Increase in computed tomography in Australia driven mainly by practice change: a decomposition analysis.

Cameron M. Wright[1, 2], Email: cameron.wright@curtin.edu.au

Max K. Bulsara [3, 4], Email: max.bulsara@nd.edu.au

Richard Norman [1], Email: richard.norman@curtin.edu.au

Rachael E. Moorin [1,4*]

1. Health Systems and Health Economics, School of Public Health, Faculty of Health, Curtin University, Perth, Western Australia.
2. Division of Pharmacy, School of Medicine, Faculty of Health, University of Tasmania, Hobart Tasmania.
3. Institute for Health and Rehabilitation Research, University of Notre Dame, Fremantle, Western Australia.
4. School of Population Health, University of Western Australia, Crawley, Western Australia.

* Corresponding author:
School of Public Health
Faculty of Health Sciences
Curtin University
GPO Box U1987
Perth, Western Australia, 6845
Tel: +61 8 9266 3536 Fax: +61 8 9266 2958
Email: r.moorin@curtin.edu.au

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Highlights

- The drivers behind the increase in computed tomography (CT) are not well characterised.
- As CT is publicly funded through Australia's universal healthcare system, Medicare, an unevaluated increase in use outside of that driven by demographic drivers has potential public health (because ionising radiation is used) and health economic implications.
- In Australia, funded CT procedures are often described by the body site of the CT, rather than the indication for use, as opposed to more contemporary technology like positron emission tomography, where item descriptors are often much more specific.
- We used Australian CT data to explore demographic drivers versus practice change. Change in practice, rather than demography, was the main driver of CT increase.
- This finding invites a prospective effort to specifically define descriptors for publicly funded services, and a discussion of whether/how often retrospective review of previously funded services that are less specifically defined should occur.

Abstract

Background: Funded computed tomography (CT) procedure descriptions in Australia often specify the body site, rather than indication for use. This study aimed to evaluate the relative contribution of demographic versus non-demographic factors in driving the increase in CT services in Australia.

Methods: A decomposition analysis was conducted to assess the proportion of additional CT attributable to changing population structure, CT use on a per capita basis (CPC, a proxy for change in practice) and/or cost of CT. Aggregated Medicare usage and billing data were obtained for selected years between 1993/4 and 2012/3.

Results: The number of billed CT scans rose from 33 per annum per 1,000 of population in 1993/94 (total 572,925) to 112 per 1,000 by 2012/13 (total 2,540,546). The respective cost to Medicare rose from $145.7 million to $790.7 million. Change in CPC was the most important factor accounting for changes in CT services (88%) and cost (65%) over the study period.

Conclusions: While this study cannot conclude if the increase is appropriate, it does represent a shift in how CT is used, relative to when many CT services were listed for public funding. This ‘scope shift’ poses questions as to need for and frequency of retrospective/ongoing review of publicly funded services, as medical advances and other demand- or supply-side factors change the way health services are used.

Key words: computed tomography, computed axial tomography, CT scan, health service utilisation.

Background

Computed tomography (CT) scanning is a commonly used medical imaging technique which takes multiple X-ray images, and assembles them to provide a 3-dimensional image (1). Since its introduction in the 1970s, CT technology has advanced substantially and its added clinical utility has led to increased use in Australia. Organisation for Economic Cooperation and Development (OECD)-collated data for Australia estimated that CT non-public hospital examinations (approximately 75% of the total (2)) increased 32% between 2007 and 2013, from 83.2 to 109.8 CT examinations per 1,000 of population (3). If the increase were due to population increases or change in distribution (i.e. reflective of an ageing population) then increasing counts of CT and associated costs should be proportionate to these changes. Indeed, population ageing is often cited as a major driver of increasing health resource utilisation and costs (4). Changes outside of that expected due to demographic changes would therefore reflect a change in the way that CT is being used. Whilst examining these proportionate changes cannot alone aid judgment in whether any ‘change in practice’ is appropriate, it would serve to demonstrate changes in the way that CT is being used from the original intention when descriptive service parameters were developed and evaluated, and decisions to provide public funding made. Whilst the potential for ‘scope shift’ is not unique to CT, it is worth examining CT in particular as, because of the radiation dose delivered in addition to the cost of the procedure, use of CT outside of settings found to be clinical and economically effective has the potential to cause harm, in addition to burden on publicly funded health systems. The absolute risk associated with CT radiation at a population-level is currently not well characterised. Epidemiological studies published to date (5-7) likely over-estimate the risk from CT exposure for adults (8).

However, existing indirect evidence (e.g. (9)) suggests the risk is non-negligible and offers support to the presiding ‘as low as reasonably achievable’ (ALARA) principle with respect to ionising radiation in medical imaging (10).

Public funding arrangements for CT in Australia

Australia has a fee-for-service model for CT scanning outside of public hospitals, where the Federal Government reimburses private radiology providers for individual services through Medicare. Medicare also funds general practitioner (GP), pathology, other diagnostic, medical specialist and allied health services, with specific item descriptors and the service fee described in the Medicare Benefits Schedule (MBS). The ‘benefit’ publicly reimbursed to the provider is usually 85% of the listed schedule fee, which the provider can either accept as the total payment, or also charge a co-payment to the patient. CTs are performed at the request of a medical practitioner, often a GP in an out of hospital setting. Services through public hospitals are funded through a combination of state and national funding and are typically not reported by Medicare. Since 1998, recommendations for item listing are made by the Medicare Services Advisory Committee to the Minister for Health, following extensive health technology assessment (11). Prior to this period services were funded without assessment and the legacy of this is that many services have extremely non-specific (if any) descriptors for their intended use. Examples of this include many CT examinations in which the item descriptor merely states the area of the body without any identification of the clinical setting under which the examination has been listed for funding. In contrast descriptors for more recently funded diagnostic technologies, such as magnetic resonance imaging and positron emission tomography, tend to be very specific about the circumstances of their use under public funding, reflective of advances in health technology assessment and concerns about the impact of technological advancement on health budgets over time (12). On 22 April 2015, the Minister for Health announced the formation of a taskforce to review whether more than 5,700 MBS items could be better aligned with contemporary clinical practice and evidence (13). Diagnostic imaging is one of the larger areas for review, due to the number of items and since many descriptors have not been re-evaluated since they were first included on the MBS

The present study and implications for health policy

Previous descriptive studies have quantified the increase in CT use (14-20), including in Australia (21, 22). However, to our knowledge, no study has analysed the proportion of change due to demographic versus non-demographic factors, to infer then change in use potentially outside of that intended when the decision to publicly fund a service was made. Thus in this study, we aimed to find whether the major proportion of change in CT scans and associated costs billed to Medicare was due to population size and structure changes, or else the complement of this (i.e. that explained by 'change in practice')?

Through examining this question for CT in Australia, a broader question of whether this situation is occurring for other health services is posed, especially in publicly funded health systems where descriptors are broad and where indications for use are not clearly characterised. This is especially so in cases where clinical progress may have driven change. Thus, analysis of the demographic versus non-demographic drivers of CT change in Australia is worthy of consideration by policy makers in other settings with similar funding and/or service delivery arrangements.

Methods

Data sources

Population data estimates disaggregated by age, sex and state/territory were sourced from the Australian Bureau of Statistics (23). The estimated population was as at June of the earlier calendar year (e.g. June 2012 for the 2012/13 fiscal year).

CT scan utilisation data were sourced from publicly available Medicare Benefits Schedule (MBS) records, extracting ‘Item I2: Computed Tomography’ (24). The MBS lists all services eligible for reimbursement through Australia’s Medicare programme. Almost all (~99% (2)) of the CT services provided in public hospitals are excluded from these data. These records were categorised by sex, age group and state/territory of service. The quarter and year recorded for a service reflected the time period that the claim was processed by Medicare. Costs are in Australian dollars as at the time of processing.

Decomposition analysis

We analysed six separate fiscal years (covering the period 1 July to 30 June): 1993/4, 1996/7, 2000/1, 2004/5, 2008/9, and 2012/13. The population (P); number of CT scans (E); and Medicare benefit paid (T) were extracted for each time period, excluding two records for which the age group was not known. From the extracted data, the mean number of CT scans per capita (CPC) in each each-specific group j was calculated as: $CPC_j = E_j/P_j$. Similarly, the mean cost per episode (CPE) was be calculated as: $CPE_j = T_j/E_j$, where T_j is the cost of benefit paid for that time period by age-specific group, j. The CPC and CPE were also calculated for the study population overall (i.e. aggregating over all j groups). Sub-analyses were conducted for each sex (comparing each of the years in the original analysis), and for individual state/territories, comparing 1993/4 to 2012/13 only.

The decomposition analysis was based on methods used by Ha and colleagues (25) ; the methods are briefly summarised below and described in detail in Appendix 1. Firstly, we investigated the proportion of the change in the number of CTs that was accounted for by: i) change in population size; ii) change in population distribution and iii) change in CPC. The change in CPC metric acted as an indirect measure of change in practice (i.e. changes in the clinical indications for CT facilitated by technological advancement). One time period was compared to the next successive time period. In addition, 2012/13 was compared to 1993/4, which compares across the entire duration of our data collection.

The proportionate change in CT count was decomposed into three explanations, namely: population growth, age distribution and the CPC metric. To estimate the proportion of change due to population growth, we assumed that both the population age distribution and number of CTs performed per capita for the latter time period did not change from the earlier comparator year. The difference between time periods predicted by holding these factors constant, as a proportion of the actual change in CT count observed, was attributed to population growth. Relaxing the assumption of the age distribution remaining identical between time periods allowed the proportion of change attributable to shifting population distribution to be calculated next. Finally, the proportion attributable to CPC – a proxy for change in practice - was simply the remaining CT growth unexplained by population growth or distribution change.

For the second part of the decomposition analysis, we repeated the approach from part one, but with five explanations for the change in cost, these being: i) change in population size; ii) change in population distribution; iii) change in CPC; iv) change in CT distribution by age group and v) change in CPE. As in the count decomposition, each factor was isolated in-turn to account for the change between compared time periods (see Appendix 1 for further details). The analyses were conducted using Microsoft Excel Version 14.5.5 (Redmond, Washington, United States).

