless, they do provide some degree of comparability to the definitions available in Australia, and are generally consistent with those that have been published domestically.

⁵⁹ University of Queensland (2012). 'Definition of research', UQ Research and Innovation, accessed from http://www.uq.edu.au/research/rid/info-funding-definition#_1_

4. Cost drivers of TT&R

This section describes some of the potential and identified TT&R cost drivers that have been documented in Australian and international literature. Much of the available literature aims to quantify an additional cost factor for global health service budgets as a result of teaching status. The literature search undertaken to prepare this paper has aimed to go one step further, to identify the precise factors that are associated with TT&R that result in additional costs at the health service level.

Key points – Cost drivers of TT& R

- It is generally acknowledged that health services that perform TT&R functions have higher costs compared to health services of a similar type where TT&R activities are not performed. 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 TT&R activity;
- The evidence with respect to health service funding shortfalls arising from inadequate TT&R allocations is mixed. Some bottom-up costing studies conducted overseas have identified that the costs associated with teaching and training functions are less than government subsidies provided to health services. On the other hand, one domestic bottom-up costing study suggested that health services may face significant cost disadvantages to train medical undergraduates;
- Identifying cost drivers associated with TT&R (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. Many of the studies identified in the literature did not separate the impact of factors such as casemix from TT&R cost drivers;
- Literature consistently distinguishes between the impact of direct and indirect activities associated with TT&R. The available literature suggests that it will be important to consider direct and indirect activities in both TT&R definition(s) and cost drivers;
- The literature is generally consistent with respect to identifying potential cost drivers of TT&R in general terms. However, there is a much lower degree of consensus regarding the quantum of impact for each potential factor;
- A recent Victorian study provides a useful baseline for assessing cost drivers in Australia. This study undertook both a quantitative and qualitative analysis of TT&R cost drivers. Volumes of teaching and training activity – as measured by the number of graduates, rotations and professional development placements – were identified as cost drivers in both the quantitative and qualitative analyses;
- Although a range of cost drivers of teaching and training have been identified, they are typically expressed in terms of demand-side indicators, such as the number of students/trainees or as a ratio of the number of students/trainees to some measure of activity;

- 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, provided only a loose association with research costs, at best.

4.1. Perspectives on the overall cost impact of TT&R

Teaching hospitals and health services have specific characteristics affecting their management system, which is complicated by the tripartite mission that they carry out – this being delivered through traditional healthcare, teaching and research.⁶⁰ A report into the determinants of hospital costs prepared for the German Department of Health Care Management⁶¹ has contended that there are two main explanations for differential costs between teaching and non-teaching hospitals:

- The first relates to perceived inadequacies in the DRG system, whereby teaching hospitals are thought to treat patients of a greater severity than non-teaching hospitals. Where the DRG classification is imperfect and is unable to account for heterogeneity at the patient level, and teaching hospitals systematically attract more complex patients, differences in costs for teaching hospitals will detect patient heterogeneity rather than having anything to do with the teaching function; and
- The second relates to how teaching is funded, insofar as additional costs related to the teaching function may not be recognised in funding models due to the difficulties associated with disentangling patient care and medical education.

A study conducted in Finland has noted that over a hospital’s global budget, “the overall impact of teaching and research on hospitals’ costs has been estimated to vary between nil and 25%. For teaching hospitals, most estimates lie between 7 and 15%, and in most studies it has been found to depend on the number residents being trained in the hospital. The actual reimbursement of teaching and research costs in different countries varies from 8 to 22% of hospitals’ recurrent costs”.⁶²

A number of studies have noted that the difficulty unpicking the precise costs associated with TT&R may result in actual funding being in excess of the additional costs due to teaching, or vice versa. However, the generally accepted position is that health services are under-funded compared to the actual costs of delivering their TT&R responsibilities.^{63,64}

⁶⁰ Mauro, M., Cardamone, E. et. al. (date unknown). ‘What do teaching and research cost in teaching hospitals? A survey from Italy’.

⁶¹ Street, A. Scheller-Kreinsen, D., Geissler, A. and Busse, R. (2010). ‘Determinants of Health service costs and performance variation: Methods, models and variables for the EuroDRG project’, prepared for the German Department of Health Care Management.

⁶² Linna, M. and Häkkinen, U. (2006), ‘Reimbursing for the costs of teaching and research in Finnish hospitals: a stochastic frontier analysis’, the International Journal of Health care, Finance and Economics, March 2006; 6(1): 83-97’.

⁶³ Madden, D. and Selby-Smith, C. (1997). The cost of training in a large teaching hospital: a pilot study, Centre for the Economics of Education and Training, Monash University, Melbourne.

⁶⁴ Productivity Commission (2009), ‘Public and Private Hospitals: Productivity Commission Research Report’, Canberra.

In examining the determinants of hospital costs in greater detail, the German paper identifies teaching status as one of ten explanatory factors that may contribute to variation in health service costs. These ten explanatory factors include:

- Patient level variables;
- Health service characteristics;
- Teaching status;
- Ownership;
- Volume of activity/the existence or absence of economies of scale;
- Range of activity/the existence or absence of economies of scope;
- Quality;
- Technological equipment;
- Geographical variation in input costs; and
- Geographical location.

A range of studies^{65,66,67} have noted the influence of health service heterogeneity with respect to costs, and many identify this variability as a major issue in defining a reimbursement system.⁶⁸ Thus, the task of isolating cost drivers for any sub-component of health service operations with any degree of certainty is a complex undertaking that will invariably be subject to a broad range of confounding factors.

The extent of efforts to understand the impact of TT&R status on health service costs is highlighted by the large range of literature that is available on the topic. However, relatively few studies provide similar estimates for the additional costs of individual departments or services. The lack of available data and the difficulty of controlling for confounders are largely to blame for the limited evidence at this level.⁶⁹

The difficulties associated with identifying cost drivers of TT&R amongst the myriad of other health service cost drivers is also highlighted by the broad range of approaches used in the literature, and the equally diverse estimates of the impact of TT&R on health service costs. A summary of relevant literature that has modelled the impact of teaching status on overall health service costs is provided in Table 2.⁷⁰

⁶⁵ The Lewin Group (2005). 'Comparing Hospital Costs: Adjusting for Differences in Teaching Status and Other Health Service Characteristics', report prepared for Bridges to Excellence.

⁶⁶ Mauro, M., Cardamone, E. et. al. (date unknown). 'What do teaching and research cost in teaching hospitals? A survey from Italy'.

⁶⁷ Lopez-Casasnovas, G. and Saez, M. (1999). 'Finance versus costs for teaching hospitals in Spain', *Journal of Health Economics*, 8, 641-651.

⁶⁸ Dormont, B. and Milcent, C. (2004). 'The sources of health service cost variability', *Journal of Health Economics*, Oct 2004; 13 (10); 927-39.

⁶⁹ Spollen, M., Dixon, P. and Hindle, G. et. al. (2003). 'Research on Additional Costs of Teaching in NHS Scotland: Report for Standing Committee on Resource Allocation Act Sub-Group', prepared by Secta Consulting.

⁷⁰ *ibid.*

Table 2: Estimates of additional costs due to TT&R activity

Country	Additional cost	Source
USA	10 – 25%	Sloan et al. (1983)
USA	8 – 15%	Zuckerman et al. (1994)
USA	0 – 15%	Granneman et al (1986)
USA	1.4%	Gaynor and Anderson (1995)
Spain	3 – 11%	Lopez-Casnovas and Wagstaff (1996)
Spain	3.1%	Gonzalez-Lopez, Valcarcel and Barber (1996)
Spain	11.1%	Wagstaff and Lopez-Casnovas (1996)
Finland	15%	Linnakko and Linna (1995)
England	15%	Culyer et al
England	4 – 43%	Foote et al (1988)

Of the available international literature, the majority aims to test the hypothesis that teaching hospitals incur additional costs compared to non-teaching hospitals, and attempts to quantify the cost differential. However, the vast majority of the international literature stops short of examining the specific factors that drive higher costs in teaching hospitals. The exceptions to these mostly include studies that attempt to examine the impact of a specific component of teaching hospital operations, such as casemix, the existence of more innovative technology and procedures⁷¹ or ownership arrangements.⁷²

4.2. How does TT&R impact on health service costs?

There is a general consensus that the existence of teaching, training and/or research missions at health services increase costs and serve to impair their efficiency. Extensive literature is available that describes how TT&R activities impact health service costs, and it is important to understand these factors as a precursor to assessing the robustness of TT&R cost driver studies.

4.2.1. Potential cost drivers of teaching and training

The literature^{73,74,75} generally identifies the factors driving teaching and training costs as including:

- Productivity impairments such as slower diagnosis, delayed discharge, longer length of stay, longer theatre time and reduced patient throughput. These may occur as a result of teaching nurses or clinicians spending more time to explain or illustrate procedures to students and trainees;

⁷¹ Dormont, B. and Milcent, C. (2004). 'The sources of health service cost variability', *Journal of Health Economics*, Oct 2004; 13 (10); 927-39.

⁷² Kane, N. and Siegrist, R. (2002). 'Understanding Rising Hospital Inpatient Costs: Key Components of Cost and the Impact of Poor Quality'.

⁷³ *ibid.*

⁷⁴ Bendigo Health Care Group (2003). 'Preliminary Cost Analysis of the Impact of the Bendigo Regional Clinical School on Bendigo Health Care Group'.

⁷⁵ Mauro, M., Cardamone, E. et. al. (date unknown). 'What do teaching and research cost in teaching hospitals? A survey from Italy'.

- Increased ordering of diagnostic tests by trainees due to inexperience;
- The need to employ additional academic staff;
- Staff time solely dedicated to TT&R activities that is not otherwise recompensed;
- Higher intensity of care;
- Costs associated with procuring and maintaining state-of-the-art equipment to support teaching and training activities; and
- Casemix complexity as a result of the availability of highly specialised facilities and services.

