Review of non-admitted classifications Final Report

Final

20 February 2014

Acronyms and abbreviations

Acronym/ abbreviation	Description
ABF	Activity Based Funding
ACG	Adjusted Clinical Groups
ACCS	Ambulatory Care Classification System
APCs	Ambulatory Patient Classifications
APGs	Ambulatory Patient Groups
CCI	Canadian Classification of Intervention
CIHI	Canadian Institute for Health Information
CMS	Centers for Medicare and Medicaid
CAC	Clinical Advisory Committee
CACS	Comprehensive Ambulatory Care System
CPT	Current Procedural Terminology
DACS	Developmental Ambulatory Classification System
DCG	Diagnostic Cost Groups
DHBs	District Health Boards
HCPCS	Healthcare Common Procedure Coding System
HRGs	Healthcare Resource Groups
HCRS	Home Care Reporting System
HHA	Home Health Agency
HHRGs	Home Health Resource Groups
HRG4	HRG version 4
IHPA	Independent Hospital Pricing Authority
ICD-10	International Statistical Classification of Diseases and Related Health Problems, Tenth Revision
IR-DRGs	International Refined-DRGs
interRAI-CA	InterRAI–Contact Assessment
MACs	Major Ambulatory Clusters
NACRS	National Ambulatory Care Reporting System
NEP	National Efficient Price
NHRA	National Health Reform Agreement
NHS	National Health Service
NHCDC	National Hospital Cost Data Collection
NNPAC	National Non-Admitted Patient Collection
NWAU	National Weighted Activity Units
NACAWG	Non-Admitted Care Advisory Working Group
OPCS-4	Office of Population Censuses and Surveys Classification of Interventions and Procedures
OASIS	Outcome and Assessment Information Set
HOPPS	Outpatient Prospective Payment System
OPPS	Outpatient Prospective Payment System
PbR	Payment by Results
PwC	PricewaterhouseCoopers

PPS	Prospective Payment System
RIV	Reduction in Variance (R2)
RAI-HC	Resident Assessment Instrument–Home Care
RIW	Resource Intensity Weights
TFCs	Treatment Function Codes
US	United States of America
WHO	World Health Organisation

Executive summary

Introduction

Expenditure on health in Australia was estimated to be $140.2 billion in 2011-12, up from $82.9 billion in 2001-02. This expenditure represented 9.5% of GDP in 2011-12, up from 8.4% in 2001-02. The largest components of health spending were public hospital services ($31.8 billion), followed by medical services ($18.1 billion) and medications ($14.2 billion).[1]

While around 70% of the health budget is spent on care delivered to hospital inpatients, it is well understood that hospital care is costly – financially, in hospital acquired conditions, and in disruption to normal independent living patterns. Increasingly, health systems around the world are working to reserve hospital admission for only those services that cannot be delivered in ambulatory or community settings.

A key driver for the development of a non-admitted classification system that can support Activity Based Funding (ABF) funding is the high volume of non-admitted services provided in Australia. The Round 15 (2010/11) National Hospital Cost Data Collection reported 5.27 million non-admitted service events. The development of a non-admitted classification system that reliably differentiates resource utilisation for non-admitted services is important infrastructure to the viability of these services in Australia.

PricewaterhouseCoopers (PwC) has been engaged by the Independent Hospital Pricing Authority (IHPA) to undertake a review of existing non-admitted patient care classifications and recommend a new or revised classification to support ABF in non-admitted services. The project objectives were to:

- Develop criteria against which to assess non-admitted classification systems including classification principles such as clinical meaningfulness, patient centricity and resource homogeneity

- Investigate existing local and international classification systems relative to the criteria developed and the existing Tier 2 Non-Admitted Services classification (Tier 2) models for patient services provided in outpatient, community and outreach settings

- Identify feasible and preferred non-admitted classification systems for use nationally – based on the investigation above

- Pending agreement on a preferred non-admitted classification system, develop a recommended approach for the development/implementation of the new or existing classification.

Project phases and findings

The project methodology had a 4 phase approach:

1   **Key informant Interviews**. In phase 1 of the non-admitted classification review we met with IHPA key experts, members of the Non-Admitted Care Advisory Working Group (NACAWG), IHPA's Clinical Advisory Committee (CAC) and local and international classification experts. A key objective of phase 1 was to obtain feedback on Tier 2 and identify classification systems deemed relevant to consider for inclusion in a literature review. Findings included:

    –   There is increasing use of non-admitted services as part of the drive for cost efficiency in care delivery and therefore an increasing need for non-admitted classification that accurately reflects the activity and cost of these services

    –   There is considerable diversity in the delivery of non-admitted care services both in regards to the patients' care requirements and the models of care in use

    –   There are inconsistent business rules and definitions for non-admitted services

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1   Health Expenditure Australia 2011-2012. AIHW. September 2013

- Limitations in the reported data have undermined development of the non-admitted classification system

- There is inconsistent interpretation of counting rules for service events

- The current system is subject to gaming and disincentivises some models of care, specifically multidisciplinary care and telehealth

- Stakeholders have specific recommendations regarding non-admitted classification development that builds on existing systems and adds data elements to better reflect resource utilisation.

2   **A literature review** was completed as phase 2 of the project (see Attachment 1). The objective of the literature review was to identify relevant non-admitted international classification systems and provide an overview of these systems: their development history; the data elements that underpin those classifications; and the counting and funding rules that apply to each system. Eleven non-admitted classifications in use in the US, England, Canada, New Zealand and Ireland were reviewed as well as eleven sub-classification, underlying datasets or primary care classifications.

Canada	• Comprehensive Ambulatory Care System (CACS) • Home Care Reporting System (HCRS).
United States of America	• Ambulatory Patient Classifications (APCs) • Adjusted Clinical Groups (ACGs) • Diagnostic Cost Groups (DCGs) • Home Health Resource Groups (HHRGs).
England	• Healthcare Resource Groups (HRGs).
Ireland	• Tier 2.
New Zealand	• National Non-Admitted Patient Collection (NNPAC).
3M	• Ambulatory Patient Groups (APGs) • International Refined- DRGs (IR-DRGs).

3   **A consultation workshop** was held in phase 3 of the project (see Attachment 2). The objectives of the workshop were to discuss and understand the various perspectives on the criteria that should be applied to the development of non-admitted classification in Australia; and the options related to counting rules, data elements and other cost drivers that will underpin non-admitted classification. Participants representing IHPA, NACAWG and CAC and other classification experts participated via videoconferencing facilities in Sydney, Melbourne, Perth, Brisbane, Canberra, Adelaide and Hobart. The findings of the workshop were:

Principles/criteria to consider in the development of a classification system[2]

- Comprehensive, mutually exclusive and consistent

- Clinically meaningful

- Resource use homogeneity

- Patient based

- Simple and transparent

- Minimising undesirable and inadvertent consequences

- Capacity for improvement

- Utility beyond activity based funding

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2   The final principles have been harmonised with those of the ED classification project in order to create a single set of principles to guide IHPA classification development.

- Administrative and operational feasibility.

The unit of count for non-admitted services within the classification

A key finding from the international literature review was that there are two types of counts used in non-admitted classification: a *service event*, where one patient visit (attendance) is classified as one unit of count and counting rules determine how procedures or interventions are bundled; or an *episode*, where all activity within a defined time period is considered one unit of count. Participants discussed the applicability and strengths and weaknesses of each unit of count.

Many participants acknowledged that the service event unit of count and the time based unit of count both had a place in the non-admitted patient care classification. It was noted that using both counting units to form a hybrid approach may be an option. The overarching feedback on determining appropriate counting rules was that data should be collected at the most granular level practical, in order to test a series of bundling rules that group the data to the highest level that achieves resource homogeneity.

The data elements captured as part of the non-admitted classifications

The workshop participants explored the benefits and weaknesses of incorporating data related to: *service descriptions* (procedures/interventions); *diagnoses*; and *other patient characteristics* (such as age and functional status). While some data elements were identified as stronger cost drivers than others there was consensus that all should be included, with some caution about the timing of implementation and the need to run studies in advance of national roll out.

Other cost drivers to be considered in the development of the classification

The discussion around other cost drivers that should be considered centred around multi/interdisciplinary care with a common view that extra time and resources are required for this care model which is not properly considered in the Tier 2 system. Other cost drivers such as transport costs incurred in the home based setting, remoteness, carer support, transfers to hospital and level of community support were also raised and discussed.

4   **Recommendations and proposed roadmap for the development of the non-admitted classification**. In the fourth phase of the project we analysed the information from the literature reviews and consultations, and undertook a national survey related to implementation issues. The survey was a non-representative sample of clinicians and administrative stakeholders in non-admitted classification, distributed via NACAWG members, regarding the types and methods of data collected (see Appendix A). The findings from all phases of the project were assimilated to develop recommendations and propose a roadmap for the future development of a feasible non-admitted classification system.

The report that follows is the final report which:

- Assesses, relative to the agreed classification development criteria, the feasibility of using one of the international classification systems reviewed or Tier 2 as the preferred non-admitted classification systems for use nationally

- Proposes a series of recommendations for the development of an enhanced non-admitted classification system and a timed roadmap related for that development.

Analysis of existing local and international classification systems relative to the criteria

Each international classification included in the literature review and the existing Tier 2 Australian system has been assessed against the principles developed for the non-admitted classification to assess their appropriateness for adoption in the Australian context (see Chapter 3).

The analysis concluded that the existing Tier 2 classification system is not considered appropriate as the long term non-admitted classification in Australia and there are substantial barriers to adoption of any of the international classification systems reviewed.

The analysis of Tier 2 concurred with the feedback received during the key informant interviews – that Tier 2 is not optimal as Australia's long term non-admitted classification. Although it is simple to use and already in operation, Tier 2 does not align to the agreed classification principles in the following regards:

- **Comprehensive, mutually exclusive and exhaustive** – some procedures can be classified under multiple Tier 2 classes

- **Clinically meaningful** – there is variable interpretation/application of counting rules by different providers and different jurisdictions

- **Resource use homogeneity** – Tier 2 has been shown to explain between 24% – 32% of cost variation[34] and internal IHPA data analysis suggests that particular classes are not resource homogenous.

- **Patient based** – The existing Tier 2 system categorises a hospital's non-admitted services based on the nature of the service provided and the type of clinician providing the service. As such Tier 2 classifies based on a single variable procedure or medical consultation or diagnostic service or allied health/nurse intervention.

The analysis of the eleven international classification systems reviewed concluded that there are substantial barriers to uptake of any of the classifications or code sets reviewed.

- Many of the international classifications did not align well to the Australian defined scope of non-admitted care. Some covered emergency or inpatient services as well as non-admitted services, and most tended to exclude the home setting from the classification, or were applicable only to the home setting

- Not all of the internationally developed classifications are currently used for funding and therefore it is not possible to assess how they would perform in the Australian non-admitted context. Of those that currently support a funding methodology, limitations exist in terms of how they align to the following principles:

  - **Simple and transparent** – many of the international systems were built to use local procedure or diagnosis code-sets, requiring further study to assess the feasibility of their adoption in Australia

  - **Capacity for improvement** – several of the classifications reviewed require purchase of a license for use of the classification and in all the reviewed classifications development would be conducted by the public or private entity who own the classification or underlying code sets

  - **Administrative and operational feasibility** –most international classifications in use for funding are developed to suit their national context, specifically, the structure and policy needs of the country and are not easily aligned to the Australian context. For example, in the UK, prices are set in part at a national level and in part at a local level.

This review therefore recommends that a new classification system be developed. The report sets out recommendations to develop the new classification system and indicative timing for the stages of development and transition from Tier 2.

Recommendations

The report that follows sets out four overarching recommendations for the future development of a non-admitted classification system: develop the new classification system; establish the foundations; implementation planning; and ongoing classification development.

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3   For 1% of Australia's hospitalised ambulatory encounters where data were not adjusted for outliers, untrimmed data. When trimmed, clinic type was an even stronger predictor, explaining 32% of cost variation.

4   Cleary M., Michael R. & Piper K. 1998, 'Outpatient Costing and classification: are we any closer to a national standard for ambulatory classification systems?', in *Medical Journal of Australia* 169(8) pp. 26-31, available <https://www.mja.com.au/journal/1998/169/8/outpatient-costing-and-classification-are-we-any-closer-national-standard>, viewed 28 July 2013.

The proposed implementation timeline sets out an 18 month work plan. This accelerated timeline assumes multiple streams of work are carried out simultaneously commencing early in 2014 with an aim of developing the first version of the non-admitted classification grouper in FY14-15, collection of data in FY15-16 and allowing a period of analysis and refinement before the incorporation into National Efficient Price weights to take effect in FY 18-19 or FY19-20.

Recommendation 1 – Develop a new classification system

Develop a new classification system for non-admitted patient care services to support ABF, building on the lessons learnt from the international experience of non-admitted classification development, ie to include data elements that have been proven to be cost drivers in outpatient and home based settings, and using existing Australian code sets. Obtain clearances and approvals from NACAWG and the Pricing Authority to develop the non-admitted classification system.

