

**DRUG AND ALCOHOL OFFICE, WESTERN AUSTRALIA**  
**NATIONAL DRUG RESEARCH INSTITUTE, CURTIN UNIVERSITY**  
**NATIONAL ALCOHOL SALES DATA PROJECT**  
**STAGE 2, FINAL REPORT**

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## **ACRONYMS**

Advisory Committee	AC
(Population) aged 15 and older	15+
Australian Bureau of Statistics	ABS
Australian Standard Geographical Classification	ASGC
Census Collection District	CCD
Distilled Spirits Industry Council of Australia	DSICA
Drug and Alcohol Office	DAO
Estimated Enumerated Population	EEP
Estimated Resident Population	ERP
Estimated Service Population	ESP
Liquor Licensing	LL
Liquor Merchants Association of Australia	LMAA
Local Government Area	LGA
National Alcohol Indicators Project	NAIP
National Alcohol Sales Data Project	NASDP
National Drug Research Institute	NDRI
Office of Liquor and Gaming Regulation	OLGR
Organisation for Economic Co-operation and Development	OECD
<i>Per capita</i> consumption	pcc
Pure alcohol content by volume	PACV
Ready to drink	RTD
Statistical Local Area	SLA
Statistical Subdivision	SSD

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## **GLOSSARY**

Australian Standard Geographical Classification	ABS coding structure for Australian geographical information into pre-established categories, including Statistical Divisions, Statistical Subdivisions and Statistical Local Areas.
Alcohol sales data	Information obtained from wholesalers regarding volumes of alcohol purchased from them by individual licensed retailers, or licensed retailer records of volumes of alcohol sold to the general public.
Estimated Enumerated Population	Count of all persons living in all occupied dwellings on the night of the Census (every 5 years), irrespective of whether they are usually resident in the area or are visitors
Estimated Resident Population	ABS measure of Australian population. Based on Census data adjusted for population change since the most recent Census year, net overseas migration and estimated interstate movements. Overseas visitors are excluded.
Estimated Service Population	Developed for use in the NASDP. Based on ERP, but accounts for absent residents, Australian visitors and international tourists.
Inter-censal years	Years between census collections.
Mead	Brewed honey-based beverage with an average alcohol content of 12.5%.
<i>Per capita</i> consumption	Litres of absolute (pure) alcohol consumed, divided by population aged 15 years and over.
Ready to drink	Pre-mixed spirit-based drinks with an alcohol content less than 10%.
Alcohol supply	Purchase of wholesale alcohol by other licensed alcohol wholesalers or producers.
Tourists	Persons travelling to a place other than that of his/her usual environment for less than twelve months (ABS, 2000).



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## **EXECUTIVE SUMMARY**

The global statistics on alcohol harm are sobering. In the year 2000, alcohol contributed to 1.8 million deaths and 58.2 million disability adjusted life-years. Estimates of the annual economic costs of alcohol each year in developed economies range from 1.1% to 2.4% of GDP, and invariably greatly exceed the economic costs of illicit drug use. In Australia, the cost of alcohol abuse in 2004/05 exceeded \$A15 billion.

Epidemiological monitoring of alcohol use and alcohol-related problems can inform and facilitate the development and evaluation of evidence-based strategies to deal with the problem of alcohol. Estimates of *per capita* consumption of alcohol across entire national populations provide policy makers with information about the magnitude of alcohol use and trends likely to be found in alcohol-related problems.

In 2008, on recommendation of the Ministerial Council on Drug Strategy, the Australian Government's Department of Health and Ageing funded the Drug and Alcohol Office of Western Australia (DAO) and the National Drug Research Institute (NDRI) at Curtin University in Perth, to develop and implement the National Alcohol Sales Data Project (NASDP). In 2010 – 11, the NASDP is in its second funding year (Stage 2) having completed Stage 1 in 2009.

The Australian Bureau of Statistics (ABS) publishes national estimates of alcohol *per capita* consumption based on import clearance, excise and domestic alcohol sales data. The latest revised estimates for Australians over the age of 15 years (15+) taken at 30<sup>th</sup> June 2007, 2008 and 2009 were average annual consumptions of 10.40, 10.32 and 10.08 litres of absolute alcohol respectively. Revisions relate to two factors: new Estimated Resident Population figures (ERP) and changes in alcohol conversion methods. In the NASDP Stage 2, we have applied the ERP revisions and alcohol conversion revisions to current and previous years' data as appropriate.

Until 1996, the ABS estimates were complemented by state and territory alcohol sales data collected by liquor licensing authorities. In 1996, however, the High Court of Australia ruled that liquor licensing fees and levies were, in fact, excise duties and as such illegal under the terms of the Australian Constitution. The ruling did not preclude the collection of wholesale alcohol purchase data by liquor licensing authorities but, for most jurisdictions, the incentive

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for continued collection was lost. Only Western Australia and Northern Territory and Queensland continued to collect this information.

The overall objective of the NASDP is to construct an ongoing, regularly updated, national database of standardised alcohol sales data, which includes all Australian states/territories. The NASDP works closely with an Advisory Committee (AC) consisting of senior representatives of Liquor Licensing (LL), Health and Police in every Australian jurisdiction and the Australian Government Department of Health and Ageing. In 2010, Queensland, Western Australia and the Northern Territory made alcohol sales data relating to the financial year 2008/09 available to the NASDP Stage 2. For the most part, the data were analysed at the Australian Standard Geographical Classification (ASGC) level of Statistical Subdivisions. Alcohol sales data can be used to identify and monitor emerging trends in alcohol consumption, and strategies to minimise harmful outcomes of these, including the emergence of so-called 'alcopops' (ready-to-drink spirit- or wine-based products, also called RTDs). The NASDP data monitor sales of different beverage categories so that volume changes in the sale of these categories can be observed, and can contribute to the evaluation of strategies such as the alcopops tax to reduce the harm associated with these emerging patterns of alcohol consumption.

*Per capita* alcohol consumption is calculated by dividing volumes of pure alcohol by the number of people in a given population (usually persons aged 15 years and older). In Stage 1, the NASDP calculated *per capita* consumption by dividing volumes of alcohol sold by the ABS Census-based measure Estimated Resident Population (ERP) (for those aged 15+) for the relevant year.

The objective in measuring *per capita* alcohol consumption is to estimate the average amount of alcohol consumed by individuals in a particular population at a particular time as accurately as possible. For that reason the denominator should exclude children and others who are not consuming purchased alcohol at that time, but should include adult residents and visitors who are buying and consuming alcohol in that place at that time.

Measures of residential population such as ERP can be poor guides to population in regions that are important in alcohol policy such as areas of high tourism or large entertainment districts, as it does not include non-residents who may be buying and consuming alcohol. A better measure would include all relevant people for a particular purpose such as the

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estimation of alcohol consumption—this has been referred to as a ‘service population’. Service populations may include tourists, seasonal workers, fly-in-fly-out workers, students, members of the armed forces, and other itinerant visitors and workers.

The Stage 1 NASDP Final Report recommended that further attention should be given in the NASDP Stage 2 to developing service population estimates to use in per capita consumption calculations, in order to obtain more reliable alcohol consumption estimates. In response to this, the NASDP Stage 2 has estimated per capita consumption using three different formulae:

- Using Estimated Resident Population (ERP) as a denominator. This would be identical to the calculation undertaken for Western Australia and Queensland in Stage 1. It is not adjusted for tourists, seasonal workers and other visitors.
- Using Estimated Enumerated Population (EEP) as a denominator. This would include all relevant persons present on Census night and has been estimated for inter-censal years.
- Using an Estimated Service Population (ESP) based on ERP, but accounting for absent residents, Australian visitors and international tourists.

These estimates are used in those states which submit alcohol sales data, and permit the data to be analysed in regular ASGC regions such as SSDs.

Alcohol sales data were made available by the Northern Territory Department of Justice for the year 2008/09. The Department of Justice also supplied Reporting Area for retailers, which allowed sales information to be aggregated into the six Urban Centres and the Remainder of the Northern Territory which is its usual mode of presenting geographical information on alcohol sales. Whole population and adult population details for the Northern Territory for the years 2000/01 to 2008/09, revised in August 2010, were supplied, as well as Department of Tourism estimates of the number of interstate and overseas visitors aged 15 and older to the Northern Territory in the same years. The NASDP was requested to report *per capita* consumption for the jurisdiction as a whole, and not for regional units where tourist estimations were not as reliable. It was agreed that volumes of alcohol sold would be reported for Urban Centres and the Remainder of Northern Territory, and that *per capita* consumption for Northern Territory as whole would be calculated primarily with the tourism estimate, but could be appended as a further calculation without the tourism estimate for comparison purposes.

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Alcohol sales data were made available by the Queensland Office of Liquor and Gaming Regulation for the year 2008/09. Wine Industry returns constituted the second source of Queensland data and were added to the total volumes sold to retail licensees by wholesalers. Postcodes were aggregated into Statistical Local Areas (SLAs) and further aggregation to Statistical Subdivisions (SSDs) was undertaken to provide regional units of an appropriate size for mapping.

Alcohol sales data were made available by the Western Australia Drug and Alcohol Office for 2008/09. Postcodes were aggregated into Statistical Local Areas (SLAs) and further aggregation to Statistical Subdivisions (SSDs) was undertaken to provide regional units of an appropriate size for mapping.

Alcohol conversion factors are required to convert volumes of different alcohol-based beverages to volumes of absolute or 'pure' alcohol content. In the NASDP Stage 2 we used updated national alcohol conversion factors in order to derive standardised rates which could be used to compare *per capita* consumption across different regions and jurisdictions.

*Per capita* consumption and volumes of pure alcohol sold were mapped for the Northern Territory, Queensland and Western Australia using the software ArcGIS 9.3, and ASGC shapefiles. Data have also been presented in figures and tables.

In every jurisdiction, estimated *per capita* consumption exceeded estimates made by the ABS for the nation as a whole. While this is most likely a reflection of actual higher levels of consumption in those jurisdictions, part of the difference may be due to the fact that the ABS estimates rely on excise tax records and customs duty data collected at a national level. Currently, it is not possible to know whether *per capita* consumption estimates for the Northern Territory, Queensland and Western Australia are higher or lower than the remaining five jurisdictions for which alcohol sales remain unknown.

The estimated alcohol consumption in the Northern Territory in 2008/09 was 14.05 litres of pure alcohol per individual aged 15+, using population figures which included tourists. This was a reduction from each of the preceding three years, including a 4.3% reduction from 2007/08. The consumption figure which included tourists was 13.7% lower than the non-tourist figure which is similar to the differences found in the preceding years. Pure alcohol sales generally decreased across the period in Alice Springs, Katherine and Nhulunbuy. Between 2007/08 and 2008/09 there was an increase of almost 5% in beer sales and almost

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36% in cider sales across the Northern Territory, but a decrease of approximately 13% in sales of wine and approximately 23% in sales of spirits. Further analysis revealed that sales of standard spirits rose by approximately 15%, but sales of pre-mixed spirits (RTDs) decreased by approximately 30% during the same period.

The overall estimated alcohol consumption for Queensland (using ERP) for 2008/09 was 10.69 litres of pure alcohol per individual aged 15+, which was higher than the national average but lower than in Queensland in 2007/08, and lower than in the Northern Territory and Western Australia in 2008/09. There were, however, regions of higher alcohol consumption particularly in the Brisbane area, the Gold and Sunshine Coasts, some northern coastal cities and the North-West. The inner Brisbane area had particularly high alcohol consumption, which was probably due to a combination of relatively low resident populations, its status as an entertainment area and alcohol sales to city workers. Across the state, sales of pure alcohol were marginally down in 2008/09 compared to the previous year. Queensland beer sales increased by approximately 19% and sales of 'other' beverages (which include cider and alcoholic sodas) increased by just over 11% between the two years. On the other hand, wine sales fell by approximately 14% and spirits sales by approximately 25%. Further analysis revealed that sales of standard spirits increased by almost 11% while sales of pre-mixed spirits (RTDs) decreased by approximately 35%.

For Queensland as a whole, there were negligible differences between consumption estimates using EEP, ERP and ESP. In seven SSDs, however, there was a larger difference between ERP and ESP, with ESP the lower estimate. It seems likely that in most if not all of these regions, the failure to account for tourists and other non-residents inflated *per capita* consumption based on ERP.

The overall estimated alcohol consumption for Western Australia (by ERP) for 2008/09 was 11.21 litres of pure alcohol per individual aged 15+, which was lower than Western Australia in 2007/08, the year with the highest consumption across the four years of study. *Per capita* consumption in 2008/09 was at its lowest across the four years in several SSDs including Central Metropolitan, Bunbury, King and Carnegie. Particularly large drops in consumption across the period were found in Lakes and Campion. Between 2007/08 and 2008/09, Western Australian pure alcohol sales decreased by 5%. Regionally, there was a trend for beer sales to decrease and wine sales to increase in metropolitan SSDs.

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While state-based differences between consumption based on different population estimates were negligible, there were seven SSDs with large differences between ERP/pcc and ESP/pcc where ESP/pcc was the lower estimate. These regions tended to be outback SSDs with small populations and large population variation relating primarily to occupations such as mining. There were also seven SSDs, mainly in the South West, with smaller differences where ESP/pcc was higher: North Metropolitan, South West Metropolitan, Preston, Vasse, Hotham, Lakes and Geraldton. These were regions with larger populations, and the effect of these appears to have countered the effect of the first group, such that there was a negligible overall difference.

In conclusion, in Stage 2 of the NASDP, we have estimated a state and SSD-based service population which takes into account absent residents, Australian visitors and international visitors. This is the first time that such an estimate has been developed for regional areas. At a state level, the differences found in the NASDP between *per capita* consumption based on ERP and ESP<sup>1</sup> were minimal, but larger differences were found in some regional areas. These differences suggest that ESP is a useful estimate for calculating *per capita* consumption at a regional level, as it takes into account variable and mobile populations and is likely to be a more accurate estimate than *per capita* consumption based on ERP. We recommend its continued use in the NASDP, resources permitting.

Analysis of spirits and cider sales in the Northern Territory and Queensland seems to endorse the finding that the alcopops tax has reduced the consumption of RTDs, which is only partly compensated for by increases in sales of regular spirits. The rise in the consumption of cider in these two jurisdictions may also be related to movements away from RTD consumption.

We look forward to continuing Stages of the NASDP and anticipate that more jurisdictions will commence alcohol sales data collections and will make their data available. At this stage there is a clear undertaking to do so in the Australian Capital Territory. We also wish to thank the three jurisdictions who have been with us for a further year, for their data, for their forbearance and for their willingness to work with us to obtain the best possible data for analysis.

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<sup>1</sup> EEP should be considered as a control group

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## **INTRODUCTION**

In May 2005 the General Assembly of the World Health Organization passed a major resolution concerning the public health impacts of harmful alcohol use and the need to apply evidence-based strategies to reduce these (WHO, 2006). This resolution was a response to the global number and severity of adverse consequences related to alcohol use. It has been estimated that globally in 2000 alcohol contributed to 1.8 million deaths and 58.2 million disability adjusted life years. Estimates of the annual economic costs of alcohol each year in developed economies range from 1.1% to 2.4% of GDP and invariably greatly exceed the economic costs of illicit drug use (WHO, 2006). In Australia, the costs of alcohol abuse in 2004/05 exceeded \$A15 billion (National Preventative Health Taskforce, 2009).

Epidemiological monitoring of alcohol use and alcohol-related problems can inform and facilitate the development and evaluation of evidence-based strategies to deal with the problem of alcohol. Alcohol consumption information can be provided by alcohol sales data, and is crucial to intelligence-led policing, to health service responses and to the evaluation of the impact of adopted strategies. Consequently, Australian initiatives to ensure alcohol policy, prevention and interventions are informed by the best available data on levels and patterns of consumption that have been developed.

In response to a 2007 Ministerial Council on Drug Strategy (MCDS) resolution highlighting the absence of systematic and standardised Australia-wide alcohol sales data collections<sup>2</sup>, the Australian Government's Department of Health and Ageing, funded the Drug and Alcohol Office of Western Australia (DAO) and the National Drug Research Institute (NDRI) at Curtin University in Perth, to develop the National Alcohol Sales Data Project (NASDP). In 2010 -11, the NASDP is in its second funding year<sup>3</sup>, having completed the first analysis and review of alcohol sales data in three Australian jurisdictions in 2009<sup>4</sup>. A final report to stakeholders on that analysis has recently been published (Loxley, Chikritzhs, & Pascal, 2010).

The current report presents the work of the NASDP Stage 2. An interim report was presented to funders in June 2010 (Appendix I).

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<sup>2</sup> Australian Bureau of Statistics national apparent alcohol consumption estimates are derived from customs and excise data and cannot be disaggregated by state/territory.

<sup>3</sup> Hereafter referred to as the NASDP Stage 2.

<sup>4</sup> Hereafter referred to as the NASDP Stage 1.

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## **THE SIGNIFICANCE OF ALCOHOL CONSUMPTION DATA**

To prevent alcohol-related problems, it is important to have a clear view of their magnitude. Estimates of *per capita* consumption of alcohol across entire national populations can provide policy makers with some sense of that magnitude and the trends likely to be found in alcohol-related problems. *Per capita* consumption is also a reliable proxy for the percentage of heavy drinkers in a population (WHO, 2006) and there are strong relationships between *per capita* consumption and alcohol-related harms such as road crashes, accidental falls and other accidents, illnesses, assaults and other crimes (Catalano, Chikritzhs, Stockwell, Webb, & Dietze, 2001).

*Per capita* consumption figures should be developed for the major categories of alcoholic beverages available (generally beer, wine and distilled spirits) because different alcoholic beverages relate to different types of alcohol-related harm. For example, in many countries spirits are the preferred beverage of persons with alcohol dependence, while cheap drinks are favoured by young excessive drinkers. Such patterns can be identified and monitored. Thus *per capita* consumption data can be valuable in combination with data on actual harm to assist in identifying high risk beverages which may require particular attention from policy makers (WHO, 2006).