Results

Table 1 shows population and Medicare-billed CT scan counts and costs over the study period. The Australian population increased in size by 29% between 1993 and 2012, from 17.7 to 22.7 million. The population age-distribution between these time periods shifted toward the right; 11.6% of the population were aged ≥ 65 years in 1993, compared to 14.2% in 2012. Over four times as many CT scans were billed to Medicare in 2012/13 than in 1993/4 (2,540, 546 versus 572,925 respectively). This yielded a CPC (per 1,000 of population) of 33 in 1993/4, compared to 112 in 2012/13. Appendix 2 shows CT count and cost data disaggregated by sex and age group. Both the population and CT count in people aged 85 years or above increased markedly over the study period (144% and 1,117%, respectively). The dollar value billed to Medicare in 1993/4 was $145.7 million (~$243 million equivalent at December 2012 (26)); this had increased to $790.7 million by 2012/13. The CPE also increased, from $253 to $311.

The results of the decomposition analysis for Medicare-billed CT scan count are displayed in Figure 1. The majority of the change in CT count was due to change in the CPC (88% from 1993/4 to 2012/13), though this became relatively less important over the study period. Conversely, population growth explained only 12% of the change in number of CT scans performed from 1993/4 to 1996/7, while it explained over a fifth (21.5%) of the change in number of CT scans from 2008/9 to 2012/13. Change in population age-distribution accounted for only a small proportion of the change in CT scan count (3.9% to 8.3%).

The analysis of change in Medicare-billed cost data showed that change in CPC was an important factor explaining the increase in cost over the study period (Figure 2). This was especially so when comparing 1996/7 to 2000/1, where the change in CPC accounted for 79% of the cost increase. However, for the last two years compared, 2008/9 versus 2012/13, the change in CPC accounted for only 45% of the cost increase. During the study period, change in mean CPE became a more important factor in explaining the change in cost, accounting for 37% of the change from 2008/9 to 2012/13.

Separating data by sex showed the male and female population were evenly distributed for the years included in the analysis (proportion female 50.2% to 50.4%), though the proportion of scans on females (53.2% to 54.3%) and associated costs (52.5% to 53.7%) was just over half. The decomposition analysis with data separated for males and females showed similar results to the analysis for both sexes (see Figure 3 (count) and Appendix 3 (cost)).

The analysis by state/territory, provided in Appendix 4, did show variable CT count increases. The lowest proportionate increase in CT was seen in the Australian Capital Territory at 240%, while Queensland saw the most increase at 508%. The results of the state/territory-based decomposition analysis were similar to those for Australia overall.

Discussion

Medicare-billed CT scans and associated costs increased markedly over the period 1993 to 2013. To provide international context within OECD countries, Australia's CT use in 2013 was markedly higher than Finland at 32 per 1,000 population (the lowest), but lower than the highest user per capita, Estonia at 495 per 1,000 (3). Our analysis shows the main factor associated with CT increase in Australia is an increase in CPC, indicative of a change in practice beyond that driven by changes in demography and potentially beyond that for which the initial decision for provide public funding was based upon. However, the importance of population growth as a factor in increasing CT increased over the study period. Likewise, the relative importance of CT cost has increased as a factor in explaining the change in total expenditure over the study period.

CT scan use increased rapidly as technology developed over the study period, as demonstrated by the importance of change in CPC over time. In 1996/7, new MBS item descriptors were added for CT imaging (i.e. new publicly funded CT services) (27); consistent with the high proportion of change from 1996/7 to 2000/1 explained by the change in CPC for both count and cost data. A limitation of the CPC is that it implies one scan per person, which is not necessarily the case. Because the aggregate-level data for MBS-billed CT scans does not identify individual patients, we could not disentangle the impact of multiple scans. Sodickson and colleagues (28) found in a U.S. setting that multiple CT scanning was very common, with a median of 3 scans/person amongst a mixed inpatient/outpatient cohort. The impact of multiple scanning is likely to mean the proportion driven by change in practice is higher than in our estimates, and thus our conclusions are unaltered.

CPE increased in importance as an explanatory factor in the increase in CT cost over the study period. Unlike other MBS services, which are indexed against the wage and consumer price indices each year, medical diagnostic fees have not been routinely indexed since 1998 (27). Changes in schedule fees would thus be expected to account for a portion of change in CPE prior to 1998, but are less useful in explaining change between 1998 and 2013. The change in CPE is thus more likely to be associated with increased use of higher-fee MBS items; this is also indicative of a change in the way CT is used in practice. A recent audit report found a 20% increase in the average benefit paid for diagnostic imaging services between 2005/6 and 2013/14; this is consistent with a 15% increase in CPE from 2004/5 and 2012/13 seen in billing data used in our study. The audit authors' attribute the increase to "growth in the use of higher-end technologies and/or changes in clinical practice" (29). As our study aimed to quantify the proportion of change in CT scans broadly to demographic versus non-demographic changes, we have not isolated individual MBS items. The utility of doing so is slightly reduced by MBS numbers in Australia indicating the site of CT, but not the indication (12). It is possible that such isolation of CT by indication would be more enlightening using data from another setting, such as the United Kingdom, where the reason for GP visits is recorded, which may allow further exploration of CT for specific indications (e.g. lower back pain). Previous work in Western Australia found the greatest changes per 1,000 population from 2006/7 to 2011/12 were for interventional CT (7.3 to 11.4), followed by facial bones (8.3 to 9.7) (2). MBS-billed CT of the spine reduced from 20.8 to 18.8 per 1,000 population (2).

While the proportionate contribution of population size increased over the study period, the change in population distribution explains less than 10% of the change in CT count and cost over all compared time periods included in the analysis, despite a shift to the right. However, this is relative to population growth and non-population size/distribution factors and it is clear that some changes in CT distribution have occurred, including an increase in CT for those aged 85 years or above.

Our study cannot determine if CT increase beyond that driven by increase in population size/ageing is appropriate. Previous Australian work has shown between-provider variation in CT technique and radiation dose, as well as scanning protocols leading to higher doses than reported as being standard in international literature (30). Simpson and Hartrick (31) have assessed the appropriateness of general practitioner-requested thoracic CTs – albeit with a small sample size of 50 – and found the majority (n = 34) to be inappropriate in their view. A larger Australian study (N= 3,533) focused on acute lower back pain found that over a quarter of patients seen by GPs were referred for imaging (6.2% specifically for CT) (32), after the publication of evidence-based guidelines advising against imaging in the absence of specific clinical ‘red flags’ (33). Aids, such as those developed by the National Prescribing Service

(34, 35) and the Western Australian Department of Health (36), have been designed to encourage appropriate use of CT, and a Medicare Taskforce is currently undertaking a system-wide review of diagnostic imaging (37).

A study using similar data in Australia found that the increase in CT was greater than the corresponding increase in population size from 1994 through 2009, though the relative proportions were not quantified (21). Our study highlights non-demographic factors as the major driver of Medicare-billed CT scan increase over two decades, and the use of routinely collected administrative data is likely to accurately capture actual CT scanning activity in the private sector. The decomposition method is suitable to the population-level aggregate data analysed, as opposed to more detailed multivariable analysis which could have been applied to individual-level data.

This study has several limitations. Firstly, the costs in this decomposition analysis reflect those reimbursed by Medicare and do not include patient co-payments; these ranged from 10% of the total fee in 1993 up to 17% by 2004 (24). The Medicare fee is an important determinant of the fee structure, making it a reasonable proxy for the cost of CT. Secondly, population-level averages may mask variation between providers. Thirdly, the before and after study design meant that the individual factors contained within the 'change in practice' metric are likely to be dynamic over time. While factors other than those isolated would ideally be held constant (25), the way the decomposition analysis has been used in this study is such that the proportion of change accounted for by 'change in practice' is simply the complement of that explained by changing population size and structure change over time. Whilst we have offered several potential non-demographic drivers, the list is not exhaustive.

Finally, data from public hospitals are omitted from this analysis. An earlier cohort study using data from Western Australia found that 74% of CT scans performed from 2006/7 through 2011/12 were billed to Medicare, rather than delivered in a public hospital (2). This analysis found differences between CT in public and private settings. For example, head CT was relatively more common in public hospitals (2). Brady and colleagues (21) also highlight that this proportion of CT performed in public hospitals is higher for children and adolescents, relative to older age groups . The results of this decomposition analysis thus cannot necessarily be extrapolated to CT in all provider settings in Australia.

Conclusion and implications for policy

Changes in the way CT is utilised, more so than changes in demography, have driven an increase in CT services and associated costs billed to Medicare from 1993 through 2013.

Because CT item descriptors are typically by body site, rather than more detailed descriptors for more recently funded techniques such as magnetic resonance imaging and positron emission tomography (12), there is a potential that practice change reflects an increase in scope beyond that intended when the decision to publicly fund was made. Our analysis therefore invites debate on how often or whether retrospective analysis of publicly funded health services is appropriate, and highlights the importance of developing specific descriptors in line with the evidence of (cost)-effectiveness considered via detailed health technology assessment. The method we have used can easily highlight areas where ‘scope shift’ may have occurred, which may aid to identify areas worthy of more in-depth review. Specific to CT, consideration of the demand- and supply side factors involved in the increase is warranted (for example, the number of CT scanners per 100,000 population increased from an estimated 21 in 1995 to 54 in 2013 (38)), especially given services are delivered by private providers.

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Table 1. Medicare-billed computed tomography (CT) scan count and cost data for Australia.

	1993/4[a]	**1996/7[a]**	**2000/1[a]**	**2004/5[a]**	**2008/9[a]**	**2012/13[a]**
Population[b]	17,667,093	18,310,714	19,153,380	20,127,363	21,498,540	22,721,995
Number of CT scans	575,925	748,756	1,083,189	1,459,958	2,008,071	2,540,546
Mean CT scans per 1,000 capita	33	41	57	73	93	112
Total Medicare Benefit Paid ($)[c]	145,739,758	192,566,931	279,414,712	394,367,896	562,255,248	790,716,566
Mean cost per episode ($)[c]	253.1	257.2	258.0	270.1	280.0	311.2

a. Fiscal year (1 July through 30 June).
b. The estimated population was as at June of the earlier calendar year (e.g. June 2012 for the 2012/13 fiscal year).
c. Cost data are at time of processing (i.e. not inflated to current value).