A vast range of other potential factors have been posed through a number of studies. However, the list above reflects the most common set of elements cited in the literature.

4.2.2. Potential cost drivers of research

A Finnish study⁷⁶ encapsulated the potential cost drivers associated with research in stating that “patients who take part in clinical research projects stay longer in health service and use more outpatient visits, tests and treatments”.

The Allen Consulting Group identified a range of major cost components in the conduct of research. Although the focus of this work was on university delivered research, it may be instructive if the nature of health service and university-delivered research is sufficiently similar. This will be established during stakeholder consultation. The Allen Group’s report identified that research costs are usually grouped into three major categories – direct costs, indirect (or ‘infrastructure support’ costs) and capital costs. This report identified the following six major research cost components:

- Salaries (researchers, technicians, PhD students, etc.);
- Laboratory maintenance and operational expenditure (consumables and laboratory supplies, minor equipment costs, access charges for equip, animal house costs, etc.);
- Facilities maintenance (rent, electricity, heating, air-conditioning, cleaning, waste removal, facilities management, etc.);
- Administration costs (costs for salaries of administrative staff, IT support, business development offices, financial management, human resources and OH&S);
- Building construction costs; and
- 'Core' shared large equipment costs.

The report identifies the first two costs in the above list as ‘direct costs’, items three and four as ‘indirect costs’, and items five and six as being related to capital.

⁷⁶ Linna, M. and Häkkinen, U. (2006), ‘Reimbursing for the costs of teaching and research in Finnish Hospitals: a stochastic frontier analysis’, the International Journal of Health care, Finance and Economics, March 2006; 6(1): 83-97’

Elsewhere^{77,78,79} the cost drivers associated with research have been reported to include:

- Time spent by staff in supporting research activities;
- Consumables;
- Equipment;
- Direct running costs;
- Infrastructure (e.g. buildings and equipment);
- Governance (e.g. Human Research Ethics Committees (HREC));
- Compliance costs (e.g. accreditation, ethics committee applications);
- Commercialisation costs;
- Collaboration costs;
- Communications;
- Research support;
- The number of funded research grants;
- The number of published articles;
- Percentage of academic staff (FTE) effort devoted to research; and
- Percentage of building space used for research.

These factors suggest a very broad range of potential cost drivers that may be of relevance. When combined with the influence of health service heterogeneity as discussed in Section 4, the potential for confounding effects may be significant.

Much of the available literature examines cost drivers of research by using measures such as the research budget or simply the existence or absence of a research capability as a proxy for research activity. As indicated above, there are a broad range of factors that have been identified as potential cost drivers of research, and their relationship to research outputs varies from quite strong, to quite weak.

Some potential activity-based measures of research have been discussed in a Finnish study⁸⁰, which cited that research was measured by the number of referenced medical articles published by the hospital. This study also cites that research intensity in Norwegian hospitals was alternatively measured using impact-weighted numbers of published articles.

⁷⁷ Brewerton and Associates (2011). Teaching, Training and Research Cost Driver Identification, report prepared for Department of Health Victoria.

⁷⁸ Huttin C., de Pouvourville G., The impact of teaching and research on health service costs: An empirical study in the French context, HEPAC 2001 · 2: 47–53.

⁷⁹ The Allen Consulting Group (2009). The indirect costs associated with university funded research through Australian Competitive Grants – Final Report, prepared for the Commonwealth Department of Innovation, Industry, Science and Research.

⁸⁰ Linna, M. and Häkkinen, U. (2006), 'Reimbursing for the costs of teaching and research in Finnish Hospitals: a stochastic frontier analysis', the International Journal of Health care, Finance and Economics, March 2006; 6(1): 83-97'.

These measures may provide some direction regarding how research activity could be captured and quantified.

4.3. Identified cost drivers of TT&R

This section describes the findings of relevant studies undertaken in Australia and internationally that have identified cost drivers associated with TT&R and have quantified their expected impact on health service expenditure. To a large extent, the literature identified focusses on the provision of TT&R in a medical context, to the exclusion of other professional groups, such as nursing and allied health. As such, it should be noted that the identified impacts may be under-stated if TT&R activities related to non-medical professional groups have a material impact on health service costs.

Although the majority of international literature examines the impact of teaching status on aggregate health service costs, our search has identified seven papers that we consider are most relevant in the context of identifying cost drivers of TT&R. These studies were undertaken in Australia^{81,82}, the United States⁸³, Scotland⁸⁴, Switzerland⁸⁵, Spain⁸⁶ and Finland⁸⁷ and are detailed below.

4.3.1. Australia (Victoria)

The Victorian Department of Health (DH) commissioned an independent investigation into the cost drivers of TT&R in 2011.⁸⁸ This study was commissioned to identify the level of recurrent expenditure on TT&R in preparation for the Commonwealth increasing its funding contribution for recurrent expenditure on TT&R functions provided in public health services. In addition, it undertook extensive consultation with health services across Victoria to establish qualitative and quantitative perspectives of the cost drivers associated with TT&R.

The quantitative analysis demonstrated that the aggregate pools for research and teaching/training represented 7.87% of the total budget of the health services that contributed data for the analysis.⁸⁹ Due to the nature of the data available for use, this

⁸¹ Brewerton and Associates (2011). 'Teaching, Training and Research Cost Driver Identification', report prepared for Department of Health Victoria.

⁸² Oates, K. and Goulston, K. (2013), 'The hidden cost of medical student education: an exploratory study', Australian Health Review, 2013, 37, 185-188.

⁸³ The Lewin Group (2005). 'Comparing Hospital Costs: Adjusting for Differences in Teaching Status and Other Health service Characteristics', report prepared for Bridges to Excellence.

⁸⁴ Spollen, M., Dixon, P. and Hindle, G. et. al. (2003). 'Research on Additional Costs of Teaching in NHS Scotland: Report for Standing Committee on Resource Allocation Sub-Group – Final Report Executive Summary', prepared by Secta Consulting.

⁸⁵ Farsi, M. and Fillippini, M. (2006). Effects of Ownership, Subsidisation and Teaching Activities on Health Service Costs in Switzerland', Journal of Health Economics, March 2008;17(3): 335-50.

⁸⁶ Lopez-Casasnovas, G. and Saez, M. (1999). 'Finance versus costs for teaching hospitals in Spain', Journal of Health Economics, 8, 641-651.

⁸⁷ Linna, M. and Häkkinen, U. (2006), 'Reimbursing for the costs of teaching and research in Finnish Hospitals: a stochastic frontier analysis', the International Journal of Health care, Finance and Economics, March 2006; 6(1): 83-97'.

⁸⁸ Brewerton and Associates (2011). 'Teaching, Training and Research Cost Driver Identification', report prepared for Department of Health Victoria.

⁸⁹ Brewerton and Associates (2011). Teaching, Training and Research Cost Driver Identification, report prepared for Department of Health Victoria.

estimate does not include the costs associated with direct TT&R activity. The study did not directly identify the contribution of research, teaching and training separately on overall health service budgets, but did estimate impacts of research, student placement days and the number of students/trainees on costs per separation.

Although the context of this study and its approach is perhaps the most relevant of all the literature that we have reviewed, it is subject to some shortcomings that will be important to address when assessing cost drivers of TT&R on a national basis.

Firstly, the study notes that staffing costs associated with a research directorate and HREC, salaries and wages of nurse educators and goods and services directly costed to a research directorate are excluded from the analysis. Although the study notes that it is standard costing practice in patient-costed sites to exclude all direct costs associated with TT&R, doing so means that a potentially significant component cost has not been considered within the Victorian analysis. It will be important to ensure that the costs of both direct and indirect TT&R activities can be captured as part of a national cost driver analysis.

The Victorian study also does not control for other drivers of health service costs that may be impacting the costs of TT&R. Although the regression models in the quantitative analysis include a casemix variable, it appears to enter the regression models at the same time as other variables, and subsequently functions to explain some of the variation in health service costs per separation, rather than to control for this variation. As noted elsewhere in this literature review, the effects of health service factors such as casemix (among others) should be controlled in order to isolate the precise impacts of TT&R on health service costs. It will also be important that the national cost driver analysis is able to identify and control for other factors that may influence health service costs, and potentially consider interactions between relevant variables. As was noted in the Victorian study, the ability to do so is highly dependent on the quality and availability of data to support this objective.

A significant benefit of the study is the inclusion of extensive consultation and survey data collection in association with health services regarding their perspectives on TT&R cost drivers, in addition to the quantitative cost driver analysis. This consultation provided a degree of validation to the quantitative analyses undertaken in this study and others, and identified a number of potentially significant cost drivers associated with teaching and training. The surveys of health services identified a high degree of agreement among stakeholders with respect to the impact of the top four factors on teaching costs:

- The number of student rotations (83.3%);
- The number of early graduates (73.3%);
- Patient complexity (63.3%); and
- The number of clinical staff in professional development years (63.3%).

The surveys reveal a much lower level of agreement with respect to the cost drivers of training. Nonetheless, it is highly relevant that the top four most prominent perceptions of training costs were the same as the perceived drivers of teaching costs. The most prominent responses included:

- The number of early graduates (54.9%);

- The number of student rotations (48.5%);
- Patient complexity (48.5%);
- The number of clinical staff in professional development years (48.5%); and
- Professional development year placements – allied health (45.5%).

The qualitative outcomes of this study appear to reinforce its quantitative findings, insofar as the number of graduate, student and professional development placements are the main drivers of teaching and training costs.

With respect to research, the surveys revealed that the following factors were perceived as most important in driving research costs:

- Time commitment to research activities (60.0%);
- Duration of research (56.7%);
- Project funding/research source (50.0%); and
- Number of research projects (50.0%).

Despite some shortcomings, the results of the Victorian study are highly relevant – both in terms of their direct applicability to how TT&R is conducted, costed and recorded in a local context, as well as to provide a basis for comparing the identified cost drivers to those that will be discussed as part of consultation with a broader (national) stakeholder group.