There are currently two ways to collect data on alcohol consumption within a population: alcohol sales data collected for taxation purposes or by wholesaler or retailer record keeping, and population-based surveys (WHO, 2006). The World Health Organization, however, does not recommend the use of survey data to estimate *per capita* consumption because several studies have found substantial discrepancies between consumption estimates based on survey data and those derived from sales data. Survey data tends to be biased towards under-reporting for a variety of reasons, and has been found to underestimate sales data by up to 60% (Stockwell, Jinhui, Chikritzhs, & Greenfield, 2008; WHO, 2006).

The term 'alcohol sales data' refers to information obtained from wholesalers about volumes of alcohol purchased from them by individual licensed retailers, or from licensed retailer records of volumes of alcohol sold to the general public. Information about volumes of alcohol sold is a basic requirement for estimating how much alcohol is consumed within a region, within a community or per person. Adjusted for population size, alcohol sales data allow comparisons of consumption levels between regions, and constitute top-level indicators



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for monitoring and evaluating policy changes and interventions. When collected at the individual licence level, *per capita* consumption can be estimated at a range of geographic levels as required, including individual suburbs, discrete communities, metropolitan areas and/or regional and remote areas.

For many years, the Australian Bureau of Statistics (ABS) has published national estimates of alcohol *per capita* consumption based on import clearance, excise and domestic alcohol sales data. The latest revised<sup>5</sup> estimates for Australians over the age of 15 years (15+) taken at 30<sup>th</sup> June 2007, 2008 and 2009 were average annual consumptions of 10.40, 10.32 and 10.08 litres of absolute alcohol respectively (Australian Bureau of Statistics, 2010b).

Until 1996, the ABS estimates were complemented by state and territory alcohol sales data collected by liquor licensing authorities (Hall, Chikritzhs, d'Abbs, & Room, 2008). From 1990 to 1996 it was possible, in Australia, to access jurisdictional electronic records of alcohol sales data, used by licensing departments to calculate fees. These data enabled estimation of alcohol *per capita* consumption by beverage type. In 1996, however, the High Court of Australia ruled that liquor licensing fees and levies (and similar imposts on tobacco and petrol) were, in fact, excise duties and as such illegal under the terms of the Australian Constitution, because only the Commonwealth Government was empowered to impose excise duties. The ruling did not preclude the collection of wholesale alcohol purchase data by liquor licensing authorities but, for most jurisdictions, the incentive for continued collection was lost. Only Western Australia and the Northern Territory and, latterly, Queensland, continued to collect this information which means that invaluable data for informing alcohol policy and liquor licensing action and evaluating licensing restrictions in Indigenous communities and numerous local, regional and jurisdiction wide monitoring exercises are no longer available (e.g. evaluation of the Northern Territory's Living With Alcohol Program; impact of extended trading hours in Western Australia on assaults and road crashes; and evaluation of the Tennant Creek alcohol restrictions) (Chikritzhs, 2009).

## **EMERGING TRENDS IN ALCOHOL CONSUMPTION**

Alcohol sales data can be used to identify and monitor emerging trends in alcohol consumption, and strategies to minimise harmful outcomes of these. One such trend is the

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<sup>5</sup> Detail of these revisions can be found below

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emergence of so-called ‘alcopops’ (ready-to-drink spirit- or wine-based products, also called RTDs). They were first introduced in Australia in the mid-1900s, and are the subject of concern to various advocacy groups who point to their significance in the consumption of alcohol by underage and young drinkers. There is good reason for this concern: alcopops account for 20% of all retail liquor sales and the category as a whole is growing faster than any other category of alcohol at 9% per annum in 2007 (Jones & Barrie, 2011).

In 2008 the Commonwealth increased the excise on RTDs to reduce excessive consumption of alcohol by young people. Given the evidence that increasing the cost of alcohol reduces consumption, this was an appropriate strategy to reduce consumption and harm in a vulnerable population (Chikritzhs *et al.*, 2009). Despite critics arguing that the RTD tax increase had not reduced alcohol consumption but merely facilitated switching from one beverage to another, evidence clearly shows that the tax decreased consumption of alcopops to such an extent that overall consumption of alcohol in Australia decreased for the first time in 4 years (Chikritzhs, *et al.*, 2009; Hall & Chikritzhs, 2010).

A further consideration is that there may be an increase in the consumption of cider, perhaps as one response to the alcopops tax. Some commentators have suggested that ‘cider is the new beer’ and that cider consumption has increased fourfold in the past three years, with one polling group suggesting that national sales are growing at about 16% annually (Koremans, 2011). The NASDP data monitor sales of different beverage categories so that volume changes in the sale of these categories can be observed.

In the current report we present sets of up to 4 years jurisdictional data, so that new trends in alcohol consumption can be identified and discussed.

## **METHODOLOGICAL REVISIONS TO THE ABS NATIONAL ALCOHOL CONSUMPTION CALCULATIONS**

The ABS latest national alcohol consumption publication presents revised estimates of *per capita* consumption of pure alcohol in Australia for years ending 30 June 2007, 2008, and 2009 (Australian Bureau of Statistics, 2010b). Revisions relate to two factors: new Estimated Resident Population figures (ERP) and changes in alcohol conversion methods.

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ERP is calculated by the Australian Bureau of Statistics (ABS) from Census data. It is based on the concept of usual residence<sup>6</sup> and refers to all people, regardless of nationality or citizenship, who usually live in Australia<sup>7</sup>. ERP figures are presented in several versions as they are updated. Preliminary estimates are normally available twelve months after the reference date, revised estimates the following year and rebased and final estimates after the following census (Australian Bureau of Statistics, 2010a).

Alcohol conversion revisions primarily relate to a review of the alcohol content of table wine, sparkling and carbonated wine, and vermouth. This review resulted in an overall increase of 1.9% for the assumed alcohol content of table wine. The alcohol strength of sparkling and carbonated wine also increased while the alcohol content of vermouth decreased. The alcohol contents of red and white wines were found to be substantially different and were provided separately (Australian Bureau of Statistics, 2010b).

In a commentary and further calculation on these revisions, Chikritzhs, Allsop, Moodie and Hall (2010) noted that previously the average alcohol content for all wines combined was estimated at about 11.2%. Under the new ABS estimates, however, they calculated that the average alcohol content for all wines was 12.7%. Using these estimates they produced corrected estimates of *per capita* consumption of alcohol in Australia for the financial years 1990/91 to 2008/09. They demonstrated that official national annual totals of *per capita* consumption of alcohol were an underestimate and had led to the mistaken impression that alcohol consumption had been stable since the early 1990s. In fact, total *per capita* consumption has been increasing significantly over time and is now at one of its highest points since 1991/92 (Chikritzhs, *et al.*, 2010).

In the NASDP Stage 2, we have applied the ERP revisions and alcohol conversion revisions to current and previous years' data as appropriate. More details are given in the sections on methods below.

## **THE NASDP OBJECTIVES AND AIMS**

The overall objective of the NASDP is to construct an ongoing, regularly updated, national database of standardised alcohol sales data which includes all Australian states/territories. This is progressed by jurisdictions supplying the project with electronic copies of their

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<sup>6</sup> The ABS define this as 'the place where you usually live'

<sup>7</sup> See also the section on population estimates below

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alcohol sales records conforming to a minimum set of specifications. These data sets are then systematically prepared and analysed by the NASDP staff.

Other project aims include:

- monitoring alcohol consumption trends by regularly estimating *per capita* alcohol consumption for all participating states/territories;
- providing an annual report on consumption by region containing summaries of alcohol sales data and alcohol *per capita* consumption estimates for all participating states/territories and the Commonwealth; and
- providing standardised alcohol sales data sets for use by jurisdictions.

It is anticipated that the annual report will demonstrate the value of alcohol sales data for policy and services evaluation and encourage jurisdictions not currently collecting these data to closely consider the merits of doing so. An important aspect of the project is its capacity to work directly with relevant personnel in specific jurisdictions to assist in the development of sales data collections.

#### **IMPLEMENTATION AND ESTABLISHMENT OF THE NASDP**

The NASDP works closely with an Advisory Committee (AC) consisting of senior representatives of Liquor Licensing (LL), Health and Police in every Australian jurisdiction and the Australian Government Department of Health and Ageing. The purpose of the AC is to:

- provide guidance and advice on proposed processes and the use of sales data;
- communicate representatives' interests and requirements regarding sales data;
- provide comment and suggestions on draft annual reports; and
- support the aims and ongoing functions of the project.

Meetings are held via group teleconference twice a year and provide an opportunity for AC representatives to discuss any data collection issues that may arise and to provide feedback on draft reports.

The first teleconference for the NASDP Stage 2 was held on September 7, 2010.

General points raised in the meeting include:

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- The NASDP is committed to the development of methods that will produce the most accurate estimate of *per capita* consumption on a national and regional basis. The NASDP Stage 2 will estimate alcohol consumption using three different population estimates, in order to evaluate which is likely to be the most accurate. This is an approach which has not, to date, been undertaken in Australia for regional areas. The three estimates to be used are Estimated Resident Population (ERP), Estimated Enumerated Population (EEP); Estimated Service Population (ESP).<sup>8</sup>
- The practical benefits of the first NASDP report include:
  - highlighting the need to collect sales data at a local level;
  - benefits to liquor licensing and the police in evaluating policy and assisting research;
  - highlighting the link between consumption and harm and other alcohol problems, particularly in showing the geographical breakdown and distribution of consumption patterns;
  - mapping being a valuable tool to show the nature and extent of harm;
  - application to outlet density issues;
  - value in inquiries on alcohol harm to assist with legal arguments and competing interests by showing the true extent of alcohol consumption;
  - constituting support for better regulation and control.
- Discussion of the applicability of alcohol sales data in the evaluation of the alcopops tax. Another year or so of data will be needed before the effect can be estimated in Western Australia and Queensland. The Northern Territory is in a particularly good position to evaluate the effect of the alcopops tax as it collects quarterly data.

## **DATA TRANSFER ISSUES**

A number of general conditions underlie data transfer arrangements in the NASDP.

- Individual state and territory governments are responsible for and retain ownership over the collection of electronic alcohol sales data within their own jurisdiction.
- The NASDP staff consult individually with responsible departments on minimum data set specifications, data transfer arrangements, confidentiality requirements and data quality checks.

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<sup>8</sup> See more details below.

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- The DAO and the NDRI liaise with participating jurisdictions to ensure confidentiality requirements are satisfied. All the NASDP staff are required to sign a data confidentiality agreement.
- All jurisdictions contributing alcohol sales data are consulted in relation to appropriate functional levels of reporting. Alcohol sales are not reported by liquor licence and minimum sample rules (i.e. by geographic area) have been established to ensure the privacy of individual retailers is protected.

In 2010, Queensland, Western Australia and the Northern Territory made alcohol sales data relating to the financial year 2008/09 available to the NASDP Stage 2. The current report presents all data available to the NASDP, including that previously presented, for comparison. Previously presented data have been revised as described below.

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## **METHODS**

### **OVERVIEW**

- All analytical work was supervised by senior researchers at the NDRI and electronic data were housed on secure servers at the NDRI.
- Upon data transfer from jurisdictional collection agencies (e.g. liquor licensing authorities), alcohol sales data were cleaned, standardised and analysed.
- Regional alcohol *per capita* consumption estimates were made using various population estimates.
- Standardised data sets containing jurisdictional alcohol sales data were made available to nominated jurisdictional representatives.
- Alcohol sales data could not be transferred to third parties without the written consent of the relevant jurisdiction(s).

### **ASGC REGIONAL UNITS**

The Australian Standard Geographical Classification (ASGC) is used by the ABS for the collection and dissemination of geographically classified statistics. It provides seven hierarchies of geographical areas which allow coding of data into pre-established categories. In the Main Structure, jurisdictions are divided into Statistical Divisions (SDs) which are made up of Statistical Subdivisions (SSDs), which are in turn made up of Census Collection Districts (CCDs) aggregated into Statistical Local Areas (SLAs).

For the most part, the NASDP data were analysed at the level of Statistical Subdivisions. These units are presented in this report as maps or tables.<sup>9</sup>

### **PER CAPITA CONSUMPTION CALCULATION METHOD**

*Per capita* consumption was calculated by relating pure alcohol content by volume (PACV) consumed, to the population aged 15+, as described in the following equation (Farah, Unwin, & Codde, 2007):

$$\textit{Per capita consumption} = \frac{\textit{litres of absolute alcohol}}{\textit{population 15+}}$$

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<sup>9</sup> Different regional areas were used for the Northern Territory. Please see that section for detail.

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- Alcohol sales data were prepared as above.
- Wine producer sales, such as those at cellar doors not included in the above, were added to the data set where volumes, postcodes and details of the nature of the beverages sold were available.
- In Queensland and Western Australia, volume data were aggregated into SSDs using postcodes contained within the data sets.
- In the Northern Territory, volume data were aggregated into Urban Centres pre-determined by the Northern Territory Department of Justice and the Remainder of the Northern Territory.
- Volume data were partialled out to regional areas, and alcohol conversion factors (see below) were applied to volumes of different beverages to create total PACV.
- Year appropriate population estimates (see below) were adjusted for the 15+ population, and *per capita* consumption calculated according to the above equation.
- For Queensland and Western Australia, alcohol volumes and *per capita* consumption were not reported for SSDs with fewer than six clearly identifiable licensed premises.

## **POPULATION ESTIMATES**

### **Background**

*Per capita* alcohol consumption is calculated by dividing volumes of pure alcohol by the number of people in a given population (usually persons aged 15 years and older, or 15+). In Stage 1, the NASDP calculated *per capita* consumption by dividing volumes of alcohol sold by the Estimated Resident Population (ERP) aged 15+ for the relevant year.

ERP is calculated by the Australian Bureau of Statistics (ABS) from Census data. It is based on the concept of usual residence and refers to all people, regardless of nationality or citizenship, who usually live in Australia, with the exception of foreign diplomatic personnel and their families. The ERP includes usual residents who are overseas for less than 12 months and excludes overseas visitors who are in Australia for less than 12 months (Australian Bureau of Statistics, 2006). The ABS adjusts Census data to calculate ERP.

Another Census population measure is the Estimated Enumerated Population (EEP) which is a count of all persons living in all occupied dwellings on the night of the Census (every 5



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years), irrespective of whether they are usually resident in the area or are visitors (Planning Information and Forecasting Unit, 2006).

The major differences between ERP and EEP of interest to the NASDP are:

- people are counted according to their place of *usual residence* in the ERP, but not in the EEP. The ERP calculation redistributes all visitors who are living in private dwellings on Census night back to their usual area of residence. The ERP is adjusted for changes in population in years between census collections (inter-censal years);
- the EEP is not produced for inter-censal years. For that reason it represents only the number of people living in an area on one specific night every five years.

The objective in measuring *per capita* alcohol consumption is to estimate the average amount of alcohol consumed by individuals in a particular population at a particular time as accurately as possible. For that reason the denominator should exclude children and others who are not consuming purchased alcohol at that time, but should include adult residents and visitors who are buying and consuming alcohol in that place at that time.

ERP is not the most accurate denominator because of the effects of population mobility, whether reflecting relatively long term stays between regions for employment and education and so on, or the daily movements of people to work or, specifically for alcohol consumption purposes, to entertainment districts. Measures of residential population such as ERP can be poor guides to population in areas that are important in alcohol policy such as areas of high tourism or large entertainment districts.

In some high tourism areas, for example, excluding tourists from the population denominator may inflate estimated *per capita* consumption. In Stage 1, the NASDP calculated the Northern Territory *per capita* alcohol consumption with a population figure that included tourists. In an appended comparison using ERP alone, we found that the inclusion of tourists had reduced the alcohol *per capita* consumption between 11% and 14%—a considerable difference (Loxley, et al., 2010).

One alternative to ERP is to use EEP, which, as noted above, counts where people actually are on census night, rather than where their usual residence is, but is only available for each census. The problem then becomes how to calculate EEP for inter-censal years.

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The term ‘service population’ is used to denote a population that is adjusted to include all relevant people for a particular purpose. Service populations may include tourists, seasonal workers, fly-in-fly-out workers, students, members of the armed forces, and other itinerant visitors and workers. Service populations can be defined and calculated in a variety of ways. In 2001, for example, the National Alcohol Indicators Project (NAIP) at NDRI estimated a service population for jurisdictional alcohol consumption that included residents at home, visitors in paid public accommodation and visitors in other accommodation (Catalano, *et al.*, 2001).

The Stage 1 NASDP Final Report recommended that further attention should be given in the NASDP Stage 2 to developing service population estimates to use in *per capita* consumption calculations, in order to obtain more reliable alcohol consumption estimates.

In response to this, the NASDP Stage 2 has estimated *per capita* consumption using three different formulae:

- using ERP as a denominator. This would be identical to the calculation undertaken for Western Australia and Queensland in Stage 1. It is not adjusted for tourists, seasonal workers and other visitors;
- using EEP as a denominator. This would include all relevant persons present on Census night and has been estimated for inter-censal years; and
- using an Estimated Service Population (ESP) based on ERP, but which accounts for absent residents, Australian visitors and international tourists. The ESP method here uses census data from the 2006 census and 2009 resident population to estimate an overnight service population for statistical subdivisions (SSDs).

Having calculated *per capita* consumption under these three conditions, it will be possible to compare estimates to determine potential upper and lower ranges in estimated *per capita* consumption and to make recommendations regarding the feasibility and reliability of denominator options. These estimates are undertaken for those states which submit alcohol sales data, and permit the data to be analysed in regular ABS regions such as SSDs.

### **Derivation of population estimates**

The following definitions apply:

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- **Age:** this project requires population of the drinking age; most population age data is presented in standard 5 year cohorts such that the drinking age is calculated upon the age 15+ (that is starting with the 15 to 19 years cohort) and above (the next five year cohort would be 20 to 24 which would not account for persons aged 18 and 19 years). This age calculation is therefore conservative in that it includes a higher population than the minimum legal drinking age. Population referred to herein refers to the population aged 15+ unless otherwise stated.
- **Geography:** the geographic unit of interest is the SSD, as defined by the ABS.
- **Boundary changes:** between 2006 and 2008 the boundaries making up SSDs were subject to changes as catalogued by the ABS (Australian Bureau of Statistics, 2009). However, these changes had a minimal impact on population numbers and only a few modifications to the data were required. These changes are described in Appendix II.
- Changes to boundaries between 2001 and 2006 were significant, particularly for Queensland, so data for 2001 was obtained directly from the ABS as a customised extraction. The 2001 data was aggregated to 2006 boundaries using census collector districts. The matching of 2001 collector districts to 2006 SSDs was done according to the location of the centroid of the 2001 CDs within the boundary of the (2006) SSDs.