Figure 1. Decomposition analysis for Medicare-billed CT scan count for Australia.

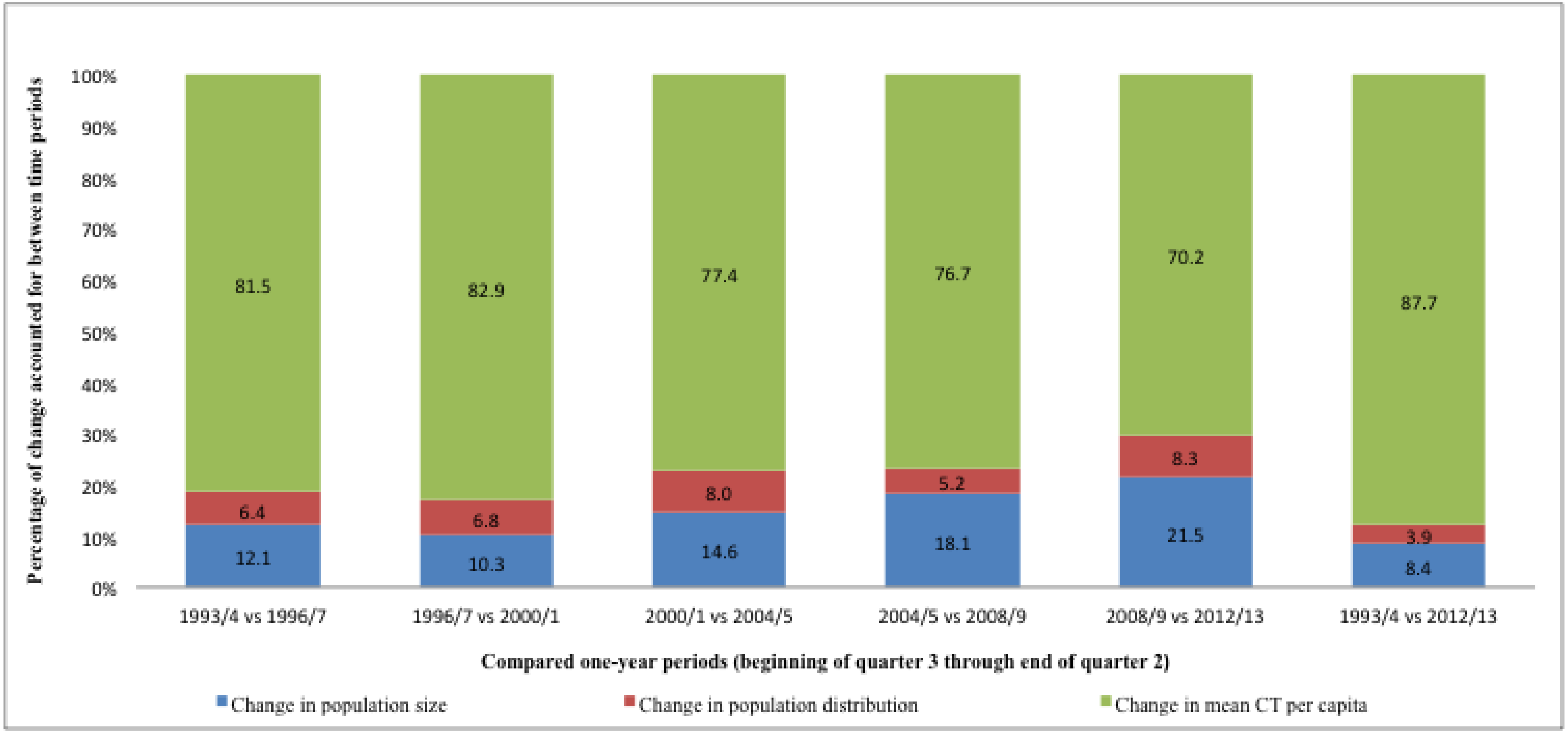


Figure 2. Decomposition analysis for Medicare-billed computed tomography scan costs for Australia.

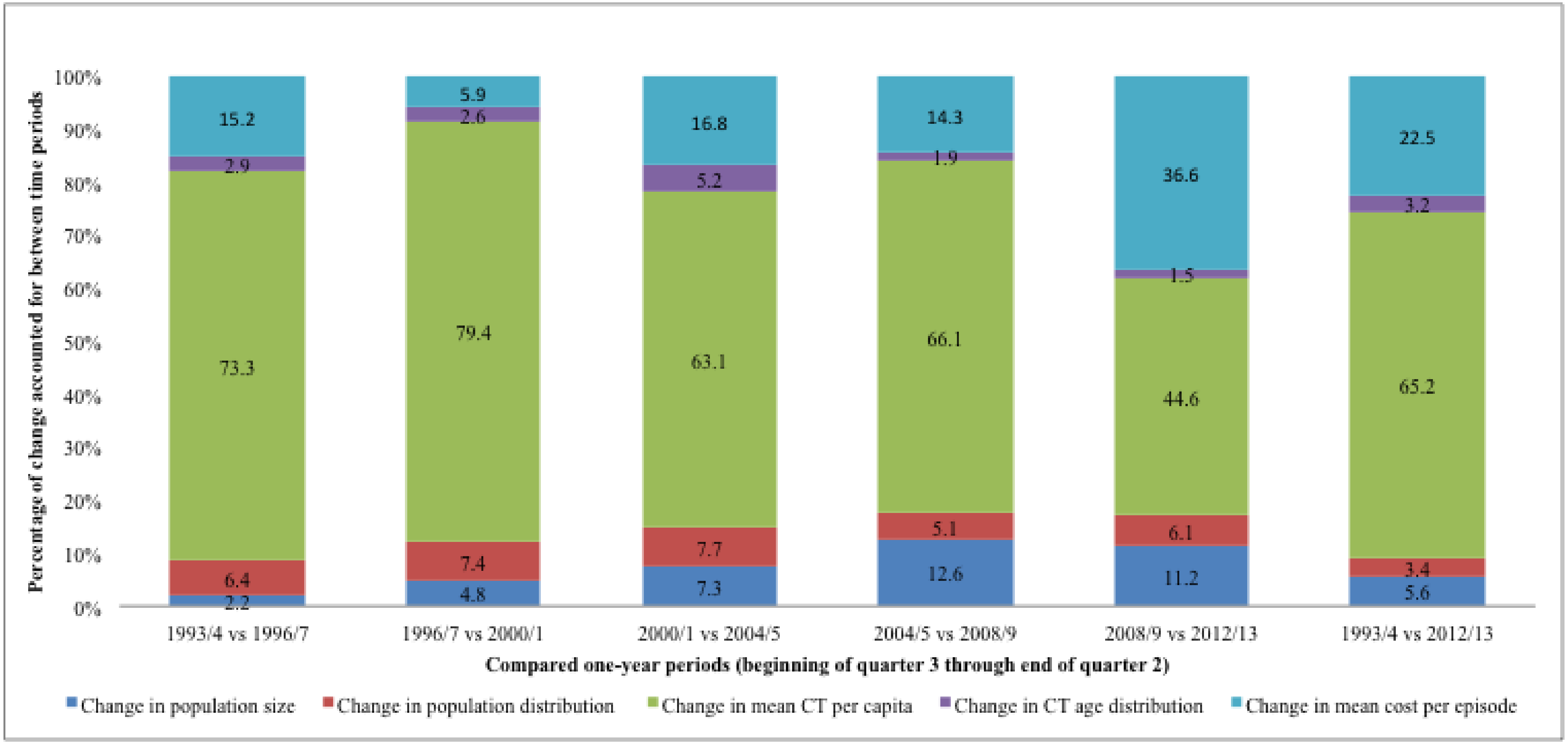
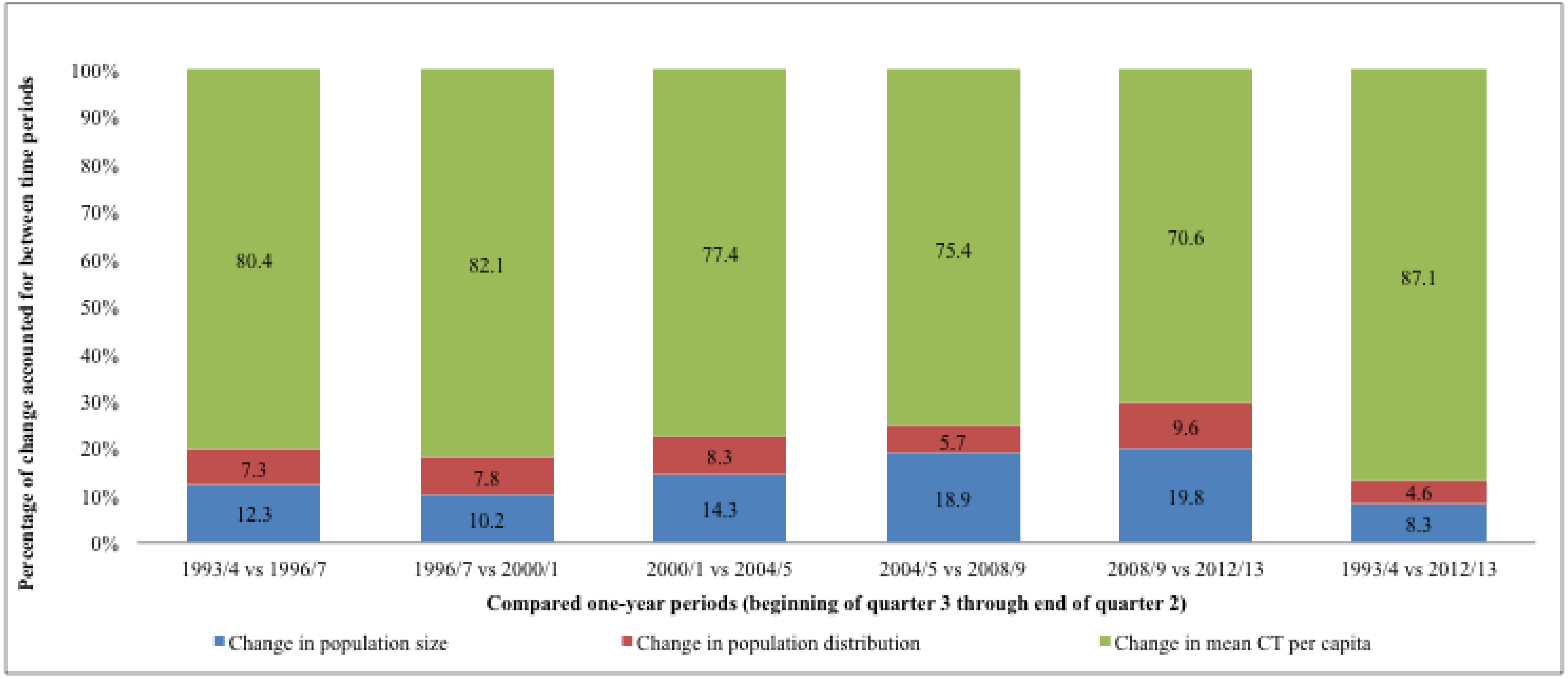
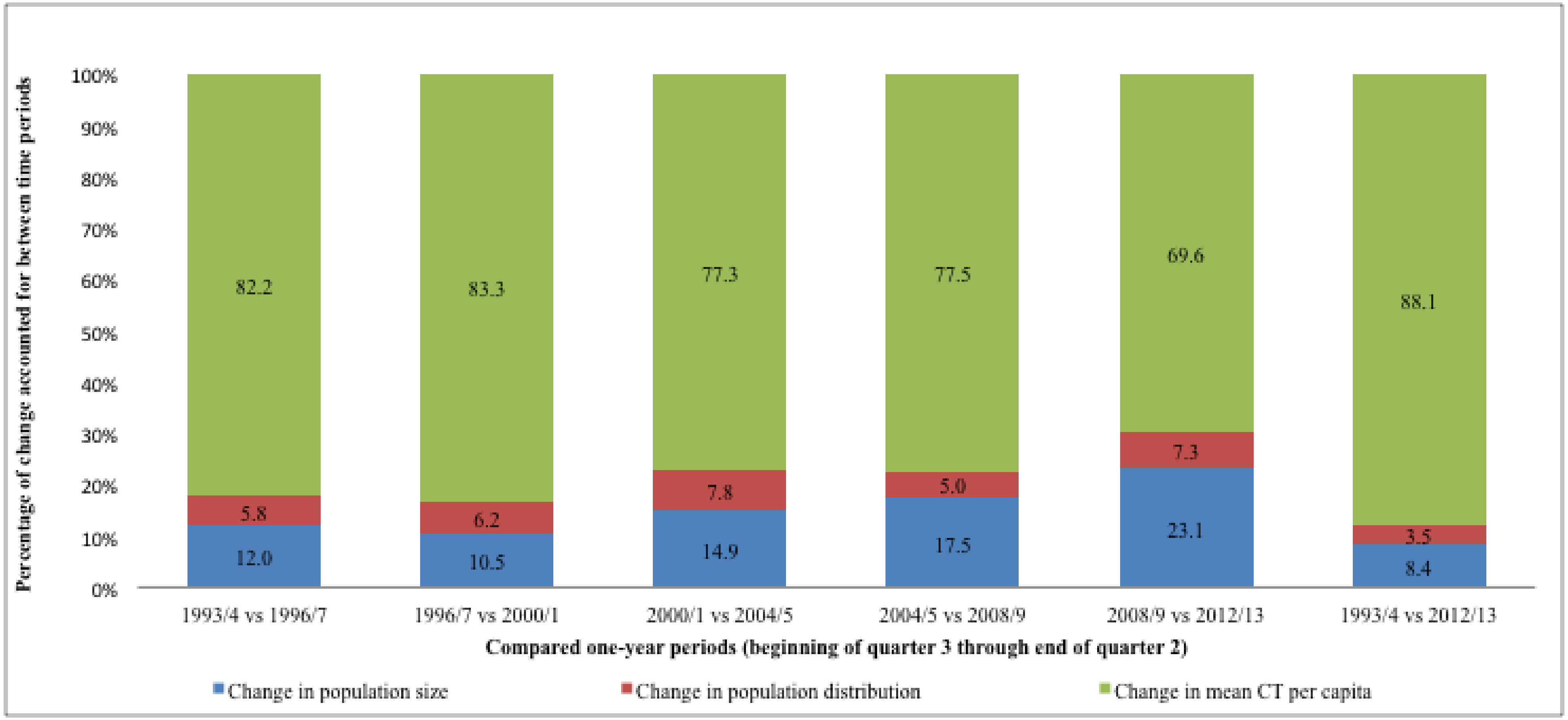


