NZIER
NEW ZEALAND INSTITUTE OF ECONOMIC RESEARCH

The net benefits of energy labelling on alcoholic beverages

Cost benefit analysis of the impacts of mandatory labelling of energy content on alcoholic beverages

NZIER Report to Food Standards Australia New Zealand

6 February 2015

About NZIER

NZIER is a specialist consulting firm that uses applied economic research and analysis to provide a wide range of strategic advice to clients in the public and private sectors, throughout New Zealand and Australia, and further afield.

NZIER is also known for its long-established Quarterly Survey of Business Opinion and Quarterly Predictions.

Our aim is to be the premier centre of applied economic research in New Zealand. We pride ourselves on our reputation for independence and delivering quality analysis in the right form, and at the right time, for our clients. We ensure quality through teamwork on individual projects, critical review at internal seminars, and by peer review at various stages through a project by a senior staff member otherwise not involved in the project.

Each year NZIER devotes resources to undertake and make freely available economic research and thinking aimed at promoting a better understanding of New Zealand's important economic challenges.

NZIER was established in 1958.

Authorship

This paper was prepared at NZIER by Peter Clough and Chris Nixon, and reviewed by John Yeabsley.

NZIER
NEW ZEALAND INSTITUTE OF ECONOMIC RESEARCH

L13 Grant Thornton House, 215 Lambton Quay | PO Box 3479, Wellington 6140
Tel +64 4 472 1880 | econ@nzier.org.nz

Key points

This report assesses the costs and benefits across both Australia and New Zealand of requiring energy (kilojoule) content on the label of packaged alcoholic beverages for retail sale. The potential impacts are examined at an aggregate population level, as disaggregation to different age groups or types of drinkers is not feasible, given the information available and what scientific literature says about alcohol and bodyweight.

Alcoholic beverages contribute to an individual's dietary energy intake, through both the energy content of alcohol (i.e. pure alcohol, ethanol) and of other nutrients that contribute to energy content, like carbohydrates. However, the relationship between alcohol consumption and weight gain is not clearly predictable due to other confounding factors.

Internationally there is currently very little mandatory energy labelling on alcoholic beverages so there is little prior experience of how effective it might be. Studies of nutritional and energy labelling on other food products show it is more effective at raising awareness than changing dietary behaviour.

Both Australia and New Zealand have experienced increase in average body weights in recent years, and now both have more than 60% of their adult populations in the overweight or obese categories. In both countries the volume of alcohol consumed per capita has been in long term decline since peaks in the late 1970s, but there has been some shift recently towards drinking more beverages with higher alcohol content (wines and spirit-based drinks). Alcohol provides between 0-6.6% of average dietary energy intake for adult populations[1].

This report provides estimates of energy labelling implementation costs for comparison with benefits. It uses a break-even approach to estimate the magnitude of benefits required to offset the costs of requiring energy labelling on packaged alcoholic beverages. The analysis draws on a literature review, interviews with a selection of interested parties, and a variety of information on alcohol consumption, labelling and weight management to examine how energy labelling may affect people's consumption choices and how many obese people would need to achieve healthier weight to achieve health savings sufficient to justify the costs of implementing labelling.

Costs are dominated by compliance costs for Australian and New Zealand businesses. The key dynamics driving these costs are the number of a business's stock keeping units requiring labelling, and the necessity and frequency of testing products to determine energy content which may vary across batches. Based on the costing data provided by industry, the present value cost of implementing energy labelling on packaged alcoholic beverages over 10 years[2] is about A$537 million across both countries in the most costly scenario considered here, with about 80% of this cost occurring in Australia. This figure may be much lower if appropriate steps are taken to optimise regulatory design and its implementation schedule. In the least costly scenario examined here the present value costs over 10 years are A$71 million.

[1] Drawn from latest figures for Australia, 2011-12, and New Zealand 2008-09

[2] The Office of Best Practice Regulation's recommended discount rate of 7% was used.

Regulators' administration costs are small by comparison and the labelling is unlikely to result in significant costs across the economies.

The potential benefits of energy labelling fall into three main categories:

- Avoided long term financial costs of overweight and obesity, due to change in consumption behaviour attributable to energy content labelling
- Welfare benefit of reducing the risk of pain, suffering and premature death from health conditions associated with overweight and obesity
- Welfare benefit of consumers being better informed, irrespective of any tangible change in behaviour or associated medical conditions.

If energy labelling improves consumers' weight management it can reduce costs of both overweight and obesity, but this report focuses on obesity alone for which better cost estimates are available. Australian estimates for costs of obesity are used to assess how many people would need to move into healthier weight categories or reduce weight within categories to avoid costs sufficient to match the implementation costs of energy labelling on alcoholic beverages.

Four obesity cost measures are used in the analysis: high and low total financial costs of obesity and high and low total economic costs of obesity. Avoiding such costs is a benefit of energy labelling for weight management.

Total financial costs comprise both direct medical costs and the indirect costs of lost productivity and the deadweight costs of additional taxation. Estimates of total financial costs incurred by the community for each obese person range from a low of A$1,852 to a high of A$3,488 per year above those of healthy weight.

Total economic costs comprise total financial costs plus the human welfare costs of pain and suffering caused by obesity and raised risk of premature death. Estimates of total economic costs for each obese person range from a low of A$9,000 to a high of A$14,000 per year above those of healthy weight. The avoided high and low total financial and total economic costs represent four potential benefit outcomes.

The welfare benefit of consumers being better informed, their 'right to know', has been discussed. However this benefit has not been included in the quantitative analysis as no reliable estimates are available.

A number of labelling implementation cost scenarios have been examined to provide decision makers guidance given the uncertainty surrounding the costs used in analysis. The four implementation cost scenarios are as follows:

- 1: high up-front and high on-going costs for industry (industry estimates)
- 2: up-front costs lowered with two year transition; high on-going costs
- 3: high up-front costs but low on-going costs, assumed to be 20% of those in Scenarios 1 & 2 after removing testing and label/product write-off costs
- 4: Up-front costs eliminated with three year transition; low on-going costs as in Scenario 3.

Under each of the four obesity costs, the proportion of obese adults in Australia and New Zealand needed to shift to a healthier weight to break-even with implementation costs is provided in the table below.

Summary of estimates under varying assumptions

All values in A$ 2014 terms

	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Low financial cost/year	**$1,852**			
Reduction required per year (percentage of obese)	0.60%	0.48%	0.23%	0.09%
High financial cost/year	**$3,488**			
Reduction required per year (percentage of obese)	0.32%	0.25%	0.12%	0.05%
Low economic cost/year	**$9,000**			
Reduction required per year (percentage of obese)	0.12%	0.10%	0.05%	0.02%
High economic cost/year	**$14,000**			
Reduction required per year (percentage of obese)	0.08%	0.06%	0.03%	0.012%

Source: NZIER

At the start of 2014 there were 5.3 million obese adults in Australia and 1.1 million obese adults in New Zealand. Under the highest implementation cost Scenario 1, energy labelling of alcoholic beverages would break-even if each year the equivalent of 0.60% of the currently obese populations in Australia and New Zealand acquired healthy weight and avoided the low financial cost of obesity. Using the high economic cost as the benefit value, the proportion required to break-even would be 0.08%.

Under the lowest implementation cost Scenario 4, the corresponding break-even would occur with the equivalent of 0.09% of the currently obese population each year using the low financial cost as benefit, or 0.012% of the population using the high economic cost as benefit value.

Break-even occurs over a 10 year period so the break-even over that period may come from the same people attaining healthier weight and sustaining it over the 10 years, or it may come from different people shifting between the obese and healthier weight categories.

Improvements in individuals' body weight and reduction in medical conditions associated with obesity may be short term or long term. This analysis suggests the costs of mandatory energy labelling may be large but would be justified if a small proportion of the obese population per year attained and sustained healthy weight status. If the estimated implementation cost were halved to reduce the risk of overstatement this conclusion would still hold as the number required to break-even adjusts linearly.