**Estimated Resident Population (ERP)**

ERP is an ABS product published annually. The data series provides an estimate of the resident population at a variety of geographical scales and includes a breakdown by age and gender. It is based on census data and aims to provide a standardised population estimate for inter-censal years.

*ERP 2006*

The 2006 ERP is derived directly from the ABS publication (Australian Bureau of Statistics, 2007b) and was downloaded from the ABS website for this project.

*ERP 2009*

The 2009 ERP was also downloaded directly from the ABS website (Australian Bureau of Statistics, 2010a).

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**Estimated Enumerated Population (EEP)**

As discussed above, the EEP is the count of persons actually in the geographical region in question at the time of the census count. It differs from the ERP in that the ERP attempts to estimate the number of people who normally reside in the geographical area. The difference arises from persons who are visiting from other areas of Australia, or are overseas visitors and also accounts for absent residents.

*EEP 2006*

The 2006 census provides comprehensive counts of EEP at all geographical levels. For the purpose of this project the 2006 EEP was obtained directly from the ABS at SSD level. It is also available from the ABS website by individual region as part of the Place of Enumeration Profile data series (Australian Bureau of Statistics, 2007a).

*EEP 2009*

EEP is a census product and as such is available only for the census years (the last being 2006 and the next being 2011). So, to calculate an EEP for 2009 for the present project, ERP data and the 2006 EEP were applied using the following formula:

$$EEP09 = (ERP09/ERP06) * EEP06$$

The formula uses the ratio between ERP for 2009 and ERP for 2006 to estimate the EEP for 2009 from the EEP for 2006. It assumes a constant relationship in EEP with ERP in 2006 and 2009. Given that the largest portion of EEP is resident population and that significant socioeconomic or demographic changes are unlikely to appear in such a short space of time, such an assumption is appropriate given the absence of alternative data.

**Estimated Service Population (ESP)**

Originally it was envisaged that ESP would be calculated by a component approach, the objective being to determine the net visitors to add to the resident population. The component approach identifies visitors to the SSD from overseas as well as from intra-state and inter-state. The net visitors calculation also includes an estimate of those residents absent.

The difficulty arises in accounting for the various combinations of movements of persons between the different geographical areas of interest. For example, it would be appropriate when estimating the number of persons visiting a particular SSD from other SSDs to use available census data to create such a matrix. However, the calculations soon become quite

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complicated when SSDs are matched against all other SSDs resulting in around 500 combinations to be taken into account.

Despite a workable methodology being developed, it was decided that this approach was too complicated given the scope of the project and the desire to develop an ESP that was simple to understand and easy to replicate.

Instead of the component approach, a simple trend approach to calculating net visitor population using 2001 and 2006 census data was used to extrapolate forward from 2006 to 2009.

The basic calculation is as follows:

$$ESP09 = ERP09 + NetVisitors09$$

That is, ESP for 2009 is calculated as the base ERP for 2009 plus an estimate of the net visitors to the SSD. NetVisitors09 is calculated from the mean of the two net visitor measures from the 2001 and 2006 census as follows:

$$A = EEP01 - ERP01 = \text{net visitors 2001 from census}$$

$$B = EEP06 - ERP06 = \text{net visitors 2006 from census}$$

$$C = ((A + B) / 2) = \text{net visitors 2009}$$

$$ESP09 = ERP09 + C$$

## **Results**

The results show that in many cases the calculated ESP figure will be actually less than the ERP for the SSD. This arises from the number of absences from residences by persons overseas in the winter months when the census is taken. For some SSDs, particularly inner city and other tourist related locations, the ESP is higher than the ERP, as would be anticipated. In other SSDs which appear to be related to the mining boom, there are significantly greater persons calculated by the ESP than ERP, though many of these SSDs have a low base population

Where the ESP results are lower than ERP then per capita consumption will rise. However, where ESP is greater than ERP, which appears to be associated with areas of tourism and remote areas attracting seasonal and mining related increases in population, then per capita consumption will reflect the higher real population on the ground in those areas and will

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subsequently fall. As these areas are the most contentious for calculating per capita consumption it would appear that the ESP results developed here are an appropriate method for determining consumption patterns.

### **PREPARATION OF ALCOHOL SALES DATA**

General considerations for data cleaning and preparation included:

- Anomalies in the data were identified and either corrected or removed.
- Apparent outliers in the data were queried with the relevant authority and appropriate action taken.
- In some data sets, postcodes were used as the basic geographical identifier. In these cases, a small number of records which did not contain a purchaser postcode were removed.
- Volumes of alcohol sold (litres) were the base unit of *per capita* consumption calculation. A small number of records which did not contain volume data were removed.
- Records were removed if they related to supply to other wholesalers or wine producers as these would otherwise be duplicated in wholesaler to retailer records.

### **The Northern Territory**

The Northern Territory utilises a quarterly return.

At the end of every quarter of each year all licensed Northern Territory wholesalers are emailed, reminding them of their obligations under Section 114 of the Liquor Act which states they have 28 days from the end of the quarter to lodge with the Wholesale Quarterly Return of Liquor Sales, showing details of all purchases and sales of liquor made in the quarter.

Alcohol sales data were made available to the NASDP by the Northern Territory Department of Justice for 2008/09, conveyed in an Excel spreadsheet. Statistical Local Area (SLA), and Local Government Area (LGA). The Department of Justice also supplied Reporting Area for retailers, which allowed sales information to be aggregated into the six Urban Centres and the Remainder of the Northern Territory which is its usual mode of presenting geographical information on alcohol sales. Whole population and 15+ population details for the Northern Territory for the years 2000/01 to 2008/09, revised in August 2010, were supplied, as well as

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Department of Tourism estimates of the number of interstate and overseas visitors aged 15 and older to the Northern Territory in the same years.

The Department of Justice has requested that the NASDP report *per capita* consumption for the Northern Territory using ERP plus tourism figures for the jurisdiction as a whole, but not for regional units where tourist estimations were not as reliable. It has been agreed that volumes of alcohol sold would be reported for Urban Centres and the Remainder of the Northern Territory, and that *per capita* consumption for the Northern Territory as whole would be calculated primarily with the tourism estimate<sup>10</sup>.

### **Queensland**

Queensland utilises two annual returns:

- a) Return of Liquor Sales under the Liquor Act 1992. This return should be completed by every holder of a producer/wholesaler licence
- b) Annual return under the Wine Industry Act 1994. This return should be completed by every holder of a wine producer or wine merchant licence.

Alcohol sales data were made available to the NASDP by the Queensland Office of Liquor and Gaming Regulation (OLGR) for the year 2008/09. Data were conveyed in Excel spreadsheets. The purchaser postcode was the primary geographical information.

The records were aggregated by wholesaler, and licence numbers of purchasers examined to determine whether supply had been made to other wholesalers, wine producers and wine merchants. As noted above, these purchases were removed from the data set to avoid double counting. Approximately 9% of the volume, and 15% of the value of alcohol purchased from wholesalers, was bought by other wholesalers, and less than 0.1% of volume and value related to supply to wine producers / merchants<sup>11</sup>.

Wine Industry returns constituted a second source of Queensland data. Postcodes of the wine producer / merchants and details of beverages sold (table or fortified wine, cider, brandy or mead) were available, so these data could be added to the total volumes sold to retail licensees by wholesalers.

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<sup>10</sup> Estimates of Northern Territory *per capita* consumption without the influence of tourism can be found in Appendix 1

<sup>11</sup> The Queensland Act defines these as follows:

a Wine Producer Licence, wherein the fruit used to produce the wine is grown by the licensee on the premises used to make wine, or; a Wine Merchant Licence, wherein the licensee purchases fruit grown in Queensland and commissions the production of wine by the holder of a Wine Producer licence, or, blends wines produced in the state to create a unique wine.

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Postcodes were aggregated into Statistical Local Areas (SLAs) using the 2009 Postcode to Statistical Local Area (SLA) Concordance, prepared by the ABS Regional Population Unit in Adelaide. Further aggregation to Statistical Subdivisions (SSDs) using the same concordance was undertaken to provide regional units of an appropriate size for mapping.

### **Western Australia**

The Government of Western Australia utilises two annual returns:

- a) Summary of Transaction Under a Wholesale Licence, Liquor Control Act, 1988. This return should be completed by every holder of a Wholesaler's Licence.
- b) Summary of Transaction Under a Producer's Licence, Liquor Control Act, 1988. This return should be completed by every holder of a Producer's Licence.

Alcohol sales data for 2008/09 were made available to the NASDP through the Western Australia Drug and Alcohol Office. These were conveyed in Excel spreadsheets. Postcode was the primary geographical information.

The records were aggregated by purchaser, and examined to determine whether they were wholesalers and/or producers. These were removed from the data set to avoid double counting, thus leaving only sales made to retail licensees for further analysis. Approximately 16% of the volume, and 20% of the value of alcohol purchased from wholesalers, was bought by other wholesalers, and less than 0.4% of volume and 0.3% of value related to supply to wine producers / merchants.

The purchaser data were aggregated into SSDs for mapping.

### **ALCOHOL CONVERSION FACTORS**

Alcohol conversion factors are required to convert volumes of different alcoholic beverages (which may contain many other substances in addition to alcohol such as water and sugar) to volumes of absolute or 'pure' alcohol content. The NASDP has used national alcohol conversion factors in order to derive standardised rates which are used to compare *per capita* consumption across different regions and jurisdictions.

As an example, the NASDP PACV for mid-strength beer is 0.348. This means that the average mid-strength beer contains 3.48% pure alcohol. In this example, the volume of mid-strength beer sold by retailers was multiplied by 0.348 to obtain the volume of pure alcohol.



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The NASDP relies on the ABS as a major source of information for its alcohol conversion factors. For the most part, the NASDP has used the ABS 2010 alcohol conversion factors for beer, table wine, fortified and sparkling wine, as shown in Table 1 (Australian Bureau of Statistics, 2010b). The new work in this publication indicates increasing alcohol content of wine over the past decade. This fact has now been taken into consideration for the first time by the ABS' own national estimates of apparent *per capita* consumption. The new alcohol conversion estimates have also been used to estimate new trends in Australian *per capita* consumption (Chikritzhs, *et al.*, 2010) demonstrating that, contrary to previous official estimates that *per capita* consumption had remained stable for over a decade, actual alcohol consumption in Australia is now at one of its highest points since 1991/92.

Information informing alcohol conversion factors for spirits and RTDs are derived from a review currently in progress by the NDRI (Chikritzhs & Catalano, in preparation)<sup>12</sup>. (The ABS collects pure alcohol volumes data for spirits and RTDs and does not collect data on cider, therefore it does not publish pure alcohol contents for these beverages in its reports.) The NDRI review is based on market brand shares for each major beverage type (beer, wine and spirits) identified using Euromonitors data. Average alcohol contents of the most popular brands were identified using on-line liquor guides and reference books. When alcohol contents could not be identified from these sources, visits were made to local liquor stores. Preliminary conversion factors were estimated for the following groups of beverages:

1. Beer: low (2.5-2.9%) mid (3.0-3.5%) and full strength (>3.5%)<sup>13</sup>
2. Bottled wine: red, white, sparkling and fortified
3. Cask wine: red and white
4. Spirits: whisky, bourbon, brandy, dark rum and white rum, vodka, gin
5. RTDs: mid strength (3.5% alcohol content); full strength (3.5% to less than 6%) and super strength (6% to 10%)<sup>14</sup>
6. Cider: in keeping with previous consensus (Catalano, *et al.*, 2001) an alcohol content of 5%.

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<sup>12</sup> Referred to hereafter as 'NDRI review'

<sup>13</sup> 'Light' beer was not included

<sup>14</sup> Any product with greater alcohol content than 10% was considered full-strength spirit and not included.

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Where applied, the specific PACV derived from the NDRI review has been identified in Table 1. Specific considerations given to each jurisdiction are described below, with final jurisdiction-specific conversion factors also summarised in Table 1

### **The Northern Territory**

The Northern Territory alcohol sales data contained the following categories:

- full (strength) beer, mid (strength) beer, low (strength) beer;
- cask wine, bottled wine, fortified wine;
- pre-mixed spirits, standard spirits; and
- cider.

The PACV estimated for different categories of beer by the ABS in 2010 has been applied to Northern Territory beers. The definition of full-strength, mid-strength and low-strength used in the Northern Territory ‘Wholesaler Return of Liquor Sales’ approximated those used by the ABS for the same categories. The Northern Territory defines full-strength beer as 3.51% or greater, mid-strength beer as 3.01% to 3.50% and low-strength beer as 1.15% to 3.00%.

The Northern Territory sales data did not differentiate between red, white and sparkling table wines. The NDRI review estimates an overall pure alcohol content for table wine of 12.3% and this figure was applied to the Northern Territory wine data Table 1). In other evaluations it has been assumed that cask wine has the same alcohol content as bottled wine (Gray, Chikritzhs, & Stockwell, 1999) and this assumption has also been applied to Northern Territory cask wine. The ABS estimate of the pure alcohol content of fortified wine has been used.

The pure alcohol contents for spirits and cider estimated by the NDRI review have been applied to the Northern Territory data.

### **Queensland**

Queensland alcohol sales data contained the following alcohol beverage categories:

- heavy beer, medium beer, light beer;
- bottled table wine, bottled fortified wine, bulk table wine, bulk fortified wine;
- regular spirits, pre-mixed spirits; and
- alcoholic sodas and cider.

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The PACV estimated for different categories of beer by the ABS in 2010 has been applied to Queensland beers, (see Table 1). The definition of 'heavy', 'medium' and 'light' beer used in the Queensland 'Return of Liquor Sales' approximated those used by the ABS for full strength, mid strength and low strength beers. Queensland defines heavy beer as 4% or greater, medium beer as 3% to less than 4% and light beer as less than 3%.

As in the Northern Territory, the Queensland sales data did not differentiate between red, white and sparkling wines, thus the NDRI overall conversion figure of 12.3% was applied. The ABS conversion factor for fortified wine has been applied.

There is also no differentiation in the Queensland data for cask wine. There is, however, a category referred to as 'bulk wine', which is a large quantity of table or fortified wine acquired or supplied in a container of more than 20 litres. We have therefore used the same alcohol content for Queensland bulk table and fortified wines as for bottled table and fortified wines respectively.

The PACV of spirits and RTDs and cider estimated in the NDRI review have been applied. The alcohol content of alcoholic sodas was established by Catalano *et al.* (2001).

Some of the Queensland wine producers' data referred to 'mead'. There is a consensus in online data sources that this refers to brewed honey-based beverages with an average alcohol content of around 12.5%<sup>15</sup>. This figure has been applied to mead in the Queensland data.

### **Western Australia**

The Western Australian alcohol sales data contained the following beverage categories:

- high (alcohol) beer, low (alcohol) beer;
- high (alcohol) wine, low (alcohol) wine; and
- spirits.

The PACV estimated for full and mid-strength beer by the ABS in 2010 has been applied to Western Australia 'high' and 'low' beers, low beer having previously been defined in Western Australia as having an alcohol content of 0.035 (Catalano *et al.*, 2001).

The Western Australian data, like the Northern Territory and Queensland data, did not differentiate between different kinds of table wine so an overall average alcohol content of

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<sup>15</sup> <http://www.bartholomewsmeadery.com.au/>

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12.3% was assumed. Low alcohol wine in the Western Australian data has been converted with a factor of 3.5% as it was by Catalano *et al.* (2001).

Western Australian alcohol sales data do not distinguish straight spirits (e.g. bottled vodka) from pre-mixed spirits (e.g. 'vodka cruisers'), as they only record volumes for all spirit-based products combined. Thus, the alcohol content of 'spirits' in Western Australia depends upon the proportion of RTD or pre-mixed spirits in the total volume sold. Information sourced from the Distilled Industry Council of Australia (DSICA) has identified that the proportion of the total spirits market made up of pre-mixed products has been steadily rising since 2001 (Distilled industry Council of Australia, 2006). Using this information, the NDRI has calculated that the average alcohol content of spirits in Western Australia was about 0.108 in 2005/06 and 0.106 in 2006/07. Information about the market share of pre-mixed spirits in subsequent years is not available. In the NASDP, therefore, we have used the alcohol conversion factor of 0.108 in 2005/06 and 0.106 in 2006/07 to 2008/09.

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**Summary of alcohol conversion factors**

**Table 1 Alcohol conversion factors by jurisdiction**

<b>Beverage</b>	<b>Source</b>	<b>Terms</b>	<b>PACV<sup>1</sup></b>
<b>Beer</b>	ABS, 2010	full beer	0.0476
		low beer	0.0269
	NT 05/06, 06/07, 07/08, 08/09	full beer	0.0476
		mid beer	0.0348
		low beer	0.0269
		heavy beer	0.0476
	Queensland 07/08, 08/09	medium beer	0.0348
		light beer	0.0269
		high beer	0.0476
	WA 05/06, 06/07, 07/08, 08/09	low beer	0.0348
<b>Wine</b>	NDRI Review	table wine	0.1230
	ABS, 2010	fortified wine	0.1790
		cask wine	0.1230
	NT 05/06, 06/07, 07/08, 08/09	bottled wine	0.1230
		fortified wine	0.1790
		bottled table wine	0.1230
	Queensland 07/08, 08/09	bulk table wine	0.1230
		bottled fortified wine	0.1790
		bulk fortified wine	0.1790
		high wine	0.1230
WA 05/06, 06/07, 07/08, 08/09	low wine	0.0350	
<b>Spirits</b>	NDRI review	spirits	0.4170
		Ready to Drink	0.0501
	NT 05/06, 06/07, 07/08, 08/09	pre-mixed spirits	0.0501
		standard spirits	0.4170
	Queensland 07/08, 08/09	regular spirits	0.4170
		pre-mixed spirits	0.0501
	WA 05/06	spirits	0.1080
WA 06/07, 07/08, 08/09	spirits	0.1060	
<b>Other</b>	NDRI review	cider	0.0500
	NT 05/06, 06/07, 07/08, 08/09	cider	0.0500
	Queensland 07/08, 08/09	alcoholic soda and cider	0.0500
	Queensland 07/08, 08/09	mead	0.1250

1. Pure alcohol content by volume

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**MAPPING THE NASDP DATA**

*Per capita* consumption was calculated for SSDs in Queensland and Western Australia and by aggregating ABS regions into Urban Centres and Remainder in the Northern Territory. Volumes of pure alcohol sold and consumption were mapped using the software ArcGIS 9.3. ArcGIS is geographical information software which allows the user to input their own information about geographical features. The NASDP downloaded ABS files with Australian SSD information for the years ending 20 June 2009, and added *per capita* consumption for each SSD. The result is more visually informative than tables, and permits rapid comparison of regions.