Recommendation 2 – Establish the foundations

a   Build the foundations of a classification based on statistical testing of the use of procedure, diagnosis and other available data variables to confirm the explanatory power. Both a service event based unit of count as well as a time based episode unit of count should be considered based on international practice. Statistical testing should identify the variables to be included in two versions of a grouper – one for each unit of count

b   Collect cost information from pilot sites under the proposed classification groupers to enable the classification to be tested with actual cost data to evidence its ability to explain resource variation. The testing should also include testing of funding/bundling rules, for example age, Aboriginal and/or Torres Strait Islander status, area of usual residence; as well as use of a multi-disciplinary flag in new data collection.

Recommendation 3 – Implementation planning

The development of an implementation plan should be carried out concurrently with establishing the foundations of the classification system.

a   Undertake a stock-take by jurisdiction of existing dataset collections and infrastructure requirements to support patient level data collection required for the classification system

b   Create procedures and diagnoses 'short lists', for example consider mapping Tier 2 clinic lists to procedure and diagnoses sets using the Australian Classification of Healthcare Interventions (ACHI) procedure set and the International Statistical Classification of Diseases and Related Health Problems, Tenth Revision, Australian Modified (ICD-10-AM) diagnoses set

c   Obtain necessary approvals for changes to the ABF non-admitted patient care data collections: Non-admitted patient Data Set Specifications (DSS); and Non-admitted patient care aggregate National Minimum Data Set (NMDS). Once the additional data elements required for the classification system have been identified, changes to either the national minimum dataset or the national datasets will need to be obtained from the National Health Information Standards and Statistics Committee (NHISSC), and the National Health Information and Performance Principal Committee (NHIPPC).

Recommendation 4 – Ongoing classification development

The fourth recommendation addresses the need to establish governance and processes for the ongoing classification development cycle.

This enables prioritisation of additional studies that should be undertaken over time regarding additional data variables that could improve the explanatory power of the classification and support the refinement/development of counting and funding rules. For example, additional variables raised during consultations in this review include: initial or subsequent visit, and the use of functional measures (especially for subacute and home delivered care).

Executive summary

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1.1 Non-admitted care in Australia

Expenditure on health in Australia was estimated to be $140.2 billion in 2011-12, up from $82.9 billion in 2001-02. This expenditure represented 9.5% of GDP in 2011-12, up from 8.4% in 2001-02. The largest components of health spending were public hospital services ($31.8 billion), followed by medical services ($18.1 billion) and medications ($14.2 billion). [5]

As a result of the National Health Reform Agreement (NHRA) signed by all First Ministers in 2011, the public hospital sector is in a major process of re-design that is underpinned by a nationally consistent Activity Based Funding (ABF) model which will over time create transparency over measures of casemix, activity and costs.

While around 70% of the health budget is spent on care delivered to hospital inpatients, it is well understood that hospital care is costly – financially, in hospital acquired conditions, and in disruption to normal independent living patterns. Increasingly, health systems around the world are working to reserve hospital admission for only those services that cannot be delivered in ambulatory or community settings.

There is increasing use of non-admitted services to avoid or substitute for hospital care. A key driver for the development of a non-admitted classification system that can support ABF funding is the high volume of non-admitted services provided in Australia. The Round 15 (2010/11) National Hospital Cost Data Collection reported on data for 5.27 million service events with an average cost of $322 per service event[6]. From this, an indication of expenditure on non-admitted care is at least $1.7 billion if the number of service events is multiplied by the average cost. This is 1.3% of total health expenditure in 2010/11 and 5.4% of public hospital services in 2010/11.

1.2 Project objectives and scope

PricewaterhouseCoopers (PwC) was engaged by the Independent Hospital Pricing Authority (IHPA) to undertake a review of existing non-admitted patient care classification system and recommend a new or revised classification for ABF.

The project objectives were to:

1   Develop criteria against which to assess non-admitted classification systems including classification principles such as clinical meaningfulness, patient centricity and resource homogeneity

2   Investigate existing local and international classification systems relative to the criteria developed and the existing Tier 2 Non-Admitted Services classification models for patient services provided in outpatient, community and outreach settings

3   Identify feasible and preferred non-admitted classification systems for use nationally – based on the investigation above and consultations with stakeholders

4   Pending agreement on a preferred non-admitted classification system, develop a recommended approach for the development/implementation of the new or existing classification.

The project scope is to consider the longer-term non-admitted classification development.

- **Mental Health** – It is expected that when any new or significantly revised non-admitted classification is implemented, the Australian Mental Health Care classification will be in place. For this reason, mental health is out of scope for the non-admitted classification review project

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5   Health Expenditure Australia 2011-2012. AIHW. September 2013

6   IHPA 2013, National Hospital Cost Data Collection Australian Public Hospitals Cost Report 2010-2011, Round 15, IHPA, Sydney.

- **Non-admitted subacute** – IHPA is undertaking a procurement of a consultancy to develop AN-SNAP version 4. Non-admitted subacute care is in scope for both the PwC consultancy, and the consultancy to develop AN-SNAP version 4. A decision on the most appropriate way to classify non-admitted subacute care will be made following the conclusion of both the non-admitted and subacute consultancies.

1.3   Classification systems

A classification is a set of related categories in a meaningful hierarchical structure. At each level of the classification, children categories are mutually exclusive and jointly exhaustive of their parent.

In an activity based funding environment there is an important distinction between the role of a classification in differentiating between patient classes and those characteristics of care delivery that are addressed via funding rules, such as:

- A classification system supports clinical categorisation based on patient dependent variables. This enables consistency in categorisation agnostic of the care setting and enables analysis of the elements of cost that are driven by patient characteristics

- Funding approaches support policy objectives and provide incentives for efficiency, effectiveness, quality and innovation.

This distinction between the role of a classification and the role of a funding methodology enables local variation in models of care (independent variables) as well as valid benchmarking of costs and outcomes of care.

Classification systems are not always used to support funding models but typically progress through the following stages as they mature (are developed) for use in funding:

- Initial collection of the data elements required to classify care delivery at the patient level

- Collection of patient level costing information and cost studies matching classified activity with patient level costs and analysis of the reduction in variance (RIV/R2)

- Continued refinement/development of the classification, including grouping of data, based on costing and R2 analysis

- Once the classification reaches a level of maturity and reliability (usually evidenced by a strong RIV/R2 score), it is used to inform price weights. Price weights and funding rules form a funding model that can also be continuously reviewed and updated.

1.4   Approach

The project methodology had a 4 phase approach:

1   **Key informant Interviews**. In phase 1 of the non-admitted classification review we met with IHPA key experts, members of the Non-Admitted Care Advisory Working Group (NACAWG), IHPA's Clinical Advisory Committee (CAC) and local and international classification experts. A key objective of phase 1 was to obtain feedback on Tier 2 and identify classification systems deemed relevant to consider for inclusion in a literature review

2   **A literature review** was completed as phase 2 of the project (see Attachment 1). The objective of the literature review was to identify relevant non-admitted international classification systems and provide an overview of these systems: their development history; the data elements that underpin those classifications; and the counting and funding rules that apply to each system. Eleven non-admitted classifications in use in the US, England, Canada, New Zealand and Ireland were reviewed as well as eleven sub-classification, underlying datasets or primary care classifications

3   **A consultation workshop** was held in phase 3 of the project (see Attachment 2). The objectives of the workshop were to discuss and understand the various perspectives on the criteria that should be applied

to the development of non-admitted classification in Australia; and the options related to counting rules, data elements and other cost drivers that will underpin non-admitted classification. Participants representing IHPA, NACAWG and CAC and other classification experts participated via videoconferencing facilities in Sydney, Melbourne, Perth, Brisbane, Canberra, Adelaide and Hobart

4   **Recommendations and proposed roadmap for the development of the non-admitted classification**. In the fourth phase of the project we analysed the information from the literature reviews and consultations, and undertook a national survey related to implementation issues. The survey was a non-representative sample of clinicians and administrative stakeholders in non-admitted classification, distributed via NACAWG members, regarding the types and methods of data collected (see Appendix A). The findings from all phases of the project were assimilated to develop recommendations and propose a roadmap for the future development of a feasible non-admitted classification system.

2 Findings from the literature review and consultation processes

2.1 Summary of findings from key informant interviews

Approximately 30 individual meetings were held with both local and international key informants to discuss Tier 2 and other classification systems in use. The seven key themes that emerged from these consultations are summarised below.

- There is increasing use of non-admitted services as part of the drive for cost efficiency in care delivery and therefore an increasing need for non-admitted classification that accurately reflects the activity and cost of these services

- There is considerable diversity in the delivery of non-admitted care services both in regards to the patients' care requirements and the models of care in use

- There are inconsistent business rules and definitions for non-admitted services

- Limitations in the reported data have undermined development of the non-admitted classification system

- There is inconsistent interpretation and application of counting rules for service events

- The current system is subject to gaming and disincentivises some models of care, specifically multidisciplinary care and telehealth

- Stakeholders have specific recommendations regarding non-admitted classification development that builds on existing systems and adds data elements to better reflect resource utilisation.

Further detail on stakeholder commentary and findings are available in Attachment 2 to this report.

2.2 Summary of findings from literature review

A literature review was completed as phase 2 of the project. The objective of the literature review was to identify relevant non-admitted international classification systems and provide an overview of these systems: their development history; the data elements that underpin those classifications; and the counting and funding rules that apply to each system. The full literature review is included as Attachment 1 to this report.

The information gathered from the phase 1 interviews, together with the application of the research questions in a search of the grey literature and peer reviewed journals resulted in identification and inclusion of the following eleven classifications reviewed in the literature review:

- Canada   Comprehensive Ambulatory Care System (CACS)
                                    Home Care Reporting System (HCRS).
- United States of America   Ambulatory Patient Classifications (APCs)
                                    Adjusted Clinical Groups (ACGs)
                                    Diagnostic Cost Groups (DCGs)
                                    Home Health Resource Groups (HHRGs).
- England   Healthcare Resource Groups (HRGs).
- Ireland   Tier 2.
- New Zealand   National Non-Admitted Patient Collection (NNPAC).
- 3M   Ambulatory Patient Groups (APGs)
                                    International Refined- DRGs (IR-DRGs).

Each of eleven classifications international classifications were reviewed in terms of their:

- Structure

- Unit of count

- Implementation and use in funding.

Inputs to the literature review included policy documentation as well as literature where identified and publically available. The findings of the literature review are summarised below:

Structure

The researched non-admitted classifications are variable in the scope of care settings to which they apply and use a variety of dimensions within their structures.

The literature review revealed there are two key types of data collected by the various non-admitted classifications reviewed. These are:

- **Service descriptions**: procedures, interventions and time are seen as key cost drivers and many classification hierarchies lead with procedures and interventions

- **Patient characteristics**: including age and diagnosis were more likely to be a secondary axis after procedure, intervention or other service descriptors. Using patient dependent variables enables consistency in categorisation that is agnostic of the care setting and supports benchmarking. Diagnosis data has been deemed as not indicative of resource use within a single encounter, but is the basis of some episode based classifications. Internationally, diagnosis data is widely collected and frequently uses International Classification of Diseases (ICD) codes. Patient characteristics also include functionality, which is a feature of some home-based care classifications.

While there is country specific variation in the underlying procedure codes used to build non-admitted classifications, there is generally consistent use of the International Classification of Disease (ICD) coding. This is shown in Table 1 below.

Table 1:   Key inputs to the classification

Classification	Diagnosis codes	Procedure codes	Key patient characteristics
Tier 2		T2 1 series	
Canada – CACS	ICD	CCI Investigative technology	Eg Age
Canada – HCRS			Eg Functionality
USA – APC	ICD	HCPCS/CPTs	
USA – ACG	ICD		
USA – DCG	ICD		Eg Age, gender and Medicaid status
USA – HHRG	ICD		Eg Functionality and available caregiver
England – HRG	ICD	OCSP4.6	
Ireland		T2 1 series	
NZ – NNPAC			Eg Age

Classification	Diagnosis codes	Procedure codes	Key patient characteristics
3M – EAPGs	ICD	HCPCS/CPTs	
3M – IR-DRGs	ICD	Accommodates country specific modifications and procedure coding systems	

The literature findings regarding classification structure suggests that the service delivered, or intervention, is deemed the most appropriate indicator of resource use with funding rules designed to discourage perverse incentives, such as providing more services than necessary[7]. Non-admitted classifications tend to lead their hierarchies with procedures and interventions over diagnoses. While patient characteristics including age and diagnosis were commonly used, patient characteristics were more likely to be a secondary axis after procedure, intervention or other service descriptors. Time or time surrogate is also used in some classifications.

Unit of count

There are a variety of counting rules in use by the different non-admitted classification systems, from a granular count of procedures through to counting individual visits/attendances or count of all services within a defined time band/episode. There are variable approaches to the counting and funding of 'multi-disciplinary' care delivery.