4.3.2. Australia (medical undergraduate-specific)

Although it did not strictly address the cost drivers of TT&R, a recent Australian paper⁹⁰ may provide some insight into the nature of costs associated with teaching and training, and how they change with the intensity of clinical service delivery. The paper identified that “medical education is a partnership between the university, the government health sector and honorary teachers”, and contends that the cost of medical student education can be divided into two parts – the cost borne by the medical school, and those costs to the government-funded health service. The paper notes that “there are very few data about the value of the contributions to medical student education made by government funded health providers, for which the university does not pay”.

This paper was focussed specifically on the costs associated with training medical undergraduates, and employed a bottom-up costing approach based upon timetabled learning in both university-based and clinically-based environments. Students were also surveyed to determine the extent of teaching and training that was provided outside of timetabled hours. The costs considered in the study included direct, face-to-face teaching costs such as time spent to prepare and deliver lectures and tutorials, marking assessments and additional time spent in clinics, operating theatres and other consultations due to the presence of a student.

⁹⁰ Oates, K. and Goulston, K. (2013). ‘The hidden cost of medical student education: an exploratory study’, Australian Health Review, 2013, 37, 185-188.

In addition, the heads of major disciplines in each clinical school were asked to survey their members to estimate the extra time taken when students are present in clinics, operating theatres and on ward rounds. These discussions identified that the presence of students added an additional 15% extra time in clinics to an additional 30% in general practice, on average. This information was used to adjust the hours of teaching. Students were also surveyed, and indicated that they received, on average, an additional one to three hours of face-to-face teaching by a consultant registrar or nurse that was not timetabled. This information was also used to further adjust teaching hours.

The study estimated the average unfunded cost of undergraduate teaching activity at \$34,326 per student per year over the duration of the four year course. However, the paper identified that the quantum of unfunded costs increases significantly as students move from a predominately theory-based learning environment, to a predominately clinical learning environment. The study estimated that the total costs of university and clinician staff time engaged in teaching and training activity totalled \$14,460 in year one, increasing to \$22,494 in year two. 41% of costs were not funded by the university in year one, and 39% of costs were not university-funded in year two. The study notes that students at the Sydney University Medical School spend one day each week and a block of five weeks at a clinical school in each of their first two years. All other teaching in the first two years is on the university campus.

However, in the last two years, all teaching is undertaken in clinical schools, with a greater emphasis on practical learning in clinical environments and a lesser emphasis on didactic learning. In these third and fourth years, the overall costs of teaching rise significantly, to \$133,495 per year. The paper estimates that almost 92% of this cost is not funded by university. The study suggests that the significant costs in third and fourth years “reflects the fact that while much teaching is given in lectures or large practical group demonstrations, the majority of teaching in the final 2 years is in small group tutorials as well as one-to-one teaching”.

The results of the study suggest that the time trainees spend in a clinical environment is a significant driver of costs. Greater supervision requirements and inefficiencies associated with medical graduate training in years three and four result in significantly higher costs associated with staff time. This, in turn suggests a variation in the costs of teaching and training within professional groups, according the level of the trainee. Cost categories identified as cost drivers in other studies, such as greater consumables costs and additional diagnostic tests, were not captured as part of this study.

In summary, the study concludes that “already there is a view that the current funding arrangements for higher education which, apart from honorary teachers, have a large component borne by government, are not sustainable...the true cost of medical education (an additional 65% on top of the university cost) would place an insurmountable burden on

medical schools unless government health departments regard their contribution as a worthwhile investment in the education of its future medical workforce”.⁹¹

4.3.3. United States

An American study undertaken by the Lewin Group in 2005⁹² examined the impact of teaching intensity on health service costs using a ratio of both medical interns and residents to the number of beds in each health service. This approach expressed the extent of teaching undertaken in the health service relative to the health service’s size, and in so doing accounted (at least partly) for the potential impact of scale on costs. This study found that as teaching intensity increases, health service costs increase at least commensurately, and up to 1.8 times as much as the increase in teaching intensity, depending on the model used.

The study also included a dummy variable to identify health services that are integrated with a medical school, as a proxy indicator to “capture costs associated with the non-teaching missions pursued by Academic Health Centre (AHC) hospitals, such as research”. The study found that AHC hospitals reported costs that were 15% higher than non-AHC hospitals. This additional cost factor is generally consistent with the findings of an analysis of health service costs in Finland.⁹³

Although this dummy variable may capture costs that are related to other factors aside from just medical research, this study represents one of the few that have been identified in this literature search as investigating the extent to which the existence of a research capability is a driver of teaching hospital costs.

4.3.4. Scotland

A Scottish study⁹⁴ examined the relative level of costs for both teaching and non-teaching hospitals, the extent to which cost variations reflect differences in teaching responsibilities, the impact of the overall cost structures and key drivers that influence teaching costs.

This study took a bottom-up approach to the costing of NHS Scotland’s input to undergraduate teaching across all five years of the common medical curriculum, and the medical elements of the undergraduate dental curriculum.⁹⁵ This study used an approach based upon comparing relative cost ratios of major teaching hospitals. After controlling for casemix, the study found a clear relationship between teaching load (measured as student-weeks per inpatient admission) and direct costs of TT&R, such as the costs of physical resources and staff time. Of the additional costs associated with ‘major teaching hospital status’ (compared to ‘district general hospitals’), the study found that 32.3% of the costs were associated with a more complex casemix at teaching hospitals, that 14.2% of costs

⁹¹ Oates, K. and Goulston, K. (2013). ‘The hidden cost of medical student education: an exploratory study’, *Australian Health Review*, 2013, 37, 185-188.

⁹² The Lewin Group (2005). ‘Comparing hospital Costs: Adjusting for Differences in Teaching Status and Other Health Service Characteristics’, report prepared for Bridges to Excellence.

⁹³ Linna, M. and Häkkinen, U. (2006). ‘Reimbursing for the costs of teaching and research in Finnish Hospitals: a stochastic frontier analysis’, *the International Journal of Health care, Finance and Economics*, March 2006; 6(1): 83-97.

⁹⁴ *ibid.*

⁹⁵ Spollen, M., Dixon, P. and Hindle, G. et. al. (2003). ‘Research on Additional Costs of Teaching in NHS Scotland: Report for Standing Committee on Resource Allocation Sub-Group – Final Report Executive Summary’, prepared by Secta Consulting.

were attributable to the presence of research, 18.5% of costs can be accounted for by direct costs, 23.0% by indirect costs and 12.0% by merit awards.

The Scottish study also found that the average annual government funding allocation per trainee (£19,800) also exceeded the imputed direct costs of teaching, which were estimated at £12,500 per trainee per annum. Further work⁹⁶ based on this approach identified that average funding provided to medical and dental trainees in health services across Northern Ireland (£24,000 per trainee, excluding the costs of clinical academics) also exceed the direct costs of teaching. In response, the study suggested that the 'surplus' was in some way compensating for the indirect costs of medical teaching.

The significance of indirect costs as a result of teaching status is a notable outcome of this study; as is its contention that teaching load appears to be largely unrelated to the level of indirect costs of teaching hospitals overall. This study categorised indirect costs as those that support the normal activities of a health service, but that increase in volume or complexity due to the need to provide teaching.⁹⁷ Although the study observed a direct relationship between teaching load and direct costs, it concluded that "the relationship between indirect costs and teaching load is far less clear". If the estimates in this paper are correct, indirect costs account for a large part of the cost variation in teaching hospitals, but only show a weak correlation with TT&R activity.

4.3.5. Switzerland

The impact of teaching status on indirect costs is also noted by a study of 150 Swiss health services between 1998 and 2003⁹⁸, which included consideration of acute, emergency department, ambulatory and geriatrics services, but did not account for the existence of research capability within the study hospital cohort.

The Swiss study showed that factors which indirectly relate to teaching hospital costs, such as the existence of a greater number of medical units and broader range of specialisation, result in teaching hospitals being relatively more costly than non-teaching hospitals. This supports the conclusions of the Scottish paper with respect to the materiality of indirect costs in teaching hospitals.

The Swiss study noted the existence of "considerable unexploited scale economies in a majority of the studied health services". The study highlighted that the length of health service stays has an important marginal cost, suggesting that health services with long average lengths of stay "can achieve considerable savings by curtailing lengthy stays". However, if the cause of longer health service stays are related to teaching status, as suggested by other studies,^{99,100} then the ability to take advantage of scale economies may be somewhat constrained.

⁹⁶ *ibid.*

⁹⁷ 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'.

⁹⁸ Farsi, M. and Fillippini, M. (2006). Effects of Ownership, Subsidisation and Teaching Activities on Health Service Costs in Switzerland', *Journal of Health Economics*, March 2008;17(3): 335-50.

⁹⁹ Street, A. Scheller-Kreinsen, D., Geissler, A. and Busse, R. (2010). 'Determinants of Health Service Costs and Performance Variation: Methods, models and variables for the EuroDRG project', prepared for the German Department of Health Care Management.

The study concluded that “a considerable marginal cost for graduate medical training positions” exists and that “the quality of medical units for teaching purposes have a positive effect on health service costs”, although the paper stops short of quantifying the impact of graduate training positions.

4.3.6. Spain

A Spanish study¹⁰¹ also analysed the existence of systematic variations in costs for teaching hospitals by estimating the impact of a range of teaching-related factors on average health service costs. The study concluded that the costs of the teaching factor depend on the number of medical residents, with an increase of 51.1% per resident for health services with fewer than 204 residents, and an increase of 41.9% for health services with more than 204 residents. This result suggests that scale impacts on the costs of teaching hospitals, whereby the marginal cost of additional residents becomes smaller for a larger number of residents.

