

Culturally and Linguistically Diverse Patient Costing Study Report

16 March 2015

Independent Hospital Pricing Authority

Executive summary

There are many dimensions to the characterisation of culturally and linguistically diverse (CALD) patients. What is hard to empirically assess, however, is the impact upon health services of a patient's low English language proficiency as well as any special considerations relating to spirituality or ethnicity.

The purpose of this report is to undertake a costing study of CALD patients to inform a policy decision for whether an adjustment is warranted to the National Efficient Price for CALD patients. This study is focussed only on the cost impact of CALD patients when hospital based services are utilised and does not focus on the rate of utilisation of health services within communities. This study has utilised the closest available proxy to identify a subset of CALD patients and then observe the cost, activity and age differentials of this subset on Australian hospitals.

From the observed differences of CALD patients within this study, a CALD adjustment to the NEP model for sub-acute, ED or outpatient encounters cannot currently be supported, based on our analysis of Round 17 NHCDC data. For acute admitted encounters, there is some evidence of the cost per weighted activity unit of CALD patients costing more than non-CALD patients; however the differences were small.

In the absence of a nationally consistent indicator to identify CALD patients, a CALD adjustment could not currently be supported. Furthermore, the varied costing processes and the allocation methodologies currently used, result in costed outputs that may not truly be reflective of CALD patient specific costs.

The key findings and associated recommendations that form this conclusion are outlined below.

Identification of CALD patients using nationally consistent indicators

These indicators need more development. Currently there's a strong focus on language being the leading indicator of CALD patients, with less emphasis placed on the cultural needs of English-speaking patients.

From discussion with the jurisdictions and the hospitals, the best available proxy for low English proficiency was "Interpreter Required" and where this was not available, the "Preferred Language" field not being English, was utilised. It is important to note the limitations with both of these proxies: this subset only covers issues relating to language and doesn't necessarily identify complexities relating to religious or ethnic sensitivities.

Recommendation: IHPA and its jurisdictions should discuss nationally consistent CALD indicators to be collected and used in the costing and reporting process.

Costing Interpreter Services

The current process of clinical costing does not make the observation of costs relating to CALD patients readily apparent. For example from the consultations, interpreter service costs are typically allocated as an overhead across all patients and care types. This is evident from the average cost per acute encounter per diagnosis related group (DRG) difference ranged from 0.3% higher in VIC to 5.8% higher in SA. However this allocation process requires improvement to specifically allocate costs to patients based on usage. The analysis of VIC interpreter costs identified a mismatch between the CALD indicator for interpreter and final cost allocated.

Interpreter services costs are similar in nature to the services provided by Social Work in that they do not directly provide clinical interventions but they facilitate the clinical activities and

streamline the patient's pathway through the hospital. Hospital and health services should aim to collect and utilise patient level interpreter service costs across product types, to reflect the cost of these services attributable to specific patient episodes.

Recommendation: Hospital and health services should aim to collect and utilise patient level interpreter service costs across product types, to reflect the cost of these services attributable to specific patient episodes.

Correlation of CALD patients and Aged patients

One of the consistent and significant characteristics of this subset of CALD patients is that they are older in age than the general population. Many of the cost and activity impacts observed, especially within the acute length of stay (LOS) and ED attendance cost closely correlate to the impacts seen within aged patients. This study has only analysed the effects of these two patient characteristics separately.

Recommendation: Future studies should consider the impact of age on cost, separate to the impact of CALD complexity on cost.

In addition to these key findings, a number of other observations were shown across the continuum of care, and related to the quality of data available for this analysis.

Acute Inpatients

1. Length of stay

Many of the cost parameters measured for Acute Inpatients are not showing significant trends for CALD patients, however it can be said that they spend longer in hospital than other acute patients within the same DRG. This is seen in the longer inlier length of stay per DRG compared to non-CALD episodes and it is also reflected in the higher average ward nursing and ward medical cost per encounter by DRG.

2. Shift in severity

Within the CALD population, there is a shift in severity towards more severe adjacent DRGs (eg: from B70D or C to B70B or A). This shift in severity and length of stay, compared to the general population, indicates a higher proportion of comorbidities and complications however, it cannot be separated from the underlying age impact.

3. Cost per weighted activity unit

The analysis of cost per weighted activity unit showed that CALD patients have a marginally higher cost per weighted activity unit than non-CALD patients in NSW, QLD and SA, with the result ranging from 0.2% to 3.8% (using standardised distribution for remoteness). There is evidence of higher cost per weighted activity unit for elderly patients aged 80 or more: the cost per weighted activity unit of CALD patients aged 80 or more relative to non-CALD patients aged 80 or more was +3% in NSW, +6.5% in QLD and +3.7% in SA (these results are standardised differences in remoteness mix between CALD and non-CALD patients).

Sub-acute Inpatients

Within the sub-acute encounters, the results were not consistent between jurisdictions and an adjustment to the NEP model cannot be supported on the basis of weighted activity unit cost results.

Within the sub-acute encounters, the increased average age of the population was identified, especially within rehabilitation. Despite the higher age profile, the weighted activity unit model appears to sufficiently account for this because the cost per weighted activity unit across age groups is consistent. Unlike ED, we found that the cost per weighted activity unit by age group was relatively uniform within sub-acute. This means that weighted activity unit

cost differences are not age-driven, but more likely to be CALD driven. Despite this, the results are not consistent between jurisdictions and a national adjustment to the NEP model cannot be supported on the basis of these results.

Emergency Attendances

There was a higher ED cost for CALD patients observed, being driven by two key factors. The first being by the shift towards Triage 1 in CALD patient attendances and the higher cost this attracts. The second factor is the older age characteristic of CALD patients outlined earlier. These results do not support a specific CALD adjustment to the NEP model, as Triage is currently been accounted for in the model, and or cannot be separated.

After accounting for the difference in URG profile of CALD patients through the weighted activity unit model, it was found that the cost per weighted activity unit of CALD patients in NSW and Victoria was lower than the non-CALD cost when the comparison was performed for patients of the same age-group. The cost per weighted activity unit analysis does not support a CALD loading to the NEP model for ED due to the lower CALD costs observed within each age group.

Outpatient observations

Victoria was the only participating jurisdiction to provide outpatient data with a CALD indicator. Nationally, the collection of outpatient data is limited with inconsistent submission by jurisdictions. The activity counting and costing methodology used for these outpatient encounters requires further development nationally. Therefore no evidence conclusions can be made for supporting an adjustment to the NEP model for outpatient encounters.

CALD and mental health encounters

We assessed the feasibility of conducting an analysis of costs for treating CALD patients for mental diagnoses.¹ The results of this analysis indicate that there is insufficient data available to draw reliable conclusions about the cost of CALD patients when being treated for mental health conditions. In summary, the available data was:

- **Acute patients:** 0.17% (2,251), 0.15% (248) and 0.14% (55) of encounters per state for NSW, QLD and SA respectively related to CALD patients with a mental health diagnosis.
- **ED patients:** 0.07% (1,265) and 0.02% (406) of encounters in NSW (PL and IR CALD indicators respectively) related to CALD patients with a mental health diagnosis.
- **Outpatients:** 0.02% (63) of encounters in Victoria related to CALD patients with a mental health diagnosis.
- **Sub-acute:** This classification was considered as part of our overall analysis, and Psychogeriatric Care was identified as being consistently lower in terms of average encounter cost across all jurisdictions. No additional analysis was conducted in the context of CALD mental health encounters.

To enable an informed opinion to identify a cost differential between CALD Mental Health patients; CALD patients; Mental Health patients; and the general population further data collection would be required to ensure sufficient comparable data was available between the patient groups.

¹ The key group for this analysis was for "non-ATSI" patients, as ATSI patients have a separate adjustment applied.

Data Quality and Treatment

A fundamental challenge in identifying whether an adjustment to the NEP model is required arises from the availability and quality of data to inform such a decision. Currently the inconsistencies in collection of CALD patient data, and the costing methodologies used do not provide a robust evidence base to make such a decision. This was evident in the analysis of VIC interpreter costs allocated to encounters which showed material proportions of these costs allocated to patients indicating no requirement for an interpreter.

For the purposes of this costing study, adjustments were limited to preserve the integrity of the data received from the jurisdictions. Adjustments were made to standardise data across jurisdictions with activity data limited to submissions for the NHCDC (Round 17). Depreciation and ED costs in acute, sub-acute and outpatient encounters costs were excluded from analysis.

Contents

Executive summary	2
1 Introduction	7
2 Findings	16
3 Literature Review	21
4 Consultation Findings	29
5 Data Analysis	35
6 Mental Health and CALD patients	52
Appendix A: Glossary	57
Appendix B: Consultation attendees and survey respondents	58
Appendix C: Submissions to the Pricing Framework 2014-15 and 2015-16	59
Appendix D: Literature Review Searches	61
Appendix E: Literature review sources	63
Appendix F: CALD data items collected for mental health	69
Appendix G: Data summary and analysis assumptions	71

1 Introduction

1.1 Background

PwC has been engaged by the Independent Hospital Pricing Authority (IHPA) to undertake a costing study of Culturally and Linguistically Diverse (CALD) patients to inform a policy decision for whether an adjustment is warranted to the National Efficient Price for CALD patients. This study has been commissioned as a result of feedback contained in submissions to the Pricing Authority on the Pricing Framework 2014-15 and 2015-16.

The existing National Efficient Price (NEP) model does not include a loading for CALD patients, although several submissions to the Pricing Authority supported the need for a loading. A summary of these submissions is included in Appendix C of this report.

The current data collections (the National Hospital Cost Data Collection (NHCDC) and the Admitted Patient Care Activity datasets) only capture 'country of birth'. This is not seen as a reliable indicator of CALD patients as it does not take into consideration how long the person has resided in Australia or what cultural or linguistic differences they may experience.

In the Pricing Framework for Australian Public Hospital Services 2014-15, IHPA discussed the need for a CALD adjustment and that they had undertaken an analysis of the relative costs of the CALD group using the NHCDC and the Admitted Patient Care activity data sets. They summarised their analysis findings which showed that patients born in non-English speaking countries:

- comprised about 22% of all patients
- cost less on average per patient (by -2.9%) than others, but
- had a slightly longer length of stay (by 2.5%) on average than other patients.

This analysis was determined to be inconclusive, mainly due to the CALD indicator of Country of Birth being used, and therefore a more detailed costing study was commissioned.

Accordingly, the CALD costing study was commissioned to include the following:

1. A literature review of local Australian and International sources to identify cost drivers, cost allocation methods for CALD patients and international activity based pricing models used,
2. Consultations with participating jurisdictions to identify the information collected that is used to identify CALD patients and the cost allocation methods utilised for CALD specific costs, and
3. Collection and analysis of CALD and non-CALD patient cost data from a sample of nominated sites.

1.2 Methodology

1.2.1 Literature review

The literature review was conducted using Google scholar, PUBMED, NHSEED and Econolit searches from 2005 to 2014 for a range of search terms including:

Socio-economic status (SES), ethnicity, DRGs, risk adjustment, refugees, immigrants, CALD, Diagnosis Related Groups, casemix funding, Activity Based Funding, health, needs and hospital costs.

Further details have been provided in Appendix D.

1.2.2 Consultations

Consultations with all participating jurisdictions, their nominated sample sites and other relevant stakeholders were undertaken to understand and obtain their views on what information is currently available to identify CALD patients. These consultations involved discussions of the associated factors for increased costs, additional resource requirements, and an overview of the cost allocation methods utilised by the nominated sites. The consultations were conducted via teleconference, face to face meetings, survey questionnaire submissions or any combination of these methods.

There was consensus across all consultations that CALD patients are primarily identified using a combination of the following indicators: preferred language (PL), first spoken language (FS) or language spoken at home, interpreter required (IR) and interpreter booked.

During consultations for this review, the majority of the stakeholders indicated that CALD specific costs are currently not specifically allocated to CALD patient episodes, instead the costs are allocated to a wider range of CALD and non CALD patients across all product types. It was also noted that CALD indicators such as “interpreter required” and “interpreter booked” are often inconsistently captured by the nominated sites and jurisdictions. It was suggested that the quality of interpreter usage data may vary significantly across hospitals, health networks and jurisdictions.

Most consultations also highlighted that minimal number of evidence based studies have been undertaken to understand any trends or characteristics (for example higher length of stay, additional nursing or health practitioner time, disease profile, higher rate of readmissions) to this patient cohort.

1.2.3 Data analysis

The purpose of the data analysis component is to observe and compare trends in cost and activity between identified CALD patient encounters and all other patients and to provide an evidence base for whether a funding adjustment is required for this patient cohort.

In our consultation with the jurisdictions, sample sites were offered to take part in the data analysis component. These sample sites were asked to provide encounter data for Round 17 (2012-13) with all CALD identifiers and the matching Episode ID. The matching Episode ID was then used to link the encounter record to the NHCDC cost and demographic (combined) data provided by IHPA. Victoria was the exception to this process; cost data, demographic information and CALD indicators for Round 17 were received directly from Victoria and no linking to IHPA’s dataset was required.

Data received from sample sites

Round 17 encounter data with a CALD identifier field was requested from each of the sample sites who agreed to participate in this costing study. Please note that references to sample sites, in the case of NSW refers to the whole of the state, and for VIC, the 4 LHNs listed below.

The details of the data submitted have been outlined in the Table 1.2.3.1.

Table 1.2.3.1: Submissions by jurisdictions of products and CALD indicators

Jurisdiction	Sites/Scope	Hospital Products	CALD identifier (Code)	fields
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Jurisdiction	Sites/Scope	Hospital Products	CALD identifier fields (Code)
NSW	State-wide	Acute, ED, Sub-acute	Interpreter required (IR) (ED only); Preferred language (PL)
VIC	Northern Health Southern Health Eastern Health Western Health	Acute, ED, Sub-acute, Outpatient	Interpreter required (IR); Preferred language (PL)
QLD	Metro South LHN	Acute, Sub-acute	Preferred language (PL)
SA	Northern Adelaide LHN	Acute, Sub-acute	First spoken language (FS)

A summary of the adjustments required and assumptions made to use the submitted data for the analysis has been described in Appendix H.

Identifying the relevant group for analysis

Using CALD identifiers provided by the sample sites in their data submissions, encounters were split into CALD and non-CALD analysis groups.

Indigenous patients (persons who identify as being of Aboriginal and/or Torres Strait Islander descent), identified by indigenous (“ATSI”) status, receive a funding adjustment under the current NEP model. To focus the analysis on CALD patients only, the CALD and non-CALD analysis groups were further split by indigenous status to separate the profiles of CALD and indigenous patient encounters.

Using this method of classification, the data received was segmented into the following four groups:

- CALD and non-indigenous encounters
- CALD and indigenous encounters
- Non-CALD and non-indigenous encounters
- Non-CALD and indigenous encounters

The analysis tests described below, has been carried out on the CALD and non-indigenous group (the ‘CALD group’) compared to the combination of all of the groups (the “overall sample site”) for each of the CALD identifiers provided by the jurisdictions. In this way, the analysis would aim to identify any observable trends using ‘interpreter required’ as a CALD indicator separately from ‘preferred language’.

Analysis categories

The analytical procedures performed have been broadly categorised into the following areas:

1. Comparison of cost per weighted activity unit
2. Encounter cost
3. Encounter length of stay

4. Encounter volume
5. Patient characteristics

For the tests described within each category, an additional test of statistical significance was performed where possible, to provide an indicator of validity over the findings.

In addition to these tests, supplementary tests were performed on acute and ED encounters that were necessary to support the conclusions reached. These supplementary tests used the data provided by the jurisdictions, but did not involve comparisons of the CALD group to the overall sample site or involved tests that combined multiple aspects of the analysis categories listed above. These supplementary tests can be found in the separate Analysis Appendix for acute and ED encounters respectively.

1. Cost per weighted activity unit

Test 1.1: Actual cost per weighted activity unit:

The purpose of this test is to identify whether CALD patient groups are more expensive after controlling for the other factors that currently receive an adjustment or higher complexity weight in the NEP pricing model.

The “actual cost” included in the calculation are those cost buckets in-scope for the NEP: for Acute Admitted, Sub-acute and Outpatients the Depreciation, Emergency Department, Payroll Tax, and “exclude” cost buckets were excluded from the analysis. For Emergency Department services, the same cost buckets were included with the addition of the Emergency Department cost bucket.

“Weighted Activity Unit” represents the price weight that is assigned to an episode of care as part of the National Efficient Price model. The price that is assigned to an episode of care is calculated as the price weight times the NEP. A higher price weight is assigned to episodes that are estimated to cost more. The acute admitted model is the most advanced and robust: in the acute admitted model, the price weight takes into account the clinical classification (DRG), length of stay, paediatric adjustments, and some patient demographics (remoteness and Indigenous status).

The episode details (length of stay, classification code, indigenous status, remoteness etc) were entered into the NEP weighted activity unit model to calculate the expected price for the episode. The NEP 2014/15 model (“NEP14”) was used for NSW, QLD and SA. For Victoria the NEP 2013/14 model (“NEP13”) weighted activity unit was adopted because the classification systems supplied by Victoria were not compatible with the classification systems required for the NEP14 weighted activity unit model.

If the weighted activity unit model fully explains the variation in cost for CALD encounters then the cost per weighted activity unit for CALD encounters should be the same as the average cost per weighted activity unit for all encounters and for non-CALD encounters.

The NEP model has a private patient discount: a discount is applied to the public patient price to account for the costs against which revenue is received for private patients. The term for the weight, taking into account the private patient adjustment, is the “National Weighted Activity Unit”, or “NWAU”. NWAU has not been used in this study. The weighted activity unit before application of the private patient discount has been used so that the results are not distorted by the different funding treatment of public and private patients.

Test Number	Name of analysis	Applicable products and classification of reporting
1.1	Actual cost per weighted activity unit	Acute – AR-DRG Sub-acute – SNAP and Care type ED – URG Outpatient – Tier 2 clinic

2. Encounter cost

Test 2.1: Average total cost by classification code

All submitted records for the sample site were used to calculate the average total encounter cost by product classification code. The same data was then used to calculate the average total encounter cost for CALD group with a comparison made between them.

The purpose of this test was to identify whether CALD patient encounters were more expensive compared to the average patient for that sample site.

Additional tests performed included comparing the average cost of same-day and overnight encounters for acute and sub-acute products, and the average cost per encounter of expected same-day DRGs for acute encounters only.

Test 2.2: Average cost per day by classification code

The average total encounter cost per day split by same-day and overnight encounters for acute and sub-acute encounters was calculated for CALD group and compared to the whole sample site.

The purpose of this test was to identify whether CALD patient groups had a higher cost per day than the average cost which may indicate a higher consumption of hospital resources arising from their cultural and/or language diversity.

Test 2.3: Average inlier cost per day by classification code

Short and long stay encounters were excluded for this analysis, which examined the cost per day of acute encounters with a length of stay within the inlier range. The inlier range was defined by that included in the NEP14 Price Determination. This data was then used to calculate the average inlier cost per day for the CALD group and compared to the sample site.

The purpose of this test was to identify the difference in costs of CALD patients compared to an average patient, having controlled for short-stay and long-stay encounter costs.

Test 2.4: Average pathology costs by classification code

The average total pathology cost (direct and overhead) by product classification code was calculated for the CALD group and compared to the average total pathology cost of the sample site.