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## RESULTS

### THE NORTHERN TERRITORY

*Per capita* pure alcohol consumption was estimated for the whole of the Northern Territory. Previous years' data have been updated with adjusted ERPs and alcohol conversion rates as detailed above.

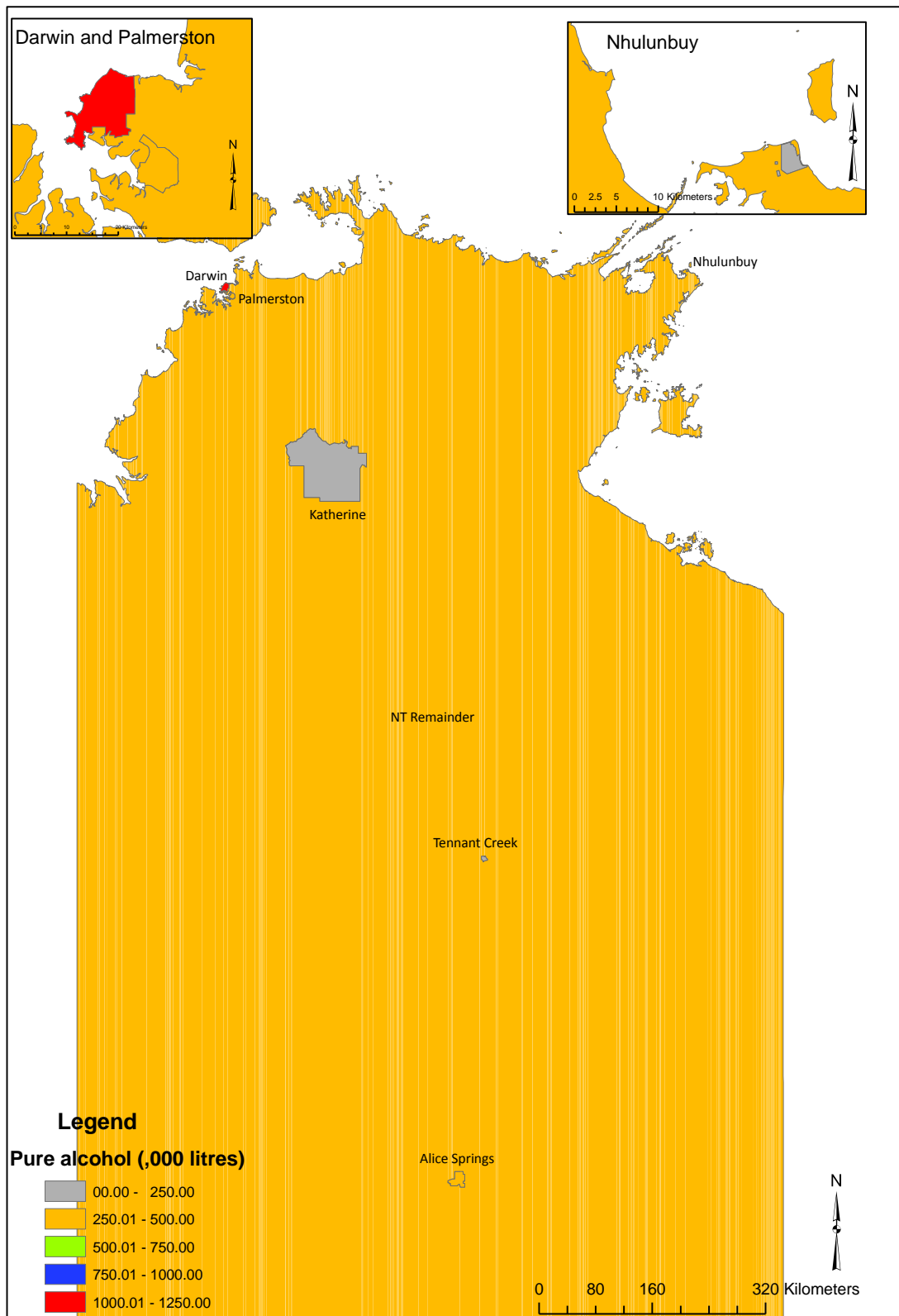
**Table 2** Estimated *per capita* alcohol consumption, Northern Territory, 2005/06 to 2008/09

	<b>Total pure alcohol (litres)</b>	<b>Adult ERP aged 15+ and tourism</b>	<b>NT <i>per capita</i> consumption</b>	<b>National <i>per capita</i> consumption <sup>1</sup></b>
2005/06	2,697,439	179,376	15.04	9.84
2006/07	2,699,393	187,194	14.42	10.40
2007/08	2,748,884	187,217	14.68	10.32
2008/09	2,719,986	193,562	14.05	10.08

<sup>1</sup> National estimate revised for 2006/07 and 2007/08. Does not include alcoholic drinks other than beer, wine and spirits (Australian Bureau of Statistics, 2010b)

Volumes of pure alcohol sold were estimated for Urban Centres and Remainder of the Northern Territory. These estimates can be seen in Figure 1 with details in Table 5.

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**Figure 1** Volumes of pure alcohol sold in Urban Centres and the Remainder, Northern Territory, 2008/09



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**Table 3 Volumes (litres) of alcohol sold by beverage and pure alcohol in Urban Centres and the Remainder, Northern Territory, 2005/06 – 2008/09**

<b>Region</b>	<b>Year</b>	<b>All beer</b>	<b>All wine</b>	<b>All spirits</b>	<b>All cider</b>	<b>All alcohol</b>	<b>All pure alcohol</b>
<b>Alice Springs</b>	2005/06	4,585,659	1,914,813	965,187	102,468	7,568,127	534,450
	2006/07	5,614,803	908,336	996,448	105,715	7,625,302	463,835
	2007/08	5,655,559	612,542	968,536	91,353	7,327,991	427,883
	2008/09	5,628,961	662,107	738,162	122,069	7,151,299	439,481
<b>Darwin</b>	2005/06	11,651,194	2,497,219	2,363,741	282,460	16,794,614	1,091,862
	2006/07	11,701,243	2,655,899	2,366,210	278,736	17,002,090	1,116,055
	2007/08	12,538,309	2,768,366	2,605,581	290,965	18,203,221	1,187,646
	2008/09	13,183,220	2,414,383	2,022,669	394,856	18,015,128	1,172,174
<b>Katherine</b>	2005/06	2,159,393	616,759	375,691	30,075	3,181,918	202,034
	2006/07	2,149,974	551,747	405,328	28,268	3,135,317	199,162
	2007/08	2,269,625	376,073	470,980	25,461	3,142,138	189,786
	2008/09	2,572,572	245,024	324,663	41,382	3,183,641	180,063
<b>Nhulunbuy</b>	2005/06	1,292,201	200,516	303,087	30,075	1,825,879	109,219
	2006/07	1,442,419	115,300	326,480	19,684	1,903,882	110,796
	2007/08	1,224,279	110,291	259,908	17,478	1,611,955	97,698
	2008/09	1,116,390	67,344	137,689	20,742	1,342,166	77,864
<b>Palmerston</b>	2005/06	3,133,527	471,526	778,152	86,100	4,469,305	264,522
	2006/07	3,291,274	579,163	796,490	88,486	4,755,413	285,880
	2007/08	3,556,880	628,167	935,323	84,833	5,205,203	315,004
	2008/09	4,048,572	529,019	778,976	113,571	5,470,137	325,538
<b>Tennant Creek</b>	2005/06	766,997	123,395	101,327	10,512	1,002,230	58,878
	2006/07	783,302	155,382	111,682	8,571	1,058,936	63,669
	2007/08	748,020	139,259	146,135	9,496	1,042,911	62,562
	2008/09	880,118	74,771	104,237	15,360	1,074,486	59,853
<b>Remainder of the NT</b>	2005/06	6,619,057	474,123	907,349	220,459	8,220,988	436,474
	2006/07	6,858,056	581,997	1,024,707	171,958	8,636,719	459,995
	2007/08	6,941,946	614,268	1,121,039	157,459	8,834,712	468,304
	2008/09	7,052,630	562,268	884,644	209,851	8,709,393	465,013
<b>NT totals</b>	<b>2005/06</b>	<b>30,208,028</b>	<b>6,298,351</b>	<b>5,794,534</b>	<b>753,496</b>	<b>43,054,409</b>	<b>2,697,439</b>
<b>NT totals</b>	<b>2006/07</b>	<b>31,841,070</b>	<b>5,547,824</b>	<b>6,027,345</b>	<b>701,419</b>	<b>44,117,659</b>	<b>2,699,393</b>
<b>NT totals</b>	<b>2007/08</b>	<b>32,934,619</b>	<b>5,248,966</b>	<b>6,507,502</b>	<b>677,045</b>	<b>45,368,131</b>	<b>2,748,884</b>
<b>NT totals</b>	<b>2008/09</b>	<b>34,482,463</b>	<b>4,554,916</b>	<b>4,991,040</b>	<b>917,830</b>	<b>44,946,250</b>	<b>2,719,986</b>

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**QUEENSLAND**

*Per capita* consumption (litres of absolute alcohol) was estimated for the whole of Queensland as shown in the following table, in which previous year's data have been updated with adjusted alcohol conversion rates as detailed above.

**Table 4** Estimated *per capita* consumption (litres of absolute alcohol), Queensland 2007/08 to 2008/09

	<b>Total pure alcohol (litres)</b>	<b>ERP aged 15+</b>	<b>QLD <i>per capita</i> consumption</b>	<b>National <i>per capita</i> consumption<sup>1</sup></b>
<b>2007/08</b>	37,955,769	3,429,367	11.07	10.32
<b>2008/09</b>	37,817,375	3,536,318	10.69	10.08

<sup>1</sup>National estimate. Does not include alcohol drinks other than beer, wine and spirits (Australian Bureau of Statistics, 2010b)

Table 5 shows *per capita* pure alcohol consumption for Queensland in 2008/09 under the three different population estimates described above.

Volumes of alcohol sold and *per capita* pure alcohol consumption were estimated for Statistical Subdivisions (SSDs) for 2008/09. These estimates can be seen in Figures 2 to 5 with details in Table 6. Previous years' data have been updated with adjusted alcohol conversion rates as detailed above. *Per capita* pure alcohol consumption in maps has been estimated using ERP.

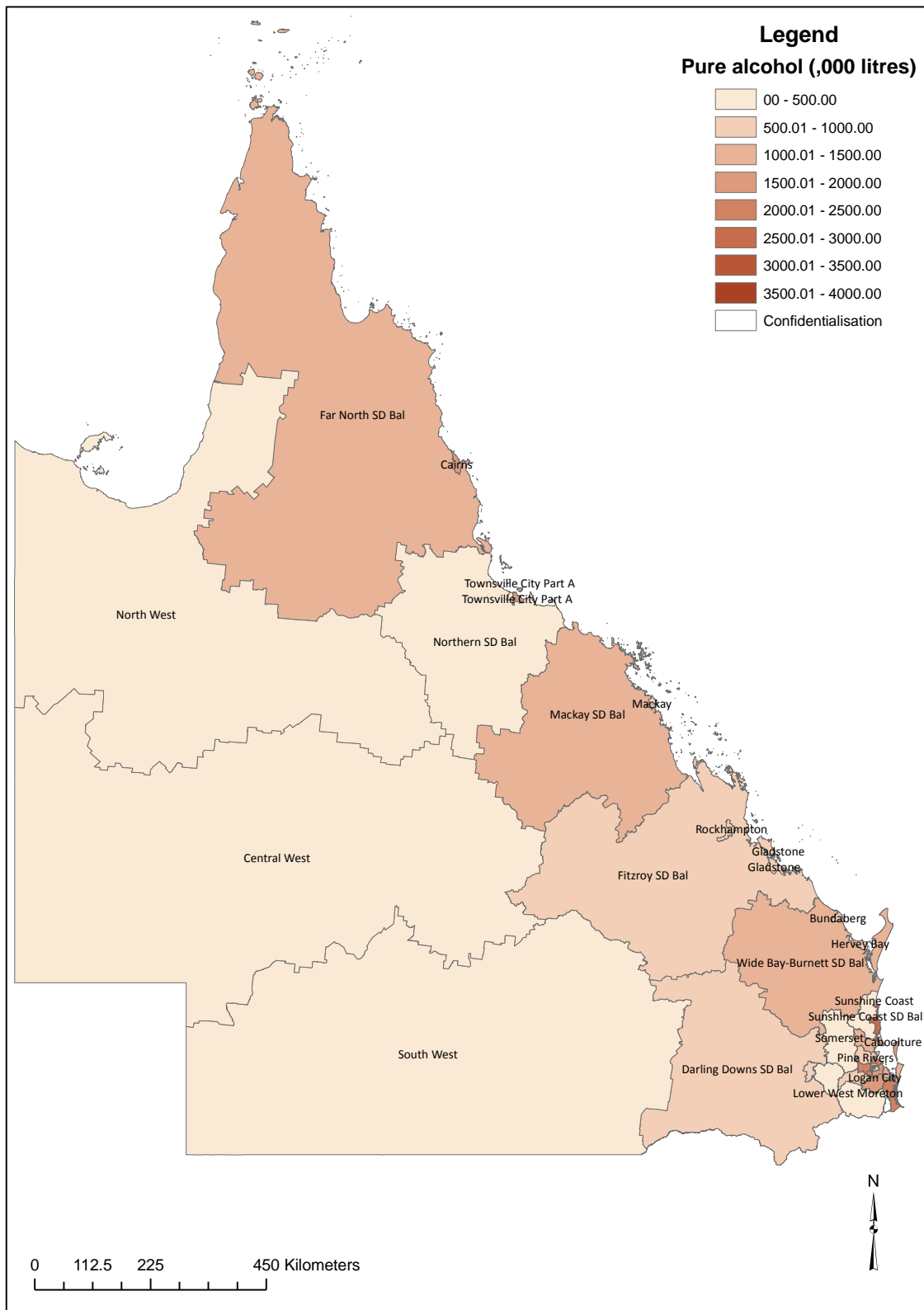
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**Table 5** Estimated *per capita* consumption (litres of absolute alcohol), Queensland 2008/09 by three different population estimates

SSD code	SSD name	ERP 15+ 2009 <sup>1</sup>	EEP 15+ 2009 <sup>2</sup>	ESP 15+ 2009 <sup>3</sup>	pcc /ERP	pcc /EEP	pcc /ESP
30501	Inner Brisbane	86,812	98,754	97,406	25.23	22.18	22.48
30503	Northwest Inner Brisbane	161,344	157,513	158,363	9.15	9.37	9.32
30507	Northwest Outer Brisbane	276,301	266,680	268,201	7.78	8.07	8.02
30509	Southeast Inner Brisbane	136,003	130,891	131,677	6.05	6.29	6.25
30511	Southeast Outer Brisbane	205,845	198,877	200,004	7.35	7.61	7.57
30520	Caboolture	118,155	115,172	115,969	10.44	10.71	10.64
30525	Ipswich City	123,824	119,771	120,739	7.62	7.88	7.81
30530	Logan City	212,936	204,156	206,498	8.44	8.80	8.70
30540	Pine Rivers	125,411	120,531	121,761	7.78	8.09	8.01
30545	Redcliffe	46,425	45,258	45,475	8.26	8.47	8.43
30550	Redland City	112,513	108,164	109,178	9.78	10.18	10.08
30710	Gold Coast East	172,561	189,573	191,147	15.72	14.31	14.19
30715	Gold Coast West	246,706	231,808	237,830	8.86	9.43	9.20
30720	Gold Coast SD Bal	3,808	3,686	3,829	11.70	12.09	11.64
30905	Sunshine Coast	200,390	204,440	205,325	13.77	13.50	13.44
30910	Sunshine Coast SD Bal	62,212	58,142	59,679	7.49	8.02	7.81
31205	Somerset	17,195	16,113	16,366	6.67	7.12	7.01
31210	Lower West Moreton	57,584	54,183	55,845	6.76	7.19	6.97
31505	Bundaberg	54,264	52,954	53,357	11.13	11.40	11.31
31507	Hervey Bay	47,961	49,324	49,718	11.18	10.87	10.79
31510	Wide Bay-Burnett SD Bal	127,532	123,854	125,101	10.60	10.92	10.81
32001	Toowoomba	101,533	94,717	96,520	9.03	9.68	9.50
32005	Darling Downs SD Bal	85,169	80,491	81,737	10.33	10.93	10.76
32505	South West	20,179	20,349	20,395	12.81	12.71	12.68
33005	Rockhampton	60,604	57,782	58,669	15.87	16.65	16.40
33010	Gladstone	38,510	36,921	37,835	13.20	13.77	13.44
33015	Fitzroy SD Bal	72,263	74,910	74,624	9.81	9.47	9.50
33505	Central West	9,866	10,991	10,976	8.94	8.02	8.03
34005	Mackay	66,153	61,708	63,504	12.37	13.26	12.88
34010	Mackay SD Bal	70,582	80,740	79,081	16.55	14.46	14.77
34505	Townsville City Part A	85,391	85,299	86,713	18.36	18.38	18.08
34510	Townsville City Part B	47,926	44,169	45,654	5.49	5.95	5.76
34515	Northern SD Bal	46,068	45,390	45,842	8.77	8.90	8.81
35005	Cairns	115,430	128,479	127,536	17.28	15.52	15.64
35010	Far North SD Bal	95,515	101,585	102,781	11.59	10.89	10.77
35505	North West	25,347	28,748	28,745	16.58	14.62	14.62
<b>State totals</b>		<b>3,536,318</b>	<b>3,502,125</b>	<b>3,534,080</b>	<b>10.69</b>	<b>10.80</b>	<b>10.70</b>