The unit of count within a classification aims to capture the service that is provided either for reporting purposes or to feed into funding models. The three methods used internationally for counting non-admitted services are:

1   The *service event* classifies one patient visit as the unit of count that is classified. The visit may contain a number of procedures or interventions that were delivered and are bundled together in one unit of count. Conversely, the count may be driven by the main procedure conducted. Service event counts are used in: the Canadian CACS, the US APC system, England's HRG system, and New Zealand's NNPAC, which groups service interventions to define one event.

2   The second method is to count an *episode* where a defined time period is set and all activity within this period forms one unit of count. This occurs in both the Canadian HCRS and the US HHRG, which are classifications dedicated care delivered in the home. The Irish Tier 2 system has a series of rules, which if met will group all services that fall within a 28 day period following a discharge from hospital. Similarly, England's HRG system count can extend to a year of care for long term conditions.

3   The third method is an extension of the episodic counting whereby a unit of count includes all services delivered with a year and supports an annual capitation payment. ACGs and DCGs are based on a capitated payment to ambulatory/primary care providers based on all diagnoses coded during a year.

The variety in the counting rules is linked to the interdependence with the funding rules in each country. This review illustrates a diverse range of rules in unit of count used in non-admitted services. Table 2 shows a comparison of the unit of count across the reviewed classification systems.

Table 2:   Unit of count for non-admitted patient care classifications

Classification	Service event	Time based (episode of care)	Annual Capitation payment	Associated funding rule
Tier 2	✓			Payment determined by main procedure
Canada – CACS	✓			Not linked to funding at a national level (but is at the provincial level in some provinces)

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7   Goldfield N. et al 2008, 'Ambulatory Patient Groups Version 3.0 – A classification System for Payment of Ambulatory Visits', Journal of Ambulatory Care Management, 31(1) pp. 2-16.

Classification	Service event	Time based (episode of care)	Annual Capitation payment	Associated funding rule
Canada – HCRS		✓		Not linked to funding
USA – APC	✓			Packaging and discounting rules apply to bundle multiple procedures/diagnoses
USA – ACG			✓	Annual capitation payment
USA – DCG			✓	
USA – HHRG		✓		Episode is funded as a 60-day period of care
England – HRG	✓			Multiple procedures/diagnoses are bundled
Ireland	✓	✓		Payments based on service events or in some circumstances, a 28 day episode linked to a discharge from admitted care
NZ – NNPAC	✓			Not linked to funding
3M – EAPGs	✓			Packaging and discounting rules apply to bundle multiple procedures/diagnoses
3M – IR-DRGs	✓			Packaging and discounting rules apply to bundle multiple procedures/diagnoses

Implementation and use in funding

Not all of the classifications reviewed are currently used to support funding, and others have progressed along a continuum of maturity from use in reporting of activity to use in supporting funding. This progression includes the collection of required data elements and costing information to refine the classification, as evidenced by improving reduction in variance (RIV/R2) scores and eventual development of price weights. As part of an ongoing classification development cycle, price weights form the inputs into the funding model, and are continuously reviewed and updated.

Classifications develop and mature over time, expanding their utility from activity reporting to costing and funding. Measurement of the 'reduction in variance', the 'R-squared' (R2) statistic, is useful in assessing the performance of a classification in achieving resource homogeneity. The following findings were identified from the literature review:

- The key cost driver in non-admitted s*ervice events* is procedures/interventions (diagnosis has not been shown to be a good indicator of resource use for a single non-admitted encounter)

- Diagnosis is a good indicator of resource use in an episode. Chronic conditions and defined treatment protocols (such as dialysis) demonstrate a better R2 based on diagnosis over an episode (including capitation)

- Functional status and additional patient characteristics, such as living situation, are cost drivers in home delivered care.

It is important to note there is not a lot of published research regarding the current RIV/R^2 measures of performance across these classifications (with most published studies being outdated). Many of the studies found identify the high variation in resource use across classifications and identify gaps in cost data as a limitation to the analysis. In order to make a true quantitative assessment of the extent to which different classifications explain resource variation in Australia it would be necessary to apply the different classifications to the same patient data-set. R^2 are more readily available for classifications that support capitated payments

and report that inclusion of diagnosis is an important factor to raise predictable power of a risk-adjusted model, but that they do not generally achieve high predictive scores in absolute terms.

Table 3: Extent of classification system use

	Use in funding	Ongoing costing studies	Regular classification development cycle	Use in reporting and data analysis
Tier 2	✓			✓
Canada – CACS		✓	✓	✓
Canada – HCRS				✓
USA – APC	✓	✓		✓
USA – ACG	✓	✓	✓	✓
USA – DCG	✓	✓	✓	✓
USA – HHRG	✓			✓
UK – HRG	✓	✓	✓	✓
Ireland	✓	✓		✓
NZ – NNPAC				✓
3M – EAPGs	✓			✓
3M – IR-DRGs				✓

2.3 Principles in classification development

A set of 9 principles were identified through the course of the review of non-admitted patient care classifications. These principles were refined through each phase of the project and are also consistent with the principles used by IHPA in the development of the emergency department classification and the mental health classification. Principles to consider in the development of a classification system are:

- Principle 1: Comprehensive, mutually exclusive and exhaustive

- Principle 2: Clinically meaningful

- Principle 3: Resource use homogeneity

- Principle 4: Patient based

- Principle 5: Simple and transparent

- Principle 6: Minimising undesirable and inadvertent consequences

- Principle 7: Capacity for improvement

- Principle 8: Utility beyond activity based funding

- Principle 9: Administrative and operational feasibility

These principles form the basis of criteria to evaluate and guide classification as described below.

2.3.1   Principles

Principle #1: Comprehensive, mutually exclusive and exhaustive

Criteria

- The classification is comprehensive, with all possible cases (episodes) within the scope of the classification able to be grouped to a class
- Should be able to be applied to all non-admitted care services in scope of activity based funding and perform similarly (clinically and statistically) when applied to different models and/or settings of care
- Classes within the classification are mutually exclusive, with every case (episode) in scope only be able to be grouped to a single class
- Class definitions and assignment to classes are clear, consistent and unambiguous.

Principle #2: Clinically meaningful

Criteria

- The underlying data elements are useful for clinical management purposes in addition to funding purposes
- Should group patients with similar clinical and other characteristics and/or requiring similar treatment
- The data element makes sense to clinicians, and aligns with the language used by clinicians for clinical management of their patients.

Principle #3: Resource use homogeneity

Criteria

- Events (episodes) should be assigned to classes with similar levels of resource use
- Estimates of resource use within classes should be stable over time
- When applied prospectively, the classification should explain a substantial level of the cost variation between classes, while minimising the variability of costs within each class.
- When assessing an individual data element for its inclusion in the classification, there is strong evidence that the data element explains variation in costs over and above other cost drivers.

Principle #4: Patient based

Criteria

- Should be based on data elements that reflect the characteristic of patients, rather than characteristics of the service provider or inputs to care
- Classification should be able to be applied consistently across different settings.

Principle #5: Simple and transparent

Criteria

- The classification has as many classes as are needed for its purpose and no more
- Assignment of cases to classes should occur through a process that is transparent and able to be understood by clinicians and health service managers.

Principle #6: Minimising undesirable and inadvertent consequences

Criteria

- The classification relies on data elements that are collected consistently and uniformly
- The classification minimises the reliance on data elements that are open to local interpretation and/or provide incentives to change reporting to optimise funding
- The classification should minimise susceptibility to gaming, inappropriate rewards and perverse incentives
- The underlying data contributing to the classification are able to be audited.

Principle #7: Capacity for improvement

Criteria

- The classification and the underlying data elements should provide information of sufficient granularity to facilitate improvement in the classification over time, for example, to reflect changes in practice patterns and technological advances, and to incorporate emerging knowledge about cost drivers
- The system should be sufficiently flexible to adapt to such change without requiring major restructuring.

Principle #8: Utility beyond activity based funding

Criteria

- The classification and the underlying data elements should allow the analysis of best practice and facilitate benchmarking
- The data elements required for the classification are useful for purposes other than funding. These may include health services management, monitoring of quality and safety, epidemiological monitoring, understanding practice and cost variation, health services planning and performance reporting.

Principle #9: Administrative and operational feasibility

Criteria

- The benefits of the data collected for the classification outweigh the administrative cost and burden of collection
- The collection of data utilises approaches that assist with or consistent with the implementation of the electronic health/medical record
- The cost to establish/purchase and maintain the classification system is balanced by the benefits that it offers, and is affordable to the health system relative to other priorities.

3 A summary of existing local and international classifications

3.1 Overview

The Tier 2 existing Australian system and each international classification included in the literature review has been assessed against the principles developed for the non-admitted classification to assess their appropriateness for adoption in the Australian context.

The remainder of this chapter sets out the analysis of each of the eleven reviewed non-admitted classifications against the nine principles, where relevant information/comparisons can be made. Where classifications have not been assessed against a principle, this is due to information or data gaps in publically available documentation.

3.2 Tier 2

Tier 2 Non-Admitted Services (Tier 2) is the current national classification for non-admitted services used for ABF purposes in Australian public hospitals. Tier 2 classifies 'service events', the base unit of count, by the type of clinic the patient attends. Cost data for these clinics was first collected in the Round 3 (1997-98) National Hospital Cost Data Collection (NHCDC), and has been reported in each subsequent year.

During 2011, the list of Tier 2 clinics was reviewed with the aim of developing the classification system for activity based funding of outpatient services. The outcome of the review was the publication of Version 1.0 of the Tier 2 Outpatient Clinic Definitions, which was released on 1 September 2011. Following some minor revisions, version 1.2 was released on 8 June 2012, and was implemented as the ABF non-admitted classification for 2012-13. Tier 2 Outpatient Clinics version 1.2 had 107 classes.

Tier 2 was refined again during 2012 under the guidance of IHPA's Non-Admitted Care Advisory Working Group (NACAWG), and was renamed Tier 2 Non-Admitted Services to reflect the extension of the updated classification beyond hospital outpatient clinics. The 2012 review particularly focused on home delivered procedures and nurse led clinics. Tier 2 Non-Admitted Services version 2.0 was implemented as the ABF non-admitted classification for 2013-14, and has 133 classes.

Tier 2 categorises a hospital's non-admitted services structuring non-admitted services into the following 'Clinics':

- Group 1 10:Procedures

- Group 2 20: Medical consultation services

- Group 3 30: Stand-alone diagnostic services

- Group 4 40: Allied health and/or clinical nurse specialist intervention services.

Tier 2 classification rules indicate that clinics are first classified to a group based on the predominant nature of health service provided by the clinic and then to the class most appropriate for the clinic's specialisation (often reflective of the specialty and discipline of the usual provider). [8]

As such Tier 2 classifies based on a single variable procedure or medical consultation or diagnostic service or allied health/nurse intervention. See Chapter 3 of Attachment 1 for further detail.

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8   Tier 2 non-admitted services compendium 2014-15. IHPA. September 2013.

Table 4:   Assessment of Tier 2 against principles

Principle	Assessment
1 Comprehensive, mutually exclusive and exhaustive	The consultation process identified that Tier 2 classes are: • Comprehensive to non-admitted care provided • Classes are not mutually exclusive.
2 Clinically meaningful	Key findings from the key informant interviews identified that: • Tier 2 classes are easily understood by clinicians • Activity is counted at the patient encounter level, however the interpretation of counting rules are variable and applied inconsistently between service providers and jurisdictions.
3 Resource use homogeneity	Studies on Tier 2 indicate: • Based on a single variable procedure or medical consultation or diagnostic service or allied health/nurse intervention and Tier 2 explained between 24% – 32% of cost variations [9,10] • Heterogeneity within classes.
4 Patient based	Tier 2 is not considered to be patient based because it uses 'clinics' as the basis for classes and does not incorporate patient based characteristics.
5 Simple and transparent	Key findings from the key informant interviews identified that the interpretation of the classification and counting rules are variable and not easy to interpret.
6 Minimising undesirable and inadvertent consequences	Stakeholders identified that the current system disincentivises some models of care, for example multi-disciplinary and telehealth, and is subject to activity by providers that may not align to best practice models of care, such as multiple counting for activity in 'groups'.
7 Capacity for improvement	Tier 2 is owned by IHPA and capable of being developed locally, however its current format limits its capacity for development to improve its explanatory power of resource use.
8 Utility beyond activity based funding	Inconsistency between jurisdictions renders benchmarking efforts unreliable in the current Tier 2 system.
9 Administrative and operational feasibility	Tier 2 is currently in operation in Australia.

3.2.1   Implications for ongoing use in Australia

The assessment against principles indicates that overall, Tier 2 does not align with the principles of being *mutually exclusive and exhaustive*, *resource use homogenous* and *patient based*.

Consultations indicated stakeholders do not believe the current structure of Tier 2 is suitable as the long term classification for non-admitted care and Tier 2 is not consistent with the international experience of development of non-admitted classifications, ie a multiple axis classification based on a combination of service descriptors and patient characteristics. Tier 2 will however need to be considered as the basis of transition planning from the current clinic groups to, for example, a multi-variable classification based on procedures and diagnoses.

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9   For 1% of Australia's hospitalised ambulatory encounters where data were not adjusted for outliers, untrimmed data. When trimmed, clinic type was an even stronger predictor, explaining 32% of cost variation.