The purpose of this test was to identify the extent to which CALD patients incur different pathology costs compared to an average patient as a result of their cultural and/or language diversity during treatment.

Test 2.5: Average imaging costs by classification code

The average total imaging cost (direct and overhead) by classification code was calculated for the sample site and compared to the average total imaging cost for each of the analysis groups.

The purpose of this test was to identify the extent to which CALD patients incur different imaging costs compared to an average patient as a result of their cultural and/or language diversity during treatment.

Test 2.6: Average ward nursing and ward medical costs by classification code

The average combined Ward Nursing and Ward Medical costs (direct and overhead) by classification code was calculated for the sample site and compared to the average combined equivalent costs for each of the analysis groups.

As these ward costs make up a significant proportion of total encounter costs, these two cost buckets were combined and compared to identify the extent to which CALD patients incur a different amount of these costs during treatment.

Test 2.7: Average ICU and CCU costs per hour by classification code

ICU and CCU costs were combined (as 'critical care') and a critical care cost per CCU hour was calculated by classification code for the sample site. This was compared to the average critical care costs per hour for the CALD group.

The purpose of this test was to identify the extent to which CALD patient groups incur a different critical care cost per unit of time, which would be reflective of increased or reduced resource intensity.

Test Number	Name of analysis	Applicable products and classification of reporting
2.1	Average total cost per encounter by product classification code	Acute – AR-DRG Sub-acute – Care type ED – URG Outpatient – Tier 2 clinic
2.2	Average cost per day by product classification code	Acute – AR-DRG Sub-acute – Care type
2.3	Average inlier cost per day by product classification code	Acute – AR-DRG
2.4	Average pathology costs by product classification code	Acute – AR-DRG ED - URG Sub-acute – Care type Outpatient – Tier 2 clinic
2.5	Average imaging costs by product classification code	Acute – AR-DRG ED - URG Sub-acute – Care type Outpatient – Tier 2 clinic
2.6	Average ward nursing and ward medical costs by product classification code	Acute – AR-DRG Sub-acute – Care type Outpatient – Tier 2 clinic

Test Number	Name of analysis	Applicable products and classification of reporting
2.7	Average ICU and CCU costs per hour by product classification code	Acute – AR-DRG

3. Encounter length of stay

Test 3.1: Average length of stay (LOS) by classification code

The average LOS by product classification code was calculated for the CALD group and compared to sample site. Same-day encounters will be excluded from the analysis as these encounters have their LOS rounded up to 1; the CALD group and the sample site average length of stay will be the same by definition.

The purpose of this test was to identify the extent to which CALD patients tend to have a different length of stay in hospital compared to an average patient and in doing so, consume different levels of hospital resources.

Test 3.2: Average ED presentation duration by URG

A calculation was made of the ED presentation duration by URG for the sample site, using the presentation time and the episode end time for all Emergency Department (ED) patients. This was then compared to the average ED presentation duration by URG for the sample site.

The purpose of this test was to identify the extent to which CALD patients have different stays within EDs than the average ED patient.

Test 3.3: Average inlier length of stay by classification code

The average length of stay for all acute patients for the CALD patient group was compared to the sample site, having excluded short and long stay encounters. The inlier range was defined by that included in the NEP14 Price Determination.

The purpose of this test was to identify whether CALD patients trend toward the upper or lower bounds of the inlier band, and would consume different amounts of resources than the average.

Test Number	Description of analysis	Applicable products and classification of reporting
3.1	Average length of stay (LOS) by product classification code	Acute – AR-DRG Sub-acute – Care Type
3.2	Average ED presentation duration by URG	ED - URG
3.3	Average inlier length of stay by product classification code	Acute – AR-DRG

4. Encounter volume and severity

Test 4.1: Volume of acute encounters by adjacent DRG and severity

The total episodes by adjacent DRG for the sample site were grouped into severity groups using the A, B, C or D classification code within adjacent DRGs (where available). For this

analysis, A and B were considered to be more severe, while C and D were considered to be less severe.

The purpose of this test was to identify what the proportion of CALD patients was for these DRG and severity codes, as a proportion of total sample site volume and whether they are diagnosed with higher or lower complexities within their acute inpatient stay.

Test 4.2: Volume of ED presentations by URG and triage category

The volume of ED encounters of the CALD group by triage category was calculated and compared to overall volume for that triage category of the sample site for admitted and outpatient encounters.

The purpose of this test was to identify the extent to which CALD patients are presenting to EDs with higher or lower triage classifications, and whether this was different for admitted or outpatient encounters.

Test 4.3: Volume of service events by Tier 2 clinic

The volume of service events of the CALD group by Tier 2 clinic was calculated and compared to overall volume for that Tier 2 clinic.

The purpose of this test was to identify the proportion of CALD patients utilising Tier 2 clinics relative to overall volume.

Test Number	Description of analysis	Applicable products and classification of reporting
4.1	Volume of acute encounters by adjacent DRG and severity	Acute – AR-DRG
4.2	Volume of ED presentations by URG and triage category	ED – URG
4.3	Volume of service events by Tier 2 clinic	Outpatient – Tier 2 clinic

5. Patient demographic factors

Test 5.1: Average patient age

The average age of the patient by product classification code was calculated for the CALD group and compared to average age for the sample site.

The purpose of this test was to identify whether CALD patient groups were older or younger than the average patient under different settings.

Test 5.2: Volume of encounters within remoteness categories

Using the postcodes of residence of patients, encounters could be grouped into one of five remoteness categories: major cities, inner regional, outer regional, remote and very remote.

The proportion of encounters in the CALD group relative to overall sample site volume for that remoteness category was then calculated for the various products.

The purpose of this test was to identify the spread of CALD patient groups across the remoteness categories for the sample sites and what proportion they made up of overall volume.

Test Number	Description of analysis	Applicable products and classification of reporting
5.1	Average patient age	Acute – AR-DRG ED – URG Sub-acute – Care type Outpatient – Tier 2
5.2	Volume of encounters within remoteness categories	Acute – AR-DRG Sub-acute – Care Type

2 Findings

Following the literature review, data analysis and consultations with the industry participants, a number of findings became evident and are described below.

Central to this review was the test of whether there are additional costs for CALD patients that would justify a CALD loading within the NEP. This question was tested, and the answer developed from this review was negative, however there are a number of issues related to the management of CALD information and costing that should be pursued further and should this occur, it may be possible to confirm that a CALD loading is appropriate.

2.1 Identification of CALD patients

From the international literature review and consultations, it was evident that there are many dimensions to the characterisation of culturally and linguistically diverse patients.

The Australian Institute of Health and Welfare (AIHW, 2014) produced a report on cultural and linguistic diversity measures in aged care. The report provides an overview of the 12 data items that the Australian Bureau of Statistics (ABS) collects to identify 'all the cultural and language information considered necessary for consistent and accurate measurement of cultural diversity in Australia'. The report concludes with identifying the 10 most important data items collected that are of relevance to CALD Australian health scenarios, namely:

- *main language other than English spoken at home;*
- *main language spoken at home;*
- *country of birth;*
- *year of arrival (the first time arrived in Australia to live here for > 1 year);*
- *interpreter services required;*
- *preferred sex of interpreter;*
- *proficiency in spoken English;*
- *religious affiliation;*
- *regular attendance at religious services; and*
- *importance of religion*

The same report by the AIHW recommended that data sets should employ, as a minimum, the ABS measures 'Country of birth' and 'Main language spoken at home', 'Interpreter required', 'Preferred sex of interpreter' and 'Preferred language'.

In the absence of actual usage data, 'Interpreter Booked' was identified through consultations as an indicator more closely aligned to patient usage than 'Interpreter Required'. It is currently not collected within the jurisdictional data collections and would be useful in identifying when actual usage of interpreter services is not captured.

2.2 Identification of Interpreter Services costs

From international studies, submissions to IHPA and the consultation process, it was generally agreed that there are cost impacts on hospitals for CALD patients. Principal amongst these CALD costs is the cost of internally and externally sourced interpreter services, which can cost more than \$1,000 per service for rare languages.

Within this study however, the CALD cost impacts could not be easily or consistently observed in the clinical costing data provided to the study. The main reason for this is the method by which CALD costs are allocated within the clinical costing systems.

Throughout the consultation process it became apparent that the interpreter service costs were not consistently collected across product types and jurisdictions. Where these costs were collected, they were often combined within the administrative costs of the hospital and are then allocated to all patients in a generalised manner, rather than specifically attributed to CALD patient activity. The result is that interpreter costs are allocated to all CALD and non-CALD patients alike.

For example, analysis of VIC interpreter costs allocated to acute encounters showed 79% of interpreter costs were being allocated to encounters where an interpreter was required. The remainder of these interpreter costs were allocated to patients where an interpreter was indicated as not required. In addition, interpreter costs allocated to ED encounters represented approximately 19% of total encounter costs. This suggests interpreter costs are a material contributor to these encounters and a consistent method of allocation and reporting of these costs would need further consideration from jurisdictions and IHPA.

In order to identify the cost of the interpreters against CALD patients, the cost would first need to be identified within the hospital General Ledger, and allocated to identified CALD patient encounters based on actual usage of interpreter services.

Studies have shown using a more granular costing approach has revealed that the costs associated with CALD interventions could be material. For example, in 2009 a study of the additional costs of providing inpatient services to CALD patients was performed in Victoria. This study used the actual interpreter service cost and usage data from three metropolitan hospitals and found that CALD patients cost an additional 17.5% to treat than equivalent non-CALD patients.

In order to easily identify and quantify this cost against CALD patients into the future, the costing methodology employed by hospitals and health services needs to be improved. These hospitals and health services should aim to collect and utilise patient level consumption data across product types, to reflect the cost of these services attributable to specific patient episodes.

2.3 Trends in CALD patient encounters

One of the consistent and significant characteristics of this subset of CALD patients across product types is that they are older than the general population. This is consistent with the findings from the literature review that the CALD patient population is skewed towards elderly individuals.

An example of this was identified in the analysis of ED data provided by NSW. Using 'Interpreter Required' as a CALD indicator for the URGs analysed, the data showed CALD patients were older than the overall population by approximately 27%. There were no URGs where the average CALD patient age was lower than the overall average age, as shown in Figure 2.1 below.

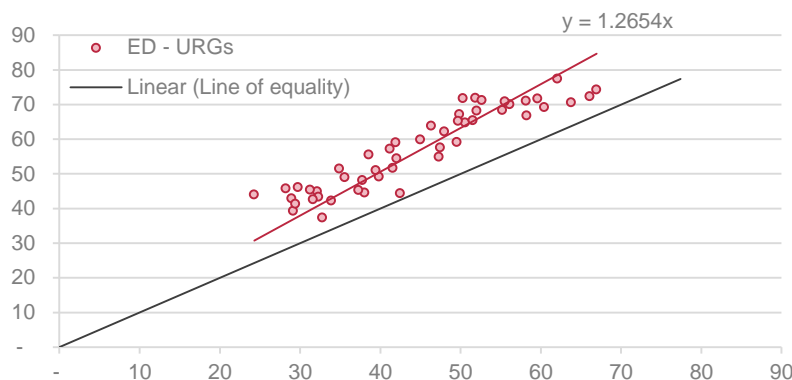


Figure 2.1: Comparison of average age by URG between sample site (X-axis) to CALD group (Y-axis) - NSW using interpreter required.

Analysis of ED encounter volumes revealed both CALD and aged patients had a higher representation of overall volume in more urgent Triage categories. This suggests increased costs attributed to CALD patient presentations arising from their urgency of treatment.

When the average inpatient inlier LOS for CALD patients was compared for acute inpatient separations, it was seen to be almost identical to the trend within aged patients as shown in Table 2.1 below. In most jurisdictions, the CALD patient groups and elderly patient groups were shown to stay longer than the overall population. The longer length of stay of CALD patients may be driven by age-related complexities of patients, which may be a significant driver in cost differences, rather than the CALD nature of patients only.

Table 2.1: Comparison in inlier length of stay differences between sample site and analysis group

Description of test output	NSW (PL)	VIC (PL)	QLD (PL)	SA (FS)
<i>Percentage difference inlier length of stay between sample site and:</i>				
CALD group	5.0%	2.1%	-1%	3.6%
Elderly group (65+ years)	3.1%	4.0%	0.6%	3.5%

Note: PL – preferred language as CALD indicator; IR – interpreter required as CALD indicator; FS – first spoken language as CALD indicator.

As CALD patients requiring interpreter services are generally older than the overall population, any future studies should consider the impact of age on cost, separate to the impact of CALD complexity on cost.

2.4 Cost per weighted activity unit – Acute Admitted

For acute admitted care, initial face-value results of CALD costs per weighted activity unit compared to non-CALD were found to be inconsistent between jurisdictions: 0.1% lower in NSW, 1.5% to 2% lower in Victoria, 2.9% higher in QLD, and no difference in SA. The result is not conclusive for Victoria due to limitations in the data supplied for the full weighted activity unit model to be applied.

The NSW lower-cost result is explained by the very high proportion of CALD patients living in major cities compared to non-CALD patients. When the remoteness mix is standardised for CALD and non-CALD patients, the CALD cost per weighted activity unit compared to the non-CALD cost per weighted activity unit is 0.2% higher in SA, 1.4% higher in NSW, and 3.8% higher in QLD.

The results were consistent between jurisdictions for CALD patients aged 80 or more. CALD costs per weighted activity unit compared to non-CALD costs per weighted activity unit for patients aged 80 or more were 2.4% higher in NSW, 4.7% higher in QLD and 3.3% higher in SA. The NSW and QLD results are statistically significant at 95% confidence. When the remoteness mix is standardised for CALD versus non-CALD patients (using the overall distribution of weighted activity units by remoteness within the State sample), the differences for patients aged 80 or more are +3% in NSW, +6.5% in QLD and +3.7% in SA. The results were variable between jurisdictions for patients of younger age groups.

Overall, the cost data suggests higher cost per weighted activity unit for CALD patients aged 80 or more. Across all age groups, cost per weighted activity unit for CALD patients were found to be higher after allowing for the differences in remoteness mix between CALD and non-CALD patients. In most cases, the CALD to non-CALD differences were less than +5%.

2.5 Cost per weighted activity unit – Other Service Categories

Analyses of the cost per weighted activity unit for other service categories do not support a national CALD loading to the NEP model. For sub-acute, the results were inconsistent between jurisdictions, being 4.8% lower in NSW, 4.1% higher in QLD, and 1% to 3% higher in VIC. For Emergency Department presentations, the cost per weighted activity unit by age group in NSW and Victoria was lower than the non-CALD cost for patients of the same age group. This does not support a loading to the NEP ED model. ED cost data was not available for QLD and SA. Outpatient cost data was supplied by Victoria only. The outpatient cost per weighted activity unit in Victoria was 5.4% lower than the non-CALD costs, which does not support an NEP loading for outpatient encounters.

2.6 Cost differences of CALD patients for individual cost buckets

Having identified CALD patients as staying longer than patients of the overall population in the acute setting, ward-related costs (which are typically allocated based on length of stay) were found to have a higher average cost. For each of the jurisdictions, the average cost per encounter for ward and clinical staff was between 1.5% and 6% higher for the CALD group. In addition to staying longer in hospitals, CALD patients may be attracting more contact time from nursing and clinical staff, which may also have been a contributing factor to this cost differential.

Based on our consultations, jurisdictions suggested pathology and imaging may be cost buckets where CALD patients may require more tests and screens, and therefore attract higher encounter costs.

For acute encounters, this was not well supported by the data. The difference in pathology costs varied between jurisdictions with some having higher and others lower costs for the CALD group. Imaging costs were mostly lower. Similarly for ED encounters, there were mixed results with respect to cost differences between NSW and VIC. Imaging costs showed little difference for CALD patients. For sub-acute encounters, the average pathology cost difference was mostly lower across the jurisdictions, with the Maintenance and Geriatric Evaluation and Management care types in NSW being the exception to this, and showing a higher average cost.

2.7 Geographical Distribution of CALD patients

There were a higher proportion of CALD patients within the “Major Cities within Australia” location (17-19% of all ‘Major City’ patients), compared to the relative proportions of CALD

patients in the other classifications² were between 1-2%. This higher representation of CALD patients from urbanised regions was consistent across the sample site data submitted by jurisdictions, and across the acute and sub-acute settings.

The challenges of accommodating the needs of CALD patients are significantly more important to the major metropolitan hospitals than in the regional or rural environments.

² Other remoteness classifications: Inner regional, Outer regional, Remote and Very Remote regions

3 Literature Review

The literature review was conducted on both Australian and International sources covering the following areas:

- CALD definitions
- Australian demography
- Australian and international costing studies and other literature on CALD, and
- Australian and international costing studies on socio-economic, ethnicity and other related measures.

3.1 Definition of Cultural and Linguistic Diversity (CALD)

There is no consistent definition used to define Cultural and Linguistic Diversity; however the literature review identified a range of papers which consider CALD specific factors such as language, spirituality and ethnicity. One of the challenges within Australia is the overlap of CALD patients who are classified as Indigenous or regional, where these patients should be separately considered in terms of their cost profiles and allocated funding.

The National Health and Medical Research Council (*NHMRC, 2006*) discussed the term Cultural and Linguistic Diversity in a paper on cultural competency in health and identified this to refer to the wide range of cultural groups that make up the Australian population and Australian communities. The term acknowledges that groups and individuals differ according to religion and spirituality, racial backgrounds and ethnicity as well as language. In this report the term 'culturally and linguistically diverse background' is used to reflect intergenerational and contextual issues, not just migrant experience.

The Australian Institute of Health and Welfare (*AIHW, 2014*) produced a report on cultural and linguistic diversity measures in aged care. Whilst the context of the work was health in aged care, these findings have relevance to other sectors of the health system. The report provides an overview of the 12 data items that the Australian Bureau of Statistics (ABS) collects to identify 'all the cultural and language information considered necessary for consistent and accurate measurement of cultural diversity in Australia'. It also identified a further 30 CALD measures that are used in international and Australian surveys, census, administrative data sets, research and assessment instruments. The report concludes with identifying the most important 10 data items collected that are of relevance to CALD Australian health scenarios, namely:

'main language other than English spoken at home; main language spoken at home; country of birth; year of arrival (the first time arrived in Australia to live here for one year or more); interpreter services required/used; preferred sex of interpreter; proficiency in spoken English; religious affiliation; regular attendance at religious services and importance of religion.'

The same report by the AIHW found that several Australian databases are not capturing appropriate measures of CALD and recommended that:

- Data sets without CALD measures should employ, as a minimum, the ABS measures 'Country of birth' and 'Main language spoken at home', augmented with 'Interpreter required', 'Preferred sex of interpreter' and 'Preferred language', where the main language is other than English;

- Data sets with selected ABS measures should ensure they comply with ABS data collection methods, and where possible, augment the measures to include 'Interpreter required', 'Preferred sex of interpreter' and 'Preferred language', where the main language is other than English; and
- 'Proficiency in spoken English' and 'Year of arrival', along with 3 linked measures that are associated with spirituality were also recommended for supplemental inclusion.