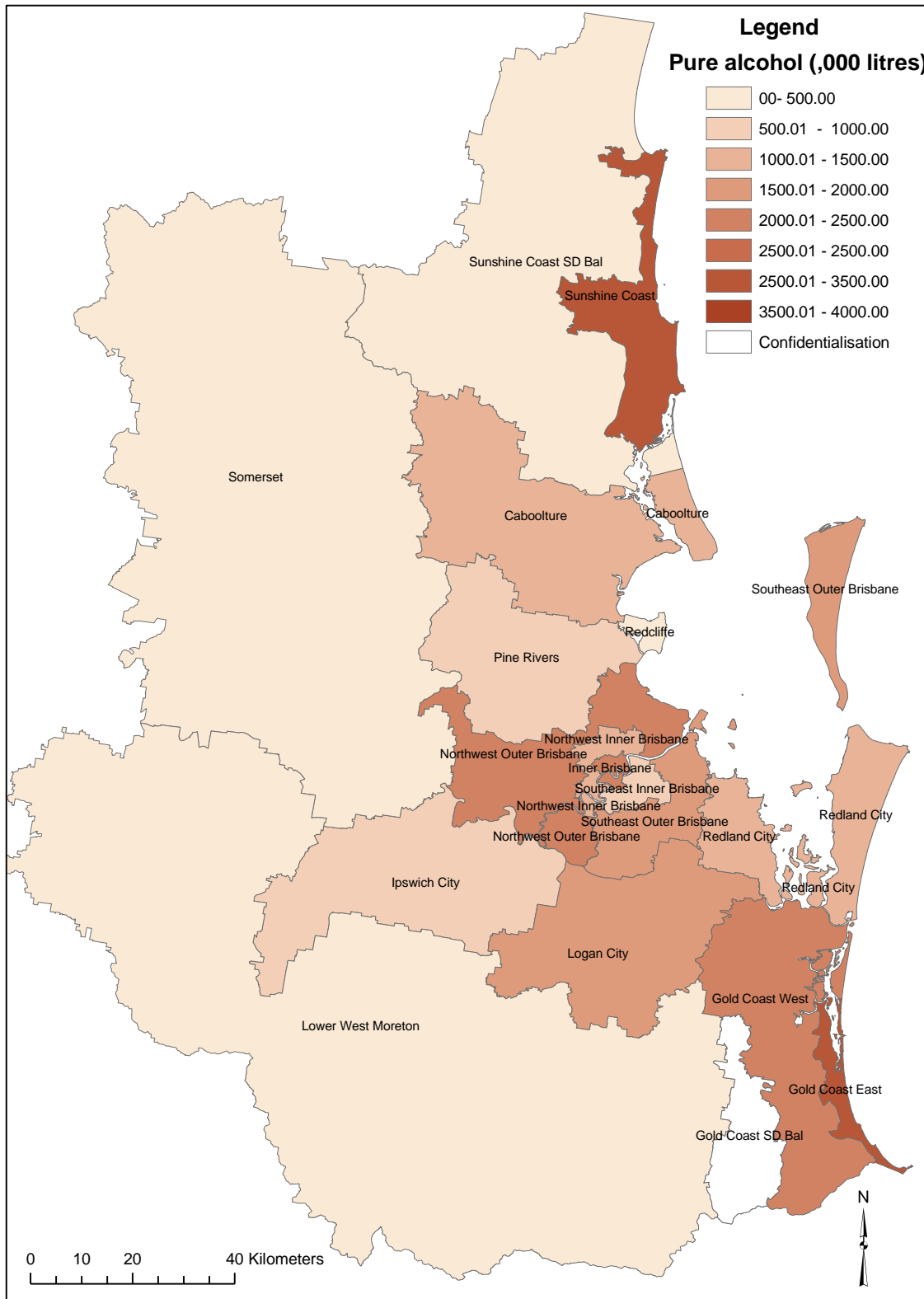
1. Estimated Resident Population
2. Estimated Enumerated Population (ratio ERP 09/06:census)
3. Estimated Service Population (mean)

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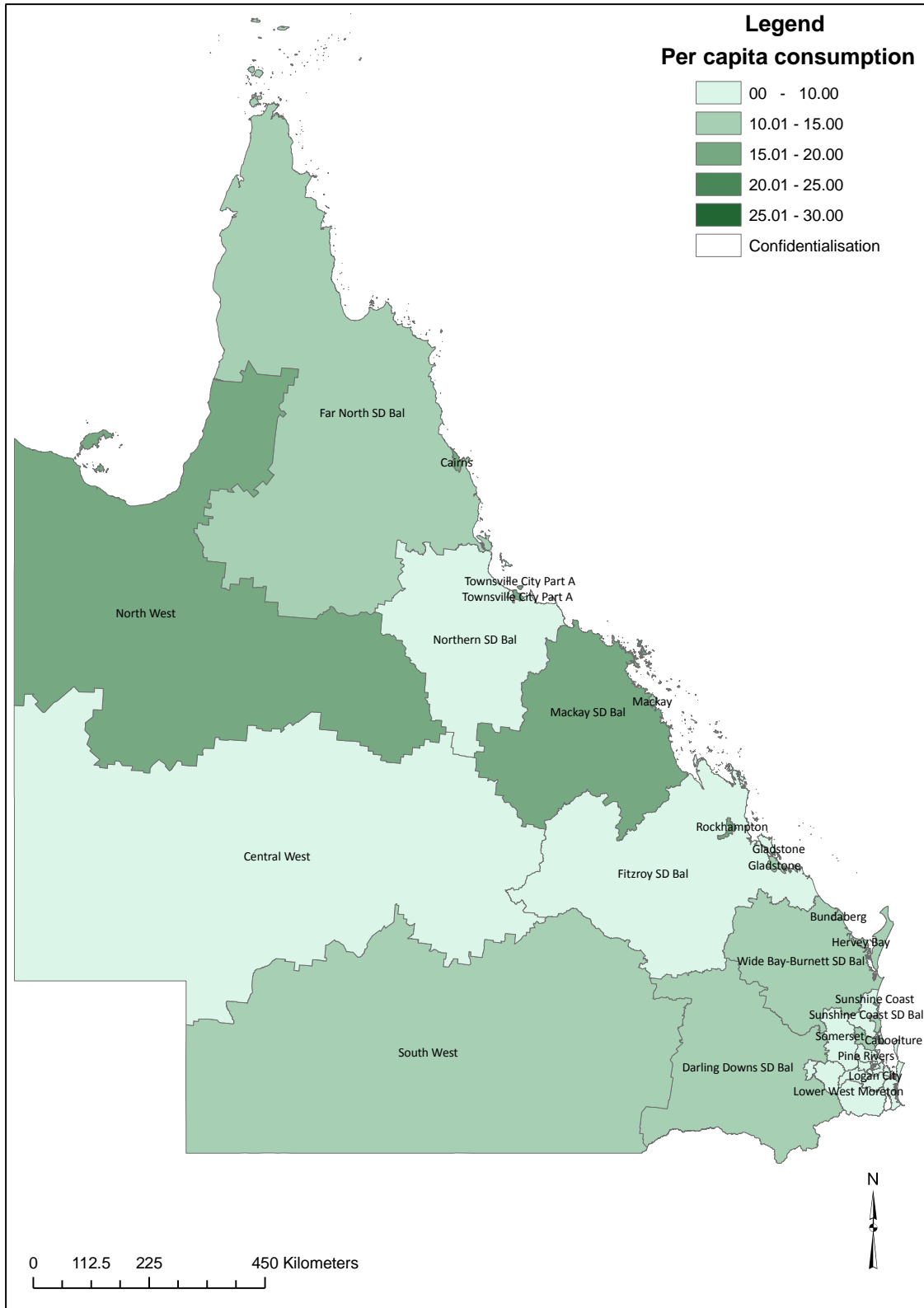
**Figure 2 Volumes of pure alcohol sold, Statistical Subdivisions, Queensland, 2008/09**

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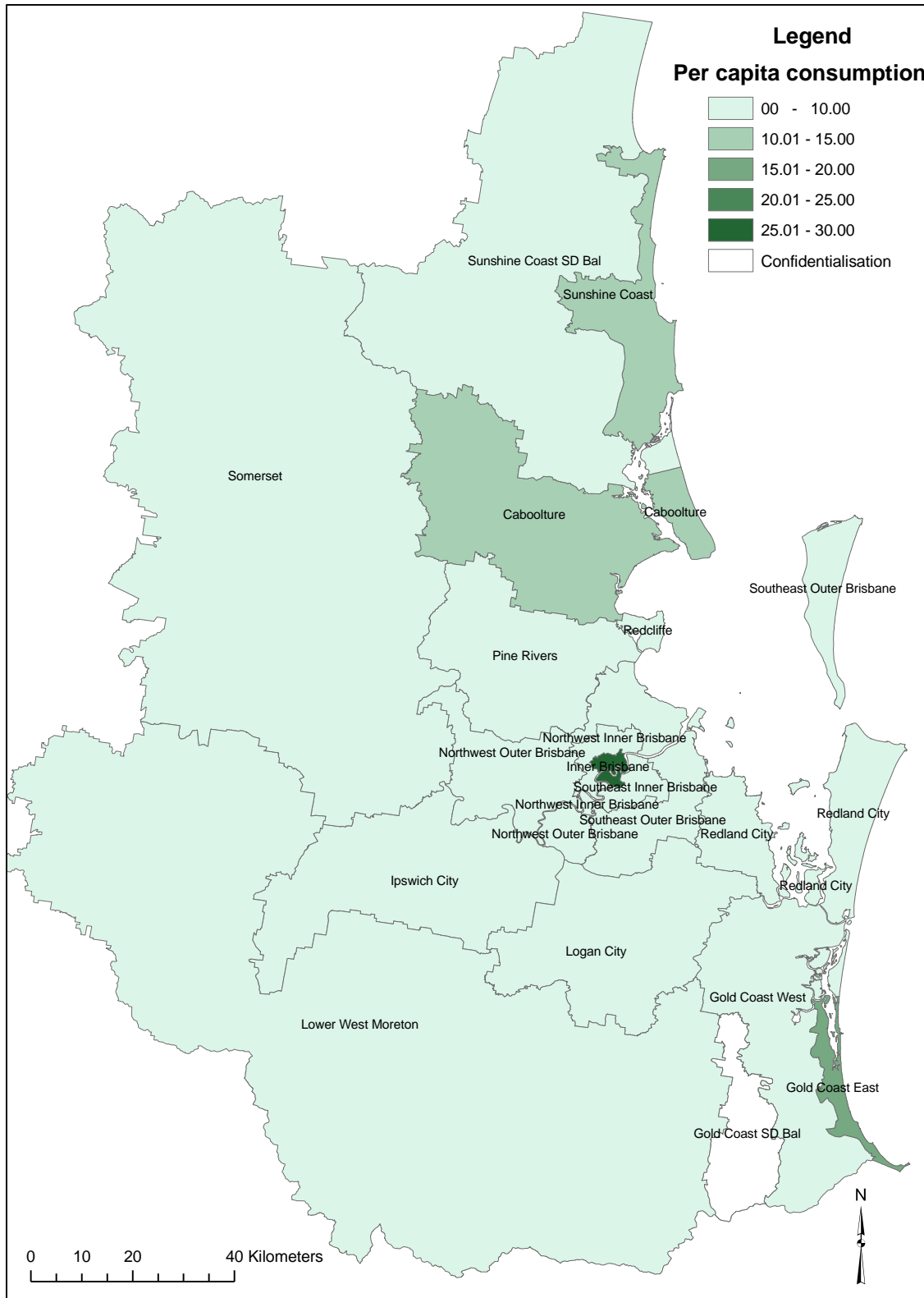
**Figure 3** Volumes of pure alcohol sold, Statistical Subdivisions, Brisbane and environs, Queensland, 2008/09

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**Figure 4** Estimated *per capita* consumption (litres of absolute alcohol) using ERP, Statistical Subdivisions, Queensland, 2008/09

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**Figure 5** Estimated *per capita* consumption (litres of absolute alcohol) using ERP, Statistical Subdivisions, Brisbane and environs, Queensland, 2008/09

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**Table 6 Volumes (litres) of alcohol sold by beverage, pure alcohol, and consumption in SSDs, Queensland 2007/08 to 2008/09<sup>1</sup>**

SSD code	SSD name	Year	All beer	All wine	All spirits	All other <sup>2</sup>	All alcohol	All pure alcohol	pcc/ERP
30501	Inner Brisbane	2007/08	20,031,020	6,254,852	4,184,702	275,687	30,746,262	2,290,449	26.93
		2008/09	21,868,893	5,420,338	3,136,763	389,815	30,815,809	2,189,956	25.23
30503	Northwest Inner Brisbane	2007/08	11,468,553	4,391,818	2,668,763	117,946	18,647,079	1,388,824	8.77
		2008/09	12,569,936	4,640,351	2,241,293	181,591	19,633,170	1,475,838	9.15
30507	Northwest Outer Brisbane	2007/08	19,711,062	6,706,825	4,523,324	190,578	31,131,789	2,140,284	7.94
		2008/09	26,160,197	5,478,986	3,300,148	209,551	35,148,882	2,150,884	7.78
30509	Southeast Inner Brisbane	2007/08	8,483,958	2,770,272	1,582,019	89,198	12,925,447	907,922	6.81
		2008/09	8,349,857	2,283,575	1,211,096	101,988	11,946,516	822,900	6.05
30511	Southeast Outer Brisbane	2007/08	12,108,612	5,856,534	3,368,305	146,451	21,479,902	1,655,400	8.28
		2008/09	15,834,063	4,202,976	2,558,023	151,172	22,746,233	1,513,496	7.35
30520	Caboolture	2007/08	11,092,220	2,577,338	3,460,788	136,645	17,266,991	1,084,755	9.56
		2008/09	16,927,467	2,488,516	2,786,151	158,965	22,361,099	1,233,937	10.44
30525	Ipswich City	2007/08	10,374,585	2,077,565	3,829,911	129,237	16,411,297	1,024,720	8.71
		2008/09	11,040,495	1,853,000	2,464,368	143,147	15,501,010	943,556	7.62
30530	Logan City	2007/08	17,704,305	4,300,939	6,697,034	206,638	28,908,916	1,882,451	9.10
		2008/09	19,450,775	3,616,880	4,797,139	216,410	28,081,204	1,796,702	8.44
30540	Pine Rivers	2007/08	8,668,196	3,071,068	2,484,311	105,396	14,328,971	990,877	8.26
		2008/09	10,559,806	2,446,004	2,080,366	119,571	15,205,748	975,444	7.78
30545	Redcliffe	2007/08	3,758,515	1,158,132	1,162,838	55,342	6,134,827	425,363	9.40
		2008/09	3,756,729	1,042,261	792,965	57,846	5,649,801	383,560	8.26
30550	Redland City	2007/08	9,168,065	3,194,018	2,862,317	123,912	15,348,313	1,086,720	9.94
		2008/09	11,764,092	2,885,453	2,006,757	131,058	16,787,360	1,100,694	9.78
30710	Gold Coast East	2007/08	23,566,544	9,061,169	6,180,895	269,206	39,077,814	2,904,879	17.24
		2008/09	24,651,929	7,770,039	4,675,222	298,219	37,395,410	2,711,945	15.72



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<b>SSD code</b>	<b>SSD name</b>	<b>Year</b>	<b>All beer</b>	<b>All wine</b>	<b>All spirits</b>	<b>All other<sup>2</sup></b>	<b>All alcohol</b>	<b>All pure alcohol</b>	<b>pcc/ERP</b>
30715	Gold Coast West	2007/08	20,421,723	7,860,125	5,702,341	269,656	34,253,845	2,473,181	10.46
		2008/09	20,312,941	6,162,922	4,208,068	284,231	30,968,162	2,186,896	8.86
30905	Sunshine Coast	2007/08	22,363,481	10,382,673	5,741,719	271,260	38,759,134	2,881,894	14.85
		2008/09	25,947,017	8,551,822	4,601,426	330,282	39,430,548	2,760,356	13.77
30910	Sunshine Coast SD Bal	2007/08	4,359,523	1,362,496	1,359,799	81,678	7,163,497	476,084	7.97
		2008/09	5,493,701	1,137,010	896,186	85,793	7,612,690	466,084	7.49
31205	Upper West Moreton Somerset	2007/08	1,476,137	229,452	401,105	15,568	2,122,261	119,364	7.28
		2008/09	1,692,809	183,721	239,837	19,282	2,135,649	114,698	6.67
31210	Lower West Moreton	2007/08	4,358,329	915,616	1,225,613	48,785	6,548,342	397,181	7.19
		2008/09	5,181,457	754,562	814,780	51,236	6,802,034	389,328	6.76
31505	Bundaberg	2007/08	5,172,629	1,268,950	1,500,257	54,541	7,996,377	497,618	9.42
		2008/09	7,931,326	1,289,720	1,200,535	65,275	10,486,857	603,713	11.13
31507	Hervey Bay	2008/09	6,323,043	1,279,219	883,452	85,321	8,571,035	536,387	11.18
31510	Wide Bay-Burnett SD Bal	2007/08	14,863,653	2,913,918	3,656,510	156,839	21,590,919	1,283,418	10.39
		2008/09	20,462,780	2,316,934	2,391,479	162,318	25,333,511	1,352,012	10.60
32001	Toowoomba	2007/08	8,398,949	2,561,390	2,690,512	76,340	13,727,191	944,630	9.56
		2008/09	9,639,930	2,050,376	2,016,707	91,213	13,798,226	916,672	9.03
32005	Darling Downs SD Bal	2007/08	9,776,719	1,591,944	2,269,747	71,525	13,709,935	791,045	9.51
		2008/09	14,814,379	1,201,365	1,495,940	67,995	17,579,678	879,408	10.33
32505	South West	2007/08	4,260,380	269,058	701,408	9,533	5,240,379	257,687	12.85
		2008/09	4,444,870	270,096	497,407	22,645	5,235,019	258,576	12.81
33005	Rockhampton	2007/08	11,302,218	1,408,513	2,841,558	81,041	15,633,330	881,987	14.83
		2008/09	13,425,994	1,466,398	2,294,747	108,985	17,296,125	961,900	15.87
33010	Gladstone	2007/08	4,779,588	597,240	1,229,470	56,500	6,662,798	376,995	10.15
		2008/09	8,319,796	592,751	935,478	63,276	9,911,301	508,443	13.20