There are many uncertainties around the estimates but on the evidence examined there are reasons to doubt whether the energy content labelling considered in this report would be sufficiently effective to induce the behaviour change required to produce net benefits. A critical unknown is what, if any, behavioural response towards improved consumption decisions will be prompted by the labelling in the form considered in this report. This analysis shows that the break-even number of weight improving people can be reduced by using transition periods for energy labelling to align its introduction with other changes in the labelling cycle, but optimising the options for implementation of labelling is beyond the scope of this report.

Contents

Appendices

Figures

Tables

Glossary

Body Mass Index (BMI) – a measure of relative weight based on individual's mass and height, calculated as the individual's body mass in kilograms divided by the square of their height in metres (kg/m^2)

Healthy weight – adults having a BMI between 18.5 and 25

Overweight – adults having a BMI between 25 and 30

Obesity – the result of excessive fat accumulation in the body, defined here as adults having a BMI greater than 30

Presenteeism – the practice of people attending work or school although afflicted by a condition that reduces their concentration and productivity below normal levels; an intermediate state to absenteeism, in which people withdraw their labour altogether resulting in direct productivity loss and indirect impact on their co-workers who may need to cover for their absence.

Stock Keeping Unit (SKU) – a product that is offered for sale which encompasses distinctive product attributes that differentiate it from all other products, e.g. product description, type of manufacturing, material, size, colour and packaging. For example in the case of alcoholic beverages, a wine of a particular type, of a specified vintage from a particular winery but sold in two bottle sizes would give rise to two separate SKUs, and distinct from a different wine from the same winery or the same wine type and vintage from a different winery etc.

1. Introduction and purpose

This report provides an assessment of the costs, benefits and net impacts of inclusion of energy (kilojoule) content on the label of packaged alcoholic beverages. It estimates the costs of implementing a mandatory energy labelling requirement, in particular the compliance costs for affected businesses, and also identifies the evidence on the beneficial effects of such labelling in gaining consumers' attention, changing their behaviour, and realising benefits for health and productivity. The assessment is intended to provide an understanding of where the costs and benefits fall, using an appropriate evidence base and transparent calculations, to help inform policy-makers.

The analysis uses a standard cost benefit analysis framework to examine the issue of energy labelling of alcoholic beverages. The relevant costs are the incremental changes to current labelling that need to be made, and extra costs that would be incurred after allowing for normal costs of the labelling life cycle, redesign, stock replacement and so on. The benefits come from more informed consumption decisions and changes in consumer behaviour. This analysis is informed by a review of literature on the relationships between alcohol consumption and weight management, and by canvassing industry participants and other interested parties for information on the likely effects of energy labelling.

1.1. Framing the issue in cost benefit terms

Applying a standard cost benefit analysis to the particulars of labelling alcoholic beverages with energy content involves comparing the likely outcome from a mandatory labelling intervention in both Australia and New Zealand against a counter-factual or projection of what would happen in the absence of such intervention. The critical parts of such analysis are:

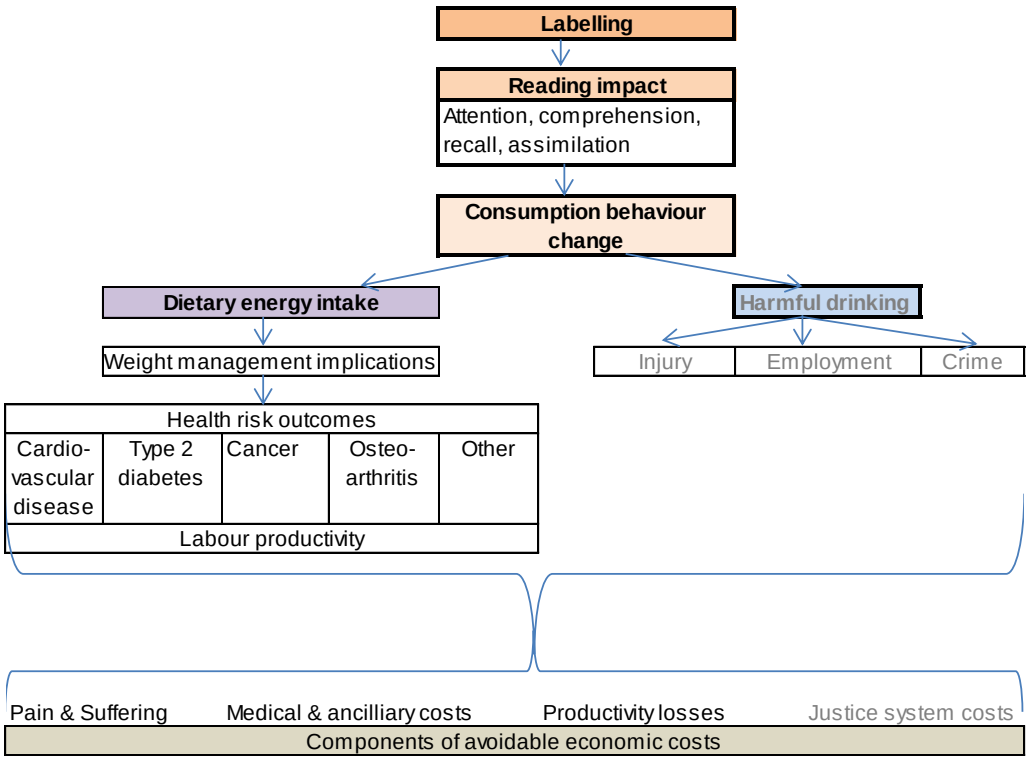
- identifying the change in activity from the intervention occurring, and distinguishing between costs and beneficial effects of such changes
- quantifying the costs and benefits and when they occur, valuing them in dollar terms where feasible
- allowing for the differences in timing of costs and benefits by converting them to present value terms through discounting
- applying sensitivity analysis to critical inputs and assumptions to test the robustness of the results.

A labelling intervention is likely to generate a number of compliance costs for affected industries and administration costs for the agencies implementing it. The benefits stem from improved information for consumers of alcoholic beverages, enabling them to make better decisions about their consumption that may contribute to improvements across the population in weight management and associated health, productivity, and general well-being.

The connection between energy labelling on alcoholic beverages and economic benefits is outlined in Figure 1 below. To effect any change from the status quo, labelling needs to have a reading impact and cause some change of behaviour, which

enables more informed consumer decisions with a positive impact on consumers' weight management and changes in risks that are associated with overweight and obesity.

Figure 1 Coverage of analysis of energy labelling of alcoholic beverages



Source: NZIER

The focus of this report is on the role of energy labelling as a tool for consumer weight management and avoidance of risks associated with overweight and obesity. There may also be effects on harmful drinking behaviour and associated economic benefits, but these are out of scope for this study and not examined further here. A brief background of the economics of obesity and public policy towards body weight management follows below.

1.1.1. The economics of body weight management

An individual's body weight rises when energy intake from food and drink exceeds the energy used in bodily activities, causing excess energy to be stored in accumulation of body fat. Average body weights have been increasing in Australia, New Zealand and most developed countries in recent decades, accompanied by

increase in risks of a number of medical conditions that are positively associated with excessive body weight.

The reasons for this increase in average body weight are difficult to pinpoint but various contributory factors are identified in scientific literature. The price of many foods has come down in real terms over the past 30 years and according to one study may have accounted for 40% of weight gain in the US population over the 1976-1994 period (Lakdawalla & Philipson 2002). Food consumption tends to be relatively unresponsive to changes in price level, as evidenced by empirical studies (Wagenaar et al 2009) and the muted effect of specific food taxes such as the recent Danish "fat tax", abolished a year after its introduction due to its unpopularity and ineffectiveness in the face of unintended consequences, such as a rise in cross-border shopping (The Economist 2012). But change in relative prices of different foodstuffs has more effect on consumption switching, and may, for instance, contribute to healthy foods being substituted by cheaper energy-rich fast foods (Crowle & Turner 2010, pp14-15).