Within Australia, there are also some CALD related data items that are collected through the ICD-10-AM diagnosis codes. ICD-10-AM is the International Statistical Classification of Diseases and Related Health Problems, Tenth Revision, Australian Modification which consists of a tabular list of diseases. There are a range of ICD-10 codes (in the Z chapter) which capture socio-economic status or literacy and education information for example: 'Z55.0 - Illiteracy and low-level literacy; Z55.8 - Other problems related to education and literacy; Z59.5 - Extreme poverty; and Z59.6 - Low income.'

3.2 CALD demography

An AIHW report for 2011 reported more than one quarter (27%) of the Australian population was born overseas, comprising 9% from 'main English-speaking countries' and 18% from 'non-main English-speaking countries'. The overseas-born population has an older age structure than the Australian-born population, with 36% of people aged 65 and over being born overseas. Within this cohort of older people born overseas, 22% of those over 65 were from 'non-main English-speaking countries' (AIHW, 2013c).

The actual composition of the Australian population born overseas has changed in recent decades. In the initial waves of migration after World War II, most migrants were born in Europe however over recent years the proportion of European migrants has been declining, while migration from Asian countries has been increasing. The 2011 Census count for migrants who arrived in Australia in 2007 or later, recorded 13% born in India, 12% in the United Kingdom and 7 of the remaining 'top-10' countries of birth were from Asia (ABS 2012c).

Migration patterns also influence the frequency and range of languages spoken in Australian households. In 2011, longer-standing migrants speaking a language other than English at home most commonly spoke Mandarin (4.3%), Cantonese (4.2%), Italian (3.7%) and Vietnamese (3.2%). Among recent arrivals, 32.6% spoke only English at home, followed by Mandarin (10.8%), Punjabi (3.7%), Hindi (3.3%) and Arabic (3.0%) (ABS 2012d).

Among older Australians, 11% spoke another language at home as well as speaking English well, while 6% of the older population spoke another language at home and spoke English poorly. This group included 1.5% of all older people, who did not speak English at all' (ABS, 2012d).

3.2.1 National mortality and hospitalisation data

There is significant variation of causes of death between population groups, for example in 2001–2002 (AIHW, 2004a; AIHW, 2005a):

- Asian-born immigrants had especially low death rates for colorectal and prostate cancer, respiratory diseases and suicide;
- immigrants born in the United Kingdom and Ireland experienced higher rates of breast and lung cancer; and
- some immigrant groups from Southern Europe, South Pacific Islands, North Africa, the Middle East and Asia had higher diabetes mortality rates.

For hospitalisation, there were also variations between groups (AIHW 2004a), with rates from 2001–2002 showing that:

- Asian-born immigrants were hospitalised more often than Australian born for tuberculosis, although the annual number of cases was small;
- females born in Asia had higher rates of hospitalisation for cervical cancer;
- hospitalisation for gastritis and duodenitis among persons born in Continental Europe and Asia was higher than for Australian-born persons; and
- the overseas-born hospitalisation rate for skin cancer was less than half that for Australian-born people.

3.2.2 State based data

Analysis of data in New South Wales suggests that among people born overseas (NSW Health, 2004):

- certain groups rate their health poorer on average than Australian-born groups (eg Italian, Chinese and women born in India and the Philippines);
- people born in Lebanon, Fiji, Italy, India, and Greece, females born in the Philippines and males born in South Africa have high rates of hospitalisation for diabetes or its complications;
- people from Lebanon, Fiji and India have high rates of hospitalisation for coronary heart disease and people from Lebanon, Fiji, India and Greece have high rates of cardiac revascularisation procedures;
- people born in the United Kingdom and women born in New Zealand have high rates of lung cancer; and
- people born in Vietnam, the Philippines, India, Indonesia, China, Hong Kong, Korea, Fiji, Malaysia, and the Former Yugoslavia have high rates of tuberculosis (NHMRC, 2006).

Newly arrived refugees are almost twice as likely to report their health as either 'fair' or 'poor', compared with the general population (NSW Health, 2004) and another study (Echevarria, 2002) identified communities from Iran and Afghanistan contend with problems of poverty, unemployment, lack of affordable housing, lack of English language skills, social isolation and exclusion, discrimination and racism.

This geographical variation and the changing migration patterns within Australia have important ramifications for the delivery of health services which may impact on the costs.

3.3 Australian Costing Studies

3.3.1 Commonwealth Grant Commission study

In 2008, the Commonwealth Grants Commission (CGC) undertook a review of 'Admitted Patient Services' as part of its 2010 review of GST relativities across the States and territories which included a comprehensive coverage of the costs associated with CALD patients Australia wide. The analysis was performed using AIHW hospital data using country of birth (COB) as the CALD indicator differentiating between people born in English or non-English speaking countries (BESC/BNESC). (Commonwealth Grants Commission, 2008)

The study concluded that CALD was not seen as a major driver of hospital use, given its hierarchical grouping analysis and findings that differences in separation rates by patients classified by country of birth were largely explained by the older age profile of people born in non-English speaking countries.

States were asked to provide feedback, to which Tasmania agreed that they did not consider CALD to be a material, stand-alone driver of admitted patient service use, however New South Wales, Victoria and the Northern Territory indicated they would like to see further examination of CALD as an additional driver of use and cost.

3.3.2 Victorian costing study

In 2009, Victoria conducted a study of the additional costs of providing inpatient services to CALD patients. They used existing Victorian administrative data from three metropolitan hospitals (Royal Melbourne Hospital, Western Hospital and Northern Hospital) to track patients along five clinical pathways identifying CALD patients as those who required and used an interpreter. (*Victorian Department of Treasury and Finance, 2009*)

The data for 2005-06 included 131 752 separations, which comprised 10% of total admissions to Victorian public hospitals in that year. After standardising for age and complexity (comparing patients of like ages and like DRGs), the Victorian study found CALD patients cost an additional 17.5% to treat in comparison to equivalent non-CALD patients, mainly due to longer lengths of stay. The results of this study were provided to the CGC in response to the national review.

3.3.3 Responses to this study

After reviewing the Victorian study, the CGC noted that there may be impacts that offset the longer length of stay of CALD patients such as a fewer number of episodes. At the Western Hospital only 16.6% of patients were from non-English speaking backgrounds (NESB) but represented 38.6% of the hospital catchment area.

Furthermore, they provided information for both 2004-05 and 2005-06 that showed that non-Indigenous BNESC expenses per capita were only higher than the equivalent BESC expenses per capita for the 50 to 84 age groups in highly accessible regions. Therefore, they concluded that the Victorian study was influenced by only including hospitals with catchments in highly accessible regions. For all other regions, and for other age groups in highly accessible regions, the BESC expenses per capita were greater than the equivalent BNESC expenses per capita indicating that the results from the Victorian study were not represented nationally.

They responded with other information from the National Health Survey data which indicated people born in non-English speaking countries and aged 18 or more used casualty, outpatient, day clinic and general practitioner services more than other people but used other health services (including inpatient services) less intensively. They provided AIHW data which reported that people born overseas are relatively healthier than their Australian counterparts, based on hospital statistics that show they have lower death and hospitalisation rates, along with other positive health indicators. They acknowledged one of the data limitations was that there are no national standard definitions of the CALD population, and that they did not have national data on the CALD identifier used by Victoria (requirement for an interpreter).

In summary, the CGC concluded that whilst there was evidence that CALD influences increased costs in the 50 to 84 age groups located in highly accessible regions, these increases were more than offset by lower costs in other regions and for other age groups and therefore CALD influences were not found to lead to materially higher costs.

In response to the CGC data that the Western Hospital only treated 16.6% of patients from a NESB when this demographic represented 38.6% of the hospital catchment area, Victoria responded by differentiating between people whose nominated preferred language is not English to people who speak a language other than English at home (who may also speak English fluently). They felt that NESB is a very broad measure, generalising the needs of highly educated individuals with proficiency in English as a second language, or business migrants with significant social and economic resources, with newly arrived refugees and those who speak little or no English.

They believe that a better measure would be the Low English Fluency (LEF) group, which accounts for some 5.5% of the catchment population. Using LEF measures, they concluded that their provision of inpatient services to 12.1% of patients requiring an interpreter actually indicates a higher level of use for the catchment area.

3.4 Other Australian literature

The literature review identified a large number of clinical studies looking at CALD patients and recommending changes or improvements that would be beneficial. One of these is the NHMRC report on 'Cultural competency in health' which recommended a system-wide approach for human resources, accountability and education strategies and a framework for information management systems in health services that promotes appropriate data capture relating to diversity. (NHMRC, 2006)

These recommendations would require additional resources (labour or IT systems) which would add to the cost of providing services to this cohort of patients.

The other studies reviewed identified the types of resources that are used to provide extra care to CALD patients, and certain disease profiles which are more prevalent in patients from certain countries. These are:

- bilingual/bicultural and multi-cultural community link workers are used in NSW (South Western Sydney) to promote access to dementia care, particularly for Chinese, Italian, Arabic and Spanish patients;
- Community navigators are used in QLD which is a partnership between government and non-government organisations;
- Cardiovascular, diabetes, renal and respiratory diseases are more prevalent in communities from Pacific Islands, Middle East, North Africa, India and China; and
- Viral Hepatitis B is more common in populations from China and Egypt.

While not specifically related to hospital services, a Productivity Commission study was conducted in 2011 considering the special needs of older people from CALD backgrounds who can have difficulty in communicating their care needs or having their preferences and cultural needs respected. The Commission noted that these circumstances can adversely affect the wellbeing of the older person receiving care and that interpreter services and consideration of the cultural appropriateness of certain diagnostics should be provided. (Productivity Commission, 2011)

3.5 Studies on socio-economic, ethnicity and other related measures

A search was conducted for international and Australian funding arrangements, cost drivers and related adjustments aimed at identifying relevant cost or pricing information on CALD patients. Any identified studies have been included in section 3.3 and 3.4 above. The search was then extended to include socio-economic status (SES), refugees, immigrants and language challenges.

The reason for including a search for SES was that broadening the research terms to include ethnicity and SES provides for certain insights which are useful in identifying cost drivers and costing studies for the CALD demographic. This is particularly the case as research identifies a link between a person's SES and their ethnicity or language. For example, an article by House and Williams identified that SES, race and ethnicity were intimately intertwined, and that race and ethnicity often determined a person's socioeconomic status (House and Williams, 2000). Furthermore, the literature search identified that, in some instances, variables such as 'Non English Speaking Background' were included as

components of SES in analysing the cost impact of this cohort of patients (for example Ansari et al, 2014).

Whilst socio-economic status is not uniquely linked to a CALD background, the fact that studies showed a relationship merited examining the literature for relevant costing studies.

3.5.1 Costing studies

A number of international and Australian costing studies were identified which looked at whether socio-economic factors or ethnicity were cost drivers of hospital activity. These have been summarised below under each of the relevant headings.

Socio-economic factors

An Austrian study was identified which analysed the associations between health care spending and health care outcomes, using aggregate data collected since the introduction of DRGs into Austria in 1997. It showed that health care spending was associated with mortality and 'years of life lost'. It also concluded that socio-economic status (SES) had a strong association between health care spending and outcomes. (*Vavken et al, 2012*)

An Australian study was conducted (*Chen et al, 2012*) which addressed socio-economic status in analysing cost variations in car crash related hospitalisations focussing on vehicle occupant, rurality of residence and socioeconomic status. It found that young adults from moderate SES areas had significantly higher costs compared to young adults from high SES areas, whilst the higher costs for young adults of low SES areas was borderline significant. It did not identify any difference in length of stay by SES.

Another study addressed hospital reimbursement incentives of DRGs in Germany and the USA (*Weil, 2012*). It found that "*even when nations provide universal access, those with mental illness, or are indigent, poorly educated and non-white used less healthcare services.*" This finding is consistent with that of the Australian Commonwealth Grants Commission that found that in Australia there were relatively lower levels of utilisation of health services especially for the younger CALD individuals.

An Australian study (*Ansari et al, 2014*) investigated factors relating to hospitalisation for paediatric constipation in the state of Victoria. The findings were that children in the highest socio-economic area had ~50% fewer admissions and severe socio-economic disadvantage was found to be one of the predictors of readmission.

Contrasting the results of some of the above mentioned studies, the following pieces of literature all found little to no impact of SES in their analysis.

The Australian Productivity Commission measured the technical efficiency of public and private hospitals in Australia. An ABS index was used as the measure of SES (Index of Relative Disadvantage and Advantage) with the findings that patient SES had no significant impact on expected productivity nor on expected resource intensity.

A study from Scotland (*Geue et al, 2012*) used hospital and DRG costs to investigate the impact of various costing methods and cost drivers. The study found that SES had a small and generally non-significant effect on costs.

A Spanish study (*Orueta, 2013*) undertook predictive risk modelling analysing SES variables in a cross sectional study involving casemix classifications. The inclusion of the deprivation index (unemployment, low education level, low education level in young people, manual workers and temporary workers) led to only marginal improvements in the explanatory power of the data.

A Northern Ireland study (*Agus et al, 2006*) investigated predictors of hospital costs of esophageal cancer during the first year following diagnosis using a range of cost predictors including socio-economic status. The SES was based on the multiple deprivation index for the area in which the patient resided. The findings were that socio-economic status had a

borderline significant impact on the costs, and patients from more deprived areas consumed less resources compared to patients from more affluent areas.

An analysis in the Netherlands on casemix funding arrangements for 687 product groups within 24 medical specialties acknowledged that socio-economic characteristics were relevant for public policy decisions around funding and recommended that further research was conducted. (*Westerdijk, Zuurbier, Ludwig and Prins, 2011*)

Ethnicity

A New Zealand study was conducted (*Davis et al, 2013*) which analysed ethnicity in the context of assessing efficiency, effectiveness and equity (the indicators) in hospital performance from 2001 to 2009 involving 35 hospitals. The study calculated the performance for each ethnic group for each indicator relative to overall hospital performance for each indicator. Although costs were not directly explored in the analysis, the results around the efficiency indicator are relevant as efficiency impacts on cost. The findings were that patient outcomes and efficiency vary greatly by ethnicity group and by hospitals.

3.5.2 Social economic status in international funding models

The literature review did not identify any international funding models which specifically adjusted for CALD factors. It did however, identify a number of studies which were conducted on related measures such as ethnicity, SES, immigrants or refugees which resulted in adjustments to the relevant international funding model.

Netherlands

The Netherlands implemented a Dutch risk equalisation model for Health Insurance in 1993, where insurers receive a prospective payment for each enrollee on their list, depending on the particular risk characteristics of that enrollee. The model includes risk characteristics of socioeconomic status and region amongst others, with the categories of 'region' being determined by the proportion of non-Western immigrants, proportion of single-households, degree of urbanisation and distance to healthcare providers.

The Dutch Ministry of Health did further analysis of risk adjustment cost drivers and concluded that the inclusion of more and better morbidity-based risk adjusters may reduce the impact of other risk adjusters, particularly indirect measures of health status such as socioeconomic status and region. This later analysis concluded that the SES and region risk factors are not good indicators of cost drivers (SES only improved the explanatory power of the model by 0.05% and region by 0.04%) and may be removed from the model in the future. (*Van Kleef, Van Vliet and Van de Ven, 2013*)

Sweden

The Swedish Health Care System, which is publicly funded and provided across nine geographically defined health authorities, changed their system of distributing funds from being based on historical activity to a mathematical formula. The formula was established following an analysis being conducted to identify the demographic and socio-economic variables that had the greatest association with utilisation. (*Rice and Smith, 1999*)

The new model includes four socioeconomic characteristics based on employment amongst other variables such as age, marital status and class of housing. The four SES bands include 'not-employed, manual work, other non-manual and high non-manual' with the capitation payments increasing by 8-33%³ between each band.

³ Percentages calculated based on Medical and Surgical categories for owner-occupied patients aged 25-64 classified as cohabitating.

A noteworthy finding from the analysis was that the model omitted a relevant variable being 'non- Nordic immigrants' who were viewed as having unmet need which was not reflected in utilisation rates.

4 Consultation Findings

All jurisdictions, with the exception of the Australian Capital Territory participated in this review. Key findings from these consultations are summarised in the table below.

Table 4.0.1: Summary of consultation findings

Jurisdiction	Primary CALD indicators	Cost drivers	Cost allocation methodology
Victoria	Interpreter required, Interpreter booked, LEP	Interpreter cost	Interpreter utilisation data, allied health intervention codes
South Australia	Interpreter required, Main language spoken at home	Interpreter cost	Interpreter utilisation data (acute patients only)
New South Wales	Preferred language, Interpreter required	Interpreter cost, longer health practitioner or consultation time	Allocated as an overhead expense to all patients
Queensland	Interpreter required, Interpreter booked, Language spoken at home	Interpreter cost, additional administration and communication cost	Allocated as an overhead expense to all patients
Western Australia	Country of birth, preferred language	Interpreter cost	Allocated as an overhead expense to all patients
Northern Territory	Country of birth, Interpreter required	Interpreter cost	No specific allocation method is used
Tasmania	Interpreter required, first spoken language	Interpreter cost	Allocated as an overhead expense to all patients

During consultations for this review, majority of the stakeholders indicated that CALD specific costs are currently not distinctly allocated to CALD patient episodes, instead the costs are allocated to a wider range of CALD and non CALD patients across all product types. Key findings from these consultations are described below.

4.1 Victoria

4.1.1 Identification of CALD patients

Four Victorian Local Health Networks (Southern Health, Northern Health, Eastern Health and Western Health) were nominated for the consultations and review of CALD indicators and cost allocation methods applied for CALD specific costs in Victoria.

Northern Health and other sites in Victoria indicated that the following CALD related measures are useful in identifying the patient groups that require extra resources within a hospital.

- Low English Proficiency (LEP)
- Interpreter Required
- Interpreter Booked

- Socio Economic Status
- Refugee status
- Year of arrival to Australia

Religion, Country of Birth, NESB (non-English speaking background) and Language Spoken at Home were not seen as useful indicators for this population.

It was noted that the most reliable indicator was the 'interpreter required' flag which is recorded against individual patient records. The 'interpreter required' flag which is supplied to the Department (Victorian Cost Data Collection) is seen as being reliable and accurate.

'Interpreter booked' field is also considered a key CALD indicator and believed to be a better indicator of actual utilisation if this is available from the hospital PAS systems.

4.1.2 Patient cost drivers

Interpreter cost is noted as the primary cost for this population of patients. It is noted that external interpreter costs are much higher in comparison and low use languages (emerging or obscure) are more expensive than high use languages.

There are two dimensions that are seen to be impacting on cost at the nominated Victorian sites, the level of health literacy of the patients and the level of English proficiency which produces barriers to effective communication. Some other key themes which impact on the cost of the patients within the hospital are access to GPs, refugee referrals within the acute phase of migration and socio economic status in this population.

A number of studies have been performed on the LOS within this patient population. Northern Health also analysed the impact of interpreter use on LOS and observed that there was a positive influence on LOS in patients that received interpreters versus those who required interpreters but did not receive them.

Age was not considered to be a major differentiator of cost within this population. The Year of Arrival in Australia was considered to be a more important indicator than age.

The group was not aware of any significant analysis done into re-admission rates or disease profiles within this population.

4.1.3 Cost allocation methods

At a number of Victorian sites (Southern Health and St Vincent's) the interpreter utilisation is stated to be applied to the patient episodes. At Northern Health relevant expenditure is isolated to the Translation and Linguistic Services cost centres. These costs are allocated using the number of interpreters and utilisation data from an interpreter feeder as cost drivers.