The Spanish paper also identified potentially significant relationships between health service costs and a range of variables, including “significant interactions between teaching status and both casemix and health service activity”. Furthermore, the study also identified that “the relationships between costs and beds, turnover index, urgent surgical interventions, casemix and number of residents are not linear”. This result has implications for the methods by which cost driver analysis should be undertaken, and suggests that linear modelling of these variables may produce misleading results.

This study concludes that “we cannot rely only on the casemix adjustment to compensate for the teaching factor in Spanish teaching hospitals.” The estimation conducted in the Spanish study also supports, amongst other things, “a clearer differentiation with regard to the size of teaching activity.”

4.3.7. Finland

In Finland, teaching subsidies are allocated according to the hospital’s teaching output. Teaching output is measured in terms of the types of medical examinations (consultant’s exam) passed and the total sum of resident labour input in a hospital (months in full-time work).¹⁰²

The Finnish paper (‘the reference paper’) reviewed as part of this report describes the results of two prior studies, in addition to the results of analysis on current data. The first study, undertaken by the Finland Ministry of Social Welfare and Health in 1996, measured teaching output in terms of the number of postgraduate medical students and the number of on-the-job training weeks of nursing students. The impact-weighted number of published studies was used to measure research intensity. This first study quantified the additional costs to university teaching hospitals due to teaching and research activities as around 15% of their operating costs.

¹⁰⁰ Oates, K. and Goulston, K. (2013). ‘The hidden cost of medical student education: an exploratory study’, *Australian Health Review*, 2013, 37, 185-188.

¹⁰¹ Lopez-Casasnovas, G. and Saez, M. (1999). ‘Finance versus costs for teaching hospitals in Spain’, *Journal of Health Economics*, 8, 641-651.

¹⁰² Linna, M. and Häkkinen, U. (2006). ‘Reimbursing for the costs of teaching and research in Finnish Hospitals: a stochastic frontier analysis’, *the International Journal of Health care, Finance and Economics*, March 2006; 6(1): 83-97’.

The second Finnish study¹⁰³ estimated the cost of teaching and research activities to be approximately 11% of total operating costs. The analysis undertaken in the reference paper¹⁰⁴ identified additional costs associated with teaching and research as being 14.6% of total hospital operating costs. Although this study did not quantify a percentage impact for teaching and research activity separately, it did quantify a marginal cost for producing teaching and research outputs, and identified important differences in how these marginal costs change according to hospital scale.

Specifically, the marginal cost for teaching activity (as measured by the number of residents) was lower for hospitals associated with a university (€15,292) than hospitals that were not university-affiliated (€18,685). Similarly, research output in non-university affiliated hospitals cost €24,129m but it cost only €3,189 in a university hospital. These results suggest that although the presence of teaching and research functions increase hospital costs, that the (typically) larger scale of teaching hospitals in Finland results in a significantly lower marginal cost to produce research outputs, in particular.

4.4. Consideration of TT&R benefits

Although it is broadly recognised that the provision of TT&R activities in public health services commonly result in additional net costs¹⁰⁵, a number of stakeholders have acknowledged that TT&R activity may provide indirect benefits that act to defray the costs associated with their provision to a certain extent.^{106,107}

Specifically, the Commonwealth Department of Health and Ageing has noted that “trainees contribute significantly to service delivery during their training, so it is necessary to ensure there is no double counting in terms of ABF funding for training of interns, junior medical officers and qualified nurses or other health professionals”.¹⁰⁸ Other stakeholders have suggested that the “payment for TT&R should consider both quality and quantity. In order to promote efficiency, loadings on TT&R should not be solely dependent on the number of hours spent on research in a particular discipline but also on the inherent value that it holds in the larger health research sphere.”¹⁰⁹

These comments highlight the potentially significant benefits associated with the delivery of TT&R, and that ‘benefit drivers’ may also need to be considered in TT&R funding models, in addition to ‘cost drivers’.

However, other stakeholders have highlighted the difficulty quantifying these benefits. These stakeholders have noted that “this is an extremely complex cost/benefit relationship

¹⁰³ Linna, M., U. Häkkinen, and E. Linnakko. (1998). “An Econometric Study of Costs of Teaching and Research in Finnish Hospitals.” *Health Economics* 7(4), 291–305.

¹⁰⁴ Linna, M. and Häkkinen, U. (2006), ‘Reimbursing for the costs of teaching and research in Finnish Hospitals: a stochastic frontier analysis’, the *International Journal of Health care, Finance and Economics*, March 2006; 6(1): 83-97’.

¹⁰⁵ Productivity Commission (2009), ‘Public and Private Hospitals: Productivity Commission Research Report’, Canberra.

¹⁰⁶ *ibid.*

¹⁰⁷ Commonwealth Department of Health and Ageing (2012). Commonwealth submission to the IHPA Draft 2013-14 Pricing Framework’

¹⁰⁸ *ibid.*

¹⁰⁹ Victorian Healthcare Association (2012). ‘Submission to IHPA Draft 2013-14 Pricing Framework’

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".¹¹⁰

¹¹⁰ 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'.

5. TT&R data sources

The importance of national data collections has been highlighted by IHPA¹¹¹ as being “essential to the development of classifications and the implementation of ABF”. They are required for a number of purposes, including:

- ensuring that activity is categorised into meaningful groups;
- analysing activity volumes between local health networks and jurisdictions; and
- monitoring trends over time.

Significant work has already been undertaken by IHPA to identify the availability of TT&R cost and activity data. Much of this was collated in the ‘2014-15 TT&R DSS Consultation Paper’.¹¹² The paper identifies that cost and activity data relevant to TT&R may be collected and reported at a health service, jurisdictional or national level, and may also be collected by other specific bodies. Members of the TTRWG have been asked to identify additional data sources, and the feedback obtained from this process is currently being collated by IHPA.

This section examines the range of existing data collections that are available at the health service, jurisdictional and national levels that may be capable of supporting a robust analysis of TT&R cost drivers.

Key points – TT&R data sources

- The available data collections appear to focus largely on teaching and training costs and activity, with little available regarding publicly funded research;
- There is no single data repository that contains dedicated cost and activity data relating to TT&R. Although such 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. It will therefore be important to investigate the availability, robustness and usefulness of data available at the health service and jurisdictional levels, and their potential to support cost driver analysis;
- The National Hospital Cost Data Collection (NHCDC) is the primary repository for data relating to hospital and health service costs. There are known variations in costing practice both between and within jurisdictions, which has resulted in variations in the coverage and overall costs reported in the NHCDC. Nonetheless, recent reviews commissioned by IHPA have indicated that most data at the health service level can be reliably reconciled to the data submitted to the NHCDC;
- Other datasets relevant to TT&R are collected by a range of quasi or non-government organisations. Some of this data is considered to be “among the most comprehensive with regard to student information”, but may also encompass elements of activity that extend beyond the public health service system.

¹¹¹ Independent Hospital Pricing Authority (2013), ‘2014-15 TT&R DSS Consultation Paper’.

¹¹² *ibid.*

5.1. TT&R data availability in Australia

A range of stakeholders have noted the importance of a robust data set in improving the reliability of an ABF model for TT&R.¹¹³ IHPA is addressing these views through the development of a TT&R activity data set specification¹¹⁴ that will aim to collect a consistent set of relevant indicators for use in recording activity associated with TT&R across jurisdictions. However, the timeframe for publication of the DSS is currently expected to occur in 2014, which will mean that the analysis of cost drivers as part of this project will need to rely on the existing range of data collected at the health service, jurisdictional and national levels. These data sources are identified in Sections 5.2 to 5.5.

Health services' financial chart of accounts and reporting systems, clinician classification profiles and costing systems (patient-level or cost modelled) are known to vary significantly across jurisdictions. Furthermore, the extent to which clinical workforce profiles and costs can be separately identified and attributed between clinical services and TT&R will be highly complex.

A definition(s) of TT&R activities may therefore prove difficult to objectively and practically cost and separate from existing clinical labour cost buckets particularly in relation to the fact that most rostering, payroll and financial systems do not separate utilisation between clinical service delivery from TT&R activities.

5.2. Health service-level data collections

IHPA's TT&R DSS Consultation Paper identifies that public health services capture a significant amount of data that may be relevant to TT&R within their own costing, human resource, learning and development systems and research databases. However, the data that is not mandated for reporting to jurisdictional or national health authorities may be highly diverse across health services, even within the same jurisdiction. It will be important to investigate the availability, robustness and usefulness of data available at the health service level, and its potential to support cost driver analysis.

Health services are required to report to a number of national data collections, as explored in Section 5.4.

5.3. Jurisdiction-level data collections

The 'units of count' for relevant TT&R activity data collected by jurisdictions were first summarised in the HOI 'National Workshop Discussion Paper', developed in 2010.¹¹⁵ Table 3 shows the units described in the report.

¹¹³ Various organisations (2012). 'Addressing the medical training pipeline: securing funding for teaching, training and research: Summary and outcomes paper of peak body meeting conducted on 18 October 2012'.

¹¹⁴ Independent Hospital Pricing Authority (2013). 'Teaching, training and research data set specification – consultation paper'.

¹¹⁵ Health Outcomes International (2010), 'ABF Teaching, Training and Research Workstream Scoping Study: National Workshop Discussion Paper', prepared for the Commonwealth Department of Health and Ageing.'

Table 3: Units of count for TT&R activity across jurisdictions

Jurisdiction	Teaching/training units	Research units
Vic	- Placement numbers - Casemix complexity (through AR-DRG)	Cost of undertaking designated research
NSW	FTE staff (or percentage thereof)	No unit recognised
SA	FTE staff (or percentage thereof)	No unit recognised
Qld	FTE staff (or percentage thereof)	Cost of undertaking designated research
NT	FTE staff (or percentage thereof)	Cost of undertaking designated research
WA, Tas, ACT	No unit recognised	No unit recognised

As noted in the IHPA TT&R DSS Consultation Paper, these units of count focus heavily on teaching and training units. Where research units are specified, these do not relate to activity measures, but rather the cost of undertaking research. This information points to a potential lack of available data regarding research activity.