Another part of the price of food and drink is the cost of time used in collecting, preparing and consuming food, which has reduced with the availability of pre-prepared foods. According to Cutler, Glaeser & Shapiro (2003), reduced preparation time lowered the effective price per calorie in foodstuffs by 29% between 1965 and 1995. Such lower time cost has also facilitated an increase in the variety, volume and frequency of food consumption – it is easier to "graze" in a way which enables increased cumulative consumption of food over the day, and an increase in snacking has been influential in weight gain (Cutler et al 2003).

Higher incomes raise the opportunity cost of time spent in preparation, and encourage consumption switching to pre-prepared foods. Rising incomes also enable people to spend more on food, although the income elasticity of food in general is low and rising incomes are more likely to lead to consumption of higher value foods or restaurant meals than an increase in volume of food consumed.[3] With reference to alcohol, Nelson (2013) in a meta-analysis of 182 primary studies found an income elasticity of demand of 0.6 and price elasticity of demand of -0.5, indicating the consumption of alcohol is not highly responsive to changes in incomes or prices.

Compounding these influences on food consumption, the cost of taking exercise has also increased in recent years. With greater automation in the workplace and decline in physical activity, workers get less exercise on the job than in former times, lowering the population's "background activity level" and raising the importance of individual choices in maintaining a healthy level of exercise. Rising incomes raise the opportunity cost of time spent in taking exercise, although they also increase the ability to pay for concentrated physical activity such as gym subscriptions. Increase in car ownership and changes in leisure time activity, with emergence of new sedentary pastimes based on household computers and home entertainment equipment, have also contributed to a reduction in average time spent in physical activity by individuals in developed countries (WHO 2014).

[3] An elasticity is a measure of responsiveness of demand to changes in a product's own price or the income of its consumers and estimated as the ratio in percentage changes in demand to percentage change in price or income. A low elasticity would be less than 1 with respect to incomes and less than -1 with respect to prices.

In summary, food caloric consumption has become relatively easier whereas physical exercise has become less frequent and vigorous for various reasons. The evidence on the role of alcohol consumption in this trend will be examined in section 2.

1.1.2. The public interest in individual weight management

The accumulation of body weight may be considered a private matter for the individuals concerned, but public policy interest emerges where market failures exist that make private decisions socially sub-optimal. Sources of such market failure include:

- Information failures, where incentives do not encourage provision of information to enable more socially optimal decisions e.g. where suppliers face a cost in providing information which is greater than the realisable market benefit to them from providing it
- Externalities, where effects of an activity which affect others' well-being are not taken into account by those deciding on the activity.

Aside from market failure, consumer behaviour characteristics may also be an impediment to optimal choices, such as Bounded rationality (decision-making constrained by information available, time limitations, and high transaction costs in overcoming limits); Bounded will-power (such as consumers' short term gratification outweighing the long term benefits of healthy eating); and Bounded capability in consumers' ability to interpret available information to make good decisions.

In a report on childhood obesity, Crowle and Turner (2010) argue that, in contrast to alcoholism and tobacco smoking that clearly inflict injury, property damage and exposure to second-hand smoke on other people, overweight and obesity cause few policy-relevant externalities that materially affect others' well-being. However, the overweight and obese increase demands on public health services which incur real resource costs for extra treatments of the conditions brought on by excessive weight, which leaves the collective of taxpayers less well off than if such conditions were less prevalent or less severe. These are real opportunity costs, as are losses from overweight-related days off work, which are borne at least in part as externalities by employers and fellow employees who cover others' absences.

There can be real welfare gains in reducing demand for such health care by averting the prevalence or severity of excessive weight. These costs remain relevant to public health policy but should not be double counted by confusing the real resource costs with the taxes used to fund the increased services. These matters are relevant to the costs of obesity and value of weight control considered later in this report.

1.2. Addressing weight issues through energy labelling on alcoholic beverages

If energy content labelling of alcoholic beverages can contribute towards improved weight management across the alcohol consuming population, one benefit should be reduction in the prevalence of overweight and obesity across the population, and a

reduction in associated costs across the economy. This can be compared against the cost of not doing so to assess net benefits of energy labelling.

The justification for public intervention in energy labelling of alcoholic beverages is basically one of market failure, in information provision or some other aspect of market supply. Mandatory energy labelling would be economically worthwhile if it resulted in benefits of greater value than costs. Costs arise from administrative activities of agencies overseeing and enforcing the labelling requirement, compliance activities of businesses in meeting the requirement, and also from any resource allocations caused by the existence of the requirement. Benefits could arise from demonstrable change in alcohol consumption resulting in reduced incidence of weight-related costs. There could also be a benefit even without any obvious behavioural change arising from the welfare gain of improved consumer information. There could be further benefits associated with changes in alcohol consumption patterns (such as reduction in harmful drinking), but these are incidental and out of scope for the purposes of this report.

The approach and sources used in comparing these costs and benefits are summarised in Figure 2.

Figure 2 Summary outline of method used

		Yr 1…n	Sources
Population			
Share of population with weight-related issues			Official statistics
Burden of weight-related issues on community			Official statistics
Consumption per capita			
	Beer		Official statistics
	Wine		Official statistics
	Spirits		Official statistics
	Total		Official statistics
Labelling effectiveness			
Volume share of bar sales			Consultation
Share of sales ex container			Consultation
Market reach of labels			Consultation
Consumer responses			
No change			
Moderation change	Drink less		International literature & local consultation
	Switch to low energy drinks		International literature & local consultation
Exacerbation change	Reduce food intake to make way for alcohol		International literature & local consultation
Benefits			
Benefit of being better informed (right to know)			International and domestic literature
Behavioural change in alcohol energy intake			Estimated
Reduced incidence of weight related costs			International literature & local consultation
Other effects of reduced alcohol intake			International literature & local consultation
	Combined total		
Costs			
Regulatory Adminstration costs	Policy design		Consultation
	Advice/promotion		Consultation
	Monitoring		Consultation
	Enforcement		Consultation
Business compliance costs	One-off costs		Prior literature and consultation
	Recurring costs		Prior literature and consultation
	Stock turnover		Prior literature and consultation
	Importer costs		Consultation
Allocative costs	Net trade impacts		International literature & local consultation
	Combined total		
Net Benefits			Estimated

Source: NZIER

2. Alcohol's contribution to nutritional energy intake

2.1. Consumption patterns in Australia and New Zealand

According to the report on Nutrient Reference Values for Australia and New Zealand including Recommended Dietary Intakes (NHMRC & MOH 2006), the typical Australian or New Zealand diet obtains between 0 and about 6% of its energy intake from alcohol. For instance in Australia, the 2011-12 National Nutrition and Physical Activity component of the Australian Health Survey (ABS 2014) shows that across all adult populations, alcohol's mean percentage share of total energy intake was 4.3%, compared to 43.5% from carbohydrate, 30.9% from fat and 18.4% from protein and 2.2% from dietary fibre (Table 1 below). The percentage obtained from alcohol was slightly higher for men (5.1%) than for women (3.5%). It peaked for both sexes in the 51-70 age band (6.6% for males, 4.7% for females) but was substantially lower in the young age groups of 14-18 years (0.5% males, 0.1% females) and 19-30 years (3.5% males, 2.1% females), coinciding with maximum total energy intake in these stages of the life cycle.

Table 1 also shows total energy intake peaks for 19-30 year old males and for 14-18 year old females and declines in successive age bands.