Eastern Health uses allied health intervention codes to allocate interpreter costs. It is a flat distribution based on the number of codes reported.

4.2 South Australia

4.2.1 Identification of CALD patients

Lyell McEwin Hospital (LMH) noted that the following indicators are commonly used to identify CALD patients:

- Originating from non-English speaking countries/non English speaking background
- Main language spoken at home

- Interpreter Required
- Asylum seeker/refugee status
- Ethnic or religious backgrounds

Some of these indicators are captured locally in the hospital PAS (Patient Administration System) but may not be submitted to the jurisdiction unless they are required for the NHCDC submissions.

4.2.2 Patient cost drivers

The cost of interpreter services was noted as the primary cost driver for CALD patients. These costs include the cost of interpreters who may be employed by the hospital as well as private providers or contracted services. LMH indicated the costs associated with interpreter services are estimated to be less than 1% of the total annual expenditure for all acute and emergency patient episodes. Suggestions were made that the majority of the interpreter costs are associated with outpatients' appointments, where a contract service was used by the hospital.

No formal studies have been undertaken by the hospital or SA Health to understand the impact on LOS, but the jurisdiction consider this to be a significant cost driver within this patient population. Age or sex is not considered a major differentiator of cost within this patient population.

Other costs include costs associated with religious services, cultural awareness services or training provided to employees, translation services, social services and/or allied health services provided in the outpatient care setting. For Emergency Department patients generally telephone interpreters services is used. However, these costs may not be allocated to actual patient episodes due to lack of patient level usage data.

At LMH interpreter utilisation/charge is captured at patient episode level for acute admitted patients. Actual charge data is used to allocate interpreter costs to patients who utilised these services.

4.2.3 Cost allocation methods

At LMH interpreter usage data is captured at patient episode level for acute admitted patients. Actual charge data is used to allocate interpreter costs to patients who utilised these services. Interpreter expenditure is assigned to episodes based that include an 'interpreter required' field. Interpreter usage information is not captured for ambulatory patients (contracted service) and therefore, interpreter related costs are not distinctly allocated to patients who receive these services.

4.3 New South Wales

4.3.1 Identification of CALD patients

NSW Health noted that the following CALD related indicators are used in NSW hospitals:

- Preferred language, and
- Interpreter Required

4.3.2 Patient cost drivers

NSW Health indicated costs associated with provision of interpreting services to be the major driver of higher costs associated with patients from non-English speaking backgrounds.

NSW Health has performed a number of analyses on the LOS within this group of patients, however the findings from studies provided insufficient evidence that LOS is longer for

admitted patients from CALD backgrounds. It was suggested that health practitioner time or consultation time in providing interpreter mediated services are significantly longer in duration, which may or may not impact the overall LOS of CALD patients.

Age and mental health status were not considered major differentiators of cost within this population.

4.3.3 Cost allocation methods

NSW suggested that culturally and linguistically diverse patients exhibit higher costs of care and costs associated with interpreter service and additional nursing or health practitioner time. Due to lack of patient level usage data for interpreter services, currently these costs are not specifically apportioned to CALD patients. Interpreter costs are allocated as an overhead expense to all patients and across all products. The costing process is relatively consistent across the state, so this is applicable to most facilities in NSW.

4.4 Queensland

Princess Alexandra Hospital (PAH) was nominated by QLD Health for the review.

4.4.1 Identification of CALD patients

QLD Health and PAH representatives noted that the following CALD related measures are useful in identifying this group of patients:

- Language spoken at home
- Country of Birth
- Interpreter required
- Interpreter booked/used

4.4.2 Patient cost drivers

Interpreter cost is noted as the primary cost for this group of patients.

Other cost drivers relevant for this group of patients include additional administrative and communication costs, additional diagnostic tests, costs associated with religious services (cultural belief with death and dying may have additional cost implications for palliative care patients), indirect costs of running cultural programs or awareness services for employees, translation services, social services, additional family/boarder costs especially when they are supporting interpretation.

No formal studies have been undertaken by the hospital or QLD Health to understand the materiality of cost differential between CALD and non-CALD patients for the purpose of funding impacts. It is estimated that average LOS is higher for these group of patients. In terms of disease profiles, clinical studies or analysis suggests high prevalence of tuberculosis and other vaccine preventable diseases among patients from West African and South East Asian backgrounds. Re-admission reasons are currently not captured as a codeable item in hospital systems and therefore no evidence based conclusion can be made about readmission rates for this group of patients.

4.4.3 Cost allocation methods

At PAH interpreter services are provided as an in-house service to all admitted, ED and outpatients. Salaries and other relevant costs for the 4 staff members who are employed to provide these services are paid from a single cost centre. An electronic register is maintained to record scheduled and delivered services, however this data is not used in the costing process. Currently these costs are not allocated to any specific group of patients and spread across all episodes.

4.5 Western Australia

4.5.1 Identification of CALD patients

WA Health identified 'Country of Birth' and preferred language as the primary indicators of patients from CALD background. These measures are currently captured for inpatient episodes only.

4.5.2 Patient cost drivers and cost allocation method

The relative costs associated with patients from CALD background are largely represented by the costs of interpreter mediated services made available to patients with low English proficiency. The costs of interpreter and associated services are not allocated particularly to the patients who receive these services. It was noted by the jurisdiction that currently service delivery costs to CALD patients across all hospitals in WA are not represented in the NHDC submission.

4.6 Northern Territory

4.6.1 Identification of CALD patients

NT Health indicated the following measures or indicators can be used to identify this cohort of patients:

- Country of Birth
- Interpreter required

The 'Interpreter required' field is commonly used for indigenous patients. However, this is not a mandatory field to complete during the patient registration process and as a result data available in hospital PAS systems may be incomplete and limited in nature.

4.6.2 Patient cost drivers and allocation method

No direct costs associated with CALD patients were noted by the jurisdiction. No specific allocation method is utilised during the costing process.

No formal study or analysis has been performed by NT Health to understand characteristics or cost profiles specific to CALD patients.

4.7 Tasmania

4.7.1 Identification of CALD patients

Tasmanian Department of Health and Human Services (DHHS) indicated that CALD patients in Tasmanian Health Organisations are identified using the following indicators:

- First spoken language - any language other than English
- Interpreter requirement

All patient activity data including relevant CALD identifier (first spoken language) are captured in the state-wide Patient Information System in Tasmania. The jurisdiction indicated there are no specific sites or hospitals in Tasmania where a higher concentration of CALD patients can be observed.

4.7.2 Patient cost drivers and allocation method

Interpreter cost was identified as the only additional cost directly attributable to CALD patients. However, costs incurred for interpreter services are allocated as overhead expense across all patients and products.

The jurisdiction did not consider CALD specific costs or pricing to be a major issue for Tasmania. Minimal analysis and investigations have been undertaken to understand characteristics or cost profiles specific to CALD patients.

4.8 Commonwealth of Australia

A high level discussion was undertaken with two members of the Acute Care Division (Public Hospital Sector) to discuss and obtain their views on the characteristics and definition of CALD patients and whether an adjustment factor is warranted in the Pricing Framework.

Country of birth, preferred language or language spoken at home, year of arrival, requirement of interpreter/translator or cultural liaison officer, religion, ethnic background were identified as the key indicators for identifying this group of patients.

It was stated that sufficient evidence derived from cost and activity data for CALD patients' needs to be present to justify the implementation of a specific CALD adjustment for NEP. It was also discussed that any evidence of additional cost or care requirement may be highly correlated with other factors such as remoteness, indigenous status, and age and needs to be carefully reviewed during the analysis. Additional complexity in the Pricing Framework for immaterial or insignificant cost may not be appropriate.

5 *Data Analysis*

Data was requested from four jurisdictions who agreed to participate in the data analysis component of the costing study.

For these tests generally, the approach has been to compare the CALD group (defined as CALD and non-indigenous encounters) to the entire population of records provided by the sample site, for summarised records where the number of encounters of the CALD group was greater than 30. The cost analysis excludes depreciation costs in all products; ED costs have been excluded from acute, sub-acute and outpatient cost analysis.

For further details of data received, the manipulation and modifications done to the data, assumptions made in developing the analysis and decisions made in excluding outliers for reporting, please refer to Appendix H.

5.1 *Acute Encounters*

All four of the participating jurisdictions provided acute encounters for analysis. NSW provided state-wide data, VIC provided 4 LHNs, while QLD and SA provided 1 LHN.

5.1.1 *Cost per weighted activity unit comparisons*

For NSW, QLD and SA the weighted activity unit acute admitted calculator for 2014/15 was applied to each acute admitted separation in the samples provided. The 2014/15 calculator requires episodes to be classified using Version 7 of the DRG classification system. Victorian episodes were classified using Version 6.0x and so the 2013/14 weighted activity unit model, which operates on DRG6.0x, was applied. The weighted activity unit calculator will produce a higher weight for the following:

- more complex DRGs,
- paediatric patients,
- patients with long lengths of stay,
- hours in a level 3 Intensive Care Unit (ICU) for certain DRGs,
- Indigenous status,
- patients living in outer regional and remote regions,
- patients with radiotherapy services (2014/15 calculator, not 2013/14 calculator), and
- patients with psychiatric care days as part of their inpatient stay (certain age groups).

The purpose of this test was to identify whether CALD patient groups are more expensive after controlling for the other factors that currently receive an adjustment or higher complexity weight in the NEP pricing model.

Overall findings

The analysis of cost per weighted activity unit showed that CALD patients have a higher cost per weighted activity unit than non-CALD patients in NSW, QLD and SA, with the result ranging from 0.2% to 3.8% (using a standardised distribution for remoteness). The result is not conclusive for Victoria due to limitations in the data supplied for the full weighted activity unit model to be applied.

The differences are small in magnitude. CALD patients need to be better identified, and the cost of interpreter services allocated based on patient utilisation of those services, for findings to be more definitive.

Results by remoteness classification

The CALD population tend to be older, and are more likely to live in major cities than their non-CALD counterparts. The cost per weighted activity unit result was therefore further broken down by age, remoteness and LHN.

The cost per weighted activity unit of CALD patients living in major cities are higher than the cost per weighted activity unit of non-CALD patients living in major cities: 1.1% higher in NSW, and 2.5% higher in QLD.

In regional and remote regions, the cost per weighted activity unit of CALD patients in NSW are 2.2% higher than non-CALD costs. In QLD, CALD patients are 10.4% higher than the cost per weighted activity unit of non-CALD patients living in the same regions: this result is driven largely by the differences in costs observed for CALD patients living in the regions that are eligible for remoteness loadings, i.e. outer regional, remote and very remote.

When the results for major cities and regional/remote are combined at a state level, the results are counter-intuitive for NSW: despite higher cost per weighted activity unit within the major cities and non-metropolitan regions, the overall state cost difference is slightly lower (-0.1%). This negative result occurs because 98% of CALD patients live in major cities that are slightly lower cost, compared to only 71% of non-CALD patients living in major cities. If the remoteness distribution is standardised across CALD and non-CALD patients (using the overall sample distribution across regions), then the cost per weighted activity unit for CALD patients in NSW is 1.4% higher than those for non-CALD patients.

In QLD, the overall cost per weighted activity unit for CALD patients is 2.9% higher than non-CALD. When the sample standardised distribution for remoteness is adopted, the cost per weighted activity unit for CALD is 3.8% higher than the cost per weighted activity unit for non-CALD. There is a larger difference (+10.4%) observed for CALD patients living in regional and remote regions compared to non-CALD patients living in the same region however this large difference is not replicated in NSW and SA.

In SA, there is no cost per weighted activity unit difference when patients are classified into CALD and non-CALD using the First Spoken language indicator.

In Victoria, the cost per weighted activity unit for CALD patients is marginally lower than the cost per weighted activity unit for non-CALD patients. However, these results might differ once the adjustments for paediatrics, ICU, remoteness and psychiatric care are applied.

Results by age group

With the exception of Victoria, CALD patients aged 80 or more demonstrated higher cost per weighted activity unit than non-CALD patients aged 80 or more (2.4% higher in NSW, 4.7% higher in QLD, and 3.3% higher in SA). When a standardised remoteness mix is adopted (based on the State sample total distribution of weighted activity units by remoteness) for CALD and non-CALD patients aged 80 or more, these differences are 3.0% higher in NSW, 6.5% higher in QLD, and 3.7% higher in SA. For younger age groups, the results were highly variable between jurisdictions. These results are presented in Table 5.1.1.2 and in the separate Analysis Appendix.

Cost ratio differences by LHN

Jurisdiction consultations indicate that the costs of Interpreter Services are allocated as an overhead to CALD and non-CALD patients. For this test, the “cost ratio” measure was adopted which is calculated as the weighted activity unit for an LHN divided by the cost per weighted activity unit for the total sample. The hypothesis is that the LHNs with a high proportion of CALD patients would be incurring additional expense relative to those LHNs with a low proportion of CALD patients, and the cost ratio for high-CALD LHNs will be higher than the cost ratio for low-CALD LHNs. This relationship has not been found: the cost ratio remains constant, close to 100%, for LHNs with a high proportion of CALD patients.

Summary of test results

The results of these tests are summarised in the table below, with more detailed results presented in the separate Analysis Appendix (Acute Encounters).

Table 5.1.1.1: Summary of Acute Admitted Cost per weighted activity unit tests

Description of test output	NSW (PL)	VIC (PL)	VIC (IR)	QLD (PL)	SA (FS)
<i>Percentage difference between CALD group and sample site in cost per weighted activity unit</i>					
Overall	-0.1	-1.5*	-2.0*	2.9*	0.0
Standardised remoteness mix	1.4*	n/a	n/a	3.8*	0.2
Patients living in Major Cities (a)	1.1*	n/a	n/a	2.5*	0.0
Patients living in inner regional, outer regional, remote and very remote and remote (a)	2.2*	n/a	n/a	10.4*	0.0
Aged 80 or more	2.4*	n/a	n/a	4.7*	3.3

Notes: * shaded cells with an asterisk are those where the difference is statistically significant at 95% confidence. PL – preferred language as CALD indicator; IR – interpreter required as CALD indicator; FS – first spoken language as CALD indicator; IR & PL as CALD indicator.
(a) Remoteness classifications were assigned in the weighted activity unit calculator based on patient residence

Table 5.1.1.2: Acute Admitted Cost per weighted activity unit tests by Age Group and Remoteness

State	Age Group	CALD to non-CALD cost per weighted activity unit (a)			
		Major Cities	Not Major Cities	All Regions	All Regions, standardised remoteness mix (b)
NSW (PL)	00_19	5.9%	4.7%	2.9%	5.6%
	20_49	-4.1%	6.5%	-5.5%	-1.2%
	50_79	-0.2%	-1.8%	-0.7%	-0.6%
	80+	2.9%	3.6%	2.4%	3.0%
	All age groups	1.1%	2.2%	-0.1%	1.4%
QLD (PL)	00_19	-3.2%	*	-3.5%	5.7%
	20_49	1.9%	4.6%	2.0%	2.4%
	50_79	3.6%	13.7%	4.6%	5.2%
	80+	5.1%	(c) 12.7%	4.7%	6.5%
	All age groups	2.5%	10.4%	2.9%	3.8%
SA (FS)	00_19	24.6%	*	26.1%	29.8%
	20_49	-3.8%	-6.7%	-4.0%	-4.3%
	50_79	-2.0%	(c) 13.6%	-0.8%	0.6%
	80+	2.9%	(c) 8.1%	3.3%	3.7%
	All age groups	-0.5%	5.5%	0.0%	0.5%

Notes:
PL – preferred language as CALD indicator;
FS – first spoken language as CALD indicator
(a) The CALD cost per weighted activity unit, less the non-CALD cost per weighted activity unit, divided by the non-CALD cost per weighted activity unit
(b) The remoteness mix is used to standardise the cost per weighted activity unit for each age group. The remoteness mix for the State shown was the percentage distribution of the weighted activity units for the State sample, distributed by Major Cities versus Non Major Cities.

(c) The percentage difference is based on fewer than 30 CALD separations and should be interpreted with caution.
 * The percentage difference is not shown for cells marked as “*” because it is based on 3 separations or fewer and is not reliable.

5.1.2 Encounter cost

The following tests used encounter costs to identify the differences between CALD patient encounters and the overall sample site for acute encounters.

The analysis of average cost per encounter showed the CALD group had a higher average cost compared to the sample sites for the respective jurisdictions. The average cost per encounter was higher by a range of 0.3% and 1.2% across the jurisdictions with the exception of SA, who were higher by 5.8%.

To understand the drivers of this average cost difference, encounters were split into same-day and overnight groups, and the analysis re-performed. This analysis showed same-day encounters to be less costly for the CALD group (with the exception of SA). VIC same-day encounters were approximately 6.6% lower than the overall sample site when ‘Interpreter required’ was used as a CALD indicator.

CALD group overnight encounters were uniformly higher across the jurisdictions. The largest variance was shown in QLD and SA; however these jurisdictions also submitted the least data, which may have influenced the size of this difference. By comparison, in NSW and VIC, where data was received for the state and 4 LHNs respectively, the average cost per overnight encounter was between 0.7% and 1.2% higher.

With the longer stay of overnight encounters contributing to higher CALD patient costs, the average cost per day was then analysed to control for this effect of duration. This analysis was performed on same-day, overnight and inlier encounters. The cost per day for overnight encounters was mixed across the jurisdictions. Using ‘preferred language’ as a CALD indicator in NSW and VIC indicated a lower average cost per day of -0.8% and -2.0% respectively, while QLD CALD encounters were 4% higher.

Analysis of inlier encounter cost per day was done to include only those encounters whose length of stay was within expected bounds. By excluding short and long stay encounters, cost differences between the CALD group and sample site for reasonable length of stay encounters could more acutely be analysed. The analysis performed indicated that CALD groups were mostly lower in terms of cost per day (SA being the exception). VIC CALD inlier encounters had the largest difference, ranging from 1.8% to 2.4% lower than the overall sample site.

The results of these acute cost analyses have been summarised in Table 5.1.2.1 below, with full results contained in Appendix F (Acute encounters).

Table 5.1.2.1: Difference in cost per encounter by same-day and overnight encounters

Description of test output	NSW (PL)	VIC (PL)	VIC (IR)	QLD (PL)	SA (FS)
<i>Percentage difference between CALD group and sample site in average cost, per:</i>					
encounter	0.9	0.3	1.2	0.8	5.8
same-day encounters	-1.0	-6.0	-6.6	-3.9	5.7
overnight encounters	1.1	0.7	1.2	5.1	6.4
day, for same-day encounters	-1.0	-6.0	-6.5	-3.9	5.8
day, for overnight encounters	-0.8	-2.0	0.7	4.0	1.5

Description of test output	NSW (PL)	VIC (PL)	VIC (IR)	QLD (PL)	SA (FS)
inlier encounter	-0.5	-1.8	-2.4	-0.1	2.9

Note: PL – preferred language as CALD indicator; IR – interpreter required as CALD indicator; FS – first spoken language as CALD indicator.

All results were significant at 95% confidence with the exception of SA's result for average cost per day, for overnight encounters.