Figure 3. Decomposition analysis for Medicare-billed computed tomography scan count for Australian: a) males and b) females

a)



b)


Percentage of change accounted for between time periods
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
82.2
5.8
12.0
83.3
6.2
10.5
77.3
7.8
14.9
77.5
5.0
17.5
69.6
7.3
23.1
88.1
3.5
8.4
1993/4 vs 1996/7
1996/7 vs 2000/1
2000/1 vs 2004/5
2004/5 vs 2008/9
2008/9 vs 2012/13
1993/4 vs 2012/13
Compared one-year periods (beginning of quarter 3 through end of quarter 2)
Change in population size
Change in population distribution
Change in mean CT per capita

Appendix 1. Equations for decomposition analysis

Note that the same process was used for comparing the time period 2009-2013 to 1993-1997 as that described below for comparing successive time periods. The same procedure was also followed when analysing by sex, though including only male or only female data, and when analysing data by state/territory.

Decomposition analysis for CT count for period 1993 through 2013

i) <u>To calculate the proportion of change in CT count attributable to population growth:</u>

This part of the decomposition analysis holds the population distribution and CT per capita constant to assess the proportion of change that can be attributed to change in population size between time periods.

(1) Population for each age bracket (Era_{n+1}) = population in age bracket (Era_n)/Total population (Era_n) *Total population (Era_{n+1}) (from raw data)

(2) CT per capita (Era_{n+1}) for each age bracket = CT per capita for age bracket (Era_n)

(3) Number of CT (Era_{n+1}) for each age bracket = CT per capita (from (2)) * Population (from (1))

(4) Total CT count (Era_{n+1}) = ∑ Number of CT (Era_{n+1}) from each age bracket.

(5) Proportion change in CT count attributable for population growth from Era_n to Era_{n+1} = [Total CT count (Era_{n+1}) (from (4)) – Total CT count (Era_n) (from raw data)]/[Total CT count (Era_{n+1}) (from raw data) - Total CT count (Era_n) (from raw data)]

ii) <u>To calculate the proportion of change in CT count attributable to change in population distribution:</u>

This part of the decomposition analysis holds the CT per capita constant, to assess the proportion of change that can be attributed to change in population distribution between time periods.

(6) Number of CT (Era $_{n+1}$) for each age bracket = CT per capita (from (2)) * Population (Era $_{n+1}$) (from raw data)

(7) Total CT count (Era $_{n+1}$) = ∑ Number of CT (Era $_{n+1}$) from each age bracket (from (6))

(8) Proportion change in CT count attributable to change in population distribution = [Total CT count (Era $_{n+1}$) (from (7)) -– Total CT count (Era$_n$) (from (4))]/[Total CT count (Era $_{n+1}$) (from raw data) - Total CT count (Era$_n$) (from raw data)]

iii) <u>To calculate the proportion of change in CT count attributable to change in CT per capita:</u>

This part of the decomposition analysis assesses the proportion of change in CT count attributable to change in per capita CT, by applying the CT distribution by age from the previous time period. The total number of CT is the same as in the raw data for the later time period, the equations are included regardless for the cost decomposition analysis (see below).

(9) Number of CT (Era $_{n+1}$) for each age bracket = Number of CT (Era$_n$) for age bracket/∑Number of CT (Era$_n$) * ∑Number of CT (Era $_{n+1}$) (from raw data)

(10) Total CT count (Era $_{n+1}$) = ∑ Number of CT (Era $_{n+1}$) for each age bracket (from (9)) = Total CT count (Era $_{n+1}$) from raw data.

(11) Proportion change in CT count attributable to change in CT per capita = = [Total CT count (Era $_{n+1}$) (from (10)) -– Total CT count (Era$_n$) (from (7))]/[Total CT count (Era $_{n+1}$) (from raw data) - Total CT count (Era$_n$) (from raw data)]

Decomposition analysis for CT cost for period 1993 through 2013

i) <u>To calculate the proportion of the change in cost attributable to population growth:</u>

This part of the decomposition analysis holds the population distribution and CT per capita constant to assess the proportion of change that can be attributed to change in population size between time periods.

(12) Cost per episode (Era $_{n+1}$) for each age bracket = Cost per episode for age bracket (Era $_n$) (from raw data)

(13) Total benefit paid (Era $_{n+1}$) for each age bracket = Population (Era $_{n+1}$) for age bracket (from (1)) * CT per capita (Era $_{n+1}$) for age bracket (from (2)) * cost per episode (Era $_{n+1}$) for age bracket (from (12))

(14) Total benefit paid (Era $_{n+1}$) = ∑ Total benefit paid (Era $_{n+1}$) for each age bracket (from (13))

(15) Proportion of change in CT benefits paid attributable to population growth from Era$_n$ to Era $_{n+1}$ = [Total benefits paid (Era $_{n+1}$) (from (14)) - Total benefits paid (Era$_n$) (from raw data)]/ [Total benefits paid (Era $_{n+1}$) (from raw data) - Total benefits paid (Era$_n$) (from raw data)]

ii) <u>To calculate the proportion of change in cost attributable to change in population distribution:</u>

This part of the decomposition analysis holds the CT per capita constant, to assess the proportion of change that can be attributed to change in population distribution between time periods.