A review of available jurisdictional documentation has also revealed a limited number of other data that could be useful to identify TT&R costs and activity. The results are shown in Table 4.

Table 4: Review of existing jurisdictional data availability to support TT&R analyses

Jurisdiction	Data sources
Vic	<ul style="list-style-type: none"> Data completed by health services through monthly F1 reports and collected in Health Collect may provide beneficial info for IHPA¹¹⁶
NSW	<ul style="list-style-type: none"> Since 1994-5 the MoH has collected expenditure on teaching and research as part of the Program Expenditure Reporting The share of HCCC activity data may be used to calculate the costs of TT&R The share of staff costs associated with TT&R activity is kept and could be used to calculate costs The relevant service shares of RDF components are recorded and tracked and could provide useful data relating to TT&R¹¹⁷
SA	<ul style="list-style-type: none"> None found
Qld	<ul style="list-style-type: none"> None found
WA	<ul style="list-style-type: none"> None found
NT, Tas, ACT	<ul style="list-style-type: none"> None found

¹¹⁶ Victorian Department of Health (2012). 'Training and development grant: fact sheet – reporting requirements'.

¹¹⁷ NSW Health (2005), 'Resource Distribution Formula: technical paper'.

5.4. National data collections

5.4.1. National Hospital Cost Data Collection

Some public health services report cost data for TT&R through the NHCDC, however, as identified by AHPCS, the costs reported only relate to 'direct teaching' and training that are distinctly identified in appropriate cost centres.¹¹⁸ Indirect teaching and research are considered 'normal patient care', and are hence captured within the costs reported as part of other ABF work-streams.

Although gains are progressively being made with respect to volume and quality of data submitted to the NHCDC, a number of sources have recognised the existence of variations in costing practice both between and within jurisdictions, which has resulted in variations in the coverage and overall costs reported in the NHCDC. Recent financial reviews of Round 14 and 15 NHCDC data commissioned by IHPA supported the need for further improvement, but also found that health service costing and financial data could be reliably reconciled to the data submitted to the NHCDC.

5.4.2. Public Hospital Establishments NMDS

The Public Hospital Establishments (PHE) National Minimum Data Set (NMDS) includes data regarding costs and FTE aggregated at the health service level, as well as whether the health service is university-affiliated.

5.4.3. Government Health Expenditure NMDS

Jurisdictions also report aggregated revenue and expenditure data relating to health research and other activities through the Government Health Expenditure (GHE) NMDS.

5.5. Other data collections

A range of quasi or non-government organisations also collect, collate and publish data relating to specific elements of their operations. These organisations are identified in IHPA's 2014-15 DSS Consultation Paper¹¹⁹ as being among "the most comprehensive data collections with regard to student information", but also cautioned that the scope of collections extends into the broader health sector, and is not solely focussed on the public health system. These data collections, as identified in IHPA's TT&R DSS Consultation Paper, are described in Table 5.

The datasets identified in Table 5 could all be used to produce useful information relating to TT&R but they are not designed or managed with a specific focus on providing robust and consistent TT&R activity data. IHPA's development of a TTR DSS aims to overcome this shortcoming.

The literature presented in this section highlights that there is no shortage of data collections that may be relevant to TT&R. However, the extent to which these are directly

¹¹⁸ Australian Government Department of Health and Ageing (2011). Australian Health Service Patient Costing Standards version 2.0.

¹¹⁹ Independent Hospital Pricing Authority (2013), '2014-15 TT&R DSS Consultation Paper'.

relevant to the intended scope of Commonwealth funding for TT&R is unclear. It will be important that stakeholder consultations are able to determine the availability, robustness and consistency of various data collections across jurisdictions, health services and peak bodies.

Table 5: Relevant TT&R data collections collected by organisations

Data source	Summary
Health Workforce Australia (HWA)	<p><u>Health workforce by numbers publication</u></p> <p>Provides demographic, training and employment information on a range of health professions sourced from a number of different data sets.</p> <p><u>Clinical placements data set</u></p> <p>Based on info from an annual survey of clinical placements for 25 professions Data is broken down by profession, EFTSL, Student level, facility type, setting (acute, aged care etc.) and geographical area.</p> <p><u>National Health Workforce data set (NHWDS)</u></p> <p>Shared custodianship between HWA and AIHW; Data collected from 14 health professions each year; Includes demographic and employment information, including labour force status, area of practice, work setting and number of hours worked in a clinical or non-clinical role.</p>
Medical Training Review Panel (MTRP)	Produce an annual report on medical training positions at the university, pre vocational and vocational level.
Medical Deans Australia and New Zealand (MDANZ)	<p>Annual student statistics calculation covering the entire medical student population – cannot be broken down to individual students.</p> <p>Medical schools outcomes database (MSOD) tracks students through medical schools and into vocational training from their first year in medical school until 8 years after they have graduated.</p>
Australian Bureau of Statics (ABS)	The ‘Higher education student statistics collection’, ‘training and expenditure and practices survey’ and the ‘Australian vocational education and training management information statistical standard’ are related to TT&R. The surveys and statistics collections could potentially be used to help develop the DDS.
National Health and Medical Research Council (NHMRC)	The Research Grants Management System (RGMS) is a system through which all research grant applications are processed.
Australian Institute of Health and Welfare	Recently became an accredited data integrating authority allowing it to handle sensitive data and provide analytical support that may be relevant to IHPA.
National Allied Health Benchmarking Committee	Carry out regular data collections relating to direct clinician time spent teaching and training.
Department of Innovation, Industry, Science and Research	Higher Education Research Data collection: is used to assess the relative research and research training performance of HEP’s and in turn drives the allocation of research block grants. ¹²⁰

¹²⁰ Department of Innovation, Industry, Science and Research (2011), ‘2011 higher education research data collection’.

6. Conclusion

It is clear from the literature reviewed and presented in this report that a number of fundamental issues remain to be addressed before a nationally consistent approach to understanding, defining and funding TT&R can be achieved. This section synthesises the findings of our literature search and describes how the findings will inform consultation with stakeholders to identify the definition(s) and cost drivers of TT&R.

The literature highlighted that the nature of TT&R is changing. The range of health services in which TT&R activities are now being conducted are significantly broader than they ever have been, and the volume of teaching and training activity, in particular has undergone significant expansion in recent years. **It will be important that consultation with health services, health departments and peak bodies explores any issues, trends and foreseen developments regarding TT&R. Subsequently, the definitions should give particular consideration for how to allow for any potential changes in the nature of TT&R over time.**

At the most basic level, there does not appear to be a consistent understanding of the nature and scope of activities associated with TT&R across Australia, and this appears to contribute to the myriad of funding arrangements across jurisdictions. The available detail describing the scope of TT&R funding is inconsistent across jurisdictions, although it is not clear whether this is due to ambiguities in the definitions of TT&R, or vice versa. **As a result, it will be important to identify a series of common characteristics or principles that stakeholders identify as being associated with TT&R. This set of common characteristics can then be used as a basis for building a broadly agreed, nationally consistent definition.**

Various definitions of TT&R have been developed over time; however, to date a nationally consistent definition has not been agreed. As a result, an element of objectivity appears to exist in how TT&R is described and understood across jurisdictions. Although recent work has resulted in the development of draft definitions that form that baseline for this project, both jurisdictions and independent organisations have identified a number of shortcomings with these definitions. **As a result, it will be important that consultation explores the views of all stakeholder groups with respect the draft definitions of TT&R that form the baseline for this project. This should include what the draft definitions do well, and their shortcomings. Given the feedback that was obtained from jurisdictions at the time the draft definitions were developed, the consultation should explore issues such as the materiality of separating teaching and training, the need for the definition to distinguish what professional groups (and levels of professional groups) are in-scope as well as giving consideration to both direct and indirect activities associated with TT&R and their relationship to costs.**

There is general consensus in the literature that TT&R is associated with additional costs and inefficiencies compared to hospitals where TT&R is not undertaken. Although the evidence is mixed, the literature generally suggests that these additional costs are not captured in current funding models. The literature also identifies a broad range of potential cost drivers of TT&R. Most of the literature deals with cost drivers of teaching and training separately to research, and consistently identifies the volumes of clinical teaching/training recipients as drivers of teaching and training costs. The volume of research activity appears to be much

more difficult to define, and as a result, the activity-cost relationship for research has not been established with the same degree of authority as for teaching and training. Nonetheless, there is a consensus that the existence of a research capability in a public health service increases costs by up to 15%. **It will be important that consultation explores the perspectives of all stakeholder groups regarding the cost drivers of TT&R, including consideration of how costs vary with both direct and indirect TT&R activities. The outcomes of the consultation should be compared to both the existing literature, and the outcomes of the quantitative cost driver analysis to provide validation of the results. It will also be particularly important to obtain stakeholder perspectives regarding appropriate measures of research activity that may be used as the basis for determining the cost drivers of research.**

The importance of robust data has been noted by a range of stakeholders as a means to enhance understanding of both the quantum of TT&R costs and activity. A number of the cost driver analyses reviewed as part of this study noted the shortcomings associated with the absence of reliable data or a sufficiently large sample size of health services where reliable cost and activity data is available. Currently, there is no single data repository that is dedicated to the collection of cost and activity data for TT&R, although IHPA has proposed the introduction of a TT&R activity data set specification that it intends to roll-out during 2013-14. As a result, our current understanding of TT&R is limited to the range of datasets at the health service, jurisdictional and national levels – which are likely to vary to some degree in the scope, type and reliability of data collected. **As a result, it will be important that consultation establishes 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.**

Subsequently, the challenges associated with establishing a broadly agreed definition of TT&R and understanding their cost drivers are many, and they are complex. However, the literature has demonstrated that it is certainly possible, and if achieved, can produce meaningful improvements in resource allocation and incentives that will support the sustainability of health systems into the future.