The analysis was then performed on individual cost buckets in order to understand whether different service events, such as blood tests and screenings during a patient's encounter were driving the difference in costs for CALD patients. The cost buckets analysed were pathology, imaging, ward nursing and ward medical (combined) and CCU costs (the separate Analysis Appendix only).

Average ward nursing and ward medical costs were observed to be consistently higher for all jurisdictions. The CALD group in QLD had a higher average ward cost by 1.5%, while SA was 6% higher. The CALD group VIC and NSW was approximately between 4 to 5% higher than the sample site average.

Average pathology costs per encounter indicated CALD average costs were highly variable across jurisdictions. The VIC CALD group average cost was approximately 10% lower than the sample site average, while NSW and QLD were approximately 10% higher.

Average imaging costs per encounter were generally lower for the CALD group. The largest difference was identified in NSW and VIC, having approximately 6% lower costs compared to the sample site average.

Analysing these cost buckets individually has shown that the CALD patients may not necessarily incur more pathology or imaging resources, however their consumption of ward-related costs appears to be greater than that of an average patient. As noted previously, this higher than average ward costs may be attributed to longer lengths of stay.

The results of these acute cost analyses have been summarised in Table 5.1.2.2 below, with full results contained in the separate Analysis Appendix (acute encounters).

Table 5.1.2.2: Difference in cost per encounter by selected cost bucket

Description of test output	NSW (PL)	VIC (PL)	VIC (IR)	QLD (PL)	SA (FS)
<i>Percentage difference between CALD group and sample site in average cost per encounter for:</i>					
ward nursing and ward medical	5.3	3.9	4.8	1.5	6.0
pathology	10	-10.8	-9.4	10.5	-2.5
imaging	-6.2	0.1	-6.1	-2.2	n/a

Note: PL – preferred language as CALD indicator; IR – interpreter required as CALD indicator; FS – first spoken language as CALD indicator.

All results were significant at 95% confidence with the exception of SA's result for average pathology cost per encounter.

5.1.3 Encounter length of stay

The purpose of the following tests were to identify whether the length of stay of CALD patient encounters was different to the average length of stay for the overall sample site.

As previously identified, overnight encounters of CALD patients were of a higher cost compared to an average patient. The analysis performed on length of stay supports this. Using the inlier bounds to exclude short and long stay encounters, NSW CALD patients

stayed approximately 5% longer than the average patient. In VIC, this increased stay ranged between approximately 2% and 4%. The only jurisdiction to have a shorter length of stay of CALD patients was QLD; estimated to be 1% less than a sample site encounter.

The results of this acute length of stay analyses have been summarised in Table 5.1.3.1 below, with full results contained in the separate Analysis Appendix (Acute encounters).

Table 5.1.3.1: Difference in length of stay

Description of test output	NSW (PL)	VIC (PL)	VIC (IR)	QLD (PL)	SA (FS)
<i>Percentage difference between CALD group and sample site average length of stay, per:</i>					
encounter	6.9	0.3	2.5	-0.7	13.7
inlier encounter	5.0	2.1	4.0	-1.0	3.6

Note: PL – preferred language as CALD indicator; IR – interpreter required as CALD indicator; FS – first spoken language as CALD indicator.

All results were significant at 95% confidence with the exception of SA's results for length of stay per encounter.

5.1.4 Encounter volume

The analysis of acute encounter volumes was divided into two steps: The first step was to identify DRGs with a high proportion of CALD patients. The second step was then to understand the severity of these DRGs. By using severity codes of DRGs, the purpose of this test was to understand the relationship between high CALD volumes and severity (and potentially more costly) of hospital encounters.

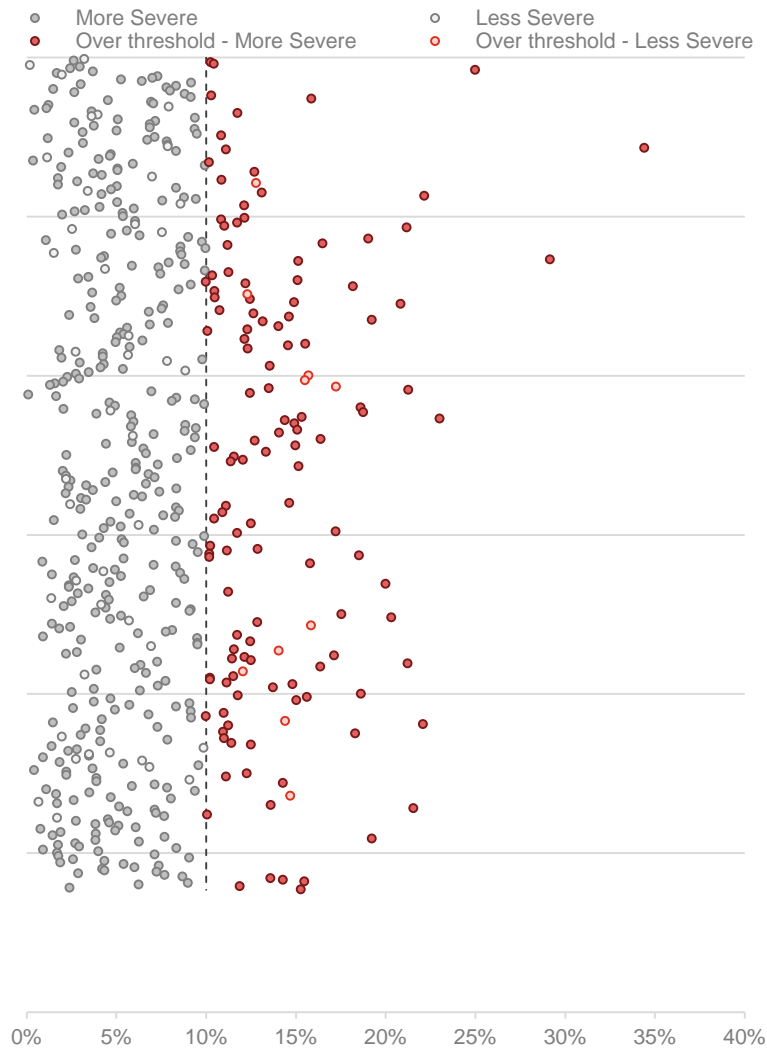
Across the jurisdictions, each DRG was analysed and those DRGs with greater than 10%⁴ of CALD patients were further analysed for their severity. Using the severity codes of DRGs ('A', 'B', 'C', 'D'), 'A' and 'B' DRGs were classified as 'More Severe', while 'C' and 'D' encounters were considered 'Less Severe'.

Figure 5.1.4.1 shows the results of the analysis of VIC data where 'Preferred Language' was used as the CALD indicator. Each point represents a DRG. The DRGs with CALD patients making up more than greater than 10% of volume have been coloured; the rest are grey. Compared to other jurisdictions, VIC had a high number of DRGs that were above the 10% threshold. The second part of the test analysed the severity. 'More Severe' DRGs have been indicated by a darker red, while 'Less Severe' DRGs are lightly coloured.

The results observed in this example show DRGs with a high proportion of CALD patients, are more likely to be 'More Severe' DRGs than 'Less Severe'. For VIC data using 'preferred language' as an indicator, there was 97 DRGs above the 10% volume threshold and of these, 86 were 'More Severe', which is indicative of this relationship between CALD volume and severity. Figure 5.1.4.1 displays the DRGs provided by VIC, with the majority of DRGs with more than 10% of CALD patients, also being classified as 'More Severe'. The data of other jurisdictions followed a similar trend.

Figure 5.1.4.1: CALD volume by DRG – coloured by severity

⁴ 10% was chosen as a threshold to sufficiently separate the data for further analysis.



5.1.5 Patient characteristics

These tests examined the attributes of the CALD patients themselves to identify differences in age, and their representation among the ABS remoteness categories.

The analysis of age was performed for each DRG provided by the jurisdictions, comparing the average patient ages of the CALD group to the sample site.

Across the jurisdictions, CALD patients were shown to be older overall across the DRGs analysed. In VIC, CALD patients were estimated to be approximately 12.3% older than an average patient for all DRGs analysed (Figure 5.1.5.1). At the lower end of the range, SA CALD patients were still approximately 5.7% older than the average for this sample site and DRGs analysed. The estimated overall difference in average age for the DRGs analysed in NSW and QLD was between these two bounds. (Table 5.1.5.1).

Older patients are more likely to attract higher hospital costs as a result of potential complexities and co-morbidities. This relationship between age and CALD status could be a confounding factor resulting in higher encounter costs.

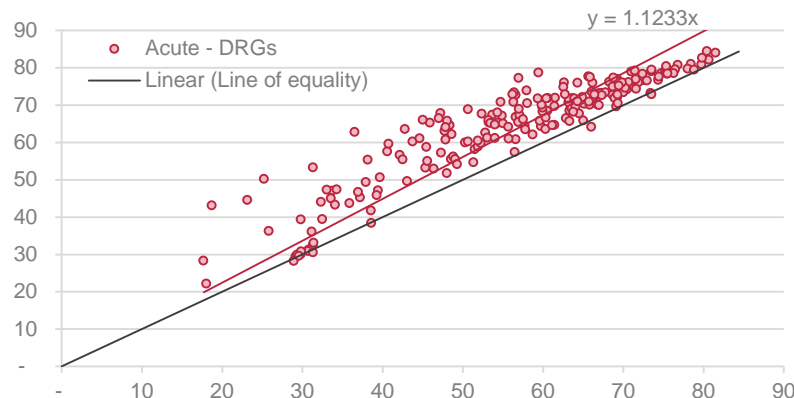
Table 5.1.5.1: Overall difference in average age for DRGs analysed

Description of test output	NSW (PL)	VIC (PL)	VIC (IR)	QLD (PL)	SA (FS)
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Description of test output	NSW (PL)	VIC (PL)	VIC (IR)	QLD (PL)	SA (FS)
<i>Percentage difference between CALD group and sample site</i>					
average age	7.0	11.7	12.3	6.2	5.7

Note: PL – preferred language as CALD indicator; IR – interpreter required as CALD indicator; FS – first spoken language as CALD indicator.
All results were significant at 95% confidence.

Figure 5.1.5.1: Average age by DRG for VIC using preferred language



Notes: CALD group (Y axis) vs Sample site (X axis)

The remoteness classification of patients was also analysed to understand the proportion CALD patients made up of remoteness category volume. CALD patients consistently made up a higher proportion of patients from 'Major city' areas, compared to other remoteness classifications. These rates were as high as 17% in 'Major Cities' of NSW. For the other remoteness classifications, CALD patients made up less than 5% of encounters.

5.2 ED Encounters

NSW and VIC were the only jurisdictions to provide ED encounter data for analysis in this costing study. The data was provided state-wide by NSW with interpreter required as the only CALD patient indicator. Victoria provided ED data for each of the 4 LHNs, with both preferred language and interpreter required available to identify CALD patient encounters.

5.2.1 Cost per weighted activity unit comparisons

The weighted activity unit emergency department calculator for 2014/15 was applied to each emergency department presentation in the samples provided. The calculator will produce a higher price weight for the following:

- more complex URGs or UDGs,
- Indigenous status (4% loading).

The purpose of this test is to identify whether CALD patient groups are more expensive after controlling for URG and Indigenous status (as previously discussed, the CALD results presented relate to non-Indigenous CALD patients).

Overall findings

The raw cost per weighted activity unit showed that CALD patients in NSW have a lower cost per weighted activity unit than non-CALD patients (-5.2% (PL) and -3.5% (IR)), while CALD patients in VIC have a higher cost per weighted activity unit than non-CALD patients (+12.5% (PL) and +17.1% (IR)). The higher cost per weighted activity unit in Victoria is purely age-driven, due to the under-estimation of costs for elderly patients within the URG

classification system for CALD and non-CALD patients. In fact, when comparing CALD cost per weighted activity unit to non-CALD cost per weighted activity unit for patients of the same age group, the CALD cost is lower than the non-CALD cost.

After standardising for differences in age distribution between CALD and non-CALD, the age-standardised cost per weighted activity unit for CALD patients is lower than the age-standardised cost per weighted activity unit for non-CALD patients in both states, ranging from -11% (NSW-IR) to -2.3% (VIC-IR).

On the basis of the cost data presented, an adjustment to the NEP model for ED is not supported: in both NSW and VIC, the CALD cost per weighted activity unit is lower than the non-CALD cost per weighted activity unit when the comparison is performed for patients of the same age-group.

Summary of test results

The results of these tests are summarised in the table below, with more detailed results presented in the separate Analysis Appendix (ED encounters).

Table 5.2.1.1 Difference in cost between cost per weighted activity unit between CALD and non-CALD groups

Description of test output	NSW (PL)	NSW (IR)	VIC (PL)	VIC (IR)
<i>Percentage difference between CALD and non-CALD groups in cost per weighted activity unit for</i>				
Overall	-5.2	-3.5	12.5	17.1
Age-standardised	-6.0	-11.1	-3.4	-2.3

*Note: PL – preferred language as CALD indicator; IR – interpreter required as CALD indicator
Results were statistically significant for all tests at 95% confidence except for VIC (IR)*

5.2.2 Encounter cost

The following tests used encounter cost data to understand the difference between the costs of treating the CALD patients compared an average patient. A summary of these results is shown in Table 5.2.2.1.

Average cost per encounter was mixed between the jurisdictions. NSW indicated lower average costs for CALD patients by up to 4.8%. VIC data however, indicated higher average costs by as much as approximately 12%. The previous weighted activity unit analysis indicates that this effect is largely age-driven.

Pathology and imaging costs were analysed to understand whether usage of these services by CALD patients were contributing to any cost differences in ED presentations. CALD patients in NSW had a lower average pathology cost, while CALD patients in VIC had a higher average pathology cost by as much as 5.4%. The difference in imaging costs between CALD patients and an average patient were less pronounced, with marginal variation identified between CALD patients and an average patient.

Table 5.2.2.1: Difference in cost per encounter; including pathology and imaging.

Description of test output	NSW (PL)	NSW (IR)	VIC (PL)	VIC (IR)
<i>Percentage difference between CALD group and sample site in average</i>				
cost per encounter	-3.2	-4.8	7.2	11.9
pathology cost per encounter	-6.0	-12.4	2.2	5.4

Description of test output	NSW (PL)	NSW (IR)	VIC (PL)	VIC (IR)
imaging cost per encounter	-0.5	0.5	2.0	-0.1

Note: PL – preferred language as CALD indicator; IR – interpreter required as CALD indicator.
All results were significant at 95% confidence.

5.2.3 Encounter length of stay

Analysis was performed on ED encounters to understand the difference in ED duration for CALD and sample site patients.

In NSW where interpreter requirement indicated CALD patients, encounters were estimated to be 7.5% longer for the URGs sampled (Table 5.2.3.1). This supports a similar finding in the acute setting for length of stay.

The VIC data supplied for analysis did not contain a field for encounter length or admission and separation times so results for this test are available for NSW ED data only.

Table 5.2.3.1: Difference in ED length of stay

Description of test output	NSW (PL)	NSW (IR)
<i>Percentage difference between CALD group and sample site average</i>		
presentation duration	0.8	7.5

Note: PL – preferred language as CALD indicator; IR – interpreter required as CALD indicator.
All results were significant at 95% confidence.

5.2.4 Encounter volume

The purpose of this test was to understand proportion of CALD patient encounters relative to overall volume of ED presentations by triage category.

The analysis showed consistently across the jurisdictions and indicators tested, a higher proportion of CALD patients in Triage 1 URGs (admitted and non-admitted encounters). In VIC, around 8-10% of these Triage 1 URG volumes were made up of CALD patients.

The data available indicates CALD patients have a higher representation in more urgent encounters, which may be indicative of higher complexities and therefore higher costs.

5.2.5 Patient characteristics

The analysis performed on average patient age by URG showed CALD patients to be consistently older. In NSW and VIC, using 'Interpreter required', CALD patients were estimated to be approximately 27% and 31% older than an average patient respectively.

These differences are significant and support the finding of acute encounters, that the average CALD patient age was older than that of the sample site. The difference in average age noted in the ED setting is larger in magnitude compared to that of acute encounters.

Table 5.2.5.1: Difference in average age

Description of test output	NSW (PL)	NSW (IR)	VIC (PL)	VIC (IR)
<i>Percentage difference between CALD group and sample site</i>				

Description of test output	NSW (PL)	NSW (IR)	VIC (PL)	VIC (IR)
average age	7.8	26.5	11.7	31.2

Note: PL – preferred language as CALD indicator; IR – interpreter required as CALD indicator. All results were significant at 95% confidence.

5.3 Sub-acute Encounters

Sub-acute data was provided by all participating jurisdictions. NSW provided data for the whole state, VIC provided data for 4 LHNs, QLD provided data for 1 LHN and while SA provided data for 1 LHN, the volume too insignificant to be reported. Results have been reported by care type for tests other than the weighted activity unit comparison.

5.3.1 Cost per weighted activity unit comparisons

The weighted activity unit sub-acute admitted calculator for 2014/15 was applied to each sub-acute admitted separation in the samples provided. The 2014/15 calculator produces weights for separations classified using the AN-SNAP classification system, and by care type if AN-SNAP details are not available. The care type model is a pure per-diem calculation, while the AN-SNAP model uses a mixture of episodic (with inlier/outlier) parameters and per-diem parameters.

The calculator will produce a higher price weight for the following:

- more complex AN-SNAP classes,
- paediatric patients (96% loading)
- patients with long lengths of stay (per-diem parameters)
- Indigenous status (17% loading),
- Patients living in outer regional and remote regions (7% to 21% loading).

The per-diem pricing parameters will, in most cases, produce a lower weighted activity unit than the AN-SNAP parameters. An adjustment to the 2014/15 parameters was applied to the per-diem price weights to support consistency of comparison between SNAP-priced episodes, and care-type episodes. Appendix F provides further detail on the rationale and nature of the adjustment. The 2013/14 NWAU calculator was applied to Victorian episodes.

The cost per weighted activity unit for CALD patients is 4.8% lower than non-CALD in NSW, 4.1% higher in QLD, and 1.0% higher in VIC. The results are not consistent between jurisdictions, and an adjustment to the NEP model cannot be supported on the basis of these results.

Unlike ED, we found that the cost per weighted activity unit by age group was relatively uniform within sub-acute. This means that the cost per weighted activity unit difference is not age-driven, but more likely to be CALD driven.

Summary of test results

The results of these tests are summarised in the table below, with more detailed results presented in the separate Analysis Appendix (Subacute Encounters).

Table 5.3.1.1: Difference in cost per weighted activity unit between CALD and non-CALD groups

Description of test output	NSW-CARE (PL)	NSW-SNAP (PL)	NSW Total (PL)	QLD-CARE (PL)	QLD-SNAP (PL)	QLD Total (PL)	VIC-CARE (PL)	VIC-CARE (IR)
<i>Percentage difference between CALD and non-CALD group</i>								

Description of test output	NSW-CARE (PL)	NSW-SNAP (PL)	NSW Total (PL)	QLD-CARE (PL)	QLD-SNAP (PL)	QLD Total (PL)	VIC-CARE (PL)	VIC-CARE (IR)
cost per weighted activity unit	-3.4	-6.1	-4.8	6.6	-3.2	4.1	3.0	1.0

Notes: PL – preferred language as CALD indicator; IR – interpreter required as CALD indicator. Results were statistically significant at 95% confidence except for VIC-CARE (IR)

5.3.2 Encounter cost

The analysis of average cost per encounter was performed across admitted patient care types, which are Rehab, Palliative Care, Psychogeriatric Care, Maintenance and Geriatric Evaluation and Management. This approach is different to the acute analysis performed earlier which compared differences within the AR-DRG classification. The results of the analysis have been described below.