Table 1 Alcohol and total energy intake in Australia

Mean contribution of alcohol to total energy intake by age group in 2011-2012

Age band	**19 & over**	***14-18***	***19-30***	***31-50***	***51-70***	***71 & over***
All people						
Total energy kJ/day	**8,671.7**	9,158.6	9,465.5	8,871.9	8,289.6	8,295.2
Alcohol kJ/day	**372.9**	27.5	265.0	381.5	464.2	331.8
Alcohol %	**4.3%**	0.3%	2.8%	4.3%	5.6%	4.0%
Males						
Total energy kJ/day	**9,954.5**	10,186.0	11,003.7	10,219.9	9,344.7	8,174.0
Alcohol kJ/day	**507.7**	50.9	385.1	511.0	616.8	408.7
Alcohol %	**5.1%**	0.5%	3.5%	5.0%	6.6%	5.0%
Females						
Total energy kJ/day	**7,420.3**	8,114.3	7,863.1	7,539.6	7,268.1	6,569.9
Alcohol kJ/day	**259.7**	8.1	165.1	271.4	341.6	210.2
Alcohol %	**3.5%**	0.1%	2.1%	3.6%	4.7%	3.2%

Source: ABS Australian Health Survey 2014

The corresponding breakdown for New Zealand is presented in Table 2 from its 2008-09 National Nutrition Survey for people aged 15 years and over (University of Otago & Ministry of Health 2011). These figures show New Zealand has slightly higher total

energy intake and a higher share of alcohol energy intake in most age bands than Australia, but the survey figures refer to an earlier year than for Australia, and there are differences in estimation process and some age categories that make the figures not strictly comparable with those in Table 1. Peak energy intake from alcohol, in both absolute levels and share of total energy, is in the 19-30 year age group other than for males for whom the share (but not the level) peaks in the 51-70 age group.

Table 2 Alcohol and total energy intake in New Zealand

Mean contribution of alcohol to total energy intake by age group in 2008-09

Age band	**19 & over**	***15-18***	***19-30***	***31-50***	***51-70***	***71 & over***
All people						
Total energy kJ/day	**8,985.5**	9,576.5	10,207.0	9,633.8	8,265.0	6,984.7
Alcohol kJ/day	**472.9**	231.8	566.7	520.3	430.6	295.6
Alcohol %	**5.3%**	2.4%	5.6%	5.4%	5.2%	4.2%
Males						
Total energy kJ/day	**10,522.8**	11,201.0	11,940.0	11,493.0	9,371.0	8,067.0
Alcohol kJ/day	**627.5**	280.0	716.4	689.6	571.6	427.6
Alcohol %	**6.0%**	2.5%	6.0%	6.0%	6.1%	5.3%
Females						
Total energy kJ/day	**7,547.6**	7,856.0	8,426.0	7,921.0	7,205.0	6,116.0
Alcohol kJ/day	**328.3**	180.7	412.9	364.4	295.4	189.6
Alcohol %	**4.3%**	2.3%	4.9%	4.6%	4.1%	3.1%

Source: NZIER: University of Otago and Ministry of Health National Nutrition Survey 2011 data

In both Australia and New Zealand, alcohol provides a small proportion of mean total energy intake, peaking around 6% in the highest age and gender categories. If total energy intake exceeds the daily metabolic requirement as indicated in the Nutrient Reference Values (NHMRC & MOH 2006) – which it does for most age groups at sedentary Physical Activity Levels – the excess of energy intake over energy expenditure can contribute to weight gain. As alcoholic beverages are a discretionary item, the energy contributed by alcohol to total energy intake could be reduced if these beverages were not consumed (NHMRC 2013, MOH 2014).

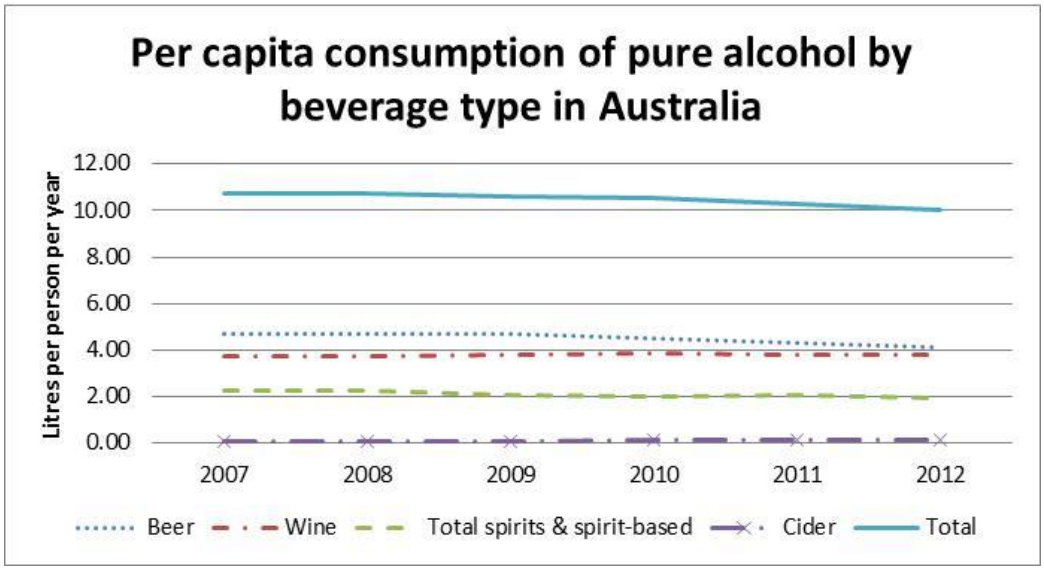
2.1.1. Alcohol demand and supply in Australia

Australian alcohol consumption peaked in the mid-1970s, and has since trended downwards, with a decline in consumption of beer but an increase in wine and a flatter trajectory in spirits-based drinks. This pattern is still apparent in recent per capita consumption, as summarised in Figure 3. In 1960 beer accounted for 76% of total alcohol consumption, but this had fallen to 42% by 2010 while wine increased from 12% to 37% over the same period (Richardson 2012). While a decline in total alcohol consumption may suggest there is no problem to address, a shift to drinks with higher alcohol density[4] may outweigh the simple volume effect, and have

[4] From ABS data, average alcohol density per litre of beverage consumed increased by 1% per year between 2007 and 2012.

disproportionate impact on some individuals that is not apparent in population averages or total figures.

Figure 3 Per capita consumption of alcohol in Australia 2007-2012



Source: NZIER, using ABS data

There have been some changes in consumption within these product categories. Light beer, which gained in popularity with tightening of drink-driving laws, has recently declined whereas mid-strength and full strength beers have had marginal growth (Richardson 2012). The fastest growing category (though from a low base) is premium beer, driven by a rise in foreign sourced beer which has also spurred production of domestic craft beers from micro-breweries across the country. This reflects a trend for consumers to drink a wider diversity of beers and to match beer flavours with particular foods and occasions. Compared with its high consumption heyday in the 1970s, beer is now a more diversified product, which implies that different beers may be somewhat less substitutable for each other than was once the case.

The price of alcoholic beverages in Australia has risen in real terms over the past 3 decades, but at less than the increase in incomes so alcoholic beverages have become relatively more affordable. Within that wine has become cheaper relative to beer or spirits, a result of differing supply conditions and market structure across the beverage types.

The beer manufacturing industry is highly concentrated in Australia, with two companies, Fosters and Lion Nathan, together enjoying about 90% market share (Richardson 2012). There is less concentration in wine suppliers, with many small producers and only about three companies just exceeding 10% market share. The market for spirits is somewhere between these two, with two companies achieving 20-30% market share each and three others with around 10% share. All the spirit companies are overseas owned and more heavily oriented to importing foreign-label beverages than the domestic production prevailing in the beer and wine sectors.

The retail duopoly formed by the Woolworths and Coles supermarket chains has had a major influence on recent availability of alcoholic beverages to a broader range of income groups, with claims that they have exercised market power and introduced their own home brands to push down the price they pay for wine (Richardson 2012). They have been less evidently successful in doing this with beer, where the concentration of manufacturers can exert some countervailing market power.

The Australian Household Expenditure Survey (AHES 2011) shows that across all households, about 38% (by value) of alcoholic beverages are purchased for consumption in licensed premises. The share by volume is lower (about 20%), because of the mark-up in beverage prices in licensed premises compared to retail sales for consumption at home. An unknown proportion of these sales in licensed premises will be sold by the glass where consumers are unlikely to see the beverage containers or their labels, and even table wine in original bottles and bottled beer will often be sold before the purchaser sees the labelling.