Obtaining a broad range of stakeholder perspectives will be critical to ensure that all relevant views can be heard and incorporated into the development of this foundation work to understand TT&R. We look forward to commencing this process, and continuing to progress the understanding of TT&R in Australia, in conjunction with key stakeholders around Australia.

Appendix A: Funding arrangements for TT&R

The following section describes the various funding and data collection arrangements that are in place across Australia and overseas. This section also identifies issues raised in the literature that may need to be addressed when developing a single national definition (or definitions) of TT&R. This section also describes the various approaches to funding TT&R that are in place overseas.

Key points – Appendix A: Funding arrangements for TT&R

- The ways in which jurisdictions make funding allocations for TT&R is not well described by the publicly-available literature. Although the quantum of funding (as a percentage of the total health budget) appears to be well understood, the basis for funding allocations are less clear;
- Only one jurisdiction (WA) refers to 'teaching, training and research' in the available funding guidelines. TT&R is referred to in various ways, including as 'Training and Development' (Vic), 'Teaching and Research' (NSW) or 'Clinical education and training' (Qld). Some jurisdictions (SA) use the terms teaching and training interchangeably.
- Victoria and South Australia are two jurisdictions where funding arrangements for TT&R are more clearly articulated in the public domain. However, the precise basis for determining funding allocations in each state is not articulated.
 - Victoria has implemented a grant-based approach for most components of its 'Training and Development' funding stream, which includes funding for medical, nursing, allied health and health information management activity at undergraduate, graduate and vocational levels;
 - South Australia provides funding for the costs of supervision and training associated with medical and allied health professionals, based upon a percentage of relevant wage payments. Costs associated with nursing are paid as grants, at fixed rates per employee.
- Both NSW and WA have undertaken to develop costing and reporting standards for TT&R, although the extent to which these standards have been implemented for funding purposes is not clear in the available literature;
- Funding arrangements for research are complex, with only a small amount of funding provided by state and territory governments;
- Jurisdictional funding allocations for research are not clearly described in publicly available literature. One jurisdiction (South Australia) articulates the funding mechanism for research, whereby the research funding stream provides a contribution to the costs of supporting infrastructure. No details are available with regard to subsidising recurrent operational costs;
- Internationally, various funding allocation mechanisms for TT&R exist. Much of the available literature focuses on postgraduate (vocational) medical training, with little attention paid to nursing and allied health disciplines. A range of international

literature notes the difficulties posed by data constraints in setting appropriate funding arrangements for TT&R.

- In the UK, funding mechanisms vary according to the type and level of trainee;
- In Italy, funding arrangements vary according to regional preferences, although the majority apply a national tariff; and
- In Norway, global hospital budgets include a cost component per DRG that is intended to compensate for research and training.

A.1 New South Wales

The literature search revealed a limited amount of publicly available documentation regarding the funding for TT&R functions within NSW. The most amount of detail was found in the 'Resource Distribution Formula (RDF) Technical Paper' (2005). Although we understand that many of the details in this document are no longer current, this is the most recent, publicly-available document that describes funding arrangements for TT&R in NSW.

The NSW documentation refers to both "teaching" and "research", but does not separately identify 'teaching as a component of its funding formula for TT&R.

The NSW literature articulates that on average, 3.5%¹²¹ of all NSW Ministry of Health (MoH) funding is directed towards teaching and research. Funding is not allocated on an activity basis or covered under the state's Episode Funding Policy but is provided in the form of block grants or bilateral agreements between NSW and the Commonwealth.¹²²

An approach has been established to identify teaching and research costs through the creation of costing and reporting standards by the NSW Department of Health (as it was previously known at the time this document was published). Despite this, there was considerable variation in the data captured and reported each year and it was not deemed satisfactory for the basis of allocating funding.¹²³ This was further complicated by the feeling that the teaching and research component of the RDF, and ABF in general, should not be based on the level of expenditure by Area Health Services (now Local Health Districts (LHDs)) as the outcomes are highly variable, can be subject to different interpretations.

Two potential indicators have been identified to assist in identifying the share of funding to be allocated for teaching and research:

- **The share of Health Care Complaint Commission (HCCC) activity:** while this is not a direct measure of teaching and research expenditure it has shown a correlation with teaching and research expenditure; and
- **Number and weighted cost of staff associated with teaching and research activity:** the weighted expenditure on these staff positions generally correlates with the

¹²¹ Department of Health NSW (2008), 'Episode Funding Policy 2008/9'.

¹²² NSW Ministry of Health (2013), 'Fact sheet: Purchasing & Funding'.

¹²³ NSW Health (2005), 'Resource distribution formula: technical paper'.

historical level of reported expenditure and this data was obtained from the Department of Health Reporting System (DOHRS).¹²⁴

The literature notes that neither of these indicators is ideal but one advantage of using weighted cost of staff associated with teaching and research is that it takes account of the different funding arrangements for clinical academics i.e. whether they are funded by the hospitals in which they are based or via universities.

The role of health and medical research funding in NSW is also noted given that between 2005 and 2010 approximately \$188m was invested each year through programs administered variously by the NSW MoH, the Department of Trade, Investment, Regional Infrastructure and Services, the Cancer Institute NSW and LHDs. There was a view that the way that these funds are directed can be non-strategic, obscure and at times arbitrary.¹²⁵ As such, a review of the way these funds are allocated has been proposed to ensure a more transparent, accountable and strategically focused process.

A.2 Victoria

Victorian policy and funding guidelines provide a greater level of detail regarding funding for TT&R than many other States and Territories. Additionally, the Victorian funding guidelines are relatively current, with the most recent publicly available version being related to the 2012-13 year.

Victorian policy and funding guidelines include a 'Training and Development (T&D) Grant' as an additional component of the casemix formula, "to recognise the additional costs inherent in the teaching, training and research activities of teaching hospitals"¹²⁶. The T&D Grant comprises four funding streams:

1. Research;
2. Professional-entry clinical placements;
3. Early graduate funding; and
4. Postgraduate medical, nursing and midwifery funding.

Funding for professional-entry clinical placements (Stream two) is intended to contribute to the costs associated with TT&R within acute areas of public health services. Professional entry courses can include certificate IV, diploma, undergraduate, graduate-entry and postgraduate courses, where the course is required for practice or initial registration¹²⁷. Payments to health services are based exclusively on their proportion of total (weighted) clinical placement activity for students enrolled in a professional-entry course of study in medicine, nursing (registered and enrolled), midwifery and allied health¹²⁸.

¹²⁴ *ibid.*

¹²⁵ NSW Health (2011), 'Discussion paper: Health and medical research strategic review'.

¹²⁶ Victorian Department of Health (2012). 'Victorian health policy and funding guidelines 2012-13'.

¹²⁷ Victorian Department of Health (2012). 'Training and Development Grant: 2013-14 professional-entry student placement subsidy – frequently asked questions', accessed from <http://www.health.vic.gov.au/workforce/learning/professional.htm>.

¹²⁸ *ibid.*

The early graduate funding stream (Stream three) provides payments to health services to contribute to the cost of supervision and on-the-job training in the first year for nursing, midwifery and allied health graduates, and the first two years for medical graduates. Funding for allied health professions moved to an activity-based model during 2012-13, which has required health services to report on allied health graduate activity from 1 July 2012, in addition to requiring that health services provide evidence of delivering a formal structured graduate supervision program or equivalent. Funding for medical positions under the early graduate funding stream is intended to support placements for graduates in postgraduate years one and two, including general practice graduates in some cases.

The postgraduate medical, nursing and allied health funding stream (Stream 4) is intended to support studies that lead to graduate certificate, graduate diploma or masters level studies that include a requirement for supervised clinical support.

A.3 Queensland

Publically available documentation relating to Queensland Health's funding for TT&R is limited. Teaching and training are generally referred to as 'clinical education and training'.

In 2010/11 (the most recent full year available) funding for clinical education represented 2.6% of all available Queensland Health Funding¹²⁹.

The only references found relating to research activities and funding noted that the research undertaken was grant funded, coming from a number of different State and Commonwealth resources.

A.4 Western Australia

The first phase of ABF in WA was initiated in 2010-11 and at that stage funding for TT&R was implicit in the price of activity for each peer group. It was proposed that this funding mechanism would continue until a new national pricing arrangement was published by IHPA.¹³⁰

In 2011 the WA Health Teaching training and Research Advisory Committee (TtRAC) sought the WA Health's Activity Based Funding and Management team to develop a robust methodology for the costing of TT&R. The data available identified that cost per casemix adjusted episode at WA's tertiary hospitals was estimated to be 12% higher than at non-tertiary hospitals in 2010-11,¹³¹ and that there were three fundamental issues with continuing their current approach towards TT&R¹³²:

1. Average cost per weighted activity was not comparable with other jurisdictions and between tertiary and non-tertiary hospitals;
2. Fixed approach to TT&R funding – the process was opaque and unresponsive with little usable data or information available; and

¹²⁹ QLD Health (2011), 'Business rules & Guidelines'

¹³⁰ Western Australia Department of Health (2012), 'Health activity purchasing intentions 2012-13'.

¹³¹ Western Australia Department of Health (2011), 'Teaching, Training and Research Costing Guideline'.

¹³² *ibid.*

3. Lack of contestability in the provision of TT&R - no contestability between public and private hospitals or as a mechanism to reduce overall cost and encourage completion.

Work was undertaken in 2011-12 involving consultations with stakeholders across WA to allow for the payment of costs relating to TT&R to be carried out separately to the State Efficient Price (SEP) and in line with the national ABF program¹³³. However, it is unclear how this has been achieved and whether or not the process and end product has been documented or communicated.