10   Cleary M., Michael R. & Piper K. 1998, 'Outpatient Costing and classification: are we any closer to a national standard for ambulatory classification systems?', in *Medical Journal of Australia* 169(8) pp. 26-31, available <https://www.mja.com.au/journal/1998/169/8/outpatient-costing-and-classification-are-we-any-closer-national-standard>, viewed 28 July 2013.

3.3 Canada

Canada has two key classification systems in use for emergency, day surgery, outpatient and home care. These are:

- The Comprehensive Ambulatory Care System (CACS) – covering emergency, day surgery and outpatient clinic patients

- The Home Care Reporting System (HCRS) – covering publically funded home care programs.

The Canadian Institute for Health Information (CIHI) is an independent not-for-profit organisation, funded through a combination of federal and jurisdiction monies, who owns the CACS grouping methodology and has made CACS available for purchase. See sections 5.1, 5.2, and Appendix A. of Attachment 1. for further detail.

Table 5:   Assessment of CACS and HCRS against Principles

Principle	CACS assessment	HCRS assessment
1 Comprehensive, mutually exclusive and exhaustive	• The CACS scope covers emergency department, day surgery and outpatient care and does not include home based care • Mutual exclusivity between classes.	The scope of HCRS is limited to home care.
2 Clinically meaningful	• Structure is driven by procedure coding based on Canadian Classification of Intervention (CCI) codes • Where multiple procedures are undertaken/specialists are seen, only the one considered to have the highest resource use is included.	Clinicians use the information to support care planning and quality improvement
3 Resource use homogeneity	• Classes are homogenous based on resource intensity • No R-squared analyses available.	No R-squared analyses available
4 Patient based	• Structure is driven by procedure coding but includes patient characteristics including some diagnoses codes, using ICD-10-CA and age.	Two interRAI assessment tools input into the HRCS – the Resident Assessment Instrument – Home Care (RAI-HC) and the interRAI-CA. These contain demographic, clinical and functional information.
5 Simple and transparent	Not assessed – insufficient information available to assess against this principle.	Not assessed – insufficient information available to assess against this principle.
6 Minimising undesirable and inadvertent consequences	CACS is not currently used in funding.	HCRS is not used in funding.
7 Capacity for improvement	As a purchased product, improvement is directed by CIHI.	Improvement is directed through CIHI.
8 Utility beyond activity based funding	Not currently used in funding Grouping methodology is reviewed on an annual basis to identify changes to models of care.	HCRS is not used in funding.

Principle	CACS assessment	HCRS assessment
9 Administrative and operational feasibility	• Uptake has been limited due to availability of data under 2 required NACRS and DAD reporting data sets • Classification and funding methodologies are determined by individual province thus CACS has not been implemented nationally • CACS classification requires purchase from CIHI.	HCRS is not used in funding.

3.3.1 Implications for adoption in Australia

The CACS scope extends from Australia's non-admitted definition, including emergency service, and HCRS addresses home care. As such each classification needs to be assessed as suitability as a partial solution.

The structure of CACS is procedures driven with diagnosis following subsequently in the logic. The CACS grouper logic identifies, mode of visit, imaging and procedure as independent branches, which all precede diagnosis (see Figure 1, p. 23 of attachment 1). This logic assigns individual CACS cells based on intervention and diagnosis codes. Following this, resource weights are applied that use patient characteristic data such as age.

This procedure-led classification has been recently adopted in Alberta, where previously the classification was driven by 'unique service provider staff' rather than procedure until 2010 (please refer to p. 25 and Appendix A in Attachment 1. for further information on CACS and Alberta's previous classification, ACCS).

The CACS methodology undergoes an annual review cycle to identify changes in models of care.

Key implementation barriers to adopting Canada's CACS and HCRS in Australia are:

• CACS and HCRS are not used across Canada, nationally, and neither CACS nor HCRS are used to inform funding allocations at present. As such, their performance would need to be tested using Australian data

• Similar to Australia's Tier 2, in CACS, where multiple procedures are undertaken or the patient sees a number of clinicians in one service event, only the one considered to be of highest resource use is recorded in the classification. Stakeholders in Australia noted that limiting the classification to one service provider disincentivises multidisciplinary care models and creates perverse incentives

• Given CACS and HCRS are based on Canadian procedure codes (CCIs) and Home Care (RAI-HC) and the inteRAI-CA and there would be a requirement to undertake studies to map current services to these code sets

• Both Canadian classification systems are owned by CIHI, and further investigation would be required regarding the opportunity for Australian development.

Characteristics of CACS that informed the recommendations for classification development for non-admitted patient care in Australia include:

• the procedure driven structure, where diagnosis is a secondary axis

• where diagnosis is used, ICD codes form the basis of this input

• the annual review cycle to improve CACS cells.

3.4   United States

Three classification systems for patients receiving non-admitted care in the US were reviewed. These are:

- Ambulatory Patient Classifications (APCs) – the classification used for outpatient hospital services[11]

- Home Health Resource Groups (HHRGs) – for classification of hospital in the home type services[12]

- Adjusted Clinical Groups (ACGs) – support a number of state Medicaid programs. ACGs are a product developed and owned by Johns Hopkins and are based on evidence that clustering of morbidity over time is a better predictor of health service resource use than the presence of specific diseases[13]. They are suitable for a capitation funding model and as such the patient is usually assigned to the provider who receives the payment. This approach is particularly relevant in managing chronic conditions

- Diagnostic Cost Groups (DCGs) – for classification on inpatients and outpatient attendance for patients with serious illnesses and longer hospital stays.

See sections 5.3 and Appendix A. of Attachment 1 for further detail.

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11 Outpatient hospital services are considered to be those covered by Medicare Part B, which are medically necessary diagnostic and treatment services received as an outpatient from a Medicare-participating hospital. Covered outpatient hospital services include emergency or observation services, Services in an outpatient clinic, Laboratory tests, Mental health care in a partial hospitalisation program, x-rays and other radiology services billed by the hospital, medical supplies, preventative and screening services and some drugs (Medicare n.d. *Outpatient hospital services,* available < http://www.medicare.gov/coverage/outpatient-hospital-services.html>, accessed 25 July 2013.

12 Home health is defined as 'skilled' nursing, physical therapy, occupational therapy, speech pathology, social work, and supporting home health aide services under specific coverage guidelines.

13 Starfield et al 1985 as in The John Hopkins ACG System 2011, *Technical Reference Guide Version 10.0,* available <http://www.healthpartners.com/ucm/groups/public/@hp/@public/documents/documents/cntrb_035024.pdf>, viewed 28 July 2013.

Table 6: Assessment of classifications used in the United States against principles

Principle	APC Assessment	ACG Assessment	DCG assessment	HHRG Assessment
1 Comprehensive, mutually exclusive and exhaustive	APCs classify hospital based outpatient services.	• ACGs classify patient receiving primary care services that may also receive hospital inpatient services • Classes are not mutually exclusive until grouped at the highest level.	DCGs classify patients under managed care plans.	The scope for HHRGs is 'home health' care which is a defined Medicare product.
2 Clinically meaningful	Structure is driven by procedure coding based on two US procedure code-sets (HCPCS, CPT).	Structure is driven by patient data where the unit of count is all diagnoses in a one year period.	Structure is driven by patient data, including diagnosis where the unit of count is one year of claims data.	Structure is driven by clinical assessment tool (OASIS) including functional status.
3 Resource use homogeneity	• Classes are homogenous based on resource intensity • No R-squared analyses for the classification publically available.	• Classes are homogenous, intended to predict a resource utilisation and cost assuming that resource level is correlated with illness burden • ACGs have been adopted in multiple countries and used in a number of research analyses • R-squared analyses range from 0.38 to 0.54 in varying international contexts between primary and non-admitted care.	• Classes are homogenous based on patient diagnosis, co-morbidities and complexity • R-squared score of 11.2% increased when outpatient attendances were added the regression model (originally including diagnosis only).	No R-squared analyses for the classification publically available.
4 Patient based	Structure is driven by procedure coding but includes diagnoses in limited circumstances where they assist to identify medical justification for service provision/time.	The ACG system assigns patient data using ICD codes (ICD-9, 9-CM and -10) over a one year period on the basis that morbidity clustering is a better predictor of health service resource use than the presence of specific disease.	Classification is driven by patient characteristics focused on diagnosis and complexity from claims data spanning one year.	Patient assessment is based on the Outcome and Assessment Information Set (OASIS) which includes functional and other patient data.

Principle	APC Assessment	ACG Assessment	DCG assessment	HHRG Assessment
5 Simple and transparent	Adoption of the APCs would require mapping to US based procedure codes.	Based on ICD and clusters to Aggregated Diagnosis Codes (ADGs).	Based on ICD	Based on Outcome and Assessment Information Set (OASIS).
6 Minimising undesirable and inadvertent consequences	Not assessed – insufficient information available to assess against this principle	Not assessed – insufficient information available to assess against this principle	Not assessed – insufficient information available to assess against this principle	Not assessed – insufficient information available to assess against this principle.
7 Capacity for improvement	Improvement directly through US Medicare and AMA.	Improvement directed through Johns Hopkins.	DCGs are owned by DxCG, a division of Urix Inc. Development occurs through this company.	Improvement directly through US Medicare.
8 Utility beyond activity based funding	The APC grouper bundles HCPCS/CPT based on expected care delivery patterns in the US context.	Licensed and maintained by Johns Hopkins University.	• Licensed and maintained by Urix Inc • Dataset is used to compare performance of classification compared to models that use data from all settings and multiple conditions.	Not assessed – insufficient information available to assess against this principle.
9 Administrative and operational feasibility	The ACP system includes a number of funding and counting rules as well as inbuilt incentives determined to drive local policies.	ACGs assign payments to a single provider based on patient data collected over one year.	• In development, DCGs require a large sample size to ensure stability and reliability • There is a long establishment period as data on patients is required for one year.	Payments to Medicare certified Home Health Agencies are based on a 60 day episode count.

3.4.1 Implications for adoption in Australia

The classifications developed in the US are diverse and all are associated with funding.

The national hospital outpatient classification, APCs, like Canada's CACS, is procedures driven with diagnosis following subsequently in the logic (see p. 30, Attachment 1). All procedures undertaken in a service event are included in the classification and these are bundled and grouped after all being collected. Diagnosis codes, which are based on ICD, are included in limited circumstances only.

Two classifications developed in the US are led by diagnoses – ACGs and DCGs. The diagnosis driven classifications are based heavily on patient characteristics; data is collated over a lengthened period of time and includes data related to hospitalisations.

HHRG count is a 60 day episode and, similar to Canada's HCRS, their scope is for services received in the home care setting and the data inputs are based on a range of patient characteristics (see p. 37, Attachment 1 for details on its structure).

Key implementation barriers to adopting a US developed non-admitted classification in Australia are:

- There would be a requirement to adopt or map to the outpatient classification's underlying US based procedure codes (HCPCS)

- Consultations indicated it would not be practical to adopt an extensive clinical assessment tool such as OASIS for those services which are home based

- Further investigation would be required regarding the opportunity for Australian development of the proprietary owned classifications and sub classifications (HCPCS/CPTs, ACGs and DCGs)

- The grouping rules that are used in the APCs are specific to the US policy context and would require further study into the relevance to the Australian market given the differences in the health sector structure

- Adopting the structure of the diagnosis driven classifications – ACGs and DCGs – is likely not feasible in Australia's health system in the non-admitted space as patients are generally treated by and funding supports multiple providers versus a single care manager. At present, information is not currently available to easily aggregate across multiple settings in Australia.

Characteristics of US developed classifications that have informed the recommendations for classification development for non-admitted patient care in Australia include:

- The procedure driven structure of APCs, where diagnosis is a secondary axis. Supporting this characteristic is the finding from DCGs that suggest that outpatient attendance data enhance a classification's explanatory power

- In all the US based classifications, as in Canada, where diagnosis is used, ICD codes form the basis of this input.

3.5 England

England's National Health Service (NHS) provides government funded healthcare nationally across the continuum of care. The NHS has developed and implemented a classification system, Healthcare Resource Groups (HRGs). HRGs[14] classify inpatient and outpatient hospital care and underpin a funding method called Payment by Results (PbR), what Australia calls Activity Based Funding.

See sections 5.4 and Appendix A. of Attachment 1. for further detail.

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14 HRG's are used in England whereas the PbR system and the underpinning OPCS codes are used in the United Kingdom.