The AHES includes a break-down of expenditures that shows changing patterns of consumption across respondent age-categories. Across all households alcoholic beverages account for 2.6% of total weekly spending, but the highest proportion of weekly income spent on alcoholic beverages (4.2%) is in the 15-25 year age group, which also has the highest absolute value of weekly expenditure on alcoholic beverages: this value falls in each successive age group. The highest proportion of expenditure in on-licence premises is in the 25-34 and 15-24 age groups (46% and 43% respectively); the lowest proportion (30%) in the 35-44 age group, and beyond that the proportion falls successively with age group, from 38% in the 45-54 age group to 34% in the 65 and over age group.

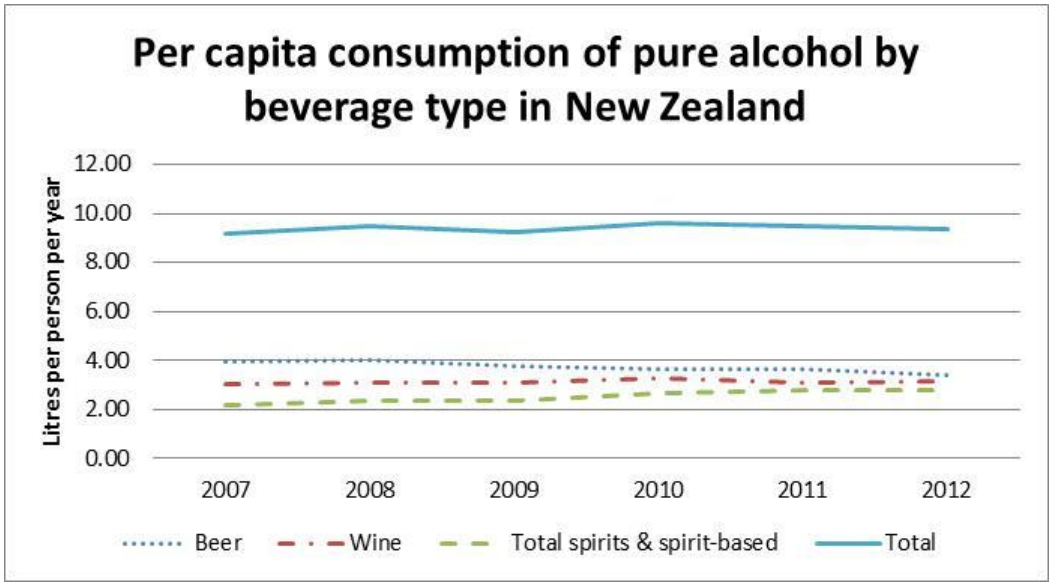
Consumption of alcoholic beverages in Australia is worth about $9.7 billion a year (Richardson 2012). It displays a strong seasonal pattern, with sharp peaks over the Christmas/New Year period, when sales are more than 80% greater than in the lowest sales month of June.

2.1.2. Alcohol demand and supply in New Zealand

Aggregate alcohol consumption in New Zealand shows similar patterns to that in Australia, with a long term decline in total alcohol consumption per capita from the 1980s but with changes in composition across the beverages. Over that period, total consumption of beer has declined, that of wine has increased, and consumption of spirits or spirit-based drinks, after a long period of stability, increased in the early 2000s driven by expansion of ready-to-drink (RTD) spirit-based beverages, before levelling out after 2008. This pattern is still apparent in recent per capita consumption, as summarised in Figure 4. Per capita consumption of pure alcohol peaked in 2010, but has since declined slightly. New Zealand has had a more marked shift than Australia to drinks with higher alcohol density[5] which creates a potential impact on individuals that may outweigh the simple volume effect.

[5] Statistics New Zealand data show average alcohol density of beverages increased by 1.7% per year between 2007 and 2012.

Figure 4 Per capita alcohol consumption in New Zealand 2007-2012



Source: NZIER from Statistics New Zealand data

Within the brewing industry there has been a similar diversification towards craft and premium beers to that which has occurred in Australia. There are now about 70 brewing operations in New Zealand, but the bulk of sales are accounted for by two major brewing groups. These two companies and a third conglomerate have acquired regional and boutique breweries to diversify their product range, which has raised the marketing of stronger craft brews. These companies also extend their product offerings with exclusive import arrangements for foreign brands of premium beer, which are either imported in final form or brewed under license within New Zealand.

As in Australia, there is much less concentration among the producers and distributors of wine in New Zealand. Wine producers are a disparate group, spanning small family operations to large-scale corporate enterprises. Large scale wine producers are typically export-oriented, selling around 80% of their product offshore, while medium scale producers in particular sell a higher proportion of their product domestically. These differences need to be considered in analysis of the impact of any regulation imposed on the New Zealand domestic wine market, as what might be small and manageable for one group of producers can have large repercussions on another. Also as in Australia a retail duopoly of super-market companies exerts market power in New Zealand and has contributed to wine and beer price rises being suppressed relative to incomes and general prices. The brewing companies do not exert much countervailing market power: supermarkets play the brewers off against each other and the companies comply with lower prices to maintain retail presence and volume sales.

The three large brewery groups also have dominant interests in import of spirits and spirit-based drinks into New Zealand. But there are also several local distillers, some of which have emerged in recent years with an export orientation.

The New Zealand Household Expenditure Survey (NZHES 2013) shows that across all households, alcoholic beverages account for about 2% of total weekly expenditure,

with about 0.8% spent on wine, 0.7% spent on beer, 0.2% on spirit-based drinks and the balance on other drinks not elsewhere classified such as ciders and alcoholic ginger beer. Between 2009/10 and 2012/13 the weekly spending on wine has been unchanged, that on spirits has declined while that on beer increased by 15%, reflecting a resurgence in consumption of a wider diversity of beers and craft brews.

In volume terms around 70% of beer sold in New Zealand is through retail outlets for private consumption, and 30% through on-licence premises. In value terms, on-licence sales account for 57% of market value and off-license retail sales account for 43%, because of the higher prices of beverages in on-licence bars and restaurants. This is different from the Australian situation, where the AHES indicates a greater share of sales value in off-licence outlets, implying, other things held equal, that the volume of on-licence sales in Australia is proportionately a significantly smaller share of total sales than in New Zealand.

2.2. International comparison

New Zealanders drink less on average than Australians, but while per capita consumption in Australia fell by 1.1% per year between 2007 and 2012, that in New Zealand rose by an annual average rate of 0.3% (contrary to the longer term declining trend outlined in section 2.1.2 above). In 2007 per capita consumption of pure alcohol in New Zealand was 85% that of Australia, but by 2012 it had risen to 93%.

Australia and New Zealand are not amongst the heaviest consuming countries of alcoholic beverages (WHO 2011). In terms of annual alcohol consumption, with around 9-10 litres of pure alcohol per capita per year, they lie towards the bottom end of the developed countries with comparable levels to Canada and USA, and well below most European countries, such as Germany (12.81 litres), UK (13.37 litres), Ireland (14.55 litres) and Eastern European countries where consumption is even higher (e.g. 16.45 litres in the Czech Republic).

A review of alcohol labelling in 44 countries (including Australia, New Zealand, other OECD countries and some non-OECD countries from Asia and Latin America) found varying requirements for labelling of alcohol, but universal absence of mandatory energy content labelling on alcoholic beverages, with the partial exceptions of Russia and the USA that require labelling on selective types of beverage (ICAP 2013). This review found that although labelling alcohol content was widespread (i.e. percentage by volume), there were very few instances of other countries currently requiring labelling of nutrients or other matters that might be indicative of energy input. Among the findings of that report:

- Only Australia and New Zealand mandate standard drinks labelling, although the UK Government has a voluntary agreement with industry for labelling standard alcohol units.
- The USA has mandatory calorie and carbohydrate labelling for light beers only, to verify that they meet the limits of a light beer.
- The Russian Federation requires labelling of the nutritional value of beer.