For average cost per encounter, the majority of care types had lower average costs for the CALD group compared to the overall sample site. The only care type that was consistently lower in terms of average encounter cost across all jurisdictions sampled was Psychogeriatric Care.

A subsequent test was performed on same-day encounters to understand if there were cost differences within encounters of the same duration. The results were mixed across jurisdictions with no single care type having a consistently higher or lower cost for the CALD group compared to the overall sample site.

The overnight cost per encounter was also compared between the CALD group and sample site. The average cost of a Palliative Care encounter was between 2% and 9% higher for the CALD group when 'Preferred Language' was used as the CALD indicator in NSW and VIC, but was lower when other indicators were used in VIC and QLD. Rehab was one care type which indicated consistently lower CALD patient average costs compared to the sample site across jurisdictions.

The cost per day for same-day and overnight encounters was analysed to control for the effect of stay duration. In these tests, GEM encounters were consistently higher across the jurisdictions for overnight encounters. The difference in cost between the CALD group and sample site ranged from 6% to 9% higher.

The individual cost buckets of imaging, pathology, and ward nursing and ward medical were also analysed to identify cost differences between CALD patient and sample site encounters. For average pathology costs and the care types analysed, the CALD group were mostly lower across the jurisdictions, with NSW being an exception and having three care types with a higher average cost. Imaging costs per encounter were mostly higher for the CALD group, with VIC having significantly higher costs by upwards of 15% for the care types analysed. Average ward nursing and medical costs were mixed across the jurisdictions and care types analysed, with no one jurisdiction or care type demonstrating a consistent trend in cost difference between the two groups.

From the cost analysis performed, it is difficult to draw conclusions about the overall differences in cost between the CALD group and sample site based on the care types analysed.

5.3.3 Encounter length of stay

The average length of stay of CALD patients was compared to that of sample site patients. For the care types analysed, trends in differences in the average length of stay of the CALD group were mixed across jurisdictions. There was no single care type that was consistently higher or lower across jurisdictions. Similarly, there were no jurisdictions whose care types were all higher or lower for the CALD group compared to the overall sample site.

As with encounter cost, the results of the analysis of average encounter length of stay were too varied across jurisdictions to identify consistent trends in length of stay for the CALD group compared to the sample site.

5.3.4 Patient characteristics

The average age of CALD patients in the sub-acute setting was higher for all the care types analysed. In VIC, the average of a CALD patient for a rehab encounter was approximately 6.5% older than an ordinary patient. Older patients may be more likely to experience increased complexities in care, which can be a factor in cost differences of CALD patients.

This trend in CALD patients being older than the average age of patients in the sample site is consistent with findings from the acute and ED settings.

Similar to the results of the remoteness analysis performed on acute encounters, a higher majority of CALD patients were in the 'Major Cities' classification. For sub-acute encounters, CALD patients made up to 23% of encounters classified to 'Major Cities'. Encounters of CALD patients were also limited to 'Outer Regional' areas for the jurisdictions tested.

5.4 Outpatient Encounters

VIC was the only jurisdiction to provide outpatient data for analysis. Non-indigenous encounters, where interpreter costs had been allocated, were treated as the CALD group.

5.4.1 Cost per weighted activity unit comparison

The weighted activity unit outpatient calculator for 2013/14 was applied to each outpatient episode in the Victorian data supplied. The calculator will produce a higher price weight for the following:

- more complex/costly Tier 2 outpatient clinics,
- Indigenous status (4% loading).

The purpose of this test is to identify whether CALD patient groups are more expensive after controlling for the Tier 2 clinic and Indigenous status (as previously discussed, the CALD results presented relate to non-Indigenous CALD patients).

After controlling for differences in Tier 2 clinics and Indigenous status, the CALD cost per weighted activity unit is 5.4% lower than the non-CALD cost per weighted activity unit. No further patient demographic variables were supplied, such as age or remoteness, so the results have not been split by any other patient demographics or clinical descriptors.

Table 5.4.1.1: Difference in cost per weighted activity unit between CALD and non-CALD groups

Description of test output	VIC (IR)
<i>Percentage difference between CALD group and non-CALD</i>	
cost per weighted activity unit	-5.4%

Notes: PL – preferred language as CALD indicator; IR – interpreter required as CALD indicator. Results were not statistically significant at 95% confidence

5.4.2 Encounter cost

The purpose of the following tests was to understand whether the costs incurred in treating outpatient CALD patients was significantly different to the average of the overall sample site.

The following tests use cost data to identify differences in CALD patient service events compared to an average patient. The average cost of a service event was higher for CALD patients by almost 16%.

To further understand the specific costs that contribute to this result, analysis was performed on the pathology, imaging and nursing/medical cost buckets. Each of these cost buckets showed higher average costs for the CALD group; with pathology costs approximately 8.3% higher.

From this data provided by VIC, CALD patients indicated a higher cost per service event, but a lower cost per weighted activity unit. This data alone should not be relied upon in isolation to make changes to the NEP funding model for CALD patients.

Table 5.4.2.1: Difference in cost per service event; for selected cost buckets

Description of test output	VIC (IR)
<i>Percentage difference between CALD group and sample site average</i>	
cost per service event	15.7
pathology cost per service event	8.3
imaging cost per service event	6.3
nursing and medical cost per service event	3.7

Note: PL – preferred language as CALD indicator; IR – interpreter required as CALD indicator. All results were statistically significant at 95% confidence

5.4.3 Encounter volume

The purpose of the following test was to understand the proportion CALD patients made up of overall encounter volume for each Tier 2 clinic.

The Tier 2 clinics that had the highest proportion of CALD patients relative to overall volume were 'Ear, nose and throat (ENT)' (73%) and Hepatobiliary (20%)

5.5 Analysis of costs specific to CALD patients

Additional interpreter costs were separately identified and provided by VIC for admitted (acute and sub-acute) inpatient encounters and ED encounters. An analysis of the data was performed to understand how the interpreter costs had been allocated to encounters as well as their overall significance with respect to total encounter costs.

Approximately 11,000 acute encounters out of a total 467,000 encounters were allocated an interpreter cost, amounting to a total of \$1.1m. Of these encounters, approximately 78% of encounters were indicated as requiring an interpreter while the remaining 22% did not. Approximately 79% of the \$1.1m of interpreter costs was allocated to those encounters requiring an interpreter, while the 21% of the interpreter costs was allocated to those encounters where no interpreter was required. The average interpreter cost for these 11,000 encounters was \$98.28, and represented 1.79% of the total costs for these encounters.

When considering total interpreter costs relative to all acute encounters, these interpreter costs made up less than 1% of total encounter costs. Approximately 45,000 encounters were indicated as requiring an interpreter; however interpreter costs were allocated to 8,800 encounters. (Figure 5.5.2) Furthermore, analysis of the individual cost amounts allocated to these encounters showed less than 96% of encounters had been allocated the same cost amount as another encounter. This suggests that the costs were more likely to be allocated

Figure 5.5.3: ED encounters allocated an interpreter cost

ED encounters - interpreter required - All encounters

CALD indicator for interpreter	Number of Encounters	% of Total Encounters	Interpreter Costs (\$)			% of Total Cost	Total Encounter Cost
			Direct	Overhead	Total		
No	492,094	95.7%	13,627	1,280	14,906	36.8%	53,496,958
Not Stated	209	0.0%	-	-	-	0.0%	29,080
Yes	21,813	4.2%	23,220	2,344	25,564	63.2%	3,558,662
Total	514,116	100.0%	36,846	3,624	40,470	100.0%	57,084,700
	(1)				(2)		(3)
Interpreter costs as a % of Total Encounter Cost: (2) / (3)					0.07%		
Average interpreter cost per encounter (\$): (2) / (1)					0.08		

Figure 5.5.4: All ED encounters

For sub-acute encounters that were allocated an interpreter cost, approximately 75% of the \$280,000 of interpreter costs was allocated to patients indicating an interpreter was required. Patients requiring an interpreter made up approximately 68% of total encounters allocated an interpreter cost. For the remaining 32% of encounters who did not require an interpreter, 25% of total interpreter costs were allocated to these encounters (Figure 5.5.5). For sub-acute encounters with an interpreter cost allocated, the average amount allocated was approximately \$213 per encounter or 1.25% of total cost for these encounters. When all sub-acute encounters were considered, interpreter costs represented approximately 0.15% of total encounter costs (Figure 5.5.6)

Subacute encounters - interpreter required - Encounters allocated an interpreter cost

CALD indicator for interpreter	Number of Encounters	% of Total Encounters	Interpreter Costs (\$)			% of Total Cost	Total Encounter Cost
			Direct	Overhead	Total		
Yes	895	68.1%	193,656	15,380	209,036	74.8%	14,037,246
No	420	31.9%	64,777	5,738	70,514	25.2%	8,504,748
Not Stated	-	0.0%	-	-	-	0.0%	-
Total	1,315	100.0%	258,432	21,118	279,550	100.0%	22,541,994
	(1)				(2)		(3)
Interpreter costs as a % of Total Encounter Cost: (2) / (3)					1.24%		
Average interpreter cost per encounter (\$): (2) / (1)					212.59		

Figure 5.5.5: Sub-acute encounters allocated an interpreter cost

Subacute encounters - interpreter required - All encounters

CALD indicator for interpreter	Number of Encounters	% of Total Encounters	Interpreter Costs (\$)			% of Total Cost	Total Encounter Cost
			Direct	Overhead	Total		
No	12,738	84.5%	64,777	5,738	70,514	25.2%	161,164,529
Not Stated	20	0.1%	-	-	-	0.0%	379,643
Yes	2,318	15.4%	193,656	15,380	209,036	74.8%	27,274,975
Total	15,076	100.0%	258,432	21,118	279,550	100.0%	188,819,147
	(1)				(2)		(3)
Interpreter costs as a % of Total Encounter Cost: (2) / (3)					0.15%		
Average interpreter cost per encounter (\$): (2) / (1)					18.54		

Figure 5.5.6: All sub-acute encounters

Analysis of the VIC interpreter cost data indicates that there appears to some inconsistency with the identification of CALD patients through their interpreter requirement and the

eventual cost allocation. Across the products analysed, between 20% and 35% of costs were being allocated to patients not requiring an interpreter.

For ED encounters which had some interpreter costs allocated, these cost amounts were a significant proportion of the total encounter cost. This may be indicative of the urgent need for interpreters in ED when time may not allow for indecisiveness regarding interpretation.

6 *Mental Health and CALD patients*

6.1 *Objective*

The purpose of this analysis was to identify CALD patients being treated for mental health conditions and if possible, understand the impact of cost differences between this group of patients and the rest of the sample.

Mental health care:

- Is delivered under the management of, or regularly informed by, a clinician with specialised expertise in mental health;
- Is evidenced by an individualised formal mental health assessment and the implementation of a documented mental health plan; and
- May include significant psychosocial components including family and carer support.

We performed the analysis for *Acute*, *ED* and *Outpatient* encounters. Subacute encounters were not further analysed in this section, as the Psychogeriatric care type was compared to other subacute care types in section 5.3

6.2 *Summary of findings*

We assessed the feasibility of conducting an analysis of costs for treating CALD patients for a mental diagnosis, using the data collected from NSW, Victoria, QLD and South Australia.⁵ The results of this analysis indicate that there is insufficient data available to draw reliable conclusions about the cost of CALD patients when being treated for mental health conditions. In summary:

- Acute patients: 0.17% (2,251), 0.15% (248) and 0.14% (55) of encounters per state for NSW, QLD and SA respectively related to CALD patients with a mental health diagnosis.
- ED patients: 0.07% (1,265) and 0.02% (406) of encounters in NSW (PL and IR CALD indicators respectively) related to CALD patients with a mental health diagnosis.
- Outpatients: 0.02% (63) of encounters in Victoria related to CALD patients with a mental health diagnosis.
- Sub-acute: Section 5.3 of this report summarises the analysis completed of sub-acute care type of which the only care type that was consistently lower in terms of average encounter cost across all jurisdictions sampled was Psychogeriatric Care.

To enable an informed opinion to identify a cost differential between CALD Mental Health patients; CALD patients; Mental Health patients; and the general population further data collection would be required to ensure sufficient comparable data was available between the patient groups.

⁵ The key group for this analysis was for "non-ATSI" patients, as ATSI patients have a separate adjustment applied.

6.3 Methodology

6.3.1 Criteria used to identify the key analysis group

To identify the relevant encounters for this analysis, we utilised three patient characteristics:

- CALD patients (using the same CALD criteria for each of the jurisdictions outlined at 1.2.3),
- Non-ATSI patients (using the patient demographic information which identifies whether a patient is Indigenous),
- Mental health encounters (refer to 6.3.2 below for the specific criteria used).

There are eight combinations of CALD / non-CALD, ATSI / non-ATSI, and mental health condition / no mental health condition (outlined in the table below). This analysis focused on Group 1; CALD, non-ATSI patients with mental health encounters.

Analysis Group	CALD	ATSI	Mental Health (MH)	Key Group
Group 1	Yes	No	Yes	Yes
Group 2	Yes	No	No	No
Group 3	Yes	Yes	Yes	No
Group 4	Yes	Yes	No	No
Group 5	No	No	Yes	No
Group 6	No	No	No	No
Group 7	No	Yes	Yes	No
Group 8	No	Yes	No	No

6.3.2 Criteria for identifying mental health encounters

Mental health encounters were identified using clinical classifications for the products analysed.

Acute

Episodes classified to a DRG from the major diagnostic categories (MDC) were considered in conjunction with psychiatric care days recorded. These conditions were used to identify patients treated for mental health conditions and have been listed in the table below :

MDC Category	Psychiatric care days recorded
MDC 19 - Mental diseases and disorders	Any number of days
MDC 20 - Alcohol/drug use and alcohol/drug induced organic mental disorders	Any number of days
All other encounters not categorised as MDC 19 or MDC 20	1 or more days

Emergency Department

Episodes with a principal diagnosis classified to a psychiatric illness major diagnostic block (MDB), identified patients treated for mental health conditions. These have been listed in the table below:

MDB Identifier	MDB Description
1D	Alcohol / drug abuse and alcohol / drug induced mental disorders
4	Psychiatric illness
5	Social problems

Outpatients

Service events classified to Tier 2 clinics where the majority of patients would be receiving mental health care were used to identify patients treated for mental health conditions. These Tier 2 clinics have been listed in the table below:

Tier 2 clinic code	Tier 2 clinic description
20.04	Developmental disabilities
20.45	Psychiatry
20.50	Psychogeriatric
20.52	Addiction Medicine
40.14	Neuropsychology
40.29	Psychology
40.30	Alcohol and Other Drugs
40.33	General Counselling
40.34	Specialist Mental Health
40.37	Psychogeriatric
40.57	Memory and Cognition

6.4 Findings

6.4.1 Acute encounters

The representation of CALD patients who were treated for a mental health condition, who identified as non-indigenous was very low relative to total sample site encounters. Across NSW, QLD and SA, these encounters made up less than 1%. The data supplied by Victoria did not contain the fields required to perform this analysis (the data did not contain the MDC field or the number of psychiatric care days).

The key group encounters represent less than 1% of the total encounters in each of the states, and therefore no further analysis was done on any cost differential between this group and the overall sample.

Description of analysis performed	NSW (PL)	QLD (PL)	SA (FS)
Key group encounters	2,251	248	55
Total sample site encounters	1,355,275	166,019	40,496
Key group encounters as a % of total sample site encounters	0.17%	0.15%	0.14%

6.4.2 Emergency Department encounters

NSW provided ED encounters with two CALD patient indicators, 'Preferred Language' and 'Interpreter Required', while the ED data supplied by Victoria did not contain the fields required to perform this analysis

In NSW, the proportion of encounters that met the "key group" criteria was very low relative to the total encounters of the respective sample sites. There were no encounters that met the criteria for the sites submitted by VIC.

The key group encounters represent less than 1% of the total encounters in NSW, and therefore no further analysis was done on any cost differential between this group and the overall sample.

Description of analysis performed	NSW (PL)	NSW (IR)
Key group encounters	1,265	406
Total sample site encounters	1,806,436	1,806,732
Key group encounters as a % of total sample site encounters	0.07%	0.02%

6.4.3 Outpatient encounters

Victoria was the only jurisdiction to provide outpatient encounters for analysis in this CALD patient costing study. The proportion of encounters that met the "key group" criteria represent approximately 0.04% of total encounters for the sample site.

The key group encounters represent less than 1% of the total encounters in Victoria, and therefore no further analysis was done on any cost differential between this group and the overall sample.

Description of analysis performed	VIC (IR)
Key group encounters	63
Total sample site encounters	280,538
Key group encounters as a % of total sample site encounters	0.02%

Appendices

Appendix A:	Glossary
Appendix B:	Consultation attendees and survey respondents
Appendix C:	Submissions to the Pricing Framework 2014-15 and 2015-16
Appendix D:	Literature Review Searches
Appendix E:	Literature review sources
Appendix F:	CALD data items collected for mental health
Appendix G:	Data summary and analysis assumptions

Appendix A: Glossary

Acronym/abbreviation	Description
AHPCS	Australian Hospital Patient Costing Standards
AIHW	Australian Institute of Health and Welfare
AR-DRG	Australian Refined Diagnosis Related Groups
ATSI	Aboriginal and Torres Strait Islander
CALD	Culturally and Linguistically Diverse
CCU	Critical Care Unit
Cost bucket	An NHCDC/other defined group of costs used for reporting.
DH	Department of Health
ED	Emergency Department
Encounter	Unique occurrence of a patient record on hospital system (also known as a separation)
FS	First spoken language
ICU	Intensive Care Unit
IHPA	Independent Hospital Pricing Authority
IR	Interpreter required
LEP	Low English Proficiency
LHN	Local Health Network
LOS	Length of stay
NEP	National Efficient Price
NESB	Non-English speaking background
NHCDC	National Hospital Cost Data Collection
NWAU	National Weighted Activity Unit
PAS	Patient Administration System
PL	Preferred language
PwC	PricewaterhouseCoopers
Triage	The process of sorting emergency patients into categories of priority for treatment. Patients presenting to emergency departments are rated on a Triage scale of 1 to 5, with patients at triage category 1 being the most urgent to be seen.
VCDC	Victoria Cost Data Collection

Appendix B: Consultation attendees and survey respondents

Jurisdiction	Jurisdiction and hospital representatives
NSW	<p>Julia Heberle, Manager, Funding and Costing, ABF Taskforce, NSW Ministry of Health</p> <p>Susan Dunn, NSW Ministry of Health</p>
VIC	<p>David Debono, Manager, Clinical Costing</p> <p>Sue Casey, Manager Health Sector Development, Foundation House</p> <p>Emiliano Zucchi, Coordinator, Transcultural and Language Services, Northern Health</p> <p>Matt Sharpe, Executive Director, Continuing Care, Ambulatory Mental Health and Statewide Services, Eastern Health</p> <p>Melanie Taylor, Director Allied Health, Eastern Health</p> <p>Cynthia Zupan, Cultural / Interpreter Services, Eastern Health</p>
QLD	<p>Colin McCrow, Manager ABF Costing, Department of Health</p> <p>Thinh Nguyen, Decision Support Analyst , Metro South Health</p> <p>Heather Meachem, Senior Decision Support Analyst, Metro South Health</p>
SA	<p>Phillip Battista, System Performance, SA Health</p> <p>Garry Wedlock, Northern Adelaide, Lyell McEwin Hospital</p>
WA	Bing Rivera, Manager, National Activity Based Funding Program
TAS	Ian Jordan, DHHS Tasmania
NT	Ian Pollock, Director Activity Based Funding, Department of Health
Department of Health	<p>Allison Clarke, Acute Care Division, Department of Health</p> <p>Richard Hurley , Acute Care Division, Department of Health</p>

Appendix C: Submissions to the Pricing Framework 2014-15 and 2015-16

IHPA release a consultation paper on the National Efficient Price (NEP) Pricing Framework each year, seeking feedback on specific areas. The 2014-15 Framework discusses feedback that was received indicating that CALD patients may exhibit higher costs. The 2015-16 Framework discusses IHPA's intention to conduct a CALD costing study to inform the development of the NEP15. The purpose of this study was to review the extent to which data on "language spoken at home" would be a better indicator to ascertain whether an adjustment is warranted for CALD patients or certain subgroups of CALD patients (such as in mental health or geriatric services).