Table 7:   Assessment of HRGs against principles

Principle	HRG Assessment
1 Comprehensive, mutually exclusive and exhaustive	The scope of HRGs covers both inpatient and outpatient patient care, not including home care
2 Clinically meaningful	• Unit of count takes a number of forms to suit the care to which they are aligned: attendance for non-admitted, episode for admitted, per-diem for specialist rehabilitation, and 'year of care' for long term conditions • Procedure codes drive the classification. Data elements are collected at a granular level • Diagnosis data is used in classifying inpatient care only.
3 Resource use homogeneity	• Classes are homogenous based on resource intensity with the flexibility to 'unbundle' where necessary • Analysis to explain cost variation shows that the variation in many HRGs (30% of reported costs deviated from the national average by 50%), demonstrating high variability between providers and by specialty.
4 Patient based	• Procedure/intervention data are based on UK specific codes (Treatment Function Codes, OPCS-4.6) • Diagnosis data is not incorporated for non-admitted care as it is collected inconsistently amongst non-admitted providers.
5 Simple and transparent	• Adoption of the HRGs would require mapping to UK based procedure codes • Adjustments and tariffs for nursing and allied health provided services are set locally. Services provided by medical doctors are based on a national level price.
6 Minimising undesirable and inadvertent consequences	Not assessed – insufficient information available to assess against this principle
7 Capacity for improvement	Ongoing development has included the unbundling of some services based on provider views should be paid separately.
8 Utility beyond activity based funding	• The grouping mechanism is tailored to the UK context and drives prices at both a national and local level • The classification is intended to support benchmarking and trend analysis over time.
9 Administrative and operational feasibility	• Grouping and bundling data inputs are conducted by a specific external body that receives hospital data • The outpatient aspect is still in development (having commenced in 2007) • Weightings are applied to suit local circumstances in the form of a 'Market Forces Factor' (MFF).

3.5.1   Implications for adoption in Australia

England's HRGs are a complex classification and have been purpose built for the structure and operational approach of NHS and are continuously developed accordingly. As such, some prices are determined on a local basis and others are set at a national level. The classification sections covering non-admitted care are less mature than their inpatient counterparts and in some aspects, such as for outpatient attendances, are still in development. At present, outpatient care is classified in two forms – attendances and procedures. Attendances have similar characteristics to clinics whereas procedures are directly mapped to England's procedure codes.

Key implementation barriers to adopting HRGs directly in Australia are:

- There would be a requirement to adopt or map to the classification's underlying UK based procedure codes (OCPS)

- Further investigation would be required regarding the opportunity for Australian development

- The grouping rules that are used in the HRGs are specific to the UK context and are designed to work on both a national and local level.

Some characteristics of England's HRGs can be adopted in an Australian classification.

- As per the Canadian and US outpatient classifications, procedure is the leading data element for the classification grouper and subsequent funding arrangements. Whilst for the non-admitted care equivalent, diagnosis data is not used, across the classification more broadly, ICD diagnosis data is used where no significant procedure is performed

- There are multiple units of count in England's HRGs which aim to align to the different types of care. These include both a service-event equivalent as well as a time based episode unit of count (see p. 45, Attachment 1 for further detail), showing that a classification is able to contain more than one unit of count

- An annual development cycle is conducted to set national prices and a staged approach was applied in developing the classification – the first non-admitted care national cost appeared in 2005-06 which was two years after the first acute costs.

3.6   Ireland's adaptation of Tier 2

The Irish adaptation of Tier 2 is based on definitions of data elements and service count measures finalised in 2013 and intended for use across hospitals providing non-admitted care. Ireland adopted the Australian Tier 2 list of clinics in 2007 and began development to classify non-admitted care in Ireland. Currently the Tier 2 adaptation includes part of the original Tier 2 clinic list combined with specialty clinics specific to the Irish context, totalling 108 clinics. The Irish adaptation of Tier 2 is used to classify non-admitted services, and social care provided in acute hospitals, community hospitals, district hospitals, health centres, dental clinics, GP surgeries and home care.

See section 5.5 of Attachment 1: Review of non-admitted classifications – Literature review for further detail.

Table 8:   Assessment of Ireland's adaptation of Tier 2 against principles

Principle	Assessment
1 Comprehensive, mutually exclusive and exhaustive	The Irish adaptation of Tier 2 covers non-admitted and social care
2 Clinically meaningful	The Ireland Tier 2 is clinics based versus being based on procedures or patient characteristics.
3 Resource use homogeneity	No R-squared analyses for the classification available
4 Patient based	As in Tier 2, the Ireland adaptation uses 'clinics' as the basis for class and does not incorporate patient characteristics or procedure data.
5 Simple and transparent	Tier 2 classes have been mapped to the Irish context
6 Minimising undesirable and inadvertent consequences	Not assessed – insufficient information available to assess against this principle
7 Capacity for improvement	The Irish adaptation of Tier 2 has been under development since 2007

Principle	Assessment
8 Utility beyond activity based funding	Not assessed – insufficient information available to assess against this principle
9 Administrative and operational feasibility	No public information available as to the use of the Ireland adaptation of Tier 2 in funding.

3.6.1 Implications for adoption in Australia

The Ireland adaptation of Tier 2 remains clinic based as per its predecessor, accordingly this classification is not considered for the Australian context as it contains the same limitations as the Australian Tier 2 clinic, being a clinic based approach and not procedure or patient centric.

3.7 New Zealand

New Zealand's National Non-Admitted Patient Collection (NNPAC) is a dataset that stores information about non-admitted secondary care events, including outpatient and emergency department visits in public hospitals. NNPAC allows regional government health funders, the New Zealand Ministry of Health and District Health Boards (DHBs), to monitor outpatient activity.

As well as informing funding allocations and policy, the main purposes of the NNPAC are to monitor non-admitted patient events, analyse service flows between regions and monitor policy impacts[15].

See section 5.6 of Attachment 1: Review of non-admitted classifications – Literature review for further detail.

Table 9:   Assessment of NNPAC against principles

Principle	Assessment
1 Comprehensive, mutually exclusive and exhaustive	The NNPAC scope includes outpatient, emergency department as well as home and community care.
2 Clinically meaningful	The NNPAC does not include procedure or diagnosis codes and is not used for funding purposes.
3 Resource use homogeneity	Not assessed – insufficient information available to assess against this principle
4 Patient based	Procedure or diagnosis codes are not used in NNPAC. The NNPAC includes: • Some patient characteristics • Clinician health specialty.
5 Simple and transparent	Not assessed – insufficient information available to assess against this principle
6 Minimising undesirable and inadvertent consequences	The NNPAC does not currently inform funding.
7 Capacity for improvement	Not assessed – insufficient information available to assess against this principle

15 Statistics New Zealand 2013, *Measuring government sector productivity in New Zealand a feasibility study,* available <http://www.stats.govt.nz/browse_for_stats/economic_indicators/productivity/measuring-govt-productivity/8-data-availability-health-care.aspx>, viewed 24 July 2013.

Principle	Assessment
8 Utility beyond activity based funding	NNPAC has no present utility for funding
9 Administrative and operational feasibility	The Ministry has reported issues with comprehensive data submission.

3.7.1   Implications for adoption in Australia

New Zealand's NNPAC does not include procedure or diagnosis codes and is not used in funding at this stage (see Attachment 1, p. 53 for NNPAC data model dimensions). Accordingly, the NNPAC is not considered at a stage of maturity relevant to be considered to adopt in full or in part in Australia to support ABF.

3.8   3M

3M, a multinational diversified technology company, has developed a number of proprietary health system classifications over the past 20 years. 3M developed an outpatient classification system originally intended for US Medicare, the Ambulatory Patient Groups (APGs). APGs and their subsequent revision to Enhanced Ambulatory Patient Groups (EAPGs) have been purchased by and are in current use by a number of state-based Medicaid programs in the US. The two 3M classifications relevant to non-admitted care are:

- Enhanced Ambulatory Patient Groups (EAPGs) – focus on the outpatient hospital setting, covering day surgery units, emergency care and outpatient clinics

- International Refined DRGs (IR-DRGs) – which classify patients across the continuum of care, including inpatient, outpatient, ED, clinics and rehabilitation.

See section 5.7 of Attachment 1: Review of non-admitted classifications – Literature review for further detail.

Table 10:   Assessment of EAPG against principles

Principle	EAPG Assessment	IR-DRG Assessment
1 Comprehensive, mutually exclusive and exhaustive	EAPG scope includes outpatient, day surgery, ED telehealth; but not home care	IR-DRG scope covers inpatient, outpatient, ED, clinics and rehab. IR-DRGS are not in use for home care
2 Clinically meaningful	EAPGs are procedure driven and require procedure codes specific to the US market (HCPCS)	- IR-DRGs are procedure driven and can be used with various national procedure code sets and multiple versions of ICD - IR-DRGs serve as a native grouper and are designed for funding and reporting - IR-DRGs combine both inpatient and outpatient settings into the one grouper.
3 Resource use homogeneity	- Classes are homogenous based on resource intensity and patient characteristics for comparable services across ambulatory care settings - No R-squared analyses for the classification available.	- Classes are homogenous based on resource intensity and patient characteristics for comparable services across ambulatory care settings - No R-squared analyses for the classification .available.
4 Patient based	ICD 9; and HCPCS/CPT	Conforms to multiple versions of ICD (9 and 10); also can be tailored to local procedure sets.

Principle	EAPG Assessment	IR-DRG Assessment
5 Simple and transparent	Adoption of the EAPGs would require mapping to US based procedure codes	Adoption of the IR-DRGs would require adoption of the non-admitted subset of the classification
6 Minimising undesirable and inadvertent consequences	Not assessed – insufficient information available to assess against this principle	Not assessed – insufficient information available to assess against this principle
7 Capacity for improvement	As a proprietary product, improvement is directed by 3M	As a proprietary product, improvement is directed by 3M
8 Utility beyond activity based funding	Not assessed – insufficient information available to assess against this principle	Not assessed – insufficient information available to assess against this principle
9 Administrative and operational feasibility	• EAPGs have substantive uptake at State level in US and are flexible to local bundling/ funding rules • Proprietary IP, requires purchase of a license.	• At present, IR-DRGs do not appear to be used in funding • Proprietary IP, requires purchase of a license.

3.8.1 Implications for adoption in Australia

3M classifications are associated with funding and in relatively wide use. They are procedures driven with diagnosis following subsequently in the logic (see p. 56, Attachment 1 for EAPG logic). Procedures are collected at a granular level and are bundled and grouped after collection. Diagnosis codes, which are based on ICD, are included in limited circumstances only.

Key implementation barriers to adopting a 3M developed classification in Australia are:

• There would be a requirement to adopt or map to the outpatient classification's underlying US based procedure codes (HCPCS) for adoption of the EAPGs. Further, EAPGs have been developed specifically for the US market

• At present IR-DRGs do not appear to be used to inform funding

• Further investigation would be required regarding the terms to acquire and/or develop the 3M classification for Australian use.

Characteristics of 3M classifications that have informed the recommendations for a new classification for non-admitted patient care in Australia include:

• The procedure driven structure, where diagnosis is a secondary axis. Supporting this characteristic is the finding from DCGs that suggest that outpatient attendance data enhance a classification's explanatory power

• As per other international examples, ICD codes form the basis of this input

• Further, in a white paper that describes IR-DRGs, it is noted that code mapping between countries can pose issues relating to incorrect grouping and the complexities associated with mapping the relationships between different types of codesets.

3.9 Conclusions

The eleven international classifications reviewed individually cover diverse scopes and serve different purposes within a country.

The analysis above supports a conclusion that the existing Tier 2 classification system is not considered appropriate as the long term non-admitted classification in Australia and there are substantial barriers to adoption of any of the international classification systems reviewed.

However, key insights can be drawn regarding common aspects and development lessons:

- International classifications that cover hospital outpatient services lead their classification structure with procedure data whereas classifications with a scope to cover primary care, home care or long term patients are led by diagnosis data in their structure. Accordingly, it is logical that the structure of the non-admitted classification be led by procedure code as exampled in international classifications such as APCs, CACS, HRGs, EAPGs and IR-DRGs

- The international experience demonstrates that an episode based unit of count can be used in tandem with a service event unit of count. Given Australia's non-admitted patient care classification will cover the outpatient setting and the home setting, incorporating both a service event unit of count and episodic unit of count is feasible and should be tested regarding explaining the resource variation between intermittent and chronic conditions

- Most international classifications, particularly those used for funding, are intended to be resource homogenous. A number of classifications, including those that are led by diagnosis data, aim to establish homogenous resource use intensity within their classes

- Home based classifications bring to light there are different cost drivers between the outpatient and care delivered in the home, such as functional status

- The procedure code sets in the classifications reviewed were country specific, but the diagnosis code sets in use were all a variant of the ICD

- The classifications not used to inform funding are not at a stage of maturity whereby their performance can be assessed as appropriate for adoption in Australia to support ABF

- Annual review cycles to update and improve classifications are exampled by numerous classifications in operation overseas.

The following chapter sets out a recommended approach for the development/implementation of a new non-admitted classification suitable for long term use in activity based funding based on the findings of consultations and literature review.

4 Recommendations for non-admitted classification development

4.1 Overview

The initial stages of work for this project (the international literature review of non-admitted patient care classification systems in use, key informant interviews with local and international classification experts and the national consultation workshop) have informed the recommendations in this section.

The consultation stages of this project established that most stakeholders believe change from Tier 2 is required to develop a new classification to support non-admitted ABF in the long term. Readiness for change has been considered in the design of recommendations and the associated implementation plan. Conceptually the readiness for change can be assessed along a continuum of importance and confidence; and both are necessary for behaviour change to occur[16].