The ICAP survey found some examples of mandatory warnings for alcohol, such as US warnings about drinking during pregnancy and driving a car, and France also mandates a pregnancy warning with a pictogram, which other manufacturers in EU

comply with so they can sell their produce in France. The review also found health warnings in 8 other countries, mostly in South America. However, it comments that although health warnings have been shown to increase awareness among consumers, there is little evidence of them having had a significant impact on changing consumer behaviour.

Additional investigation to the ICAP survey has found that:

- Australia and New Zealand allow voluntary nutrition information panels (NIP) on all alcoholic beverages, which include the energy content. However, an NIP is mandatory if a nutrition content claim is made. Only claims about energy and carbohydrate are permitted for alcoholic beverages.
- Canada also allows voluntary nutrition facts, including calories, on the label of alcoholic beverages. A nutrition facts table is mandatory if a nutrition claim is made or if a reference is made to energy or certain nutrients, and if certain artificial sweeteners are added to unstandardised alcoholic beverages.[6]
- In 2013, the UK government advised it was in discussion with industry on the voluntary introduction of calorie labelling on alcoholic beverages.
- The European Union (EU) has committed to consider nutrition labelling requirements in the future, particularly energy labelling, for alcoholic beverages[7].
- In 2013 the US Treasury permitted alcohol suppliers to use labels that include serving size, calories, carbohydrates, protein and fat content on a voluntary basis, as an interim measure pending a final decision by the Alcohol and Tobacco Trade and Tax Bureau[8].

2.3. Alcohol related health effects

There is a lot of published commentary on the links between alcohol and weight management and the associated health effects of excessive weight. After fat, alcohol has the second highest energy content per gram of the principal food constituents, and it is commonly described as having “empty calories”, because there is little other nutrient value to accompany the energy. This leads to the inference that consuming alcohol probably contributes to an excess balance of energy intake over exertion from those who continue to eat other foods to meet nutrient requirements.

However, medical and epidemiological literature does not show a strong determinative relationship between alcohol consumption and weight gain. Literature provides clearer evidence of the association of overweight and obesity with a range of debilitating diseases and medical conditions. However, the relationships are not as predictable or linear as commonly assumed, with empirical studies showing mixed results.

---

6 http://www.inspection.gc.ca/food/labelling/food-labelling-for-industry/alcohol/eng/1392909001375/1392909133296?chap=12

7 Regulation (EU) No 1169/2011 of the European Parliament and of the Council of 25 October 2011. Article 16 (4).

8 TTB Ruling 2013-2

Jéquier (1999) describes what he calls an "energy paradox" in that epidemiologic evidence does not show a clear relation between daily alcohol energy intake and body weight. He finds most studies report that people do not compensate for the alcohol energy by decreasing non-alcohol food energy intake. Jéquier also cites other studies that confirm that alcohol ingestion reduces fat oxidation and favours a positive fat balance that can lead to weight gain. Except in alcoholics, alcohol energy is usually added to total food energy intake. Moderate alcohol drinkers tend to consume more energy than non-drinkers, but they do not necessarily experience increase in weight.

Westerterp-Plantenga and Verwegen (1999) report that ingesting an alcoholic appetiser 30 minutes before lunch leads to a greater energy intake at lunch than with other non-alcoholic drinks. The alcohol appetiser also induces a higher eating rate and a longer meal duration. But the total energy intake for the day is not significantly altered in comparison with those who have other non-alcoholic drinks, except water in which case subjects consume less energy. They conclude that in most individuals, the energy of alcohol is added to (not substituted for) the energy from carbohydrate, fat, and protein in the daily diet.

Wannamethee and Shaper (2003) examine the links between alcohol intake and body weight in a large sample of middle aged British males, examining their weight five years after a baseline and controlling for age and other influences. They found that the age adjusted body mass index (BMI), and the percentage of men with high BMI, increased significantly with higher alcohol consumption. But they also found there was no significant difference over time of those who were non-drinkers or only occasional to moderate drinkers. They concluded that heavy alcohol intake (greater than 30 grams per day) contributed to weight gain, but that there was no evidence to suggest that intake less than that would be associated with weight gain.

Suter (2005) came to rather different conclusions after a wide ranging survey of relevant literature. He found some evidence that moderate amounts of alcohol enhance energy intake, both from the energy content of the alcohol and because it enhances appetite and food intake. He also found empirical evidence in metabolic studies that alcohol suppresses lipid oxidation and encourages positive additions to the fat balance. But across a wide range of reliable studies, the weight impact of alcohol on individuals varies widely with such variables as the absolute volume consumed, the frequency of consumption, and genetic or metabolic factors. Because of this variability in empirical results, Suter concludes that the effect of alcohol energy on individual weight gain cannot be answered with any precision, but it does contribute towards population-wide weight gain. Somewhat paradoxically, at low to moderate alcohol consumption it appears to have stronger correlation with weight than at heavy consumption levels, and it appears also that infrequent binge drinking is more conducive to weight gain than frequent consumption of amounts with similar cumulative annual total. Suter's review of the literature concludes that alcohol energy may count for more weight gain among occasional and low alcohol consumers than among regular heavy drinkers, and also for more among those who are already overweight or who have a diet high in fat.

A more recent review of literature linking alcohol consumption with weight gain found positive, negative or no associations in the individual studies, but where there is a positive association it is more likely to be found in men than in women (Manton 2013). The lack of strong connection between levels of alcohol consumption and

obesity means that policies for controlling obesity are unlikely to have much effect on drinking and vice versa. An implication is that the justification for providing energy content information on labels of alcoholic beverages may rest as much on consumer rights to information as on its contribution to policy on obesity.

In summary, scientific literature does not identify any simple relationships to explain the recent rise in obesity in Western countries and the studies of contribution of consuming alcoholic beverages also give mixed results.

2.4. The economic value at risk from uninformed drinking

The value of labelling in a cost benefit analysis arises from demonstrable economic welfare gain exceeding the costs incurred in labelling. Economic welfare or well-being consists of economic surpluses to producers and consumers in the market for alcoholic beverages and third parties affected by externalities (such as taxpayers). The costs of administering, complying with and responding to allocative incentives created by mandatory energy labelling of alcoholic beverages detract from the producer surpluses, but consumer surpluses can be enhanced to the extent that labelling improves consumers' consumption choices and to the extent that they and third parties avoid future costs that would arise in the absence of labelling.

The economic value at risk from uninformed drinking therefore has two principal components: the tangible value of avoided future costs due to better decision making on choice of drinks and more effective weight management across the alcohol consuming populations of Australia and New Zealand and the less tangible consumer benefits from improved information. The economic value of such consumer surpluses is usually approached through estimation of willingness to pay for the matter at hand, in this case information on the energy content of alcoholic beverages. A welfare value also exists additional to the avoided costs of future weight management, to the extent that people have an aversion to the pain and suffering of being overweight or obese and are willing to pay to reduce the probability of incurring these conditions in future.

2.4.1. Avoided costs of energy labelling of alcoholic beverages

The principal tangible economic benefit of energy labelling of alcoholic beverages is a potential reduced contribution of alcohol to overweight and obesity, relative to the counterfactual in which there is no energy labelling and these weight conditions continue to be prevalent across the population.

One way to approach the economic benefit of energy labelling is to examine the costs of the conditions that the labelling is intended to alleviate, identify a proportion of these costs that can be attributed to alcohol in the absence of energy labelling, and estimate how that proportion would change in response to the energy labelling. A number of estimates of the cost of obesity and overweight have been made for Australia and New Zealand in recent years which provide a starting point for such estimation. These use different methods, different coverage (of obesity, or

overweight or both) and different diseases or medical conditions, but all indicate very substantial annual costs from conditions related to excessive weight.