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SSD code	SSD name	Year	All beer	All wine	All spirits	All other <sup>2</sup>	All alcohol	All pure alcohol	pcc/ERP
33015	Fitzroy SD Bal	2007/08	8,390,937	1,274,119	2,255,305	88,767	12,009,128	699,269	9.97
		2008/09	10,351,511	1,027,871	1,551,739	91,633	13,022,753	709,252	9.81
33505	Central West	2007/08	1,740,883	143,527	290,016	7,096	2,181,522	112,198	11.46
		2008/09	1,584,712	112,369	154,290	6,435	1,857,806	88,153	8.94
34005	Mackay	2007/08	11,248,840	1,676,191	2,734,248	117,466	15,776,745	913,507	14.26
		2008/09	9,306,092	1,273,394	2,344,887	130,348	13,054,721	818,081	12.37
34010	Mackay SD Bal	2007/08	13,100,251	1,829,374	3,102,168	163,996	18,195,790	1,074,703	15.69
		2008/09	16,887,400	1,672,313	2,226,969	162,049	20,948,731	1,167,858	16.55
34505	Townsville City Part A	2007/08	15,165,861	3,018,275	3,395,824	199,896	21,779,856	1,331,680	16.01
		2008/09	25,305,733	2,504,331	2,895,162	250,713	30,955,939	1,567,855	18.36
34510	Townsville City Part B	2007/08	2,639,622	338,713	761,376	33,474	3,773,186	207,167	4.56
		2008/09	3,191,428	449,346	817,140	39,741	4,497,654	262,965	5.49
34515	Northern SD Bal	2007/08	6,255,679	749,521	1,237,735	54,190	8,297,125	444,091	9.82
		2008/09	6,452,059	613,298	767,868	38,097	7,871,323	403,883	8.77
35005	Cairns	2007/08	18,319,120	4,196,580	4,287,710	355,827	27,159,238	1,731,593	15.54
		2008/09	23,986,864	4,495,517	3,425,454	371,713	32,279,548	1,994,343	17.28
35010	Far North SD Bal	2007/08	13,753,546	2,816,187	3,073,542	201,364	19,844,639	1,188,965	12.75
		2008/09	14,081,326	2,521,194	2,166,264	160,941	18,929,725	1,106,733	11.59
35505	North West	2007/08	5,822,305	616,507	1,640,791	42,978	8,122,582	439,398	17.44
		2008/09	5,793,598	597,725	1,091,363	44,183	7,526,868	420,306	16.58
<b>Queensland total<sup>3</sup></b>		<b>2007/08</b>	<b>370,470,237</b>	<b>101,367,242</b>	<b>96,478,749</b>	<b>4,396,134</b>	<b>572,712,362</b>	<b>37,955,769</b>	<b>11.07</b>
<b>Queensland total<sup>3</sup></b>		<b>2008/09</b>	<b>444,286,004</b>	<b>86,776,624</b>	<b>72,053,441</b>	<b>4,899,241</b>	<b>608,015,309</b>	<b>37,817,375</b>	<b>10.69</b>

1. Details for SSDs with fewer than 6 clearly identified licensed premises have been excluded including Gold Coast SD Bal (30720) in both years, and Hervey Bay (31507) in 2007/08.
2. Alcoholic soda, cider and mead.
3. Totals include all SSDs and may not equal the sum of individual SSDs shown.

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*Per capita* consumption (litres of absolute alcohol) was estimated for the whole of Western Australia as shown in the following table in which previous year's data have been updated with adjusted alcohol conversion rates as detailed above.

**Table 7** Estimated *per capita* pure alcohol consumption, Western Australia, 2005/06 to 2008/09

<b>Year</b>	<b>Total pure alcohol (litres)</b>	<b>ERP aged 15+</b>	<b>WA <i>per capita</i> consumption</b>	<b>National <i>per capita</i> consumption<sup>1</sup></b>
<b>2005/06</b>	17,797,940	1,649,725	10.79	9.84
<b>2006/07</b>	18,006,305	1,695,343	10.62	10.40
<b>2007/08</b>	21,312,499	1,743,344	12.23	10.32
<b>2008/09</b>	20,245,103	1,806,481	11.21	10.08

<sup>1</sup>National estimate. Does not include alcohol drinks other than beer, wine and spirits (Australian Bureau of Statistics, 2010b)

Table 8 shows *per capita* pure alcohol consumption for Western Australia in 2008/09 under the three different population estimates described above.

Volumes of alcohol sold and *per capita* pure alcohol consumption were estimated for Statistical Subdivisions (SSDs) for 2008/09. These estimates can be seen in Figures 6 to 9 with details in Table 9. Previous years' data have been updated with adjusted alcohol conversion rates as detailed above. *Per capita* pure alcohol consumption in maps has been estimated using ERP.

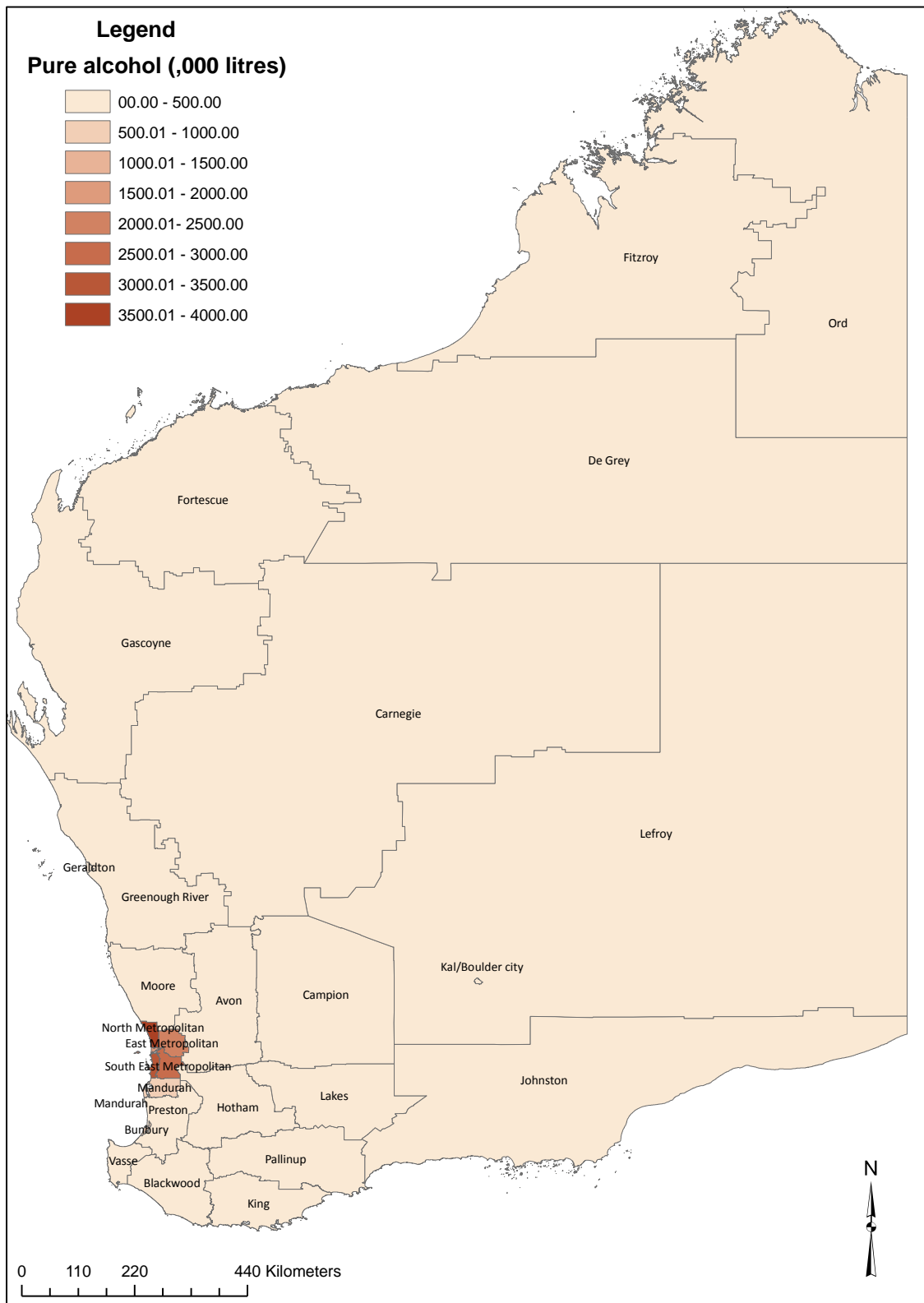
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**Table 8** Estimated *per capita* consumption (litres of absolute alcohol), Western Australia 2008/09 by three different population estimates

SSD code	SSD name	ERP 15+ 2009 <sup>1</sup>	EEP 15+ 2009 <sup>2</sup>	ESP 15+ 2009 <sup>3</sup>	pcc /ERP	pcc /EEP	pcc /ESP
50505	Central Metropolitan	123,158	123,971	124,558	15.19	15.09	15.02
50510	East Metropolitan	223,738	209,780	212,747	9.02	9.62	9.49
50515	North Metropolitan	406,013	379,768	385,306	9.70	10.37	10.22
50520	South West Metropolitan	283,965	265,705	269,125	10.73	11.46	11.32
50525	South East Metropolitan	308,544	291,158	295,081	9.14	9.68	9.55
51001	Mandurah	68,005	61,660	63,166	12.32	13.59	13.26
51003	Bunbury	52,423	48,515	49,339	11.14	12.04	11.84
51010	Preston	28,920	26,306	26,610	10.73	11.79	11.66
51015	Vasse	33,843	31,970	32,369	14.69	15.56	15.36
51020	Blackwood	13,956	13,170	13,320	10.49	11.12	10.99
51505	Pallinup	8,989	8,149	8,275	11.21	12.37	12.18
51510	King	37,944	35,026	35,578	10.16	11.01	10.84
52005	Hotham	11,387	10,522	10,643	13.95	15.09	14.92
52010	Lakes	3,655	3,393	3,412	13.55	14.59	14.51
52505	Moore	12,712	12,073	12,195	13.48	14.19	14.05
52510	Avon	23,503	21,747	21,900	9.33	10.08	10.01
52515	Campion	8,098	7,967	7,943	9.81	9.97	10.00
53001	Kalgoorlie/Boulder City Part A	24,357	23,559	23,663	18.64	19.27	19.18
53005	Lefroy	6,510	8,401	8,443	9.84	7.62	7.59
53010	Johnston	14,110	14,650	14,313	14.24	13.71	14.04
53503	Geraldton	27,977	26,009	26,473	14.88	16.01	15.73
53505	Gascoyne	7,744	13,541	13,270	26.25	15.01	15.32
53510	Carnegie	2,843	4,845	4,697	18.16	10.66	10.99
53515	Greenough River	11,910	12,262	12,349	13.73	13.34	13.24
54005	De Grey	16,823	21,570	19,782	20.94	16.33	17.80
54010	Fortescue	18,995	22,822	21,823	25.73	21.41	22.39
54505	Ord	8,324	11,283	11,347	20.67	15.25	15.16
54510	Fitzroy	18,035	25,226	24,311	24.75	17.70	18.36
<b>Western Australia totals</b>		<b>1,806,481</b>	<b>1,735,048</b>	<b>1,752,032</b>	<b>11.21</b>	<b>11.67</b>	<b>11.56</b>

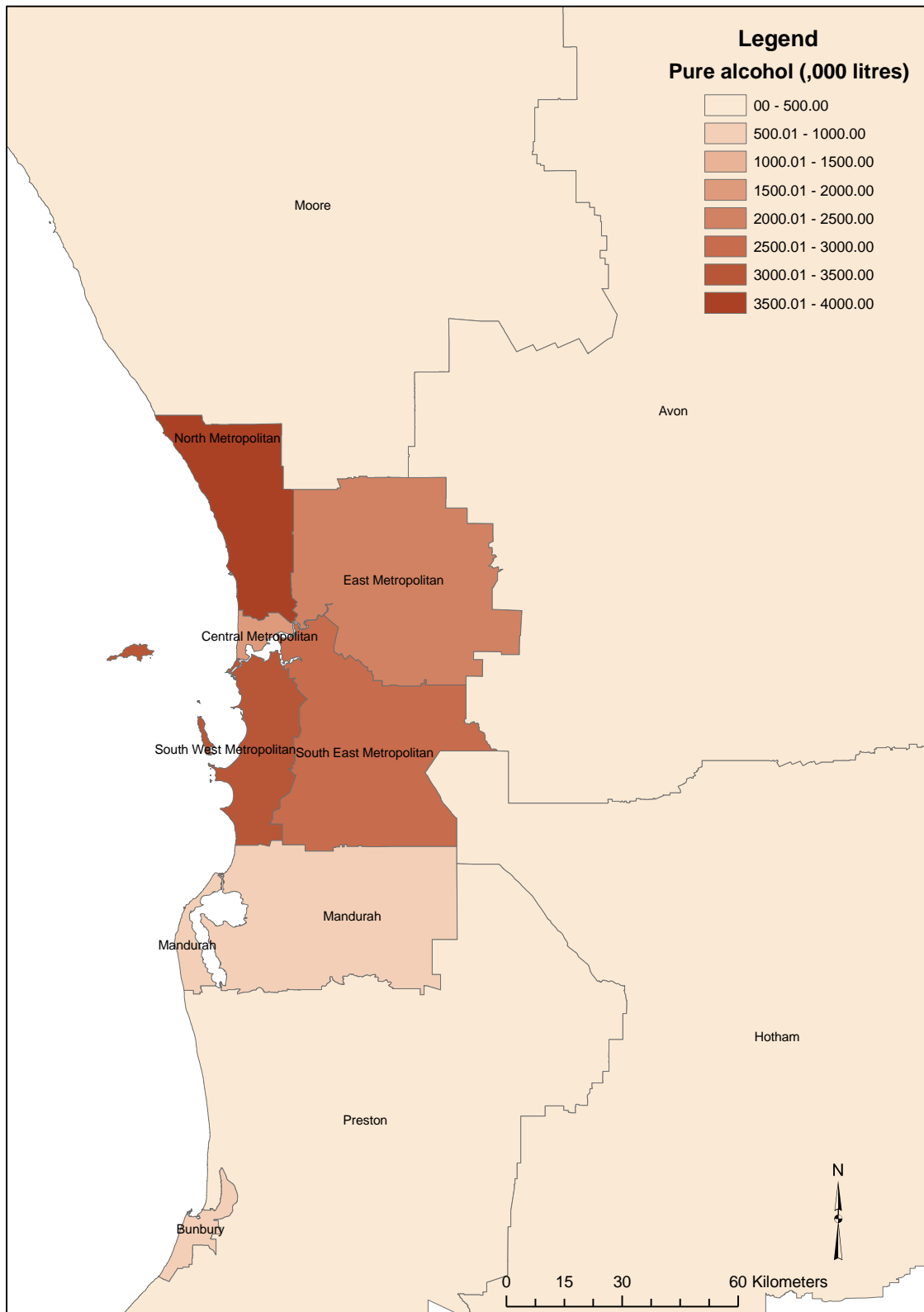
1. Estimated Resident Population
2. Estimated Enumerated Population (ratio ERP 09/06:census)
3. Estimated Service Population (mean)