- **Importance** is defined by values and expectations regarding the importance of change and refers to the reasons why the change should be undertaken

  Stakeholders consulted for this project expressed strong dissatisfaction with the current Tier 2 and there was a broad consensus that changing the classification was important. Additionally non-admitted/out of hospital care is a fundamental plank of the successful implementation of a patient centred continuum of care that represents good clinical care models and offers the right care, in the right place and the right time.

- **Confidence**, in this context, refers to belief that proposed change is feasible/there is the capability to change. The recommendations that follow are designed to build confidence along the timeframe required to design, test and transition to a new non-admitted classification. Specifically, it:

  – Recognises the existing operational reality and the time/effort required to change practices

  – Incorporates detailed planning and staged implementation milestones that will provide interim benefits over a multi-year development cycle

  – Leverages the use of existing data while testing/confirming the benefits of taking on additional data collection.

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16 Holloway, A., Watson, H.E., (2002) role of self efficacy and behaviour change, international journal of nursing practice 2002; 8: 106-115.

Figure 1: Readiness to change

Based on consultations and the international review non-admitted classifications, we have developed four overarching recommendations, each with multiple work streams, required to develop a feasible, robust non-admitted classification suitable for long term use in Australia:

- Recommendation 1 – Develop a new classification system

- Recommendation 2 - Establish the foundations

- Recommendation 3 – Develop an implementation plan

- Recommendation 4 – Ongoing classification development

The streams of work described aim for the development of a 'version zero' non-admitted classification in FY14-15, collection of the required data in FY15-16 and allowing for a period of analysis and refinement before incorporation into National Efficient Price Weights to take effect in FY18-19. This timeline depends heavily on the engagement and buy-in of jurisdiction stakeholders.

These recommendations have been explained in more detail below and the subsequent sections of report define the timeline.

4.2 Recommendation 1: Develop a new classification system

4.2.1 Recommendation 1 – Obtain approvals to develop the non-admitted classification system

Develop a new classification system for non-admitted patient care services to support ABF, building on the lessons learnt from the international experience of non-admitted classification development, ie to include data elements that have been proven to be cost drivers in outpatient and home based settings, and using existing Australian code sets.

Clearances from NACAWG and the approval from the Pricing Authority of recommendations and work streams for development of 'non-admitted' classification in Australia is a required first step to implementation.

Members of NACAWG have been included in the key informant interviews, review of the literature review and participants in the consultation workshop leading into these recommendations

Obtaining approval from the Pricing Authority for the four recommendations and various work streams to develop a new non-admitted classification system will provide governance direction/commitment and address the need for IHPA to prioritise this with its other work programs.

4.3 Recommendation 2: Establish the foundations

There are two separate work streams within this recommendation.

4.3.1 Recommendation 2a – Build the foundations of a new classification system

Undertake a study to build a classification based on use of multiple variable data elements and perform statistical analyses to test the explanatory power of the variables.

The foundations of a classification are the units of count and the grouper. These foundations should be tested based on statistical analysis using procedure, diagnosis and other available data variables to confirm classification units of count.

Both a service event based unit of count as well as a time based episode unit of count should be considered based on international practice. Statistical testing should identify the variables to be included in two versions of a grouper – one for each unit of count.

It is proposed that available data be used (including procedure and diagnosis data from the 2013 Non-Admitted Costing study) for this initial testing. The outcome of the testing should identify the variables and define the first version of a grouper algorithm. The data elements that could be included are, for example:

- Procedures and diagnostic services

- Medical consult and allied health/nursing service

- Patient characteristics

- Service Delivery Mode

- Service Delivery Setting

Episodes of care should be designed for select number of predictable clinical scenarios (based on evidence of good practice models of care) and should be agreed with an expert group of clinicians practicing in non-admitted settings (including subacute, and home-based care).

Existing non-admitted data collection

IHPA currently collects non-admitted activity data through two sources:

- A patient level dataset which is entitled "Non-Admitted Patient DSS". This dataset is a national dataset specification (DSS), which means that its submission is optional (although a requirement to derive ABF funding)

- An aggregate level dataset which is entitled "Non-Admitted Patient Care Aggregate NMDS". This dataset is a National Minimum Dataset (NMDS), which means that its submission is mandatory.

In the longer term, the aggregate NMDS will be phased out and replaced with a non-admitted patient NMDS, collecting patient level data on all non-admitted patient service events.

In addition to the Tier 2 service type, the ABF Non-Admitted Patient Care Patient Level Data Request Specifications 2013-14[17] includes definitions and collection of the following service and patient data elements

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17 METeOR Metadata Online Registry, Non-admitted patient DSS 2013-14, exported from METeOR (AIHW's Metadata Online Registry)

(an excerpt of the total collection) that have been identified as classifying variables in consultation and/or international non-admitted classifications:

- Group session indicator

- Service delivery mode (in person, telephone, videoconference, electronic mail, postal, other)

- Service delivery setting (community health/day centre, general practice, residential aged care, private residence, other)

- Patient area of usual residence

- Patient date of birth

- Patient indigenous status

- Patient sex.

Additionally, the non-admitted costing study undertaken in 2013 included the collection of diagnosis and procedure information in a free text form box. Following the coding of this information, this data could also be used to undertake some initial pilot studies.

Design of episodes

The time-based episodic counting and funding rules should be based on evidence based good clinical practice. Steps to action this recommendation could include:

- Convene a clinical advisory group to identify a limited number (to be added to over time) of specific predictable (evidence based) non-admitted scenarios to model for the care of chronic/long term conditions

- These scenarios should including non-admitted subacute, rehabilitation and palliative care as well as episodic home delivered care

- Recruit provider/patient cohorts and define data collection (for example, addition of diagnosis) to enable modelling of the clinical scenarios for resource homogeneity. Note the time period per episode could be variable/specific to the clinical cohort, up to and including annual capitation (consider suitability of data set based on 2013 non-admitted costing study)

- Test other funding/bundling rules that evidence good reduction in variance, for example, 'short stay' and 'outliers'.

The use of episodes as a unit of count would constitute a separate branch of the classification and require a statistical analysis to test the explanatory power of relevant data variables and the development of a second grouper for a time/episode based unit of count. Differing cost drivers could include for example phase of care in palliative care, or functional status in home based care.

4.3.2   Recommendation 2b – Collect costing data and test the classification

After pilot testing and analysis, current costing information and further analysis will enable testing of the classification to see if it evidences strong explanatory power. The testing should also include testing of funding/bundling rules, for example age, Aboriginal and/or Torres Strait Islander status, area of usual residence; as well as use of a multi-disciplinary flag in new data collection.

Costing information under the new classification system will need to be collected from pilot sites. Costing specifications will need to be developed and provided to the pilot sites.

Costing studies

Based on findings of how international classifications have been developed, cost studies would need to be designed based on the collection of new data. Costing specifications will need to be developed, which could include:

- The nominated classification classes

- The relevant dates within the study period

- Guidance on the costing methodology to use such as the inclusion of certain costs; overhead allocation methodologies; relative value unit guidance as a proxy to allocate costs where no feeder system exists.

The costing specification should be refined following the completion of the costing study based on feedback obtained from the sites to be used during the implementation phase of the project.

Explanatory power for resource variation

One criterion to assess classification systems is how well those systems explain resource variation. This is often measured using the 'reduction in variance' summary statistic, ie the 'R^2' statistic, or sometimes the 'Adjusted R^2' statistic. However, in many instances, comparing the R^2 statistics between systems is not a true comparison because the patient data sets on which those measures were derived are different in terms of sample size, time period, and patient sub-population. A true quantitative assessment of the extent to which different classifications explain resource variation in Australia requires applying the different classifications to the same patient data-set.

The classification grouper should be tested with actual cost data to evidence its ability to explain resource variation.

The literature review indicated that some types of care (especially related to chronic conditions treated in the home care setting) are better explained by diagnoses information of a period of time and the unit of count should be considered on an 'episode' basis (up to and including capitation).

Multi-disciplinary care

The treatment of multi-disciplinary care was a frequent issue raised in key informant interviews, with the literature review finding that these services are variably addressed by the classifications counting or funding rules. In the classifications reviewed the variation ranged from systems where only one resource (that deemed the more resource intensive) is captured, through to algorithms that weight multiple services during the same visit; and funding rules that dictate separate payments for each or bundled procedures.

The grouper would need to be tested as to whether the inclusion of data surrounding multi-disciplinary care improves the explanatory power of the classification system.

4.4   Recommendation 3 – Implementation planning

There are three separate work streams within this recommendation. The development of an implementation plan should be carried out concurrently with Recommendation 2: establishing the foundations.

4.4.1   Recommendation 3a – Undertake a stock-take by jurisdiction of existing dataset collections and infrastructure requirements

A detailed implementation plan should be developed to support a successful implementation of the classification across the country. The implementation plan should include, but is not limited to:

- A stock take of the data collected by each jurisdiction in their local DSS's

- The use of technology and electronic capturing of the data elements, particularly in community settings

- Identification and clarification of the different practices between rural and metropolitan settings

- Stock take of existing resources, infrastructure and capabilities within each jurisdiction to manage the change

- A comprehensive risk assessment of the plan

- Optional methods of implementation (for example, a phased approach or pilot sites).

The feasibility of change management initiatives should be thoroughly investigated to support the timely implementation of the new non-admitted classification.

Current data stock-take

At present, a number of the data elements that could be used in the classification are collected in the ABF Non-Admitted Patient Care Patient Level DSS, such as service setting and mode, patient sex and indigenous status. The table below sets out the number of hospitals currently reporting service events through the Patient Level DSS by jurisdiction for the September, December and March quarters, 2012-13.

Figure 2:   Number of hospitals reporting service events in 2012-13

State	No of hospitals	Sep Q	Dec Q	March Q	Total
NSW	52	1,009,200	899,502	875,304	2,784,006
VIC	81	272,912	-	-	272,912
QLD	63	938,654	867,526	860,668	2,666,848
SA	11	331,650	329,804	311,978	973,432
WA	85	487,639	474,416	478,899	1,440,954
TAS	17	90,142	89,050	85,370	264,562
NT	5	59,526	60,360	57,198	177,084
ACT	2	165,036	141,401	139,323	445,760
	316	**3,354,759**	**2,862,059**	**2,808,740**	**9,025,558**

4.4.2 Recommendation 3b – Obtain approval for changes to the NMDS or national DSS

> Once the additional data elements required for the classification system have been identified (in the workstream phases outlined in Recommendation 2), approval for changes to the dataset (either the national minimum dataset or the national datasets) will need to be obtained from NHISSC and NHIPPC. This involves presenting a business case to NHISSC by December 2014, to obtain to necessary approval by March 2015.

Approval process for classification development

Changes to the national minimum dataset (NMDS) and national datasets require formal approval from the National Health Information Standards and Statistics Committee (NHISSC) and the National Health Information and Performance Principal Committee (NHIPPC). Changes to the NMDS can take up to 18 months to be approved, while the process for a National DSS change could be shorter due to its non-mandatory nature.

NHIPPC has ultimate responsibility for information management in health services. NHISSC is a standing subcommittee of NHIPPC and is responsible for providing NHIPPC with strategic advice on national health information needs and priorities and advises NHIPPC on the development, implementation and maintenance of the Australian Family of Health and related classifications (including endorsing classifications for inclusion in the family) and endorsing maps to classifications to be used for statistical reporting on national health information.

4.4.3 Recommendation 3c – Create procedure and diagnosis shortlists

> A set of procedures and diagnoses short lists should be created to support the transition from Tier 2 to the data collection of procedures and diagnoses. We propose undertaking a mapping exercise of Tier 2 clinic lists to procedure and diagnoses sets using the Australian Classification of Healthcare Interventions (ACHI) procedure set and the International Statistical Classification of Diseases and Related Health Problems, Tenth Revision, Australian Modified (ICD-10-AM) diagnoses set.

This aim of this recommendation is to:

- Develop a short list of diagnoses and procedures that clinics can use to capture and report against

- Simplify the transition for Tier 2 clinics to reporting procedure and diagnosis datasets.

There is broad consensus amongst stakeholders that data should be collected at the most granular level practical, in order to test a series of bundling rules to group the data to the highest level that achieves resource homogeneity. This also speaks to the development of the classification over time as costing data can be analysed and funding rules refined.

Consistent with international experience, a well performing non-admitted classification should be based on collection of both service characteristics and patient characteristics that will enable a hybrid system of counting service events and episodes. Accordingly, we recommend the following mapping exercises are undertaken.

Mapping to ACHI

A mapping exercise between the Tier 2 Group 10 Procedure Clinics and Group 30 Standalone Diagnostic Clinics to ACHI should be undertaken to create a shortlist of procedures which can be reported against for the classification system. Given that the known primary cost driver in outpatient services is procedures/interventions and that Australia has already made an investment in the robust ongoing development of the ACHI procedure set, a first development step in non-admitted classification should be to determine if the entire or a modified version of ACHI can be used to support non-admitted classification.