(16) Total benefit paid (Era_{n+1}) for each age bracket = Population (Era_{n+1}) for age bracket (from (6)) * CT per capita (Era_{n+1}) for age bracket (from (2)) * cost per episode (Era_{n+1}) for age bracket (from (12))

(17) Total benefit paid (Era_{n+1}) = ∑ Total benefit paid (Era_{n+1}) for each age bracket (from (16))

(18) Proportion of change in CT benefits paid attributable to change in population distribution from Era_n to Era_{n+1} = [Total benefits paid (Era_{n+1}) (from (17)) - Total benefits paid (Era_n) (from raw data)]/ [Total benefits paid (Era_{n+1}) (from raw data) - Total benefits paid (Era_n) (from raw data)]

iii) <u>To calculate the proportion of change in cost attributable to change in mean per capita CT:</u>

This part of the decomposition analysis assesses the proportion of change in CT count attributable to change in per capita CT.

(19) CT per capita (Era_{n+1}) for each age bracket = Number of CT for age bracket (Era_{n+1}) for age bracket (from (9))/Population for age bracket (Era_{n+1}) (from raw data)

(20) Total benefits paid (Era $_{n+1}$) for each age bracket = Population (Era $_{n+1}$) for age bracket (from raw data) * CT per capita (Era $_{n+1}$) for age bracket (from (19)) * cost per episode (Era $_{n+1}$) for age bracket (from (12))

(21) Total benefits paid (Era $_{n+1}$) = ∑ Total benefit paid (Era $_{n+1}$) for each age bracket (from (20))

(22) Proportion of change in CT benefits paid attributable to change in per capita CT from Era$_n$ to Era $_{n+1}$ = [Total benefits paid (Era $_{n+1}$) (from (21)) - Total benefits paid (Era$_n$) (17)]/ [Total benefits paid (Era $_{n+1}$) (from raw data) - Total benefits paid (Era$_n$) (from raw data)]

iv) <u>To calculate the proportion of change in cost attiributable to the change in CT distribution by age group:</u>

For this part of the decomposition analysis, the cost per episode is held constant compared to the previous time period, with all other data left as the raw data for that time period.

(23) Total benefit paid (Era $_{n+1}$) for each age bracket = Population (Era $_{n+1}$) for age bracket (from raw data) * CT per capita (Era $_{n+1}$) for age bracket (from raw data) * cost per episode (Era $_{n+1}$) for age bracket (from (12))

(24) Total benefits paid (Era $_{n+1}$) = ∑ Total benefit paid (Era $_{n+1}$) for each age bracket (from (23))

(25)) Proportion of change in CT benefits paid attributable to change in cost due to change in per capita CT from Era$_n$ to Era $_{n+1}$ = [Total benefits paid (Era $_{n+1}$) (from (24)) - Total benefits paid (Era$_n$) (21)]/ [Total benefits paid (Era $_{n+1}$) (from raw data) - Total benefits paid (Era$_n$) (from raw data)]

v) <u>To calculate the proportion of change in cost attributable to change in benefit paid per episode:</u>

This part of the decomposition analysis assesses the proportion of change in cost attributable to change in the mean cost per episode

(24) Proportion of change in CT benefits paid attributable to change in cost per episode from Era_n to Era_{n+1} = [Total benefits paid (Era_{n+1}) (from raw data) - Total benefits paid (Era_n) (24)]/ [Total benefits paid (Era_{n+1}) (from raw data) - Total benefits paid (Era_n) (from raw data)]

Appendix 2. Medicare-billed computed tomography (CT) scan count and cost data for Australia, including a breakdown by sex and age group.

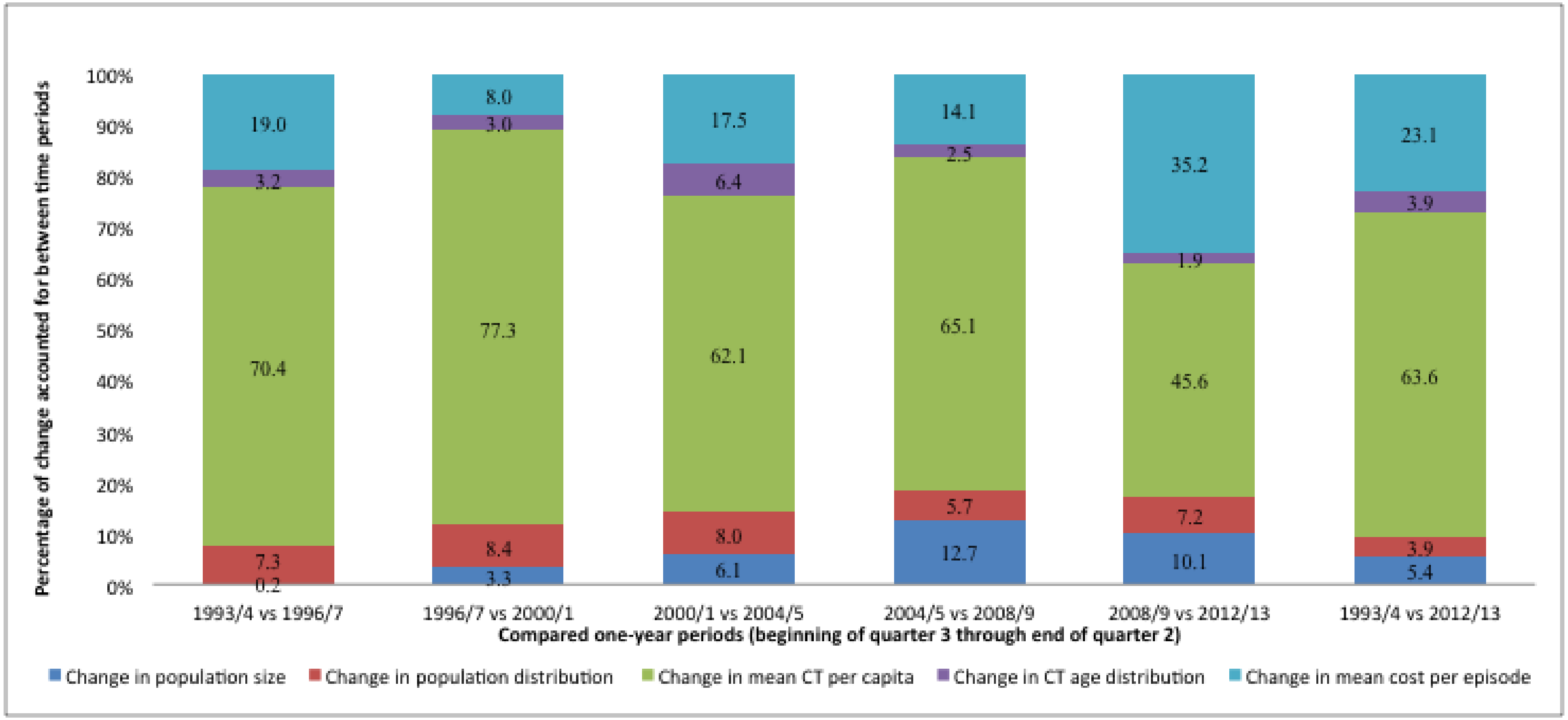
	1993/4[a]		**1996/7[a]**		**2000/1[a]**		**2004/5[a]**		**2008/9[a]**		**2012/13[a]**	
Population[b]	**17,667,093**		**18,310,714**		**19,153,380**		**20,127,363**		**21,498,540**		**22,721,995**	
	Male	**Female**	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**
0-4 years	662,989	629,533	665,611	631,438	655,870	623,100	654,340	621,369	707,613	670,615	764,413	724,675
5-14 years	1,305,410	1,239,594	1,339,478	1,274,788	1,377,301	1,309,796	1,402,451	1,329,981	1,411,650	1,340,626	1,442,309	1,368,481
15-24 years	1,394,315	1,342,131	1,364,251	1,311,734	1,333,011	1,285,283	1,420,120	1,365,323	1,560,974	1,473,105	1,578,337	1,504,818
25-34 years	1,415,819	1,411,308	1,431,179	1,431,357	1,430,700	1,445,332	1,439,379	1,444,503	1,512,033	1,494,968	1,655,798	1,628,295
35-44 years	1,338,869	1,335,272	1,402,797	1,408,273	1,468,188	1,485,321	1,493,140	1,514,955	1,548,930	1,571,105	1,585,083	1,605,701
45-54 years	1,051,640	1,006,927	1,171,754	1,137,116	1,301,564	1,297,262	1,371,334	1,387,393	1,466,831	1,495,504	1,513,673	1,542,535
55-64 years	741,581	735,347	773,686	764,196	890,998	870,336	1,057,851	1,043,387	1,203,045	1,210,687	1,284,058	1,305,764
65-74 years	580,440	658,895	613,550	681,757	631,622	678,724	664,799	700,831	732,116	764,065	879,357	899,714
75-84 years	256,503	388,325	285,448	420,402	338,559	477,744	398,675	528,671	432,953	543,254	459,956	558,720
85+ years	50,349	121,846	60,301	141,598	77,518	175,151	90,639	198,222	119,978	238,488	146,907	273,401
Number of CT scans	**575,925**		**748,756**		**1,083,189**		**1,459,958**		**2,008,071**		**2,540,546**	
	Male	**Female**	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**
0-4 years	1,614	1,222	1,445	1,085	1,704	1,187	1,300	1,049	1,394	986	1,292	933
5-14 years	9,693	7,563	10,951	8,381	14,017	10,763	13,248	10,445	14,789	11,936	15,994	14,181
15-24 years	21,265	22,425	25,796	26,846	32,237	34,264	36,781	38,418	49,437	50,451	58,046	59,332
25-34 years	30,845	37,311	38,943	45,339	48,846	57,373	55,246	63,558	70,163	80,652	87,565	94,822
35-44 years	41,229	49,928	51,397	63,184	70,171	85,240	84,948	103,589	108,061	137,199	127,887	154,386
45-54 years	47,042	55,733	61,179	76,464	87,326	113,069	110,912	145,449	146,753	196,681	179,268	225,969
55-64 years	49,629	48,871	62,166	65,529	94,082	103,491	140,301	159,079	192,125	226,395	238,239	274,484
65-74 years	44,182	49,049	62,002	64,993	96,218	95,537	136,367	137,442	189,291	195,736	259,849	272,751
75-84 years	20,613	29,022	27,212	41,247	40,977	68,505	80,135	101,936	130,257	143,464	179,877	189,953
85+ years	3,101	5,588	5,130	9,467	9,238	18,944	12,590	27,165	20,120	42,181	41,803	63,915