Recent economic estimates are presented in Appendix A. These distinguish:

- Financial costs
  - Direct costs – principally of medical treatment expenditures, hospitalisation costs and some associated equipment
  - Indirect costs – principally productivity losses caused by absenteeism, presenteeism (at work, but performing under par), deadweight losses of extra tax revenue collection, costs of care and other sundry items, and sometimes costs incurred by patients and their families in attending treatment, on transport and accommodation
- Non-financial costs
  - Human cost, also known as welfare cost (loss of well-being) or burden of disease, due to pain and suffering from illness and aversion to risk of premature death[9]
  - Government subsidies – a pecuniary transfer and not welfare-affecting, but of interest as an indication of government liabilities.

The principal numerical results from the most recent studies are summarised in Table 3 below. Further details of these estimates, both in their original values and in 2014 dollar terms are provided in Appendix A (Table 7 and Table 8).

Table 3 Estimates of annual costs of obesity and overweight in Australia and New Zealand

A$M Updated to March 2014 terms from original literature using the ABS Consumer Price Index

Source and publication date	Direct Health Costs	Productivity and Other Costs	Total Financial Costs	Welfare Costs (Disease Burden)	Total Economic Costs
Obesity only					
Access Economics 2008a	2,287	7,383	**9,669**	58,241	**67,910**
Medibank 2010	1,517	7,470	**8,988**	35,017	**44,004**
Colagiuri et al 2010	16,925	na	**16,925**	na	43,537[a]
New Zealand Government 2007	492	396	**888**	na	na
Obesity and overweight combined					
Colagiuri et al 2010	24,512	na	**24,512**	na	66,065[a]
Lal et al 2012 (NZ)	749	107-247	**996**	na	na
Note: [a] Total including estimate of obesity related subsidies, which are transfer payments not relevant to an economic welfare measure, included here for illustration only.					

Source: NZIER compiled from source literature: for more details see Appendix A.

[9] The terms welfare cost and burden of disease are sometimes used in the literature to refer to the total cost of ill-health, and sometimes just the component additional to the financial cost. Human cost only refers to the additional component.

The most detailed study in providing a break-down of effects of different diseases attributable to obesity is that by Access Economics (2008a), which estimated total financial costs in 2008 of A$9.7b and additional welfare cost from burden of disease of A$58.2b, with a total cost for obesity of A$67.9b per year (valued in 2014 dollar terms). This was an update which more than doubled an estimate Access Economics made in 2005, because of changes in methodology (Access Economics 2006). The 2008 estimates show the non-financial costs to be about six times larger than the financial costs, and within the latter category the indirect costs to be more than double the size of the direct health system costs, dominated by the lost productivity from absenteeism and presenteeism (see glossary).

A similar pattern is shown by estimates for 2007-08 of Medibank (2010), although levels and relativities differ. The Medibank figures are based on a KPMG-Econtech model, and they show total financial costs of A$9b and additional welfare cost from burden of disease of A$35b, with a total cost for obesity of A$44b in 2014 dollar terms. The financial costs are dominated by indirect costs, which are nearly five times greater than the direct health system costs.

Both these studies are top down estimates which calculate the costs associated with the diseases and attribute a share of these to causation by obesity (for the diseases in the Access Economics estimates, the reported attribution factor is about 20-25%). Both studies cover the same four diseases, but neither of the reports contains sufficient detail of their methodologies and assumptions to pinpoint the reasons for the differences in their estimates.

A different approach is taken by Colagiuri et al (2010), who describe a bottom-up method to estimating the cost per patient with the weight-related conditions, by collecting condition-related costs from a survey of adults aged 30 and over, and extrapolating these across the prevalence of the conditions in the population. They estimate direct health and non-health system annual costs per person, and also government subsidies paid to those with the conditions. They further distinguish between those of healthy weight, those who are overweight and obese, and provide alternative estimates based on BMI, waist circumference and a combination of both.

In aggregate Colagiuri et al's estimates are larger than those of Access Economics and Medibank, with a total financial cost for obesity of A$16.9b in 2007-08, and in addition A$7.6b cost for the overweight in 2014 dollar values. They also add the cost of government subsidies, but while there is a fiscal implication for government subsidies or welfare payments to the unemployed or infirm, the face value of those payments is mainly a pecuniary transfer payment from taxpayers to the recipients. The real resource costs are confined to the deadweight losses such as the transaction costs of additional taxation and distribution, the possibility that subsidy recipients use funding less effectively than those from whom it is taken, and the risk that welfare recipients fall into a cycle of dependency in which their productive capabilities are not available to the economy.

Colagiuri et al do not provide an estimate for the disease burden or welfare cost of obesity which is borne by obese individuals and their families. Both Access Economics and Medibank identify this as the largest cost component in their estimates. However, these welfare estimates need to be viewed with caution, as they may not be strictly comparable or additive to the financial costs estimates, because of the way

they have been calculated from the value of statistical life (VSL) used in public policy appraisals (see Appendix A.3).

The New Zealand Government (2007) estimated direct and indirect costs of obesity in New Zealand by updating estimates from an earlier study by Swinburn (1997). The 2007 study estimated A$492m (NZ$553m) of direct health system costs and A$396m (NZ$445m) of indirect costs in 2014 dollar terms (restricted to lost productivity). The total financial cost estimate is 9% of the corresponding figure of Access Economics and 11% of that of Medibank, but the relativity between direct and indirect cost estimates for New Zealand is quite different from that of the Australian estimates. There is insufficient description of methodologies and assumptions to reconcile these differences between the studies.

Lal et al (2012) estimate the health care costs attributable to overweight and obesity to be 4.5% of New Zealand's total health expenditure in 2006. Their estimate in 2014 dollar terms was A$749m (NZ$842m) for direct medical costs, and between A$107m (NZ$120m) and A$247m (NZ$277m) for productivity losses (depending on how they are estimated). Their estimate is slightly larger than that for New Zealand Government (2007), but contrary to the Australian estimates that all show productivity losses to exceed direct health care costs.

Connor et al (2013) estimate the burden of disease attributable to alcohol in New Zealand using records of mortality and morbidity to calculate Years of Life Lost (YLL) from premature deaths and Disability Adjusted Life Years (DALYs) of non-fatal conditions attributable to alcohol. Overall this found that injuries were responsible for 52% of deaths and 73% of YLL among males and lower shares among females. Injuries, alcohol use disorders and cirrhosis of the liver were the main causes of DALYs, rather than diseases related to overweight and obesity, although within the population the significance of diseases (including those associated with overweight) increased in older age groups. No estimates of monetary value of burden of disease associated with alcohol were provided, and no estimates of the costs of various interventions suggested in its conclusions. Another study of costs of harmful alcohol and other drug use was prepared by BERL (2009) and used as input into an extensive review by the New Zealand Law Commission in 2010. This however concentrates on costs of alcohol and drug abuse and contains little guide to the linkages between alcohol and weight management.

Of the available estimates of obesity costs, the Access and Medibank estimates use a more comprehensive framework and conventional approach, but differences between them make it difficult to select one or the other as the best figures to use. In both cases the welfare costs are much larger than the financial cost estimates, and there is ongoing debate about the estimation methods for such welfare costs. The Colagiuri et al (2010) estimates provide what appear to be more detailed information on obesity and overweight, but this may be skewed towards older and more costly age groups from their sample selection of 30 years and older, and their framework is unconventional.

Summarising the estimates and turning them into per person costs per obese adult per year, Table 4 shows the ranges of costs provided by the Australian estimates. These costs are used in the analysis, namely a low and high estimate for total financial cost ($1,852 - $3,488) and a low and high estimate for total economic cost (rounded to $9,000 - $14,000). These costs are informed by the existing estimates

and the financial cost figures should be regarded as firmer than the total economic cost figures in view of the issues around estimation of welfare cost noted above and in Appendix A.3.