In response to these consultation papers, IHPA received a number of submissions specifically discussing the requirement for a CALD adjustment. The key points from these submissions have been summarised below.

1 Mental Health in Multicultural Australia

Mental Health in Multicultural Australia's (*MHiMA, 2013*) made a submission to IHPA in 2013. This submission stated that evidence was needed to determine whether there were significant differences for CALD patients in the costs of providing the same service. They concluded that if that was found to be the case, that an adjustment should be incorporated into the funding model.

They believe that the identification of a CALD patient should include broader data variables than country of birth, and referred to a study they had conducted for the National Mental Health Commission which could inform the data collection processes. This study identified the data elements relating to cultural and linguistic diversity that were collected through data collections or surveys by various agencies and organisations in Australia. A summary of these data items is included in Appendix D of this report.

2 Royal Australian & New Zealand College of Psychiatrists

The Royal Australian & New Zealand College of Psychiatrists (*RANZCP, 2014*) made a submission to IHPA in 2014. In this submission, they expressed their view that there was a need to understand the contextual issues relating to the respective processes and costs of delivering mental health care activities for CALD populations. They concluded that they supported the proposal to develop a CALD adjustment.

3 St Vincent's Hospital Melbourne

St Vincent's Hospital Melbourne (*SVHM, 2014*) provided a submission in 2014 regarding interpreter services. Their 2012-13 demographic data indicated that 48% of patients registered on their Patient Administration System database were from a CALD background, and 20% of these patients required an interpreter to provide effective communication. They employed interpreters for the highest demand language groups and outsourced these services from accredited agencies for the remaining 60+ languages.

Their submission also indicated that low health literacy was particularly prevalent in people from CALD backgrounds and those with low English proficiency. They referenced other studies which demonstrated that limited health literacy is often associated with poor health behaviours, higher rates of hospital admissions and poor communication with health

providers, resulting in incorrect use of medications and greater use of emergency care services.

They concluded that there is a significant cost incurred for the provision of accredited interpreter services which are merited as their use supports reduced risks of poor clinical outcomes and adverse events, hospital readmissions, medication errors and extended lengths of stays.

4 Royal Australian College of Physicians

The Royal Australian College of Physicians (*RACP, 2014*) submission in 2014 agreed with IHPA's intention to conduct a costing study to consider whether there should be an adjustment for CALD patients. They identified the main additional cost associated with treating this class of patients was the use of translator services to provide adequate communication between the medical professionals and these patients. They also acknowledged that on average, these costs would be insignificant as a share of the total episode cost.

They recognised that some local health networks (LHNs) would have a disproportionate share of CALD patients, and gave Western Sydney Local Health District in NSW as an example where 66% of the local residents speak a language other than English. For these LHNs with disproportionate levels of CALD patients, accounting for additional CALD patient costs at the DRG level alone may be insufficient to adequately compensate the hospitals.

They also referenced recent research which suggested that CALD patients were overrepresented in particular disease profiles including the major chronic disease of diabetes (*Colagiuri, Thomas and Buckley, 2007*), and therefore more effective treatment of CALD patients could contribute to better management of chronic disease in Australia.

Appendix D: Literature Review Searches

5 Searches on Google Scholar

a Socio-economic status

Search Terms on Google Scholar were : 'DRGs AND socio-economic status AND 'country' AND casemix funding, undertaken for Germany, Canada, UK, USA, Switzerland, The Netherlands, Australia. and ordered by 'relevance' for 2010 to 2014. 1,742 articles were identified with 24 being selected.

b Ethnic, DRGs and risk adjustment

Search terms on Google Scholar were: Ethnic AND DRGs AND risk adjustment for 2010 - 2014, sorted by 'relevance'. 836 articles identified and 3 were selected.

c Refugee hospitals risk adjustment DRGs

Google Scholar Search terms were: Refugee AND hospitals AND risk adjustment AND DRGs for the years 2010 -2014, sorted by 'relevance'. 29 articles identified but none selected.

d Immigrants hospitals risk adjustment DRGs

Google Scholar Search terms were: Immigrants AND hospitals AND risk adjustment AND DRGs for 2010 -2014, sorted by 'relevance', resulting in 201 articles identified but none selected.

e DRGs and Culturally and Linguistically Diverse (CALD)

Google Scholar search terms were DRGs and Culturally and Linguistically Diverse for 2010 - 2014, sorted by relevance resulting in 1,880 articles but none selected.

6 PUBMED searches

a To identify clinical issues impacting CALD and to identify guidelines

Search (("Australia"[Mesh] OR austral*)) AND (((((((CALD) OR (cultural* AND linguist*)) OR NESB) OR non english speak*) OR non-english speak*)) AND (((clinical guideline* OR clinical practice*)) OR ("Guidelines as Topic"[Mesh] OR "Practice Guidelines as Topic"[Mesh] OR "Guideline" [Publication Type] OR "Clinical Protocols"[Mesh]).

This identified 20 articles but no articles were selected as directly on topic. An additional search was undertaken at 2(b) to further explore cost driving impact of clinical issues on CALD.

b To identify clinical issues impacting CALD and potential resource and cost implications

The search strategy involved several iterations of search terms such as those identified below::

- ((hospital cost* OR (cost* AND hospital*))) AND (cultur* and diver*) Schema: all
- cultur* AND diverse AND (languag* OR linguist)
- DRG* AND cultural*
- (healthcare cost*) AND(cultural* AND linguist* divers* OR "Cultural Diversity"[Mesh])

206 articles were identified, and from these 19 articles were selected.

7 NHSEED data base and Econolit

The NHSEED data base was searched using term cultural* resulting in 10 items identified. None were selected. Econolit was searched using the search terms relating to culture and 2 articles were obtained. Neither was considered relevant.

8 PUBMED

PUBMED was searched to obtain international journal articles addressing DRG funding mechanisms internationally and cost drivers. The search terms used related to DRGs, casemix funding and activity based funding to obtain review articles that may include cost drivers and adjusters to the various international studies about DRGs. The period searched was 2005 to 2014. This resulted in 81 journal articles and from this 17 journal articles were selected.

9 Internet searching

The internet via Google was searched using the terms:

- CALD AND Health AND needs AND hospital AND costs. This resulted in 185,000 items ordered by 'relevance'
- 'CALD AND Health AND Costs'. This resulted in 4,850,000 items ordered by relevance.

From the above searches, several reports were selected relating to deliberations of the IHPA including its pricing framework and submissions relating to CALD.

Appendix E: Literature review sources

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Appendix F: CALD data items collected for mental health

Table 2: Data elements relating to cultural and linguistic diversity

Agency/Organisation	Data Collections/Surveys	CALD variables								
		Country of birth	First language spoken	Interpreter service required	Main language other than English spoken at home	Period of residence in Australia (years)	Preferred language	Proficiency in spoken English	Year of first arrival in Australia	Country of birth of parents
Australian Bureau of Statistics	Causes of Death collection ^b	✓				✓				
	General Social Survey ^c	✓			✓			✓	✓	
	Australian Health Survey ^b	✓			✓			✓	✓	
	National Survey of Mental Health and Well-being(2007) ^d	✓			✓			✓	✓	
	Survey of Disability, Ageing and Carers (SDAC) ^a	✓			✓			✓	✓	✓
Australian Institute of Family Studies ^b	Growing up in Australia: The longitudinal study of Australian children ("Ethnicity data collected for study child and all other members of the household)	✓			✓				✓	
Australian Institute of Health and Welfare	Alcohol and Other Drug Treatment NMDS ^a	✓					✓			
	Community Mental Health Care NMDS and Residential Mental Health Care NMDS ^a	✓								
	Computer Assisted Telephone Interview demographic module DSS ^a	✓							✓	
	National Drug Strategy Household Survey ^b	✓			✓				✓	
	National Hospital Morbidity Database ^b	✓								
	National Mortality Database ^b	✓				✓				
	Non-admitted patient emergency department care NMDS ^a	✓								
	Perinatal NMDS ^a	✓								
Family Medicine Research Centre, University of Sydney	National Dental Telephone Interview Survey ^b	✓								
	Bettering the Evaluation and Care of Health (BEACH) ^b	✓								

<i>Centre for Behavioural Research in Cancer, The Cancer Council Victoria</i>	Australian Secondary Students Alcohol and Drug Survey ^b					✓						
<i>Australian Institute of Health and Welfare – General Practice Statistics and Classification Unit, University of Sydney^b</i>	National Coroners Information System	✓					✓					
<i>The Kirby Institute, University of New South Wales^b</i>	Australian Needle and Syringe Program Survey	✓				✓						
<i>The Kirby Institute, University of New South Wales^b</i>	National HIV Registry	✓										
<i>National Drug and Alcohol Research Centre, University of New South Wales^b</i>	National Clients of Treatment Service Agencies census	✓				✓						
<i>AIHW National Epidemiology and Statistics Unit, The Perinatal and Reproductive Epidemiology Research Unit, University of New South Wales^b</i>	Perinatal Data Collection, Australia	✓										
<i>Women's Health Australia^b</i>	The Australian Longitudinal Study on Women's Health											

Source: *AIHW* (2012); *b* Source: *Blignault and Haghshenas (2005).125*; *c* Source: *ABS (2011).126*, the survey also includes 33 questions on visa category (e.g. type of visa for people who are not an Australian citizen, type of first visa, whether the person was a temporary resident before becoming an Australian citizen or permanent resident and so forth); *d* Source: *ABS (2009). 127*; *e* Source: *ABS (2010)128*.

Appendix G: Data summary and analysis assumptions

10 Summary of data received

The Round 17 datasets received PwC and used in analysis have been outlined in the following table:

Product / Care type	Description of dataset
Acute	Cost and demographic data summarised to the separation level
ED	Cost and demographic data summarised to the presentation level
Subacute	Cost and demographic data summarised to the separation level
Palliative Care	Cost and demographic data summarised to the service (phase) level

The palliative care and subacute datasets were merged into a single 'Subacute' table. Records were kept at the service level (i.e. no aggregation to the separation level).

Acute encounters

Jurisdiction	Provided by IHPA	Provided by jurisdiction	Matched records	Unmatched records
NSW	1,376,814	176,756	176,719	1,200,095
VIC	n/a	122,351	122,351	0
QLD	167,898	167,898	167,898	0
SA	341,162	41,908	41,908	0

ED encounters

Jurisdiction	Provided by IHPA	Provided by jurisdiction	Matched records	Unmatched records
NSW	1,954,569	89,003	89,003	1,865,566
VIC	n/a	514,116	514,116	0

Subacute encounters

Jurisdiction	Provided by IHPA	Provided by jurisdiction	Matched records	Unmatched records
NSW	67,842	9,248	9,245	3
VIC	n/a	360,543	360,543	0
QLD	60,109	17,809	11,947	5862
SA	12,106	137	137	0

Outpatient encounters

Jurisdiction	Provided by IHPA	Provided by jurisdiction	Matched records	Unmatched records
VIC	n/a	287,905	287,905	0

Each of the jurisdictions provided the following fields which were used in the analysis to identify CALD patients:

Jurisdiction	CALD indicator 1	CALD indicator 2
NSW	Interpreter required	Preferred Language
VIC	Interpreter required	Preferred Language
QLD	Preferred Language	n/a
SA	First spoken language	n/a

11 Assumptions made in synthesising a dataset for analysis

Following discussions with each of the jurisdictions with agreement from IHPA, the following assumptions were made in preparing the data for analysis:

Jurisdiction	Product	Data Issue	Resolution
All	All	Exclusion of out of scope NEP costs	Depreciation costs have been excluded for all cost analysis. ED costs in acute, sub-acute and outpatient encounters was excluded for all cost analysis.
QLD	Acute,	Patients were identified to have	QLD resubmitted their data with a Medical Record Number (MRN) and

Jurisdiction	Product	Data Issue	Resolution
	Sub-acute	responded inconsistently for their preferred language	<p>the following rules were used to correct the preferred language:</p> <ol style="list-style-type: none"> 1. If the patient responded with English for one encounter and a non-English language for any other encounter, the record was excluded. 2. If the patient responded with multiple non-English languages, the all encounters for that patient were considered to be CALD. 3. If the patient responded with a particular language for one encounter, and then did not state for other encounters, all encounters were assumed to be that language.
NSW	Acute, Sub-acute, ED	It was agreed that the analysis would be done on state-wide data; however data was provided for the CALD group only.	<p>The data provided by IHPA was taken as the starting point, and matched to the NSW provided data.</p> <p>Records did not match, were assumed to be non-CALD (i.e English as a preferred language or no interpreter required). Additionally, unmatched were also assumed to be non-indigenous.</p>
SA	Acute, Sub-acute	Blank EpisodeIDs were provided in the data submission.	These records were excluded from analysis as they could not be linked to IHPA's cost and demographic data.
SA	Acute, Sub-acute	Duplicate encounters were identified with different care types in the data submission	A unique list of Episodes was obtained, and the care type as provided in the IHPA dataset was taken as the correct one.
VIC	Acute, Sub-acute, ED	Statistical Local Areas (SLAs) were provided as a field to indicate patient residence, while IHPA use postcodes of patient residence mapped to remoteness to indicate remoteness	<p>The correspondence of 2011 SLAs to 2011 Postal Areas was obtained from the ABS, which uses a population weight average to align match SLAs and postcodes.</p> <p>Since SLAs correspond to multiple postcodes, the postcode with the higher population was used as the matching postcode and the VIC records updated.</p>
VIC	Outpatient	No field was provided for interpreter required, unlike datasets provided for	There were two fields which identified direct and indirect interpreter costs allocated to encounters. If either of these fields was non-zero, it was assumed that

Jurisdiction	Product	Data Issue	Resolution
		other products	these encounters required an interpreter. All other encounter records were assumed to have not required an interpreter.

12 Assumptions made in identifying CALD patient encounters

Encounters were classified into three groups for analysis: CALD, non-CALD and Excluded.

For the language-based indicators ('preferred language' and 'first spoken language') provided by NSW, VIC, QLD and SA, the approach to the classification of these language groups has been listed below:

Category	Classification
English	Non-CALD
Australian indigenous languages	Non-CALD
Sign languages, non-verbal, baby languages	Excluded
Unknown/Not Stated	Excluded
Non-English, non-excluded languages	CALD

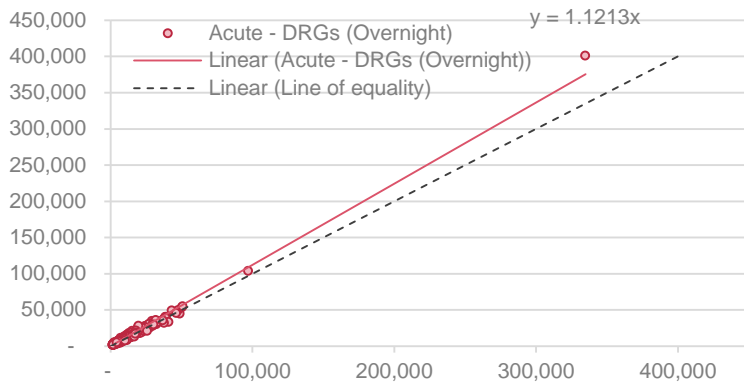
The decision to classify Australian Indigenous languages as non-CALD was made with assistance from PwC's Indigenous Consulting, and had the effect of not including these encounters in any CALD group, while retaining them in the overall sample site population (i.e. they were not included). They would further be disaggregated by the Indigenous Status of the encounter.

'For the 'interpreter required' indicator provided by NSW and VIC, the classification of the categories have been listed below:

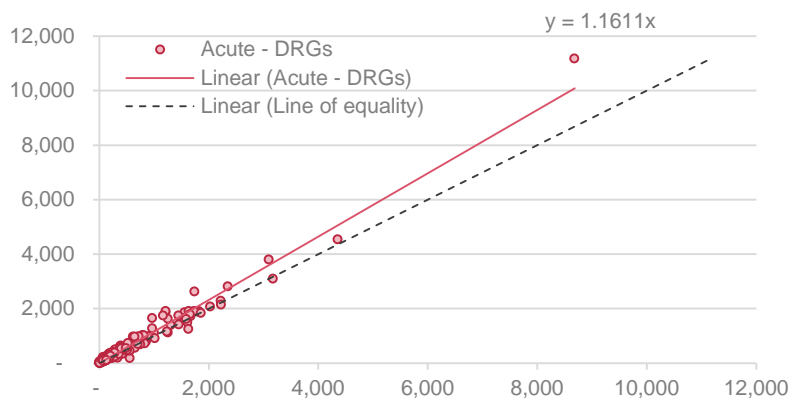
Category	Classification
Yes	CALD
No	Non-CALD
Unknown/Not Stated	Excluded

13 Assumptions made performing and reporting analysis

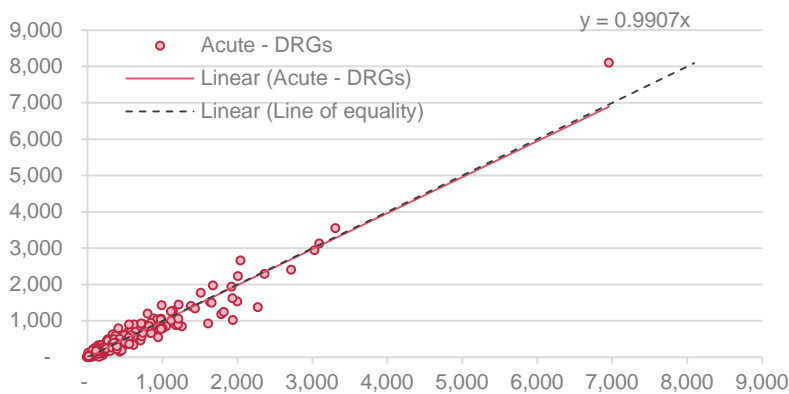
The following series of charts are the original output for the respective test, jurisdiction and CALD indicator used.