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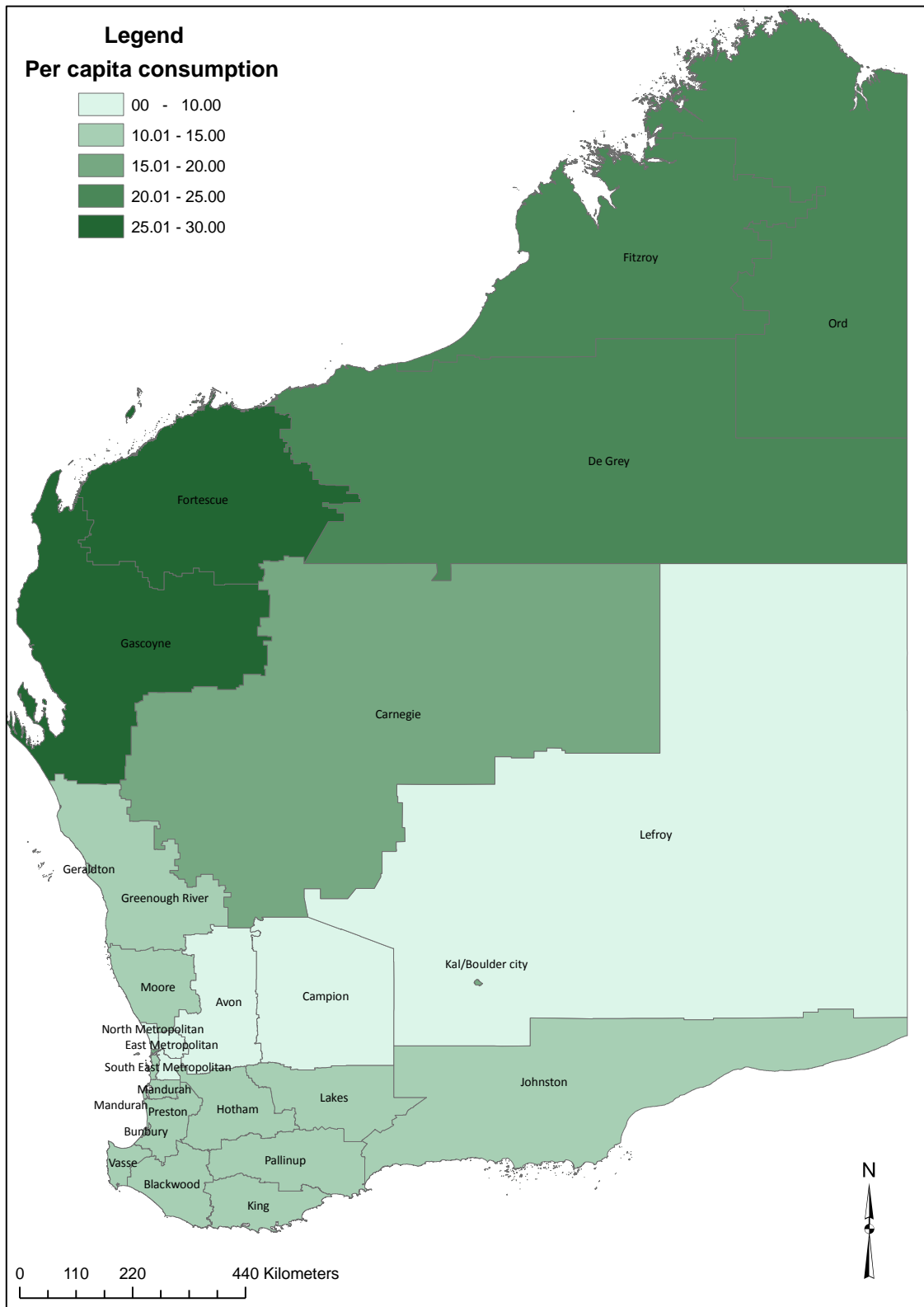
**Figure 6 Volumes of pure alcohol sold, Statistical Subdivisions, Western Australia, 2008/09**

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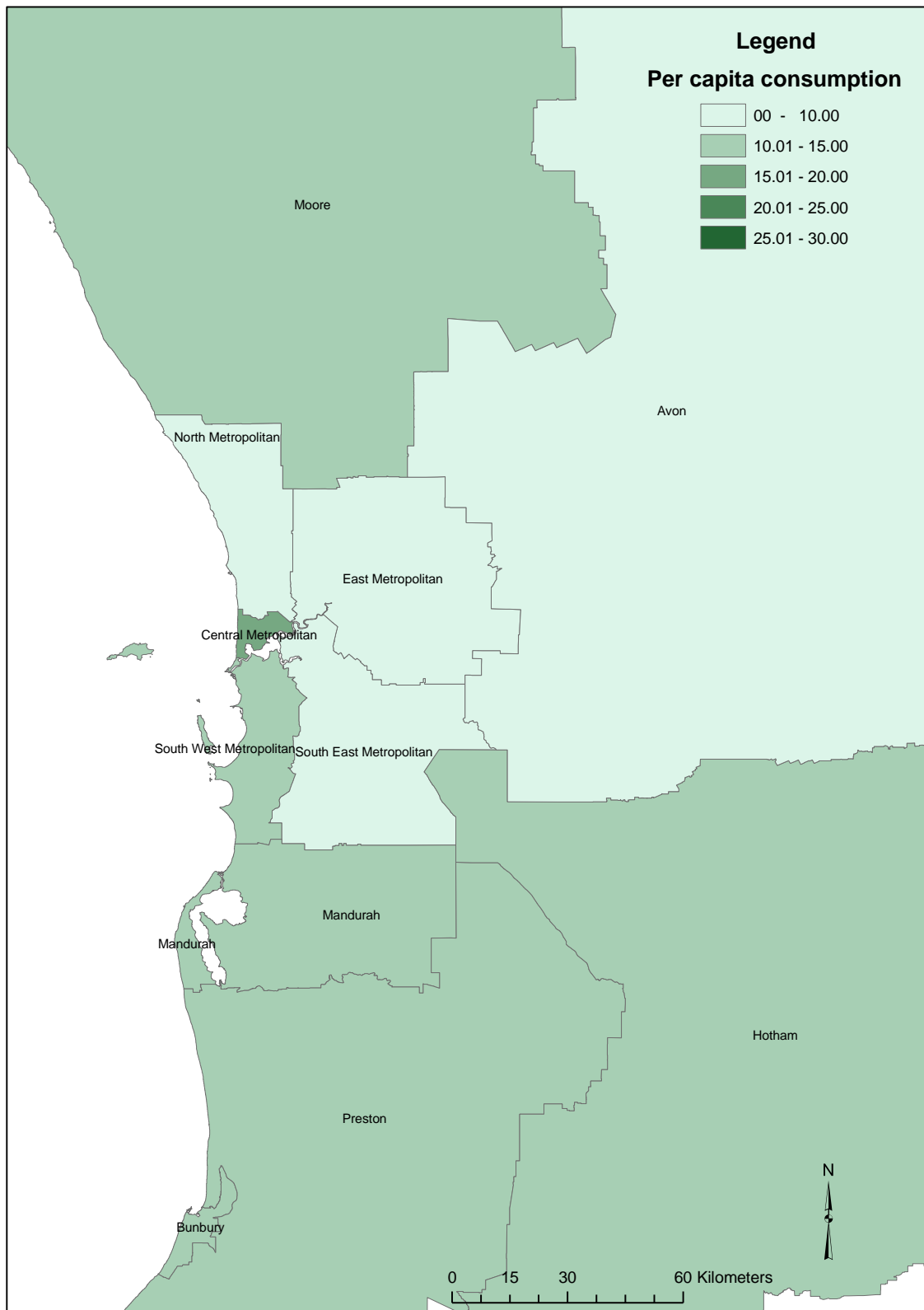
**Figure 7** Volumes of pure alcohol sold, Statistical Subdivisions, Perth and environs, Western Australia, 2008/09

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**Figure 8** Estimated *per capita* consumption (litres of absolute alcohol) using ERP, Statistical Subdivisions, Western Australia, 2008/09

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**Figure 9** Estimated *per capita* consumption (litres of absolute alcohol) using ERP, Statistical Subdivisions, Perth and environs, Western Australia, 2008/09



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**Table 9 Volumes (litres) of alcohol sold by beverage, pure alcohol and consumption in SSDs, Western Australia, 2005/06 to 2008/09**

SSD code	SSD name	Year	All beer	All wine	All spirits	All alcohol	All pure alcohol	pcc/ERP
50505	Central Metropolitan	2005/06	17,248,607	7,258,490	2,035,995	26,543,092	1,894,608	16.63
		2006/07	18,265,400	6,070,811	3,178,137	27,514,348	1,897,047	16.30
		2007/08	28,932,979	4,687,754	2,368,757	35,989,490	2,134,699	17.95
		2008/09	18,150,270	6,416,269	2,349,059	26,915,599	1,870,402	15.19
50510	East Metropolitan	2005/06	18,692,695	4,243,287	3,647,112	26,583,094	1,758,871	8.53
		2006/07	19,905,179	4,047,972	3,432,631	27,385,782	1,730,017	8.19
		2007/08	30,977,368	4,615,083	4,054,507	39,646,958	2,380,088	10.99
		2008/09	20,724,211	5,512,715	3,935,032	30,171,958	2,019,055	9.02
50515	North Metropolitan	2005/06	29,365,073	7,994,220	4,961,644	42,320,937	2,856,734	7.74
		2006/07	30,752,196	8,928,726	5,386,876	45,067,798	3,026,932	7.95
		2007/08	60,269,880	7,787,075	4,653,816	72,710,771	4,201,931	10.73
		2008/09	37,032,674	12,551,909	6,799,177	56,383,759	3,937,121	9.70
50520	South West Metropolitan	2005/06	23,889,339	7,280,395	4,543,175	35,712,909	2,468,477	9.56
		2006/07	26,378,785	7,068,077	5,138,986	38,585,848	2,568,979	9.65
		2007/08	40,947,881	8,515,527	4,346,084	53,809,492	3,354,285	12.26
		2008/09	28,756,693	9,180,629	5,872,010	43,809,332	3,045,848	10.73
50525	South East Metropolitan	2005/06	25,285,454	7,121,300	4,888,628	37,295,382	2,545,291	9.05
		2006/07	26,628,132	7,547,412	5,700,917	39,876,461	2,697,521	9.36
		2007/08	31,831,646	4,916,426	5,256,687	42,004,759	2,575,784	8.68
		2008/09	28,584,766	7,782,109	5,445,905	41,812,779	2,819,128	9.14
51001	Mandurah	2005/06	7,403,499	1,598,272	1,241,463	10,243,234	658,586	11.25
		2006/07	7,472,082	1,625,707	1,364,667	10,462,456	660,975	10.84
		2007/08	10,180,296	1,648,656	1,421,490	13,250,442	796,299	12.38
		2008/09	9,015,162	2,269,713	1,582,181	12,867,056	837,867	12.32

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SSD code	SSD name	Year	All beer	All wine	All spirits	All alcohol	All pure alcohol	pcc/ERP
51003	Bunbury	2005/06	6,230,267	990,367	1,279,093	8,499,727	540,164	11.70
		2006/07	6,199,175	1,255,455	1,681,833	9,136,463	600,674	12.46
		2007/08	7,568,656	1,223,668	1,205,603	9,997,927	610,293	12.13
		2008/09	6,614,537	1,313,645	1,219,473	9,147,655	584,042	11.14
51010	Preston	2005/06	4,288,249	481,717	782,515	5,552,481	336,787	12.60
		2006/07	3,394,334	417,386	487,377	4,299,097	248,589	9.15
		2007/08	4,843,193	409,127	495,062	5,747,382	313,838	11.28
		2008/09	3,826,009	505,572	752,240	5,083,821	310,244	10.73
51015	Vasse	2005/06	4,286,815	1,469,871	925,286	6,681,972	476,061	15.87
		2006/07	4,609,592	1,204,809	1,038,667	6,853,068	463,585	14.87
		2007/08	5,468,754	824,968	556,188	6,849,910	407,722	12.59
		2008/09	5,176,074	1,390,120	843,114	7,409,308	497,317	14.69
51020	Blackwood	2005/06	1,213,283	231,718	302,382	1,747,383	115,771	8.81
		2006/07	1,218,419	224,291	239,624	1,682,334	105,647	7.91
		2007/08	1,172,152	132,114	81,587	1,385,853	75,544	5.54
		2008/09	1,667,206	351,706	278,614	2,297,526	146,393	10.49
51505	Pallinup	2005/06	1,549,939	169,624	296,778	2,016,341	123,418	14.09
		2006/07	1,253,409	148,293	270,096	1,671,798	101,571	11.68
		2007/08	1,581,389	145,028	207,471	1,933,888	109,005	12.46
		2008/09	1,339,734	154,029	206,791	1,700,553	100,784	11.21
51510	King	2005/06	3,409,659	1,138,254	930,163	5,478,076	394,550	11.22
		2006/07	3,501,588	1,009,226	987,792	5,498,606	381,011	10.61
		2007/08	5,305,570	885,786	765,778	6,957,134	426,919	11.58
		2008/09	3,967,696	1,043,498	765,391	5,776,584	385,670	10.16

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SSD code	SSD name	Year	All beer	All wine	All spirits	All alcohol	All pure alcohol	pcc/ERP
52005	Hotham	2005/06	1,865,509	141,939	223,318	2,230,766	127,260	11.60
		2006/07	3,162,542	253,145	295,480	3,711,167	204,354	18.39
		2007/08	1,438,353	647,762	271,385	2,357,500	171,072	15.27
		2008/09	2,357,104	212,255	238,004	2,807,363	158,818	13.95
52010	Lakes	2005/06	1,227,244	68,923	198,092	1,494,259	86,521	23.74
		2006/07	768,439	51,626	105,158	925,223	50,884	14.13
		2007/08	1,330,301	49,514	94,891	1,474,706	75,465	21.01
		2008/09	585,849	51,250	160,016	797,115	49,515	13.55
52505	Moore	2005/06	1,903,034	213,163	391,801	2,507,998	153,934	13.20
		2006/07	1,863,514	332,467	339,238	2,535,219	155,914	13.07
		2007/08	1,825,863	116,814	222,467	2,165,144	116,127	9.49
		2008/09	2,068,567	350,771	358,480	2,777,817	171,318	13.48
52510	Avon	2005/06	3,478,411	530,264	669,059	4,677,734	293,611	13.23
		2006/07	2,766,474	446,972	567,541	3,780,987	231,796	10.31
		2007/08	3,322,239	293,414	309,085	3,924,738	211,009	9.21
		2008/09	2,730,065	463,487	417,785	3,611,337	219,242	9.33
52515	Campion	2005/06	2,121,959	171,462	323,709	2,617,130	151,969	19.02
		2006/07	1,286,476	164,111	212,274	1,662,861	96,788	11.98
		2007/08	2,236,742	113,975	153,428	2,504,145	127,827	15.86
		2008/09	1,108,822	131,652	138,534	1,379,009	79,415	9.81
53001	Kalgoorlie/Boulder City Part A	2005/06	5,283,787	654,274	646,879	6,584,940	386,608	17.01
		2006/07	5,478,822	651,341	970,955	7,101,118	415,038	17.86
		2007/08	7,003,119	706,377	1,219,569	8,929,065	519,521	21.83
		2008/09	5,665,201	816,165	1,021,058	7,502,423	453,949	18.64

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53005	Lefroy	2005/06	1,343,079	37,099	69,835	1,450,013	75,418	12.24
		2006/07	571,906	85,588	137,320	794,814	50,195	7.88
		2007/08	626,624	10,452	14,214	651,290	30,854	4.78
		2008/09	801,700	85,902	169,005	1,056,607	64,041	9.84
53010	Johnston	2005/06	2,381,306	378,440	495,627	3,255,373	207,386	15.88
		2006/07	2,564,401	404,704	507,046	3,476,151	213,623	15.67
		2007/08	2,776,545	382,061	485,153	3,643,759	218,655	15.56
		2008/09	2,390,902	420,676	418,850	3,230,428	200,897	14.24
53503	Geraldton	2005/06	4,617,263	1,086,851	864,328	6,568,442	433,696	16.83
		2006/07	4,420,101	819,332	914,844	6,154,277	384,754	14.53
		2007/08	7,339,747	1,023,493	802,068	9,165,308	531,486	19.53
		2008/09	4,965,502	954,794	780,974	6,701,270	416,357	14.88
53505	Gascoyne	2005/06	2,509,911	428,969	489,716	3,428,596	217,794	29.51
		2006/07	2,514,026	439,439	431,294	3,384,759	206,525	27.86
		2007/08	3,004,602	266,005	254,444	3,525,051	188,999	25.10
		2008/09	2,413,646	501,072	349,442	3,264,160	203,245	26.25
53510	Carnegie	2005/06	1,397,438	123,963	221,776	1,743,177	102,979	36.39
		2006/07	895,929	102,775	151,488	1,150,192	68,063	24.28
		2007/08	1,365,392	49,914	133,289	1,548,595	80,128	28.83
		2008/09	742,217	56,851	108,939	908,007	51,628	18.16
53515	Greenough River	2005/06	2,975,188	365,517	479,245	3,819,951	231,087	20.20
		2006/07	2,099,985	304,800	364,796	2,769,580	165,172	14.33
		2007/08	3,192,533	218,305	215,176	3,626,015	188,474	16.14
		2008/09	2,189,443	329,155	264,788	2,783,387	163,550	13.73

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SSD code	SSD name	Year	All beer	All wine	All spirits	All alcohol	All pure alcohol	pcc/ERP
54005	De Grey	2005/06	4,316,558	351,769	885,187	5,553,514	335,010	22.23
		2006/07	4,335,420	333,957	828,163	5,497,540	315,905	20.40
		2007/08	5,759,766	351,009	909,296	7,020,071	391,159	24.48
		2008/09	5,008,800	381,559	796,558	6,186,917	352,190	20.94
54010	Fortescue	2005/06	1,677,077	594,135	950,394	3,221,606	246,458	13.73
		2006/07	4,970,823	591,263	1,123,433	6,685,519	408,080	22.14
		2007/08	6,815,362	521,791	1,013,243	8,350,396	471,877	25.37
		2008/09	6,251,309	694,781	1,175,913	8,122,003	488,649	25.73
54505	Ord	2005/06	2,435,159	210,364	242,366	2,887,889	161,642	21.34
		2006/07	2,365,639	278,213	250,055	2,893,907	163,884	20.85
		2007/08	2,420,616	279,928	256,277	2,956,821	167,330	20.58
		2008/09	2,642,344	232,364	257,329	3,132,038	172,026	20.67
54510	Fitzroy	2005/06	5,288,575	704,337	872,040	6,864,952	417,250	25.98
		2006/07	5,144,392	676,047	821,119	6,641,558	392,782	23.12
		2007/08	6,741,933	653,520	606,178	8,001,631	436,109	24.93
		2008/09	5,425,776	966,075	850,692	7,242,543	446,391	24.75
<b>Western Australia totals</b>		<b>2005/06</b>	<b>187,684,377</b>	<b>46,038,984</b>	<b>33,857,607</b>	<b>267,580,968</b>	<b>17,797,940</b>	<b>10.79</b>
<b>Western Australia totals</b>		<b>2006/07</b>	<b>194,787,180</b>	<b>45,483,945</b>	<b>36,927,807</b>	<b>277,198,931</b>	<b>18,006,305</b>	<b>10.62</b>
<b>Western Australia totals</b>		<b>2007/08</b>	<b>286,279,501</b>	<b>41,475,546</b>	<b>32,373,194</b>	<b>360,128,241</b>	<b>21,312,499</b>	<b>12.23</b>
<b>Western Australia totals</b>		<b>2008/09</b>	<b>212,202,279</b>	<b>55,120,724</b>	<b>37,555,353</b>	<b>304,878,355</b>	<b>20,245,103</b>	<b>11.21</b>

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## **DISCUSSION**

### **SUMMARY OF REGIONAL DATA**

#### **The Northern Territory**

- The estimated alcohol consumption in the Northern Territory in 2008/09 was 14.05 litres of pure alcohol per individual aged 15+, using population figures which included tourists. This was higher than the national average, but a reduction from each of the preceding three years, including a 4.3% reduction from 2007/08.
- Overall, less pure alcohol was sold in 2008/09 than in 2007/08, but more than in the preceding years. The reduction in *per capita* consumption across the period was thus related to relatively higher growth in the population. Pure alcohol sales generally decreased across the period in Alice Springs, Katherine and Nhulunbuy.
- Between 2007/08 and 2008/09 there was an increase of almost 5% in beer sales and almost 36% in cider sales across the Northern Territory, but a decrease of approximately 13% in sales of wine and approximately 23% in sales of spirits. Further analysis revealed that sales of standard spirits rose by approximately 15%, but sales of pre-mixed spirits (RTDs) decreased by approximately 30% during the same period.
- Beer sales increased in 2008/09 in the large population centres of Darwin, Katherine and Palmerston, while wine sales decreased in the same centres. Wine sales increased in Alice Springs. Sales of cider increased in Alice Springs and Darwin, while sales of spirits decreased in Alice Springs. Trends in the smaller Urban Centres and the Remainder of the Northern Territory were not discernable.