	1993/4[a]		1996/7[a]		2000/1[a]		2004/5[a]		2008/9[a]		2012/13[a]	
Total Medicare Benefit Paid ($)[c]	**145,739,758**		**192,566,931**		**279,414,712**		**394,367,896**		**562,255,248**		**790,716,566**	
	Male	**Female**	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**
0-4 years	302,994	234,697	275,165	214,913	324,806	231,032	263,401	221,659	286,434	209,979	290,552	224,818
5-14 years	1,993,789	1,597,522	2,258,932	1,752,010	2,801,011	2,170,709	2,672,719	2,142,858	3,025,342	2,496,636	3,208,025	2,699,854
15-24 years	4,724,915	5,007,669	5,754,552	6,032,028	7,005,653	7,411,411	8,154,489	8,599,824	11,221,766	11,735,301	14,050,894	14,407,301
25-34 years	7,381,167	8,730,089	9,256,355	10,470,728	11,268,141	13,013,897	13,204,870	15,155,110	17,294,161	19,945,679	23,638,838	25,429,278
35-44 years	10,250,235	12,545,915	12,720,853	15,664,682	17,069,541	20,753,574	21,633,672	26,480,989	28,272,773	36,181,212	37,449,337	45,023,459
45-54 years	12,203,154	14,420,181	15,943,662	19,825,045	22,683,272	29,153,626	30,128,965	38,845,259	41,124,635	54,416,299	56,414,878	69,609,148
55-64 years	13,494,065	13,030,983	17,234,816	17,725,721	26,184,207	27,999,659	40,521,993	44,231,662	57,282,480	65,090,767	78,928,704	88,087,519
65-74 years	12,101,115	13,065,719	17,690,081	17,791,624	27,861,566	26,344,026	40,901,190	39,024,640	58,394,729	57,607,255	89,179,814	90,180,577
75-84 years	5,339,212	7,286,820	7,495,531	10,848,677	11,613,861	18,321,064	23,505,893	28,264,870	39,441,968	41,334,461	60,043,923	60,776,917
85+ years	755,109	1,274,408	1,317,381	2,294,175	2,442,781	4,760,875	3,431,998	6,981,835	5,634,134	11,259,237	12,730,088	18,342,642
Mean CT scans per 1,000 capita	**33**		**41**		**57**		**73**		**93**		**112**	
Mean cost per episode ($)[c]	**253.1**		**257.2**		**258.0**		**270.1**		**280.0**		**311.2**	

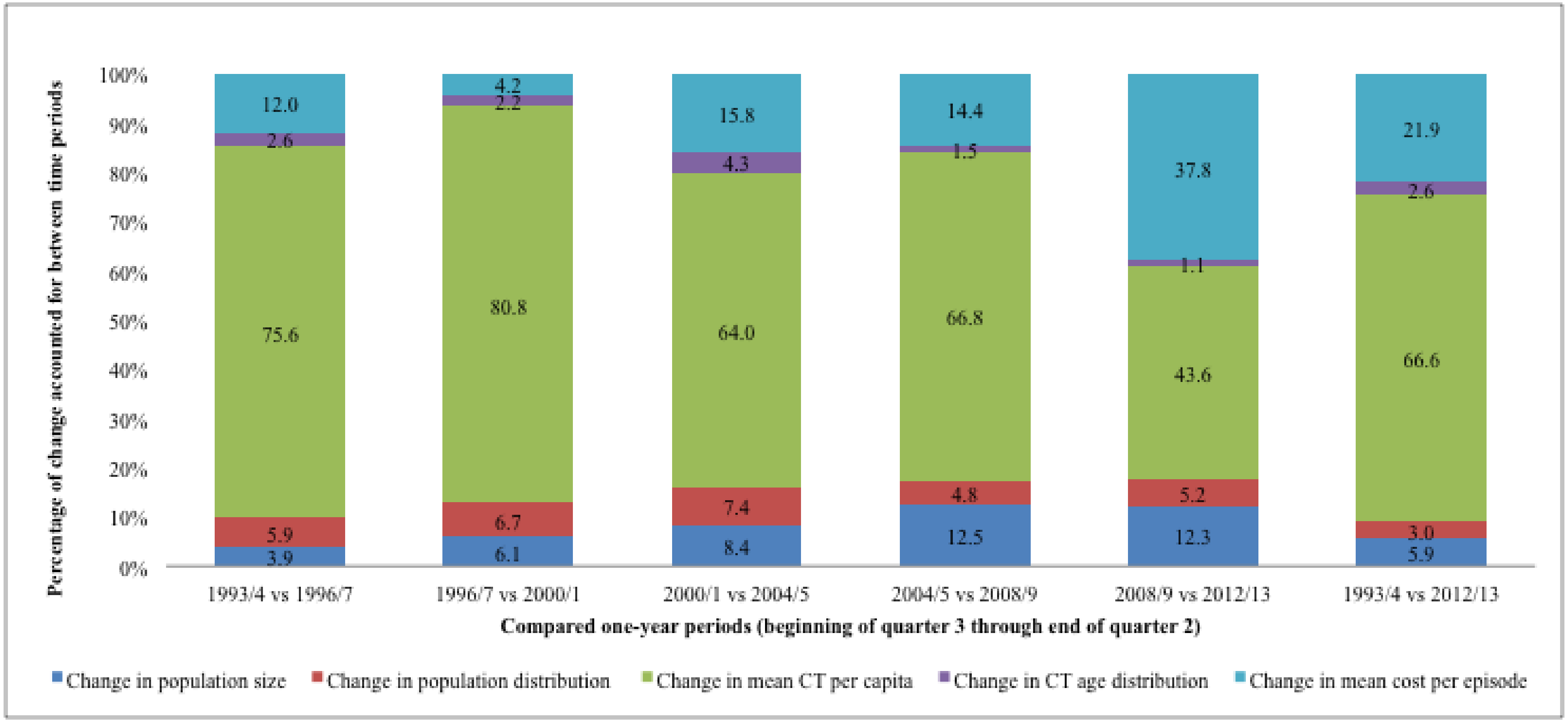
a. Fiscal year (1 July through 30 June).
b. The estimated population was as at June of the earlier calendar year (e.g. June 2012 for the 2012/13 fiscal year).
c. Cost data are at time of processing (i.e. not inflated to current value).

Appendix 3. Decomposition analysis for Medicare-billed computed tomography scan costs for Australian: a) males and b) females

a)

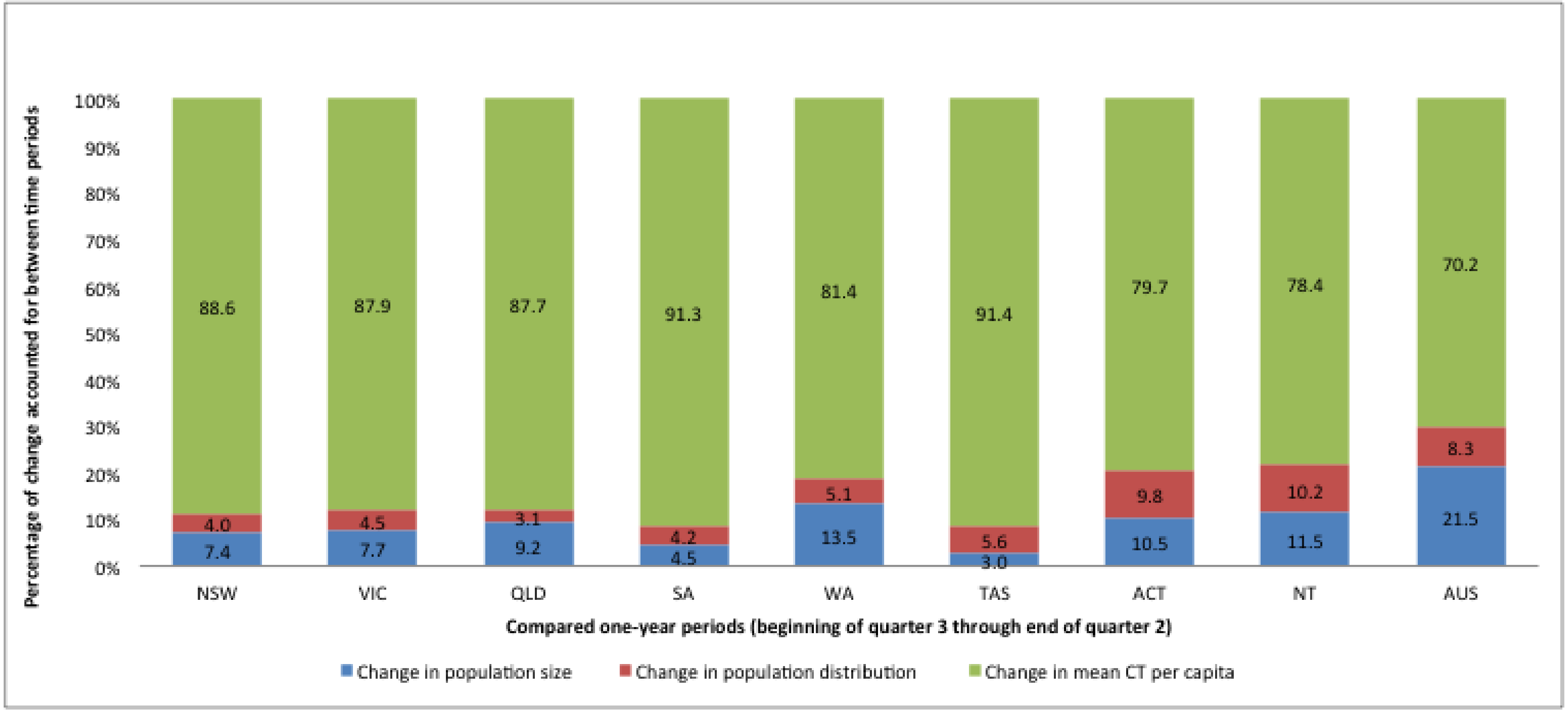


b)