With regard to the funding of clinical academics, similar concerns were raised in WA as in NSW. Namely that 'as a general rule, the traditional 'teaching' hospitals are more likely than the newer teaching and research hospitals to have clinical academic staff that are employed or funded by the university.'¹³⁴

A.5 South Australia

A preliminary framework has been created for the funding of teaching in recognised teaching hospitals within SA through the 'Teaching Grant'. Although the basis for allocating the specific loading percentages and allowances is not made explicit within the available documentation, the Teaching Grant can be applied to nursing, medical and other health professionals as follows:

Nursing:

- \$11,000 will be paid for each graduate nurse in an approved program with a maximum level of nurses undergoing such programs being set at 12% of the total nursing headcount (excluding external participants);
- \$4,000 will be paid per nurse in an approved hospital course with the additional funding of \$1,000 per external participant where the cost is incurred by the employing unit; and
- \$6,000 will be paid per participant 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.

Medical officers:

- a training component for Training Medical Officer (TMO) paid at the rate of 50% of their base salary to compensate for their reduced clinical productivity;
- a supervisory component for visiting medical officer/salaried medical officer time paid at 25% of a senior director's salary, applied to the number of TMO full time equivalents supervised; and
- a supervision allowance for medical undergraduates paid at 10% of the total hospital medical salaries and wages payments.

¹³³ Western Australia Department of Health (2012), 'Health activity purchasing intentions 2012-13'.

¹³⁴ Western Australia Department of Health (2011), 'Teaching, Training and Research Costing Guideline'.

Other health professionals:

The grant will be calculated on the basis of 5% of the salaries and wages costs for allied health, dental, scientific and technical staff. The actual cost to hospitals for the education and supervision of these personnel has not been measured and the 5% figure has come from the pre-casemix Output Performance Model and will be applied until the true cost can be calculated.¹³⁵

Research:

The South Australian Department of Health and Ageing provides infrastructure funding for program and project research grants supported by the National Health & Medical Research Council (NH&MRC) grants, and where research is relevant to the clinical workload of the hospital. The research grant is calculated on the basis of 15.73 cents for each research dollar received by relevant research units. The basis for this calculation is not made clear in the available documentation. No operational cost subsidy appears to be provided.

A.6 Tasmania, Australian Capital Territory and Northern Territory

Our literature search was unable to recover any detail regarding TT&R funding arrangements in Tasmania, the Australian Capital Territory and the Northern Territory.

A.7 Health and medical research funding

Of the \$135bn spent on health in Australia in 2011-12¹³⁶, it is difficult to quantify the level of HMR currently invested in Australia across biomedical, clinical, public health and hospital research domains. Indicatively, total expenditure in 2011-12 was estimated at approximately \$6bn¹³⁷ made up of:

- \$0.8bn from National Health and Medical Research Council grants;
- \$1.1bn through Local Health Networks (of which \$0.7bn is derived from State based Health Funds);
- \$2.1bn through universities and other government institutions; and
- \$1.7bn through the business and not for profit sector.

Furthermore, sources of HMR funding and their application remains poorly understood. Some of the findings in relation to the different sources were:

- Australian Government – HMR spending (largely through the NH&MRC) is well tracked for competitive research grants with good data on grants issued and DoHA expenditure;

¹³⁵ SA Health (2012), 'Casemix funding for hospitals: Methodology 2012-13'.

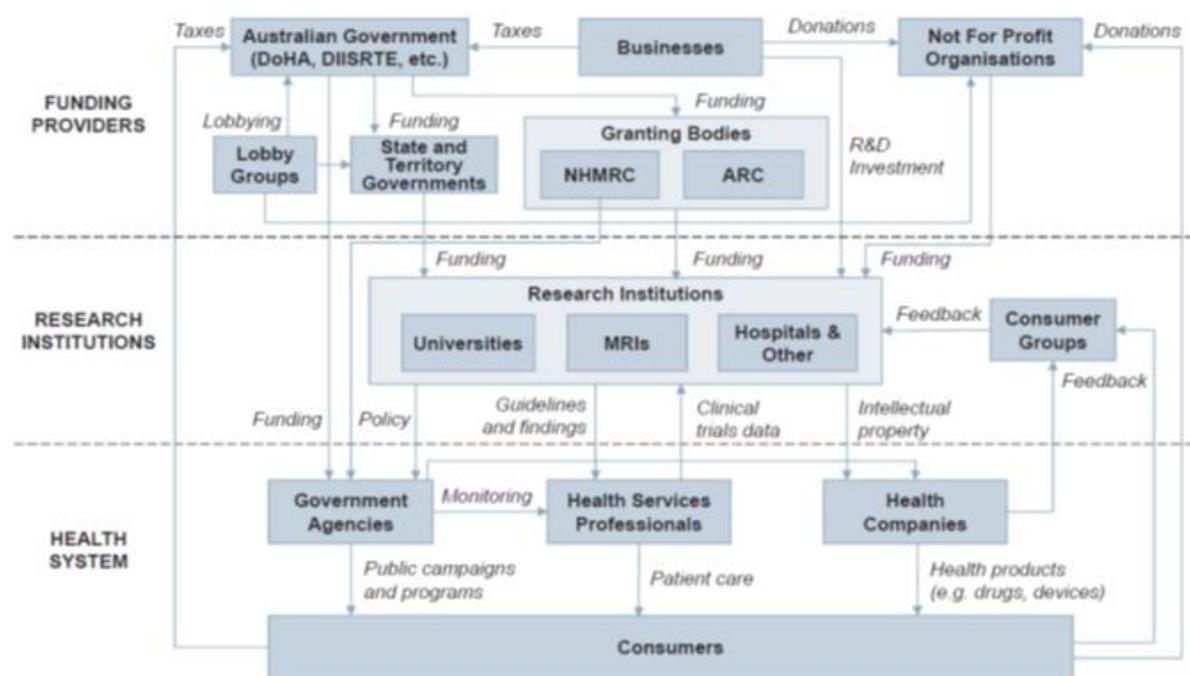
¹³⁶ Department of Health and Ageing (2013), Strategic review of Health and Medical Research

¹³⁷ *ibid.*

- State and Territory Governments –indirect support provided for research by health services is generally not measured and concerns are raised regarding the extent to which it is therefore managed;
- Business investment – reasonably well managed through the commercial sector and is tracked by the ABS; and
- Philanthropy – currently only partially tracked via surveys conducted by Research Australia every few years.

The Strategic review of Health and Medical Research also acknowledges the complexities of the current health and medical research funding and activities flows as presented in Figure 1 below.

Figure 1: Research funding arrangements in Australia



The report notes the disparity in research indirect cost funding for competitive grants, whereby:

- Indirect cost funding for research activities is considered inadequate, with the level of funding dependent on the type of institution and state or territory in which the HMR is undertaken;
- Funding to cover research indirect and capital costs come from diverse sources and through diverse mechanisms, depending on where the work is conducted and which research agencies are funding the work. The costs associated with these categories can vary widely between research agencies, especially where research facilities are shared; where ‘in-kind’ or ‘administration’ cost allocation arrangements are made; or where research and teaching overlap (e.g. in universities);
- Indirect costs can vary considerably as a proportion of the direct costs of the research. For example, ‘wet’ laboratory-based research programs are typically much

more expensive than 'dry' office-based research programs involving desktop research or computer modelling; and

- Indirect research costs are, on average, around 60c per direct research dollar and comprise laboratory costs (25c), administrative costs (20c) and building and facility costs (15c).

The Review argues that the current system is inequitable with universities given 30c per direct research dollar through one set of schemes and medical research institutes given 20c per direct research dollar through another scheme, while hospitals do not have access to any support schemes. Previous reviews note that a rational approach to indirect cost funding is urgently needed where indirect costs are attached to national competitive grants.

A.8 International funding models for TT&R

This section examines the available literature describing how TT&R is funded internationally, with the aim of identifying any trends, issues and approaches that may be useful to inform the definitions of TT&R. International literature on cost drivers is dealt with separately, in Section 4. This section intentionally focuses on comparable health systems to that of Australia that have also implemented ABF models for public health care, including the United Kingdom, and a range of other European countries.

A.8.1 United Kingdom

The United Kingdom (UK) Department of Health funds the cost of investment in education, training and development of the health, and parts of the social care workforce, through the Multi Professional Education and Training (MPET) budget. Previously, Strategic Health Authorities (SHAs) were responsible for commissioning education and training, including the clinical placements for healthcare students and trainees. In April 2013, Health Education England (HEE) took over their responsibilities, with Local Education and Training Boards (LETBs) leading local commissioning decisions and quality management of education and training.¹³⁸

Currently the MPET allocation amounts to £4.9billion and the scope of the MPET allocation includes flexibility for education for the current and wider workforce as well as the future professional workforce.¹³⁹ Traditionally, there have been three main funding streams that make up the MPET allocation¹⁴⁰:

- Service Increment For Teaching (SIFT) – Undergraduate medical students. The rationale behind the SIFT funding stream is that it recompenses providers for the additional costs which they incur through the provision of placements for **medical undergraduates**;

¹³⁸ UK Department of Health (2013). 'Introduction of Tariffs for Education and Training', Impact Assessment 8050-MEF

¹³⁹ UK NHS (2013). 'Financial Planning', accessed from <http://hee.nhs.uk/work-programmes/resources>

¹⁴⁰ South London LETB (2013). 'MPET Finance update'.

- Medical And Dental Education Levy (MADEL) – Postgraduate medical staff. The rationale behind the MADEL funding stream is that it partially funds **postgraduate medical and dental staff**, in recognition that – in addition to being training posts – the staff filling these positions also make a significant contribution to service delivery within providers; and
- Non-Medical Education & Training (NMET) – All other staff/students. The rationale behind the NMET funding stream is to fund the costs of tuition, salary support, student bursaries and placements for **non-medical staff** training, particularly first qualifications for nursing staff.