The outcome of this investigation could provide clinics with simplified procedure 'short lists' relevant to their practice. Australia has a significant investment in the design and maintenance of the Australian Classification of Health Interventions (ACHI) which is used by Australia's ARDRG classification system. The ACHI is based on the *Medicare Benefits Schedule* (MBS) and was previously known as the Medicare Benefits Schedule-Extended (MBS-E). It was developed with assistance from specialist clinicians and clinical coders.

The ACHI codes have seven digits. The first five digits are the MBS item number. The two-digit extension represents specific procedures included in that item. The classification is structured by body system, site and procedure type. Procedures not currently listed in MBS have also been included (eg allied health interventions, cosmetic surgery) – these can be easily identified as the codes starting with a '9'. Like the disease classification, ACHI consists of a tabular list of interventions and accompanying alphabetic index.

It is also worth noting that the World Health Organization (WHO) has in development an *International Classification of Health Interventions* (ICHI) which is not yet in use. ICHI has been designed to be used as a national classification of health interventions without need for further adaption, to allow for the classification of a range of treatments and services provided across the health system and care settings beyond acute and admitted care[18]. ICHI has been build using the ICD-9-CM Volume 3 as its basis. ICHI contains definitions and a multi-axial structure and can be used across all components of health systems.

An example of selected Tier 2 Group 10 Procedure Clinics and Group 30 Standalone Diagnostic Clinics mapped to ACHI codes has been shown below (other clinics may be more complex and not easily aligned). This mapping study should be undertaken with the intention for future refinement that is more tailored to non-admitted care provision.

Table 11:   Mapping of select Tier 2 clinics (group 10 and 30) to ACHI codes

10. Procedure clinics

Tier 2 short descriptions	ACHI
10.01 Hyperbaric Medicine	• Hyperbaric oxygenation (HBO) (<90 minutes) (wound) 96191-00 • Hyperbaric oxygenation (HBO) (>90 minutes and <3 hours) (wound) 13020-00 • Hyperbaric oxygenation (HBO) (> 3 hours) (wound) 13025-00
10.02 Interventional Imaging	• Examples include: • Magnetic resonance (MRI) (nuclear) 90901-08 • Radiography (diagnostic) 90909-00 • Ultrasound (diagnostic) (scan) 90908-00 for abdomen, abdominal 55036-00
10.04 Dental	• Examples include: • Comprehensive oral examination 97011-00 • Periodic oral examination 97012-00 • Dental bagteriological examination 97041-00 • Removal or plaque or stain of teeth 97111-00

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18 WHO 2013, ICHI Alpha2

30. Standalone Diagnostic clinics

Tier 2 short descriptions	ACHI
30.04 Nuclear medicine	• Examples include: • Nuclear medicine imaging (study) of other region or organ 90910-00 • Hepatobiliary study 61360-00 • Nuclear medicine imaging (study)avid, for myocardial infarct 61310-00, • Nuclear medicine imaging (study)avid, for myocardial infarct flow, dynamic 61417-00
30.07 Mammography Screening	• Examples include: • Mammography, bilateral 59300-00 • Mammography, unilateral ductal, with contrast 59303-00.

Mapping to ICD-10-AM

A mapping exercise between the Tier 2 Group 20 Medical clinics and Group 40 Allied Health clinics to ICD-10-AM should be undertaken to create a shortlist of diagnoses which can be reported against for the classification system. ICD diagnosis coding was used in the large majority of international non-admitted classifications reviewed, and similarly to the ACHI mapping, a first development step in non-admitted classification should be to determine if the entire or a modified version of ICD-10-AM can be used to support non-admitted classification.

The outcome of this investigation could provide clinics with simplified diagnoses 'short lists' relevant to their practice.

The International Statistical Classification of Diseases and related Health Problems, Tenth Revision, Australian Modification' (ICD-10-AM), is the disease classification component which underpins AR-DRGs for classification of acute inpatient admissions based on the WHO's ICD-10. It uses an alphanumeric coding scheme for diseases structured by body system and aetiology, and comprises three, four and five character categories.

ICD-10-AM *permits and supports the systematic recording, analysis, interpretation and comparison of morbidity data. ICD-10-AM is used to translate diseases of diseases and other health problems from words into an alphanumeric code, which permits easy storage, retrieval and analysis of the data.ICD-10-AM has been regularly reviewed and updated since its first release and implementation in 1998. Seventh Edition is currently in use and Eighth Edition will be implemented on 1 July 2013.*[19]

An example of selected Tier 2 Group 20 Medical clinics and Group 40 Allied Health clinics mapped to ICD-10AM codes has been shown below (other clinics may be more complex and not align as easily). This mapping study should be undertaken with the intention for future refinement that is more tailored to non-admitted care provision.

The outcome of this investigation could provide clinics with simplified diagnoses 'short lists' relevant to their practice.

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19 https://nccc.uow.edu.au/icd10am-achi-acs/overview/icd10am/index.html

Figure 3:   Mapping of select Tier 2 clinics (Group 20 and 40) to ICD-10 codes

20. Medical clinics

Tier 2 short descriptions	ICD-10
20.14 Epilepsy	G40 Epilepsy
20.20 Respiratory – Cystic Fibrosis	E84 Cystic Fibrosis
20.51 Sleep disorders	G47 Sleep disorders

40. Allied Health and/or Clinical Nurse Specialist Interventions/Clinics

Tier 2 short descriptions	ICD-10
40.31 Burns	T20-T32 Burns and corrosions
40.32 Continence	R15 Incontinence – Faecal
40.32 Continence	R32 Incontinence – Urinary

4.5 Recommendation 4 – Ongoing classification development

4.5.1 Recommendation 4: Ongoing classification development

> To ensure the long term stability and continual refinement of the classification, as well as its ongoing alignment to relevant funding policies and approaches, governance, operational structures and processes need to be established for the ongoing development and refinement of the classification.
>
> This includes performing studies to address changes in technology (for example, advent of new non-admitted procedures), as well as investigations of cost drivers that improve the explanatory power of the classification, for example initial and subsequent visit.

The fourth recommendation addresses the need to establish governance and processes for the ongoing classification development cycle.

This enables prioritisation of additional studies that should be undertaken over time regarding additional data variables that could improve the explanatory power of the classification and support the refinement/development of counting and funding rules. For example, additional variables raised during consultations in this review include: initial or subsequent visit, and the use of functional measures (especially for subacute and home delivered care).

The literature review demonstrated that classifications evolve over a period of years, progressing along a continuum of maturity that spans from use in reporting of activity to use in supporting funding. This progression includes the collection of required data elements and costing information to refine the classification (as evidenced by improving reduction in variance (RIV/R2) scores) and eventual development of price weights. As part of an ongoing classification development cycle, cost weights form the inputs into the funding model, and are continuously reviewed and updated.

Establishment of leadership, governance and operational structures to continue development of the classification should be part of the near term planning for the classification development.

5 Timeline and implementation roadmap

In this section of the report we discuss a timeline/roadmap for implementation of the recommendations.

5.1 Timing assumptions

In the preceding chapter this report sets out a series of four recommendations regarding the development of a new classification system for non-admitted care services. In defining a timeline for implementation of these recommendations we assume that:
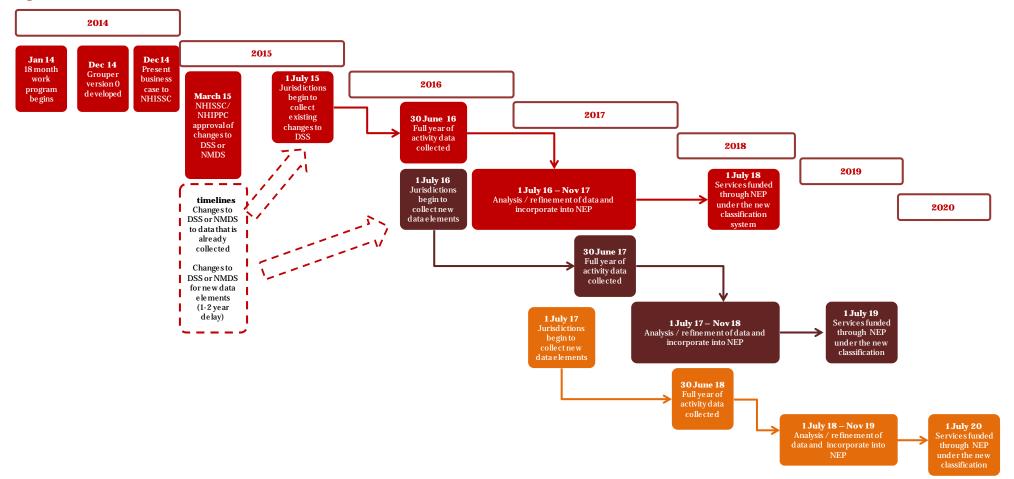
- There is an urgency to get work underway and achieve the aims of these recommendations, and therefore multiple work streams should be actioned simultaneously

- There is a constraint to the timing of the work program which is the timing of achieving support from NACAWG and required approvals from the Pricing Authority and from NHISSC and NHIPPC to approve changes to the NMDS or national DSSs

- The benefits of achieving the results will have to be balanced with the quantum of change jurisdictions and providers are willing/able to adopt

- Change will be easier to achieve at the provider level by beginning with existing data, defining transition plans, conducting studies and pilots that evidence benefits before moving to national roll-out of changes.

In the diagram below (Figure 5) we define an 18 month work program which starts in January 2014 for actioning the four recommendations. This timeline assumes a timely support and approval by NACAWG and the Pricing Authority.

The diagram below sets out a 5-6 year horizon indicating how the 18 month work program from January 2014 through till June 2015 results in the incorporation of the price weights for newly classified activity in the FY18-19 or FY19-20 National Efficient Price (NEP) model. Key milestones include:

- Presenting the business case for changes to the NMDS or DSS to NHISSC by December 2014

- Obtaining NHISSC and NHIPPC approval by March 2015

- Changes to the dataset that relate to data elements that are already collected by the jurisdictions can take effect and begin being collected in July 2015

- Changes for new data elements (such as first and follow up visit flags) will require a longer period of time before being capable of being collected. In the diagram below, it is assumed this could take between 15 and 27 months and will occur by July 2016 or July 2017

- By December 2016 or 2017, a full year of activity data and costed data will be collected for FY15-16 or FY16-17

- An 11 month period of analysis and refinement will occur with the data incorporated into the National Efficient Price and sent out to jurisdictions for their comments by November 2017 or 2018

- Following the jurisdictions feedback, the non-admitted services can commence activity based funding under the new classification from 1 July 2018 or 1 July 2019

- Subsequent classification development changes will be implemented in annual cycles.

Figure 4: Timeline to inclusion in NEP

2014	

Jan 14 18 month work program begins	**Dec 14** Grouper version 0 developed	**Dec 14** Present business case to NHISSC

2015

March 15 NHISSC/ NHIPPC approval of changes to DSS or NMDS

1 July 15 Jurisdictions begin to collect existing changes to DSS

timelines Changes to DSS or NMDS to data that is already collected

Changes to DSS or NMDS for new data elements (1-2 year delay)

2016

30 June 16 Full year of activity data collected

1 July 16 Jurisdictions begin to collect new data elements

2017

1 July 16 – Nov 17 Analysis / refinement of data and incorporate into NEP

30 June 17 Full year of activity data collected

1 July 17 Jurisdictions begin to collect new data elements

2018

1 July 18 Services funded through NEP under the new classification system

1 July 17 – Nov 18 Analysis / refinement of data and incorporate into NEP

30 June 18 Full year of activity data collected

2019

1 July 19 Services funded through NEP under the new classification

2020

1 July 18 – Nov 19 Analysis / refinement of data and incorporate into NEP

1 July 20 Services funded through NEP under the new classification

5.2   18 month work program

The timeline above assumes the four recommendations can commence in January 2014 and are completed by June 2015. Whilst this timeline appears accelerated with multiple work streams occurring concurrently, this is necessary to develop and implement the new non-admitted classification system for ABF by 1 July 2018 (or 2019).