Percentage of change accounted for between time periods
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
12.0
2.6
75.6
5.9
3.9
4.2
2.2
80.8
6.7
6.1
15.8
4.3
64.0
7.4
8.4
14.4
1.5
66.8
4.8
12.5
37.8
1.1
43.6
5.2
12.3
21.9
2.6
66.6
3.0
5.9
1993/4 vs 1996/7
1996/7 vs 2000/1
2000/1 vs 2004/5
2004/5 vs 2008/9
2008/9 vs 2012/13
1993/4 vs 2012/13
Compared one-year periods (beginning of quarter 3 through end of quarter 2)
Change in population size
Change in population distribution
Change in mean CT per capita
Change in CT age distribution
Change in mean cost per episode

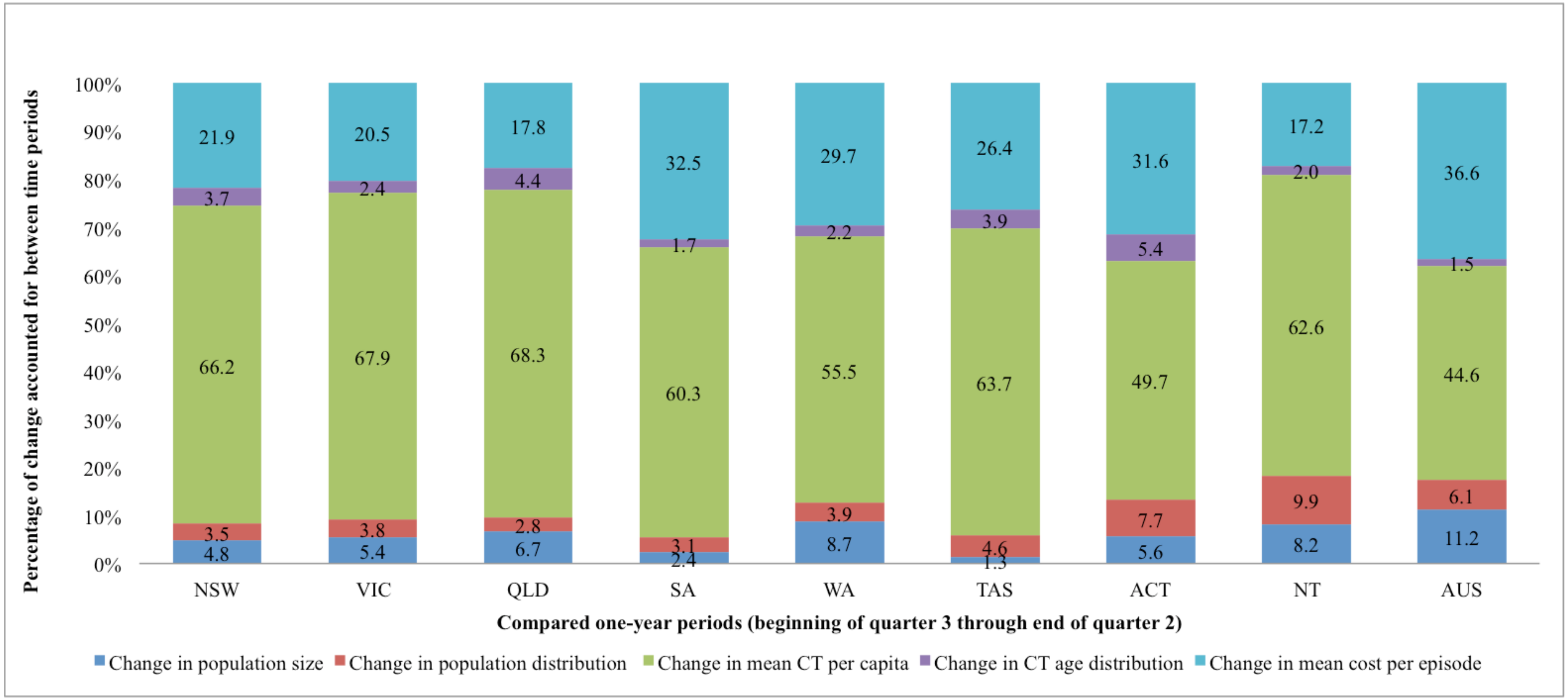
Appendix 4. Decomposition analysis of Medicare-billed computed tomography scan count and cost comparing 1993/4 to 2012/13, by state/territory.

4a. Decomposition of Medicare-billed computed tomography scan count for Australia comparing 1993/4 to 2012/13, also analysed separately by state/territory.



NSW = New South Wales, VIC = Victoria, QLD = Queensland, SA = South Australia, WA = Western Australia, TAS = Tasmania, ACT = Australian Capital Territory, NT = Northern Territory, and AUS = Australia.

4b. Decomposition of Medicare-billed computed tomography scan costs for Australia comparing 1993/4 to 2012/13, also analysed separately by state/territory.



NSW = New South Wales, VIC = Victoria, QLD = Queensland, SA = South Australia, WA = Western Australia, TAS = Tasmania, ACT = Australian Capital Territory, NT = Northern Territory, and AUS = Australia.

Medicare-billed computed tomography (CT) scan count and cost data for each state and territory, comparing 1993/4 to 2012/13.

4c. New South Wales

	1993/4[a]					2012/13[a]				
Age group (years)	**Population[b]**	**Number of CT**	**Mean CT per capita**	**Mean cost per episode ($)[c]**	**Total Benefit Paid($)[c]**	**Population[b]**	**Number of CT**	**Mean CT per capita**	**Mean cost per episode ($)[c]**	**Total Benefit Paid($)[c]**
0-4	438,927	1,395	0.003	192.40	268,400	479,945	964	0.002	224.24	216,164
5-14	849,984	7,375	0.009	212.53	1,567,424	900,928	11,367	0.013	200.85	2,283,084
15-24	904,108	17,611	0.019	225.85	3,977,470	964,185	42,908	0.045	243.33	10,440,861
25-34	955,640	27,706	0.029	241.46	6,689,850	1,036,967	66,058	0.064	271.61	17,941,737
35-44	899,260	37,214	0.041	254.95	9,487,691	1,013,503	101,597	0.100	295.17	29,988,050
45-54	702,610	42,802	0.061	262.76	11,246,457	981,602	146,147	0.149	315.56	46,118,013
55-64	520,109	41,181	0.079	274.47	11,302,774	841,110	186,750	0.222	330.13	61,652,032
65-74	444,129	38,314	0.086	277.16	10,619,015	591,233	196,551	0.332	340.10	66,846,065
75-84	230,607	20,171	0.087	264.29	5,331,083	349,925	138,149	0.395	328.42	45,370,614
85+	59,506	3,206	0.054	245.69	787,673	146,484	39,865	0.272	294.00	11,720,382
Total or mean	**6,004,880**	**236,975**	0.039	258.58	**61,277,837**	**7,305,882**	**930,356**	0.127	314.48	**292,577,002**

a. Fiscal year (1 July through 30 June).
b. The estimated population was as at June of the earlier calendar year (e.g. June 2012 for the 2012/13 fiscal year).
c. Cost data are at time of processing (i.e. not inflated to current value).

4d. Victoria

	1993/4[a]					2012/13[a]				
Age group (years)	**Population[b]**	**Number of CT**	**Mean CT per capita**	**Mean cost per episode ($)[c]**	**Total Benefit Paid($)[c]**	**Population[b]**	**Number of CT**	**Mean CT per capita**	**Mean cost per episode ($)[c]**	**Total Benefit Paid($)[c]**
0-4	321,620	495	0.002	186.76	92,447	330,091	392	0.001	239.97	94,068
5-14	623,854	3,372	0.005	209.65	706,951	675,658	7,261	0.011	182.81	1,327,419
15-24	697,352	10,229	0.015	224.59	2,297,353	748,038	27,701	0.037	237.76	6,586,095
25-34	724,306	16,222	0.022	236.78	3,841,072	848,524	44,457	0.052	263.41	11,710,288
35-44	672,281	20,599	0.031	250.88	5,167,897	802,533	68,174	0.085	286.67	19,543,203
45-54	517,048	22,954	0.044	261.20	5,995,499	756,733	96,095	0.127	304.87	29,296,937
55-64	381,696	23,455	0.061	270.45	6,343,421	642,958	120,009	0.187	319.65	38,360,676
65-74	320,048	23,190	0.072	269.45	6,248,563	462,319	125,934	0.272	331.01	41,685,219
75-84	167,231	12,978	0.078	251.45	3,263,351	275,915	93,757	0.340	319.21	29,928,018
85+	46,951	2,589	0.055	230.65	597,142	128,252	28,593	0.223	282.77	8,085,381
Total or mean	**4,472,387**	**136,083**	0.030	253.92	**34,553,696**	**5,671,021**	**612,373**	0.108	304.74	**186,617,304**

a. Fiscal year (1 July through 30 June).
b. The estimated population was as at June of the earlier calendar year (e.g. June 2012 for the 2012/13 fiscal year).
c. Cost data are at time of processing (i.e. not inflated to current value).

4e. Queensland

	1993/4[a]					2012/13[a]				
Age group (years)	**Population**[b]	**Number of CT**	**Mean CT per capita**	**Mean cost per episode ($)**[c]	**Total Benefit Paid($)**[c]	**Population**[b]	**Number of CT**	**Mean CT per capita**	**Mean cost per episode ($)**[c]	**Total Benefit Paid($)**[c]
0-4	231,105	487	0.002	177.92	86,646	311,408	504	0.002	231.75	116,803
5-14	465,657	3,110	0.007	206.81	643,186	597,588	5,853	0.010	215.57	1,261,732
15-24	500,201	6,784	0.014	231.56	1,570,883	633,467	24,272	0.038	253.68	6,157,304
25-34	489,208	9,948	0.020	245.70	2,444,233	645,111	37,721	0.058	277.15	10,454,443
35-44	468,127	13,802	0.029	258.33	3,565,441	645,044	59,965	0.093	297.79	17,856,932
45-54	365,719	15,588	0.043	270.48	4,216,263	612,768	85,567	0.140	315.92	27,032,744
55-64	248,582	14,077	0.057	284.26	4,001,576	514,787	107,043	0.208	330.44	35,371,046
65-74	206,161	13,232	0.064	285.86	3,782,547	351,833	109,682	0.312	338.68	37,147,140
75-84	106,832	7,044	0.066	268.96	1,894,577	183,689	69,465	0.378	328.53	22,821,292
85+	28,196	1,245	0.044	248.68	309,604	72,719	18,367	0.253	295.78	5,432,664
Total or mean	**3,109,788**	**85,317**	0.027	263.90	**22,514,956**	**4,568,414**	**518,439**	0.113	315.66	**163,652,100**

a. Fiscal year (1 July through 30 June).
b. The estimated population was as at June of the earlier calendar year (e.g. June 2012 for the 2012/13 fiscal year).
c. Cost data are at time of processing (i.e. not inflated to current value).