The Commons Health Select Committee summarised the current arrangements as “anachronistic and anomalous” in its Education, training and planning report in May 2012. And it provided a succinct explanation of the need for reform. “Payment is only partially based on student or trainees numbers; it is not linked to quality; it is unjustifiably inconsistent between different professional groups, parts of the country and types of provider; and there is an almost total lack of transparency about how it is spent”.¹⁴¹

HEE has commenced implementing a tariff based system for education and training from April 2013. There will be different tariffs for different professions and these will be developed through the inclusion of education within the annual reference costs exercise. Over time the tariff will be aligned to quality payments similar to the Commissioning for Quality and Innovation (CQUIN) payments for service tariffs.¹⁴² The tariffs proposed are:

- Undergraduate medical placements in secondary care;
- Non-medical placements; and
- Postgraduate medical placements in secondary care.¹⁴³

Costs were also collected for the provision of non-medical placements, however, the Department has noted it will need to do further work to calculate what an appropriate tariff would be that reflected the cost of providing non-medical placements.¹⁴⁴

The costing exercise also attempted to establish the cost of providing postgraduate medical placements, both in terms of the non-salary costs (support provided by the teaching staff and the infrastructure used), and the payment of the trainee’s salary whilst they were training. The costing exercise was also considered by the Department as not providing a robust basis to set a tariff for postgraduate medical placements in secondary care due to considerable variation in the data provided regarding the amount of time a trainee spends training and delivering service. This made it difficult to draw any conclusions about how much funding should be provided for the trainee’s salary. A working group was established to consider the most appropriate way of funding postgraduate medical training in secondary

¹⁴¹ Healthcare Finance Management Association. (2013). ‘LOCATION, LOCATION, LOCATION’, Healthcare Finance, May 2013.

¹⁴² UK NHS (2013). ‘Financial Planning’, accessed from <http://hee.nhs.uk/work-programmes/resources/>

¹⁴³ UK Department of Health (2013). ‘Introduction of Tariffs for Education and Training’, Impact Assessment 8050-MEF.

¹⁴⁴ *ibid*

care within the current funding envelope and favoured funding 50% of the basic salary for all posts plus a placement rate.¹⁴⁵

The Department has outlined an approach to the future setting of tariffs. "We aim to start collecting costs for education and training as part of the annual reference cost collection from 2013-14. This would allow us to base the tariffs on those reference costs and also reduce the amount of cross-subsidisation between service and education and training by netting off education and training costs, rather than income as is currently the case, from the service reference costs. If we collected education and training reference costs in 2013-14, we would be able to use these costs to set the 2016-17 tariffs, if the data was sufficiently robust. The collection of reference costs would be an annual process that would allow us to review the appropriate level for the tariff each year. We will also review the appropriateness of tariffs for education and training if any changes are made to the way service is funded."¹⁴⁶

HOI noted in their discussion paper that it has been acknowledged in the UK that costing of teaching and training "presents many challenges and is difficult to undertake, particularly from the perspective of determining the boundary issues as to the point at which service ends and training starts, and defining the 'outputs' of a product unit." The paper also noted that 'NHS Foundation Trusts are already concerned that the training responsibilities leave them with costs, which are explicit, such as teaching staff costs, and hidden costs such as slower activity to accommodate training time e.g. in theatre, outpatients and during ward rounds.'¹⁴⁷

A.8.2 United States

In the United States, students training to be physicians attend four years of medical school, typically paying most of those costs directly or through loans. Upon graduation, they receive their MD degrees and finish their preparation as residents. During this period, they see and treat patients under the supervision of more seasoned physicians. This training usually takes place in hospital settings. On average, physicians spend four years in graduate training, although the length of training in highly specialised fields is several years longer.¹⁴⁸

The federal government is the largest single supporter of Graduate Medical Education (GME) through Medicare, Medicaid and other Departments such as Defence. Other funding sources for GME are states and private insurers through payments they negotiate with teaching hospitals which are typically higher than what they pay other hospitals.¹⁴⁹

In federal fiscal year 2011, the Medicare program paid hospitals that train residents approximately \$3.2 billion dollars in Direct Graduate Medical Education (DGME) funds, out of approximately \$15 billion in DGME-related costs.¹⁵⁰ DGME payments cover a portion of the direct costs of training residents, such as residents' stipends and benefits, teaching

¹⁴⁵ *ibid*

¹⁴⁶ *ibid*

¹⁴⁷ Health Outcomes International (2010). 'ABF teaching, Training and Research Workstream Scoping Study: National Workshop Discussion Paper', prepared for the Commonwealth Department of Health and Ageing

¹⁴⁸ Downer, C. (2012). 'Health Policy Brief: Graduate Medical Education', Health Affairs, August 16, 2012.

¹⁴⁹ *ibid*.

¹⁵⁰ Association of American Medical Colleges (2013). 'Medicare Payments for Graduate Medical Education: What Every Medical Student, Resident, and Advisor Needs to Know'.

physicians' salaries, other direct costs (e.g. a GME office to administer programs, accreditation fees, educational space) and related overhead expenses. The amount each hospital receives for DGME is based on the number of residents it is allowed to count, the percentage of its inpatient population that is comprised of Medicare beneficiaries, and its hospital-specific Per Resident Amount (PRA). The PRA was determined for each teaching hospital in the 1980s and is updated each year by an inflation factor. Because DGME payments are based on historical costs, they are not related to the current costs the hospital incurs for training residents.¹⁵¹ In 2010, the National Commission on Fiscal Responsibility and Reform recommended reducing DGME to equal 120% of the national average of a resident's salary.

Teaching hospitals also receive an Indirect Medical Education (IME) adjustment from Medicare. These payments are designed to reimburse hospitals for:

- Increased patient care costs associated with treating more complex patients;
- Direct costs associated with the salaries of the residents and supervising physicians' time; and
- Indirect costs associated with other hospital expenses such as running training programs, longer inpatient stays and more use of tests.

Studies have shown that teaching hospitals are more costly than non-teaching hospitals with recent research finding that the increased cost is explained by the teaching mission and underutilised technological capabilities. An example of the costs associated with the teaching mission is the extra time required for surgery in a teaching hospital. The indirect medical education calculations are complicated and controversial and there are estimates that indirect payment levels may be \$3.5 billion higher than actual indirect costs.¹⁵²

The following issues regarding the funding of medical training are currently being debated in the US:

- Are enough doctors being trained vs. the impacts of too many physicians – such as greater healthcare supplied to people, including care that may be unnecessary or even harmful;
- Whether federal support should be directed to funding training of other types of health care professionals e.g. nurse practitioners and physician assistants;
- Whether federal support should be tied to achieving certain outcomes such as higher levels of competence among trainees, being trained in systems where community based ambulatory care is integrated with hospital care and the use of health information technology; and
- Balancing the distribution of physicians across urban and rural areas. Policies to address this include providing loan repayments or scholarships for medical school, residency cap exemptions for rural hospitals and telemedicine links between rural and urban hospitals.

¹⁵¹ *ibid.*

¹⁵² Downer, C. (2012). 'Health Policy Brief: Graduate Medical Education,' Health Affairs, August 16, 2012.

The debate of these issues is expected to continue into 2014, with the Macy Foundation funding the Institute of Medicine to study and issue a report on GME financing in 2014.¹⁵³

A.8.3 France

A specific budget ('Budget for General Interest Mission and Contacting Promotion'; MIGAC) applies to special services that are defined by the Ministry of Health and allocated by the Regional Hospital Agencies. This includes activities associated with teaching and training, research and innovation.¹⁵⁴

A.8.4 Germany

There are a number of surcharges that hospitals may negotiate including surcharges to major university teaching hospitals that provide highly specialised care and are characterised by a highly complex casemix and to teaching and research.¹⁵⁵

A.8.5 Italy

Regions are generally advised to use a nationally uniform tariff. However some regions differentiate the tariff according to provider profit status. Almost all regions differentiate tariffs according to selected provider characteristics such as activities performed (e.g. research activity). Five regions have developed a regional tariff on the basis of local cost assessments; the majority have adopted the national tariff (with or without amendments).¹⁵⁶

A.8.6 Norway

There is a high proportion of funding through global budgets. Global budgets comprise four components including a cost component per DRG equivalent to compensate for research and training.¹⁵⁷ The regional health authorities receive the grant from the state based on the degree of research activity. Teaching hospitals receive two grants: one to cover teaching and research, and the other to finance the treatment of complex and costly patient cases.

A.8.7 Sweden

Research, development and education are usually covered by special grants according to national guidelines that specify the corresponding costs. It has, however, been noted that the calculation of these costs has remained a 'grey zone'.¹⁵⁸

A.8.8 Finland

In Finland, the Ministry of Social Affairs and Health sets the total annual budget for teaching and research which is then divided into a teaching budget and a research budget. These

¹⁵³ Downer, C. (2012). 'Health Policy Brief: Graduate Medical Education,' Health Affairs, August 16, 2012.

¹⁵⁴ London School of Hygiene and Tropical Medicine (2006). 'Reimbursing highly specialised hospital services: the experience of activity-based funding in eight countries'.

¹⁵⁵ ibid

¹⁵⁶ ibid

¹⁵⁷ ibid

¹⁵⁸ ibid.

budgets are allocated to hospitals according to their teaching and research outputs. Consequently, the unit price paid for teaching and research output varies annually due to changes in the output volumes and the total budget.¹⁵⁹

Since 1995, research costs have been reimbursed on the basis of the output of refereed and published scientific articles, and medical dissertations. The impact factor of the publishing journal is used to weight each article and the payment to each hospital is based on the weighted sum of publications. The impact factor is a citation index compiled for scientific journals by the Institute of Scientific Information. Impact factors have been used for ranking, evaluating, categorizing, and comparing journals, but they are only a crude approximation of true research output.¹⁶⁰

¹⁵⁹ Linna, M. and Häkkinen, U. (2006), 'Reimbursing for the costs of teaching and research in Finnish Hospitals: a stochastic frontier analysis', the International Journal of Health care, Finance and Economics, March 2006; 6(1): 83-97'.

¹⁶⁰ *ibid.*

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