#### **Queensland**

- The overall estimated alcohol consumption for Queensland (by ERP) for 2008/09 was 10.69 litres of pure alcohol per individual aged 15+, which was higher than the national average but lower than in Queensland in 2007/08, and lower than in the Northern Territory and Western Australia in 2008/09.
- There were, however, regions of higher alcohol consumption particularly in the Brisbane area, the Gold and Sunshine Coasts, some northern coastal cities and the North-West. The inner Brisbane area had particularly high alcohol consumption, which was probably due

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to a combination of relatively low resident populations, its status as an entertainment area and alcohol sales to city workers. Some of the other regions with higher alcohol consumption such as northern coastal cities may also have relatively high levels of tourism.

- Across the state, sales of pure alcohol were marginally down in 2008/09 compared to the previous year, and the largest amounts of alcohol were generally sold on the eastern seaboard although these did not necessarily translate into high *per capita* consumption.
- Queensland beer sales increased by approximately 19% and sales of ‘other’ beverages (which include cider and alcoholic sodas) increased by just over 11% between the two years. On the other hand, wine sales fell by approximately 14% and spirits sales by approximately 25%. Further analysis revealed that sales of standard spirits increased by almost 11% while sales of pre-mixed spirits (RTDs) decreased by approximately 35%.
- In terms of the different *per capita* consumption estimates (based on ERP, EEP and ESP), overall there was little difference. For Queensland as a whole, EEP returned the most conservative consumption figure at 10.80 litres of pure alcohol, with ESP at 10.70 and ERP at 10.69 litres. Of the 36 SSDs, there were just seven with differences between ERP/pcc and ESP/pcc of greater than 5% (in every case ERP/pcc > ESP/pcc). The largest difference was in the North West (approximately 12%), followed by Inner Brisbane (approximately 11%), Mackay SD Bal (approximately 11%), Central West (approximately 10%), Gold Coast East (approximately 10%), Cairns (approximately 10%), and Far North SD Bal (approximately 7%). It seems likely that in these regions, the failure to account for tourists and other non-residents inflated *per capita* consumption based on ERP.

### **Western Australia**

- The overall estimated alcohol consumption for Western Australia (by ERP) for 2008/09 was 11.21 litres of pure alcohol per individual aged 15+, which was lower than Western Australia in 2007/08, the year with the highest consumption across the four years of study.
- Alcohol consumption in 2008/09 was at its lowest across the four years in several SSDs including Central Metropolitan, Bunbury, King and Carnegie. Particularly large falls in consumption across the period can be seen in Lakes and Campion.

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- In 2008/09 pure alcohol consumption more than 3 litres above the state average was found in Central Metropolitan, Vasse, Kalgoorlie/Boulder, Johnston, Geraldton, Gascoyne, Carnegie, De Grey, Fortescue, Ord and Fitzroy.
- Between 2007/08 and 2008/09, Western Australian pure alcohol sales decreased by 5%. Beer sales reduced by almost 26%, wine sales increased by almost 33% and spirit sales increased by 16%. It should be noted that Western Australian data do not separate regular and pre-mixed spirits, and do not include sales of cider and other alcoholic beverages.
- Regionally, there was a trend for beer sales to decrease and wine sales to increase in metropolitan SSDs.
- In terms of the different *per capita* consumption estimates, differences between estimates for the state as a whole were relatively small: EEP/pcc was the most conservative at 11.67 litres of absolute alcohol, with ESP/pcc of 11.56 and ERP/pcc of 11.21 litres.
- There were different patterns of *per capita* consumption variation to those found in Queensland. In Western Australia there were seven SSDs with differences between ERP/pcc and ESP/pcc ranging from 13% to 42%, where ESP/pcc was the lower estimate: Gascoyne, Carnegie, Ord, Fitzroy, Lefroy, De Grey, and Fortescue. These seven regions tended to be outback SSDs with small populations and large population variation relating primarily to occupations such as mining.
- There were also 12 SSDs, mainly in the South West, with differences between ERP/pcc and ESP/pcc of 5 to 10%, where ESP/pcc was the larger: North Metropolitan, South West Metropolitan, East Metropolitan, Mandurah, Bunbury, Preston, Palinup, King, Hotham, Lakes, Avon and Geraldton. These were regions with larger populations and the difference between the two estimates were far lower than in the first group.

### **CHANGES IN BEVERAGE CONSUMPTION AND CHOICE**

As noted above, in 2008 the Commonwealth increased the excise on so-called ‘alcopops’ or RTDs to reduce excessive consumption of alcohol by young people. Evidence clearly shows that the tax decreased consumption of alcopops to such an extent that overall consumption of alcohol in Australia decreased for the first time in 4 years (Chikritzhs, et al., 2009; Hall & Chikritzhs, 2010). There may also be an increase in the consumption of cider, perhaps as one



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response to the alcopops tax. Some of these issues are amenable to investigation with the NASDP data.

Changes to volumes of sales of different alcoholic beverages between 2007/08 and 2008/09 can be seen in Table 10.

**Table 10** Changes in volumes of sales of different alcohol beverages, 2007/08 to 2008/09

Beverage	Jurisdiction	Direction of change	per cent difference
Beer	NT	up	5
	Qld	up	19
	WA	down	26
Wine	NT	down	13
	Qld	down	14
	WA	up	33
Spirits	NT	down	23
	Qld	down	14
	WA	up	16
Cider	NT	up	36
	Qld <sup>1</sup>	up	11

<sup>1</sup>.In Queensland the category includes alcoholic sodas and cider.

Table 10 shows that the Northern Territory and Queensland were similar in the direction, and in some cases the extent, of differences in the sales of different beverages types. In both of these jurisdictions, beer and cider sales increased, and wine and spirit sales decreased over the period. Western Australia had opposite trends, with beer sales decreasing and wine and spirits sales increasing.

Spirits were further categorised as ‘standard’ (or regular) and ‘pre-mixed’ (or RTD) in the Northern Territory and Queensland. In both jurisdictions sales of standard spirits rose (between 11 and 15%) while sales of RTDs decreased (by 30 – 35%). This seems to endorse the finding that the alcopops tax has had a beneficial effect on the consumption of RTDs, which is only partly compensated for by increases in sales of regular spirits. The rise in the consumption of cider in these two jurisdictions may also be related to shifts away from RTD consumption.

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## **REFINING THE NASDP METHODS**

### **Trial of population estimates**

In this Stage of the NASDP, we have estimated a state and SSD-based service population which takes into account absent residents, Australian visitors and international visitors. This is the first time that such an estimate has been developed for regional areas—previously it had only been undertaken at state level. We were able to undertake this analysis in only two states—Western Australia and Queensland—so our conclusions must be seen as preliminary. Hopefully we will be able to confirm these findings with these and additional jurisdictions in later Stages of the NASDP.

At a state level, the differences found in the NASDP between *per capita* consumption based on ERP and ESP<sup>16</sup> were negligible: 0.01 litres of absolute alcohol in Queensland and 0.35 litres in Western Australia. This concurs with the work of Farah et al. (2007) who investigated four different estimation methods and concluded that at the state level there were no significant differences in population estimates for Western Australia.

At a regional level, however, some important differences emerged. In Queensland there were seven SSDs with a greater than 5% difference between ERP/pcc and ESP/pcc, where ESP/pcc was lower. Most of these regions appeared to have significant tourist populations. In Western Australia there were seven SSDs with large ERP/pcc versus ESP/pcc differences (up to 42%), where ESP/pcc was lower and the population appeared to be variable, perhaps in response to occupational demands such as mining. There were another 12 SSDs with smaller differences in the opposite direction which appeared to counter the first group. Here the differences are less explicable but may relate to a high absentee rate with residents going overseas in the winter.

These differences suggest that ESP is a useful estimate for calculating *per capita* consumption at a regional level, as it takes into account variable and mobile populations. Our Northern Territory estimations of *per capita* consumption across 4 years, comparing populations including and not including tourists (Appendix III) also show that the inclusion of tourists can produce substantially lower consumption estimates.

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<sup>16</sup> EEP should be seen as a control group and as such has not been reported

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The calculation of a service population estimate is not a negligible task and adequate resources would be needed for the NASDP to continue to do this for as many jurisdictions as possible in future years. Nevertheless, we believe that for some regions the ESP *per capita* consumption is a more accurate estimate than *per capita* consumption based on ERP, and we recommend its continued use in the NASDP where feasible.

**Future developments in the NASDP**

We anticipate that more jurisdictions will commence alcohol sales data collections and will make their data available to the NASDP. The ACT has recently introduced new liquor laws (Liquor Act and Liquor Regulation 2010) which require liquor licensees to provide (not later than one month after the end of each financial year) to the ACT Chief Health Officer information about the volume in litres of various liquor purchased for sale for the previous financial year. This will take effect on 1 July 2012.

We look forward to welcoming the ACT, and any other jurisdiction who has a sales data collection, to the NASDP and we trust that the present report and the report that preceded it (Loxley, *et al.*, 2010), will demonstrate to them the policy and practice value of alcohol sales data analysis.

We also wish to thank the three jurisdictions who have been with us for a further year, for their data, for their forbearance and for their willingness to work with us to obtain the best possible data for analysis.

The analysis of changes in beverage type distribution presented above, is testament to the value of detail in the datasets. In general, we would encourage those responsible for data collection to pursue the greatest level of detail than can be managed, so that fine-grained analysis which facilitates interpretation of changes in consumption can be undertaken.

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**APPENDIX I INTERIM REPORT SEPTEMBER 2010**

In response to a 2007 Ministerial Council on Drug Strategy resolution highlighting the absence of systematic and standardised Australia-wide alcohol sales data collection, the Commonwealth Australian Government's Department of Health and Ageing funded the Drug and Alcohol Office of WA (DAO) and the National Drug Research Institute at Curtin University (NDRI) to develop the National Alcohol Sales Data Project (NASDP).

The NASDP is now in its second year of funding with contracts signed between the Australian Government Department of Health and Ageing (DoHA) and DAO; and between DAO and NDRI.

**RE- ESTABLISHMENT OF THE ADVISORY COMMITTEE (AC)**

In 2009 an Advisory Committee (AC) consisting of senior representatives of Liquor Licensing (LL), Health and Police in every Australian jurisdiction and the Australian Government Department of Health and Ageing was established. The AC aims to:

- provide guidance and advice and oversee the use of sales data;
- communicate representatives' interests and requirements regarding sales data;
- provide comment and suggestions on report draft annual reports; and
- support the aims and ongoing functions of the project.

Meetings provide an opportunity for AC representatives to discuss any data collection issues that may arise and to provide feedback on draft reports. Meetings are held via group teleconference twice a year. All jurisdictions are represented, although not necessarily with representatives from all three areas.

AC members were contacted in 2010 to ascertain whether they would be able to continue representing their agency on NASDP and if not, to suggest alternative representation.

**ADVISORY COMMITTEE TELECONFERENCE SEPTEMBER 7 2010**

All jurisdictions were represented at this teleconference.

**Agenda**

1. Progress with 2009 NASDP report
2. Discussion of issues relating to service populations

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3. Availability of data for 2010
4. Reports from states and territories
5. Next steps
6. Any other business

**Summary of discussion**

**Refinement of population estimates for alcohol consumption calculations.**

The NASDP will trial three different population estimates in the calculation of alcohol consumption in 2010. This will be undertaken in order to move towards our objective of estimating the average amount of alcohol consumed by individuals in a particular population at a particular time as accurately as possible. Population estimates are based on Census figures and not all estimates include all those who are consuming alcohol at a specific place and point in time (e.g. tourists) or exclude those who are not consuming alcohol (e.g. during absence from residence). The three estimates to be trialled by NASDP during 2010 are:

- the Australian Bureau of Statistics (ABS) Estimated Resident Population (ERP) as used by NASDP in 2009;
- the ABS Enumerated Population (Census count); and
- a derived Estimated Service Population (ESP) calculated for NASDP which includes tourists and excludes residents who are away from home.

It should be noted that this approach has not previously been used in Australian regions smaller than jurisdictions.

At the end of the trial, we will compare estimates to determine potential upper and lower ranges in estimated pcc and to make recommendations regarding the feasibility and reliability of denominator options at a regional level.

**Value of 2009 NASDP data and report**

Members of the AC demonstrated that the NASDP calculations and mapping of regional alcohol consumption in 2009 had been valuable to various state and commonwealth agencies including Liquor Licensing, Police and Health.

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**Relevant activity in jurisdictions**

The Allen Consulting Group is finalising its report to the Victorian government on the costs, benefits and limitations of the collection of alcohol sales data in Victoria. NASDP will be kept informed of subsequent decisions.

The (ACT) Legislative Assembly have passed the 2010 Liquor Act which will include a requirement to report wholesale alcohol sales data.

The Queensland 08/09 sales data is ready for analysis and will be forwarded to the NDRI, and 09/10 data is being collected.

South Australia is currently undergoing a review of the Liquor Licensing Act 1997 and the Code of Practice.

**FUTURE NASDP ACTIVITIES IN 2010**

- Methods to establish three population estimates for the calculation of per capita consumption (pcc) will be finalised.
- Alcohol conversion factors used in 2009 will be reviewed and updated where necessary.
- Per capita consumption analysis of data sets with geophysical mapping of regional pcc will be undertaken.
- The annual report on activities and data outcomes will be prepared, and a draft circulated to all NASDP participants for comment.
- A teleconference will be held with the AC to discuss the draft report and NASDP progress.
- The annual report will be completed and distributed.



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**APPENDIX II ADJUSTING FOR BOUNDARY CHANGES BETWEEN  
2006 AND 2009**

These changes were identified in comparing 2006 and 2009 ERP and matching to the 2009 boundaries as described in Ewing (2009).

**Queensland**

<b>Region</b>	<b>Boundary change</b>	<b><i>NASDP adjustment</i></b>
Beaudesert Shire Pt A	Part to Logan (C) and part to Lower West Moreton SSD	<i>Attribute all to Logan (C) which is in Logan City SSD</i>
Gold Coast North	Part to Logan (C) and part to Gold Coast West	<i>Attribute all to Logan (C) which is in Logan City SSD</i>
Upper West Moreton		<i>Renamed Somerset</i>

Other changes between 2006 and 2009 due to adjustment of boundaries occur, but most are part allocations and do not affect straight allocation on SSD name. Caboolture, Central West, North West and Upper West Moreton SSDs may be affected.

More significant changes:

- Gold Coast West – enlarged to include parts of Gold Coast North – no adjustment done
- Gold Coast SD Balance – in 2008 significant component added to Lower West Moreton
- Lower West Moreton – as above – no adjustment done

**Western Australia**

No boundary changes were evident in data comparison but note that recorded boundary changes may affect Avon, Central Metropolitan, East Metropolitan, South East Metropolitan and South West Metropolitan SSDs.

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**APPENDIX 1III ESTIMATES OF NORTHERN TERRITORY PER  
CAPITA CONSUMPTION EXCLUDING CONSUMPTION BY  
TOURISTS**

As we did in Stage 1, we have presented consumption estimates for the Northern Territory using ERP which is not adjusted for tourism, so that direct comparisons can be made with the similar Northern Territory estimates in previous years, and also with Queensland and Western Australia (ERP/pcc estimates).

Table 11 shows that the Northern Territory consumption figure which included tourists was 13.7% lower than the non-tourist figure which is similar to the differences found in the preceding years.

Given our recommendation above that a consumption estimate which allows for the influence of tourists is more likely to be accurate than one which does not, we recommend that readers use the Northern Territory estimates given in the main text.

**Table 11      Estimated *per capita* pure alcohol consumption, Northern Territory  
2005/06 – 2008/09**

	<b>Total pure alcohol (litres)</b>	<b>ERP aged 15+</b>	<b>NT <i>pcc</i> 1<sup>1</sup></b>	<b>ERP aged 15+ and tourism</b>	<b>NT <i>pcc</i> 2<sup>2</sup></b>	<b>National <i>pcc</i> 3<sup>3</sup></b>
<b>2005/06</b>	2,697,439	157,030	17.18	179,376	15.04	9.84
<b>2006/07</b>	2,699,393	161,034	16.76	187,194	14.42	10.40
<b>2007/08</b>	2,748,884	165,243	16.64	187,217	14.68	10.32
<b>2008/09</b>	2,719,986	170,263	15.98	193,562	14.05	10.08

<sup>1</sup> Total pure alcohol divided by ERP aged 15+

<sup>2</sup> Total pure alcohol divided by ERP aged 15+ and estimated tourism.

<sup>3</sup> National estimate revised for 2006/07 and 2007/08. Does not include alcohol drinks other than beer, wine and spirits (Australian Bureau of Statistics, 2010b).