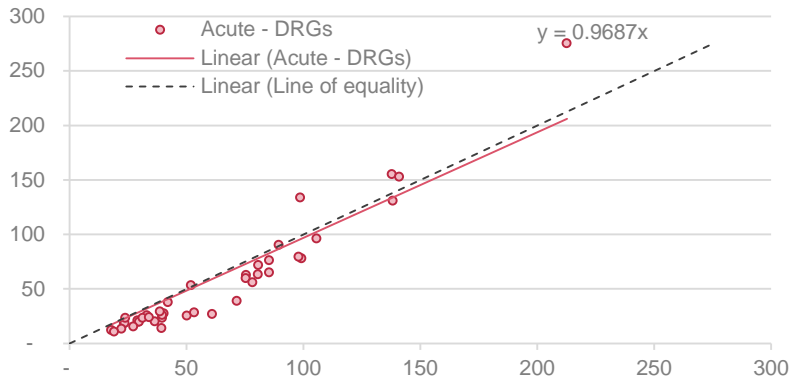
NSW – Using preferred language as CALD indicator – Average cost per encounter of overnight acute encounters – DRGs with an average cost greater than \$100,000 excluded.



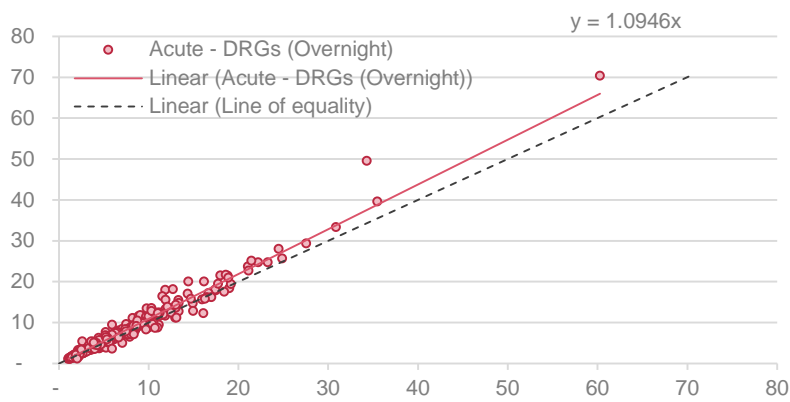
NSW – Using preferred language as CALD indicator – Average pathology cost per encounter – DRGs with an average cost greater than \$10,000 excluded.



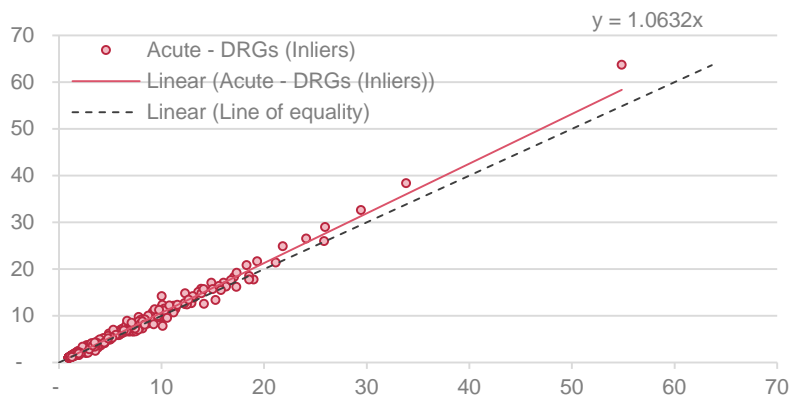
NSW – Using preferred language as CALD indicator – Average imaging cost per encounter – DRGs with an average cost greater than \$8,000 excluded.



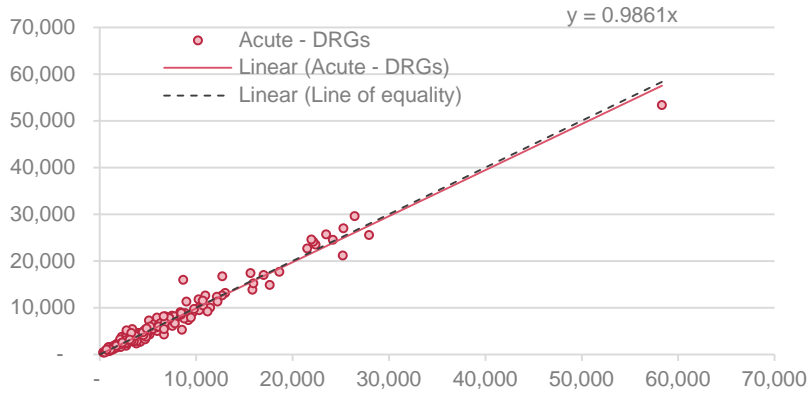
NSW – Using preferred language as CALD indicator – Average CCU cost per CCU hour – DRGs with a cost greater than \$250 excluded.



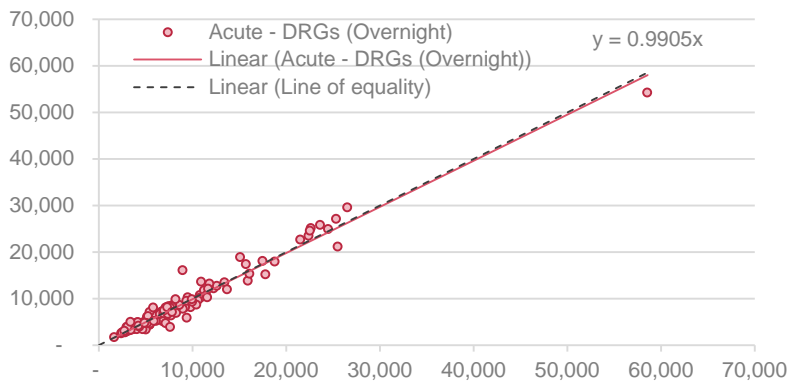
NSW – Using preferred language as CALD indicator – Average length of stay of overnight encounters – DRGs with an average length of stay greater than 45 excluded.



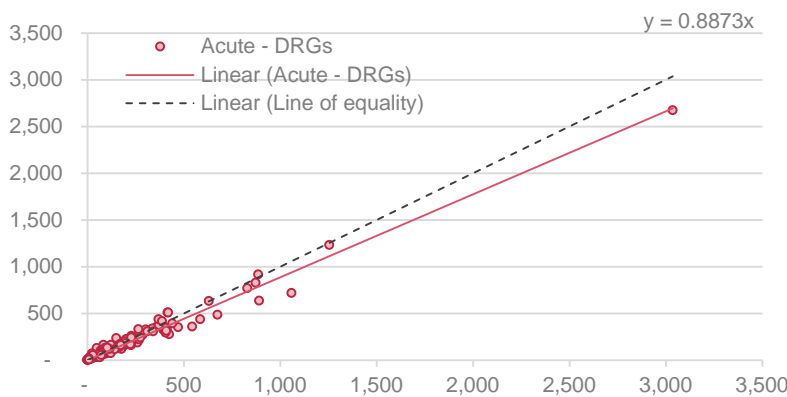
NSW – Using preferred language as CALD indicator – Average inlier length of stay of acute encounters – DRGs with an average length of stay greater than 60 excluded.



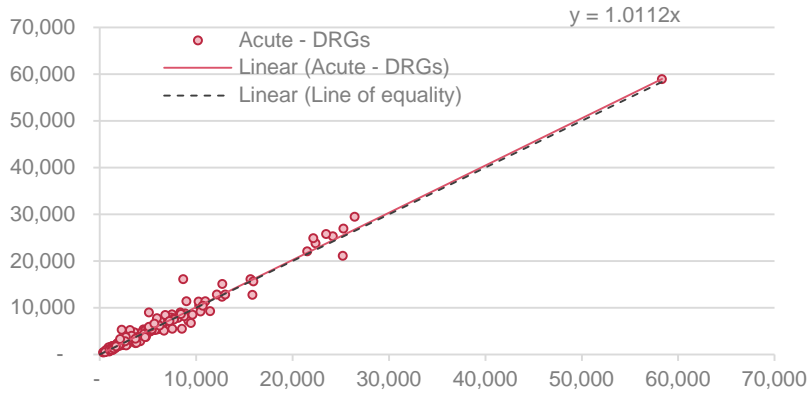
VIC – Using preferred language as CALD indicator – Average cost per encounter – DRGs with an average cost greater than \$50,000 excluded.



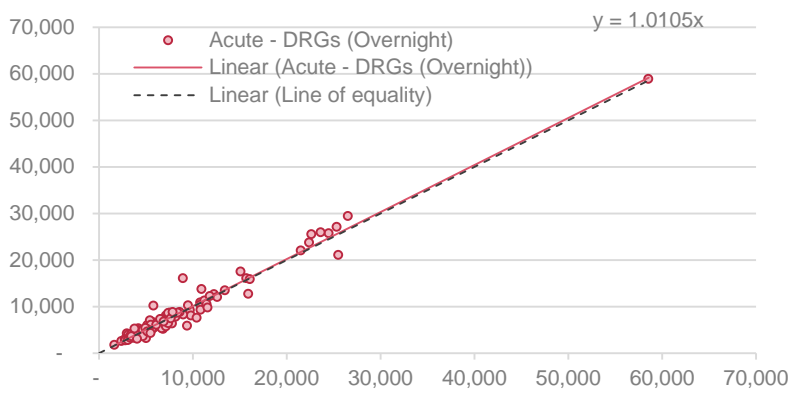
VIC – Using preferred language as CALD indicator – Average cost per encounter of overnight acute encounters – DRGs with an average cost greater than \$50,000 excluded.



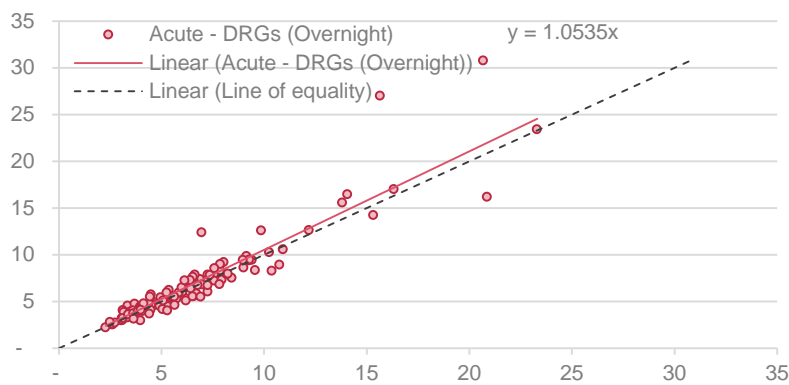
VIC – Using preferred language as CALD indicator – Average pathology cost per encounter – DRGs with an average cost greater than \$2,500 excluded.



VIC – Using interpreter required as a CALD indicator – Average cost per encounter – DRGs with an average cost greater than \$50,000 excluded



VIC – Using interpreter required as a CALD indicator – Average cost per overnight encounter – DRGs with an average cost greater than \$50,000 excluded

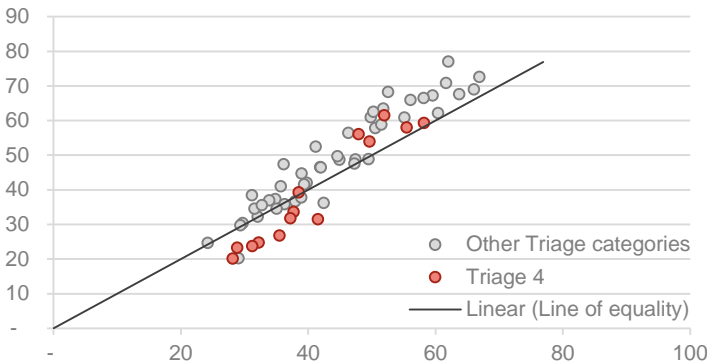
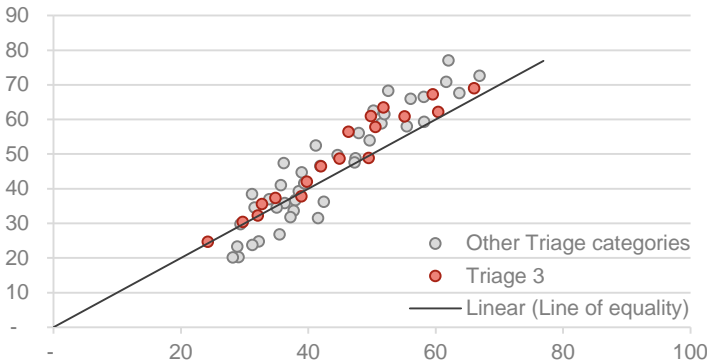
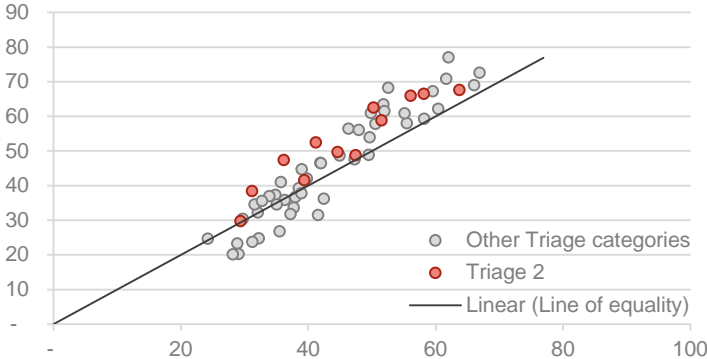


VIC – Using interpreter required as CALD indicator – Average length of stay of an overnight encounter – DRGs with a length of stay greater than 25 excluded.

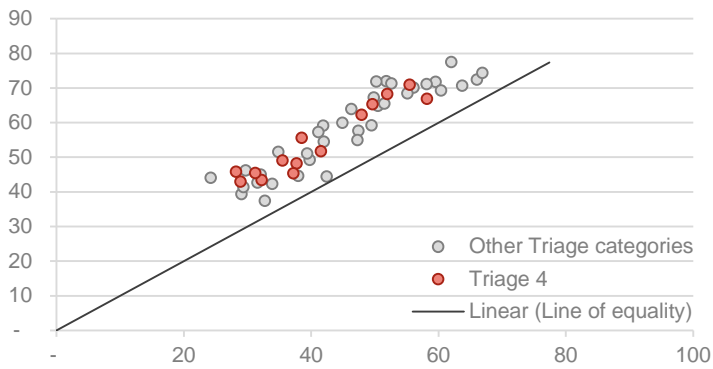
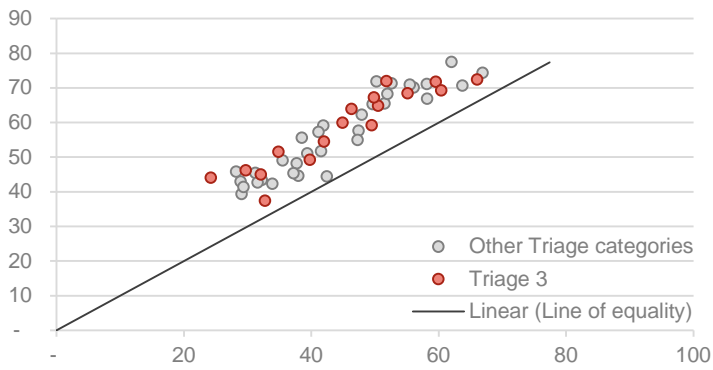
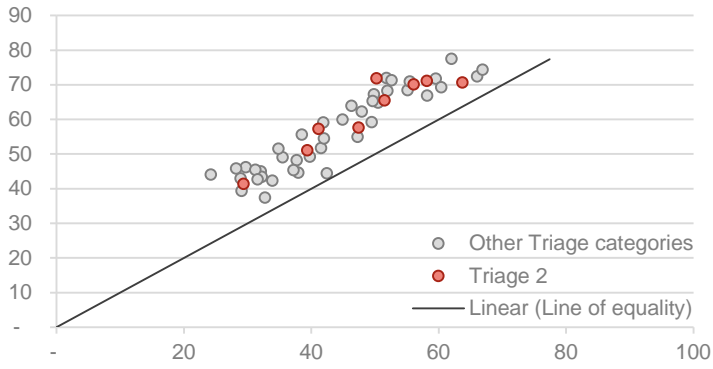
14 Additional data not reported in main body of analysis

Section 6.2.4 – ED – Patient Characteristics

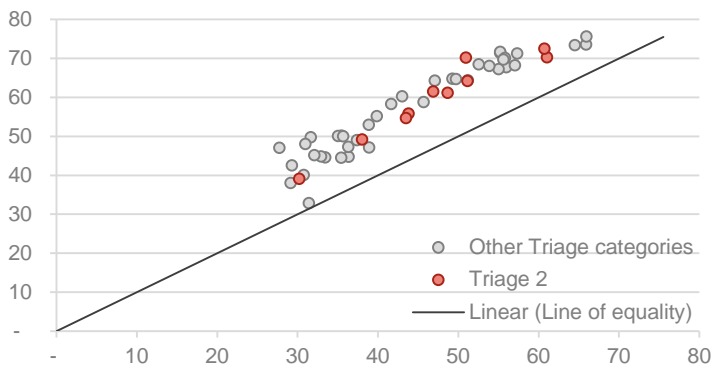
Highlighting average age of URGs in Triage category 2, 3 and 4 – NSW using preferred language

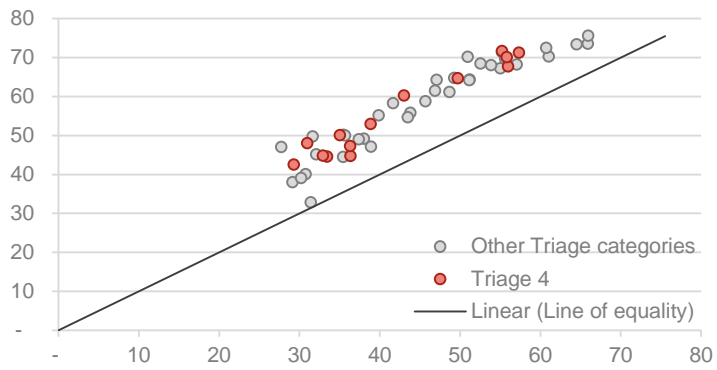
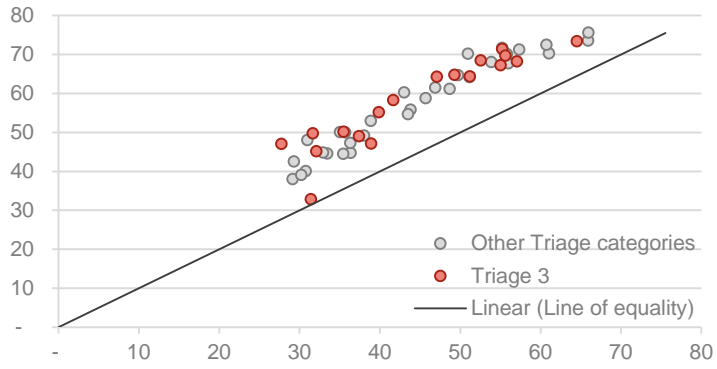


Highlighting average age of URGs in Triage category 2, 3 and 4 – NSW using interpreter required



Highlighting average age of URGs in Triage category 2, 3 and 4 – VIC using preferred language





Highlighting average age of URGs in Triage category 2, 3 and 4 – VIC using interpreter required