The diagram below sets out the recommendations in an eighteen month work program and includes the following:

5.2.1   Recommendation 1 – Develop a new classification

1. Obtain approval to develop the classification system: Gain endorsement from NACAWG and the Pricing Authority to begin development of the non-admitted classification system. *Timing: Gain approval of recommendations from the Pricing Authority and NACAWG by Jan 2014.*

5.2.2   Recommendation 2 – Establish the foundations

- **2a. Build the foundations of a new classification system**: Undertake a study to build a classification based on use of multiple variable data elements and perform statistical analyses to test the explanatory power of the variables. Both a service event based unit of count as well as a time based episode unit of count should be considered and statistical testing should identify the variables to be included in two versions of a grouper (an algorithm based on use of multiple variables) – one for each unit of count. *Timing: Build grouper v.0 February -Sep 2014.*

- **2b. Collect costing data and test the classification**: Prepare data specifications and collect costing information from pilot sites under the new classification system. This cost data can be used to test the classification grouper to see if it evidences good reduction in variance (R2). *Note: consider use of the 2013 non-admitted costing study data already provided. Timing: Testing and adjustments to grouper March 2014 – May 2015.*

5.2.3   Recommendation 3 – Implementation planning

- **3a. Undertake a stock-take by jurisdiction of existing dataset collections and infrastructure requirements**: Develop a full implementation plan, incorporating a stocktake of infrastructure requirements by each jurisdiction to support collection of the patient level data elements for classification at both the local health network (LHN) and clinic level. *Timing: Stocktake March – June 2014; Implementation plan development March – Dec 2014.*

- **3b. Obtain approval for changes to the NMDS or national DSS**: Once the additional data elements required for the classification system have been identified, approval for changes to the national minimum dataset will need to be obtained from NHISSC and NHIPPC. *Timing: Table a proposed change to NMDS or DSS with NHISSC by March 2014*; *Present business case to NHISSC by Dec 2014; Obtain approval by March 15.*

- **3c. Creation of procedures and diagnoses short lists** by undertaking a mapping exercise of procedures to the Australian Classification of Healthcare Interventions (ACHI) procedure set and diagnoses to the International Statistical Classification of Diseases and Related Health Problems, Tenth Revision, Australia Modification (ICD-10-AM*). Timing: March – June 2014.*

5.2.4   Recommendation 4 – Ongoing classification development

- **4. Ongoing classification development**. Establish governance, operational structures and processes for the ongoing development and refinement of the classification. *Timing: Jan – June 2015.*

Figure 5: Recommendations included in an 18 Month work program

Weeks commencing: *Monday, 6 Jan 14*

Timeline columns: Jan 14, Feb, Mar, Apr, May, Jun, Jul, Aug, Sep, Oct, Nov, Dec, Jan 15, Feb, Mar, Apr, May, Jun, Jul

R1: Build a new classification system
- Obtain approval of recommendations from the Pricing Authority
- Obtain endorsement of recommendations from NACAWG

R2: Establish the foundations

2a) Build the foundations of a new classification
- Build a classification using multiple data variables
- Perform statistical testing to test the explanatory power of the variables
- Consider the use of 'episodes' and 'service events' in the classification
- Convene clinical advisory group
- Identify and develop scenarios
- Recruit provider and patient cohorts
- Perform statistical testing to test the explanatory power of the two units of count
- Test other funding and bundling rules

2b) Collect costing data and test the classification
- Select pilot sites
- Define data collection together with costing specifications
- Pilot sites prepare costing data
- Collect costing data
- Use costing data to test grouper

R3: Implementation planning

3a) Undertake a stocktake of dataset collections and infrastruction
- Undertake stocktake of local dataset collections & infrastructure requirements by jurisdictions
- Develop implementation plan

3b) Obtain approval for changes to NMDS or national DSS
- Develop data set changes with jurisdictions and NACAWG
- Table change items at NHISSC meeting
- Present business case to NHISSC
- Obtain approval from NHISSC and NHIPPC

3c) Create procedure and diagnoses shortlists
- Map Tier 2 to ACHI
- Map Tier 2 to ICD-10

R4: Ongoing classification development
- Establish governance structures and processes
- Undertake studies to improve explanatory power of classification

Appendix A Implementation survey

An online survey was developed and sent to Non-Admitted Care Advisory Working Group (NACAWG) members to assess the views of jurisdictions; local hospital networks; and medical, nursing and allied health personnel regarding:

- Whether data on diagnoses, procedures and select patient characteristics are captured for non-admitted services

- The extent to which the abovementioned data is available in electronic formats.

The purpose of the survey was to obtain a high level understanding of the available data elements and potential implementation issues to inform the recommendations for development of a new classification for non-admitted care. The distribution list covered jurisdictions, local health networks, clinicians and allied health professionals and included questions around the electronic format of capturing the data.

Two versions of the survey were developed covering the same topics, one for clinicians (medical, nursing and allied health) and one for administrative staff (jurisdictions and local hospital networks) to ensure that the questions were properly worded for each type of non-admitted care stakeholder. Responses are by jurisdiction, but respondents are anonymous.

Questions applicable to all respondents

1   In which jurisdiction do you work?

2   Please select the one profile below that best describes your role?

   a   Medical clinician

   b   Allied health practitioner

   c   LHN or hospital administration

   d   Central agency.

Questions applicable to Medical Clinician or Allied Health practitioners:

3   How would you define your patient catchment area:

   a   Metropolitan

   b   Rural

   c   Not applicable.

4   Type of clinic

5   Do patients have a '*unique patient identifier*' in your medical records system?

6   Do you complete a medical record clinical note *for each patient visit*?

7   Is there a record of whether a patient visit is a *new or follow-up visit*?

8   Is *new or follow-up visit* information collected in an electronic/computer system?

9   What is the electronic form of *new or follow-up visit* information (select all that apply)?

    a   Electronic Health Record

    b   Scheduling system

    c   Patient Administration System

    d   Other (please specify).

Procedures

10   Do your clinical notes include a record of *procedures/interventions* associated with a patient visit?

11   Is patient *procedure* information collected in an electronic/computer system

12   What is the electronic format where patient *procedure* information is captured? (select all that apply)

    a   Electronic Health Record

    b   Scheduling system

    c   Patient Administration System

    d   Other (please specify).

13   What is the *procedure* set being used?

    a   Australian Classification of Health Interventions (ACHI) codes

    b   Documented as free text

    c   Other procedure set (please specify).

Diagnosis

14   Do your medical record/clinical notes include documentation of the *diagnoses* associated with each patient visit?

15   What is the *diagnosis* set you are using?

    a   ICD10 – AM (or excerpt/shortlist of ICD10-AM)

    b   SNOMED Clinical Terms

    c   Documented as free text

    d   Other diagnosis set (please specify).

16   Is your patient *diagnosis* information collected in an electronic/computer system?

17   What is the electronic format where patient *diagnosis* information is captured? (select all that apply)

    a   Electronic Health Record

    b   Scheduling system

    c   Patient Administration System

d   Other (please specify).

Questions applicable to Central Agency or LHNs respondents

18   Do patients have a '*unique patient identifier*' in your medical records systems, ie one that is used across ED, Admitted, Non-admitted care?

19   If your answer above was variable, approximately what per cent of non-admitted *encounters have a 'unique patient identifier*'?

20   In which *electronic system is the unique patient identifier used* (select all that apply)?

a   Electronic Health Record

b   Scheduling system

c   Patient Administration System

d   Other (please specify).

21   Is there an *electronic record of patient encounters* (each face to face visit with a patient)?

22   If your answer above was variable, approximately what per cent of non-admitted *encounters have an electronic record*?

23   What is the *electronic source of patient encounter information* (select all that apply)?

a   Electronic Health Record

b   Scheduling system

c   Patient Administration System

d   Other (please specify).

24   Is there a record of whether a patient visit is a *new or follow-up visit*?

25   If your answer above was variable, approximately what per cent of non-admitted visits is there information regarding *new or follow-up visits*?

26   Is *new or follow-up visit* information collected in an electronic/computer system?

27   What is the electronic form of *new or follow-up visit* information (select all that apply)?

a   Electronic Health Record

b   Scheduling system

c   Patient Administration System

d   Other (please specify).

Procedures

28   Is there an *electronic record of procedures/interventions* associated with a patient visit?

29   If your answer above was variable, approximately what per cent of non-admitted visits is there information regarding *procedures/interventions*?

30   What is the electronic form of patient *procedure* information (select all that apply)?

    a   Electronic Health Record

    b   Scheduling system

    c   Patient Administration System

    d   Other (please specify).

31   What is the most prevalent *procedure* set being used?

    a   Australian Classification of Health Interventions (ACHI) codes

    b   Free text

    c   Other (please specify).

Diagnosis

32   Is there an *electronic record of the diagnoses* associated with a patient visit?

33   If your answer above was variable, approximately what per cent of non-admitted visits is there information regarding *diagnoses*?

34   What is the electronic form of patient *diagnosis* information (select all that apply)?

    a   Electronic Health Record

    b   Scheduling system

    c   Patient Administration System

    d   Other (please specify)

35   What is the most prevalent *diagnosis* set being used?

    a   ICD10 – AM

    b   Locally developed list

    c   Free text

    d   Other (please specify)

Survey Results

The survey results shown below are indicative only, ie the survey was not a representative or comprehensive study. The following figures demonstrate responses to the electronic capturing of procedure and diagnoses data. The survey collected additional information, for example on the availability of 'New or Follow-up visit' data; use of 'Unique Identifiers'; and electronic systems in which data sits, which has not been presented in this report. Additional analyses could be performed from this data as a starting point to developing the implementation plan.

Response rates from survey

Questions: In which jurisdiction do you work; and please select the one profile that best describes your role: medical clinician, allied health practitioner, local hospital network or hospital administrator, central agency?

The graph below sets out the number of respondents to the survey, by jurisdiction and by profile and shows that responses were received by 29 clinicians and 114 administrative staff across seven jurisdictions.
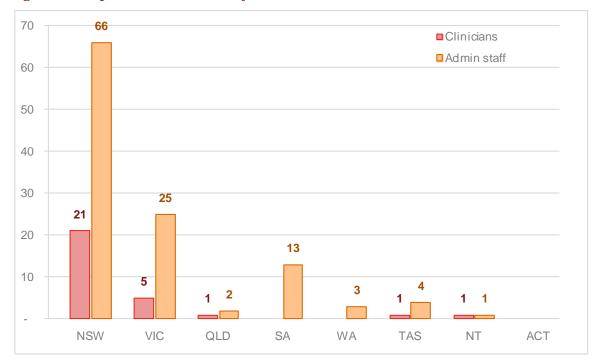
Figure 6:   Response rates from survey (n= 29 Clinicians, n= 114 Administrative staff)

Availability of procedure data in medical records

Question: Do your clinical notes include a record of procedures/interventions associated with a patient visit?

The graph below shows that responses were received from 26 clinicians across five states, who all responded favourably that procedures and interventions associated with a patient visit were recorded in clinical notes.
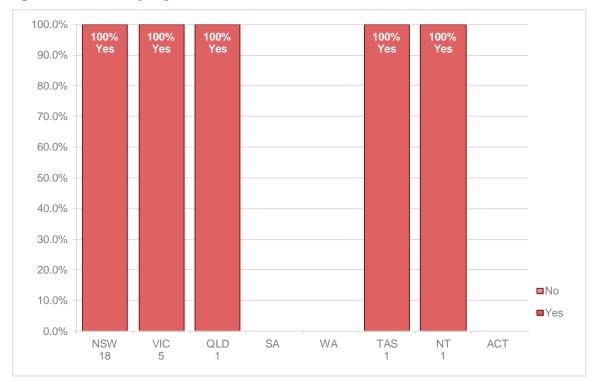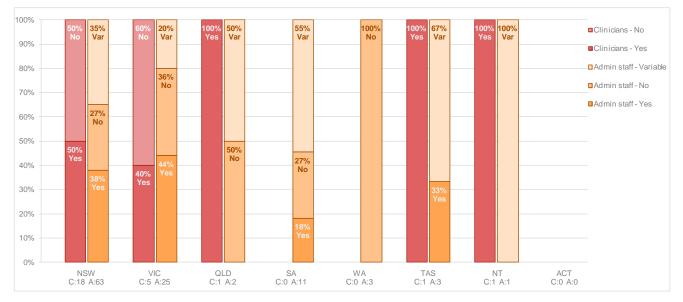
Figure 7:   Availability of procedure data in medical record (n=26)

Availability of electronic procedure data

Question (clinicians): Is patient procedure information collected in an electronic/computer system?

Question (administrative staff): Is there an electronic record of procedures/interventions associated with a patient visit?

The graph below contains responses from 26 clinicians and 108 administrative staff and shows that in at least 50% of cases, clinicians report that procedure data is captured electronically, whereas administrative staff has mixed responses across the country.

Figure 8:   Availability of electronic procedure data (n=134)

Availability of Diagnoses

Question: Do your medical record/clinical notes include documentation of the diagnoses associated with each patient visit?

The graph below shows that responses were received from 25 clinicians across five states, with mixed responses of whether diagnoses were captured in the clinical notes.

Figure 9:   Availability of Diagnoses data (n=25)

Availability of electronic diagnoses data

Question (clinicians): Is your patient diagnosis information collected in an electronic/computer system?

Question (administrative staff): Is there an electronic record of the diagnoses associated with a patient visit?

The graph below contains responses from 25 clinicians and 97 administrative staff and variable responses from both groups whether diagnoses are captured electronically.
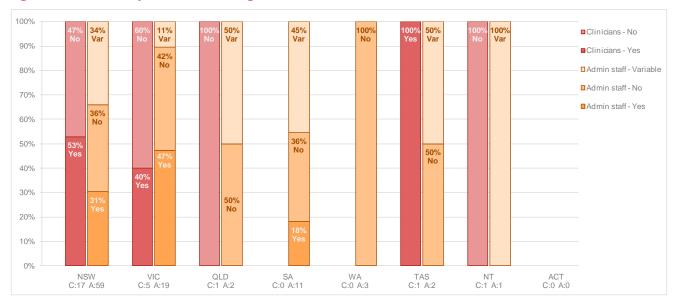
Figure 10: Availability of electronic diagnoses data (n=122)

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