4f. South Australia

	1993/4[a]					2012/13[a]				
Age group (years)	**Population[b]**	**Number of CT**	**Mean CT per capita**	**Mean cost per episode ($)[c]**	**Total Benefit Paid($)[c]**	**Population[b]**	**Number of CT**	**Mean CT per capita**	**Mean cost per episode ($)[c]**	**Total Benefit Paid($)[c]**
0-4	99,368	166	0.002	195.63	32,475	99,112	178	0.002	219.94	39,150
5-14	201,035	1,169	0.006	191.42	223,774	194,235	2,104	0.011	188.28	396,134
15-24	216,209	3,307	0.015	201.74	667,162	220,337	8,211	0.037	241.41	1,982,206
25-34	229,417	5,420	0.024	213.79	1,158,732	218,829	11,963	0.055	270.32	3,233,852
35-44	220,276	7,029	0.032	231.21	1,625,201	220,756	18,830	0.085	289.80	5,456,960
45-54	170,057	7,769	0.046	239.04	1,857,079	228,925	28,438	0.124	306.06	8,703,648
55-64	128,638	8,058	0.063	246.29	1,984,584	202,882	36,739	0.181	320.64	11,780,104
65-74	117,051	8,098	0.069	240.87	1,950,530	143,973	39,414	0.274	335.23	13,212,814
75-84	62,078	4,438	0.071	218.10	967,909	87,890	29,087	0.331	328.91	9,567,086
85+	16,545	817	0.049	193.71	158,257	39,515	8,893	0.225	300.17	2,669,406
Total or mean	**1,460,674**	**46,271**	0.032	229.64	**10,625,703**	**1,656,454**	**183,857**	0.111	310.25	**57,041,360**

a. Fiscal year (1 July through 30 June).
b. The estimated population was as at June of the earlier calendar year (e.g. June 2012 for the 2012/13 fiscal year).
c. Cost data are at time of processing (i.e. not inflated to current value).

4g. Western Australia

	1993/4[a]					2012/13[a]				
Age group (years)	**Population**[b]	**Number of CT**	**Mean CT per capita**	**Mean cost per episode ($)**[c]	**Total Benefit Paid($)**[c]	**Population**[b]	**Number of CT**	**Mean CT per capita**	**Mean cost per episode ($)**[c]	**Total Benefit Paid($)**[c]
0-4	126,466	168	0.001	200.63	33,705	162,567	119	0.001	241.34	28,719
5-14	256,449	1,262	0.005	199.85	252,212	305,096	2,067	0.007	189.11	390,884
15-24	262,491	3,590	0.014	213.46	766,315	338,830	9,169	0.027	235.55	2,159,784
25-34	271,854	5,522	0.020	223.06	1,231,742	376,556	14,907	0.040	261.01	3,890,851
35-44	265,770	7,974	0.030	233.94	1,865,416	351,133	23,114	0.066	285.55	6,600,259
45-54	194,868	8,995	0.046	237.90	2,139,869	330,095	34,022	0.103	301.76	10,266,352
55-64	131,220	7,765	0.059	241.23	1,873,114	269,765	42,230	0.157	316.82	13,379,241
65-74	101,047	7,016	0.069	242.72	1,702,946	171,090	41,612	0.243	333.91	13,894,686
75-84	52,715	3,459	0.066	227.88	788,249	93,251	27,326	0.293	333.15	9,103,785
85+	14,789	587	0.040	209.37	122,899	36,355	6,969	0.192	317.65	2,213,680
Total or mean	**1,677,669**	**46,338**	0.028	232.56	**10,776,467**	**2,434,738**	**201,535**	0.083	307.28	**61,928,241**

a. Fiscal year (1 July through 30 June).
b. The estimated population was as at June of the earlier calendar year (e.g. June 2012 for the 2012/13 fiscal year).
c. Cost data are at time of processing (i.e. not inflated to current value).

4h. Tasmania

	1993/4[a]					2012/13[a]				
Age group (years)	**Population[b]**	**Number of CT**	**Mean CT per capita**	**Mean cost per episode ($)[c]**	**Total Benefit Paid($)[c]**	**Population[b]**	**Number of CT**	**Mean CT per capita**	**Mean cost per episode ($)[c]**	**Total Benefit Paid($)[c]**
0-4	35,162	45	0.001	206.16	9,277	31,710	21	0.001	232.14	4,875
5-14	72,357	436	0.006	218.57	95,298	63,583	411	0.006	187.21	76,942
15-24	70,262	1,018	0.014	216.69	220,592	65,702	2,336	0.036	227.09	530,484
25-34	71,422	1,686	0.024	227.85	384,153	59,102	3,166	0.054	258.70	819,060
35-44	70,444	2,337	0.033	240.62	562,338	65,535	5,205	0.079	287.69	1,497,434
45-54	54,301	2,346	0.043	253.96	595,800	72,560	7,882	0.109	308.33	2,430,258
55-64	40,031	2,279	0.057	257.67	587,234	68,319	11,560	0.169	325.29	3,760,329
65-74	34,385	2,076	0.060	256.27	532,020	48,574	11,950	0.246	336.01	4,015,343
75-84	18,675	991	0.053	244.70	242,497	26,607	7,651	0.288	330.62	2,529,543
85+	4,620	175	0.038	220.10	38,518	10,507	1,843	0.175	305.77	563,537
Total or mean	**471,659**	**13,389**	0.028	244.06	**3,267,727**	**512,199**	**52,025**	0.102	311.92	**16,227,805**

a. Fiscal year (1 July through 30 June).
b. The estimated population was as at June of the earlier calendar year (e.g. June 2012 for the 2012/13 fiscal year).
c. Cost data are at time of processing (i.e. not inflated to current value).

4j. Australian Capital Territory

	1993/4[a]					2012/13[a]				
Age group (years)	**Population** [b]	**Number of CT**	**Mean CT per capita**	**Mean cost per episode ($)[c]**	**Total Benefit Paid($)[c]**	**Population** b	**Number of CT**	**Mean CT per capita**	**Mean cost per episode ($)[c]**	**Total Benefit Paid($)[c]**
0-4	22,762	55	0.002	174.82	9,615	25,157	35	0.001	342.77	11,997
5-14	45,583	399	0.009	186.51	74,419	43,596	469	0.011	187.69	88,027
15-24	55,568	864	0.016	195.08	168,552	57,602	1,632	0.028	243.79	397,859
25-34	50,712	1,114	0.022	215.64	240,221	64,038	2,739	0.043	260.99	714,855
35-44	49,625	1,504	0.030	230.31	346,389	55,030	3,553	0.065	289.08	1,027,116
45-54	36,216	1,656	0.046	242.88	402,206	48,964	4,596	0.094	314.28	1,444,418
55-64	18,886	1,295	0.069	253.18	327,867	39,464	5,691	0.144	326.41	1,857,617
65-74	13,059	1,106	0.085	252.07	278,789	24,005	5,617	0.234	345.84	1,942,596
75-84	5,560	507	0.091	249.74	126,619	12,224	3,707	0.303	344.23	1,276,074
85+	1,331	63	0.047	220.75	13,907	4,996	1,094	0.219	328.56	359,448
Total or mean	**299,302**	**8,563**	0.029	232.23	**1,988,584**	**375,076**	**29,133**	0.078	313.05	**9,120,007**

a. Fiscal year (1 July through 30 June).
b. The estimated population was as at June of the earlier calendar year (e.g. June 2012 for the 2012/13 fiscal year).
c. Cost data are at time of processing (i.e. not inflated to current value).

4h. Northern Territory

	1993/4[a]					2012/13[a]				
Age group (years)	**Population**[b]	**Number of CT**	**Mean CT per capita**	**Mean cost per episode ($)**[c]	**Total Benefit Paid($)**[c]	**Population**[b]	**Number of CT**	**Mean CT per capita**	**Mean cost per episode ($)**[c]	**Total Benefit Paid($)**[c]
0-4	17,112	25	0.001	205.04	5,126	18,775	12	0.001	299.50	3,594
5-14	30,085	133	0.004	210.88	28,047	34,441	643	0.019	130.10	83,657
15-24	30,255	287	0.009	223.89	64,257	35,364	1,149	0.032	177.20	203,602
25-34	34,568	538	0.016	225.38	121,253	42,364	1,376	0.032	220.23	303,030
35-44	28,358	698	0.025	251.83	175,777	36,200	1,835	0.051	274.03	502,842
45-54	17,748	665	0.037	255.88	170,162	31,237	2,490	0.080	293.84	731,656
55-64	7,766	390	0.050	267.89	104,478	22,885	2,701	0.118	316.62	855,178
65-74	3,455	199	0.058	263.44	52,424	10,134	1,840	0.182	335.07	616,528
75-84	1,130	47	0.042	249.94	11,747	3,132	688	0.220	326.20	224,428
85+	257	7	0.027	216.71	1,517	701	94	0.134	300.34	28,232
Total or mean	170,734	2,989	0.018	245.83	734,788	235,233	12,828	0.055	276.95	3,552,747

a. Fiscal year (1 July through 30 June).
b. The estimated population was as at June of the earlier calendar year (e.g. June 2012 for the 2012/13 fiscal year).
c. Cost data are at time of processing (i.e. not inflated to current value).