Table 4 Costs per obese adult in 2014

A$ per person/year 2014 dollar terms (converted to March 2014 dollars with the ABS Consumer Price Index)

Authors	Direct Medical Costs	Total Financial Costs (Direct plus Indirect costs)	Total Economic Cost (Financial plus Welfare costs)
Access Economics	471	1,992	13,994
Medibank	313	1,852	9,068
Colagiuri et al	3,488	3,488	NA

Source: NZIER from source documents (see appendix A.2)

In a study of the impact of obesity on the US economy, Hammond & Levine (2010) identify two further costs not included in the Australian estimates. One is the extra fuel costs of the national transportation task in carrying heavier people around the country. The other is the effect of enhanced greenhouse gas emissions, partly arising from increased transport fuel, partly from greater food production, and partly from increased methane emissions from higher organic waste production.

2.4.2. The welfare value of improved information

A less tangible benefit of energy labelling is the welfare value of improved information, in satisfaction of the consumer's right to know what they are eating. Even if a consumer does not change their behaviour in response to labelling, just being better informed implies they obtain a welfare benefit.

Kiesel et al (2011) review various approaches to estimating the value of nutritional information and consumer choices, including revealed preference and stated preference non-market valuation techniques. They find the record for nutritional labelling is mixed, and its effectiveness in raising awareness and influencing choices varies with the presentation of information, style of labelling and location on the packaging. In one of the few studies to report a monetary value, Drichoutis et al (2009) found consumers would be willing to pay 5.9% over the original price for nutritional information on the food product under study, and also that what are described as non-price sensitive consumers are willing to pay double what price-sensitive consumers would pay.

While non-market valuation can be used to estimate the value of information and such estimates used for benefit transfer from their source setting to analogous settings elsewhere, we have not found a suitable value to apply to the scale of welfare benefits derived from labelling alcoholic beverages with energy information. Accordingly, we have not included an economic estimate of the welfare benefit for the value of information regarding energy labelling on alcoholic beverages.

3. The potential effects of energy labelling of alcoholic beverages

Internationally there is currently little mandatory labelling of alcoholic beverages (ICAP 2013). While there is pressure from some consumer groups to have energy labelling, views seem to be split on this matter. Consumer and public health advocates in other countries want alcohol content to be mandatory (as it is in Australia and New Zealand) so consumers know how much they are drinking, and similar arguments apply to energy content. But internationally, consumer groups are divided over the labelling of nutrients in general, as this may make alcohol look like "food" and encourage its substitution for healthier foods.

The US Wine Institute supports voluntary calorie labelling in principle, although suggesting that such information is not a key factor in consumer choice (Shereen 2011). It claims that the response to pregnancy warning labels in France suggests they can be effective in raising awareness of issues, but their effect on buyer intentions and behaviours has been modest, particularly compared to more graphic tobacco warning labels, suggesting it is not labelling per se, but rather the scale and design of labelling and other complementary policies that may impact behavioural choices. This is a point that finds support in some more scientific studies of the effectiveness of labelling (Wilkinson et al 2009). The extent of consumption changes that can be expected as a result of energy labelling of alcoholic beverages is unknown as reliable evidence on the effects of such labelling is scarce.

3.1. Raising awareness and behaviour change

Although there is research showing that nutritional and energy labelling of food can be noticed and recalled, there appears to be little evidence of marked behaviour change and weight management from such labelling. Harnack & French (2008) found evidence of calorie information influencing food choices in cafeteria or restaurants to be weak or inconsistent. FSANZ research has found 38% of Australians and 30% of New Zealanders look for energy information when purchasing a food for the first time. Todd & Variyam (2008) found 67% of respondents in a US survey in 2006 always or sometimes referred to nutrition labels for information on energy/calorie content, but also that the use of information labels appeared to have declined over the decade preceding that survey. Swartz et al (2011) found only 2 of 7 studies they reviewed resulted in a statistically significant reduction in calories purchased, and concluded that energy labelling does not necessarily have its intended effect. Campos et al (2011) reviewed 120 articles in seven jurisdictions and concluded that nutrition labels on pre-packaged foods are prominent and credible sources of information which many consumers use to guide their consumption choices, but that use varies considerably across sub-groups. They find nutrition labels on packaged

foods to be cost effective at a population level, but suggest new formats and different information contents are needed to ensure information is understood.

Reliable evidence of the effect of labelling alcoholic beverages in particular is scarce. VicHealth (2009) report a random sample of 1523 adults that found a high level of support for health advisory labels on alcoholic beverage containers, with specifically 76% supporting nutritional information on kJ, protein, fat and carbohydrates. Bui et al (2008) test the potential impact of labelling nutrient content of alcoholic beverages in the United States, having undertaken a review of literature and not found any other previous research that examines the effectiveness of such labelling on the perceptions of alcohol. They report a pilot study of college students that revealed respondents had very poor awareness of the content of alcoholic beverages, both of energy and other forms of nutrient. Their full survey tested the drinking intentions of sample respondents both without, and with, the content information that would be found on labels. Exposure to information facts resulted in a significant increase in consumption intentions for wine and spirits, no alteration in intentions towards light beer, but a reduction in consumption intentions for regular beer which was widely perceived as having more carbohydrate loading than wine or spirits. Bui et al conclude that the provision of serving facts may lead to increased consumption of beverages with higher alcohol content, which may confound intended consequences for weight management.

Martin-Moreno et al (2013) conducted a literature review of published and grey literature (i.e. from agency websites) into the state of alcoholic beverage labelling across a broad selection of mostly OECD countries. They found labelling of alcoholic beverage contents to be rudimentary in most countries, but singled out Australia as an exception for its standard drinks labelling. They concluded that the current evidence seems to support including energy information on the labels of alcoholic beverage products, but they provide no explicit consideration of the costs and benefits of so doing.

It is possible that energy labelling could trigger innovation such as the reformulation of products to lower energy versions that could contribute to positive weight management outcomes. Such responses have been observed in, for instance, food manufacturers removing salt or fat to obtain a heart foundation tick. However, the incentive provided by a high visibility symbolic endorsement is not necessarily the same as that of a single entry item on a nutrient information panel. CIE (2014) in analysing a health star rating scheme for small businesses found that although some businesses saw potential opportunity to reformulate products to obtain higher ratings, most business felt that such reformulation would compromise taste, texture or other properties of their product, and were hesitant to change formulation for fear of consumer backlash. They also found that businesses producing gourmet or specialised products thought labelling had no influence on people making “treat” purchases, and that labelling changes would have negative impact on their product branding without adding value to consumers.

3.2. Consultation overview

To further understand the costs and benefits of energy labelling on alcoholic beverages we conducted a number of phone interviews with brewers, distillers, winemakers, public health organisations, government entities, and other relevant

stakeholders in both Australia and New Zealand. This should not be seen as a representative sample from each industry although we did contact a number of the major players within the various sectors. Our aim was to understand the complexity of the markets and use the information to give some very broad magnitudes of the costs and benefits.[10] Further information on those contacted is in Appendix B.

To elicit as much focused information from each interview as possible we tailored the interviews to the various groups e.g. government contacts, public health researchers and industry (wine, distillers, and breweries). The contacts were suggested to us by FSANZ and to further improve coverage additional contacts were provided by those interviewed.

Even though each group was given a specific set of questions, interviewees were not restricted to commenting on cost or benefits. In fact many were forthright in their views on both costs and benefits of energy labelling on alcoholic beverages. There was uncertainty over how the labelling would be implemented which may cause industry to over-estimate the likely cost of implementation.

3.2.1. Industry

Producers and importers were asked a range of questions aimed at understanding the costs faced if energy labelling was made mandatory in Australia and New Zealand. The following is a brief overview of the answers given.

Respondents said they required between six months and five years to clear existing stocks of alcoholic beverages. In general (although not in all cases) respondents said that the higher the price of the unit the longer it took to shift.

Responses on the number of stock keeping units (SKUs) each entity managed were less predictable. Large entities had many hundreds of SKUs. The number of SKUs per medium and small companies varied considerably depending on the marketing channels and strategies used by each company e.g. some smaller companies varied between 4 and 20 SKUs. This meant that the impact of energy labelling regulations would vary from company to company: as a rule of thumb the fewer the SKUs the less the compliance cost impact.

The larger the company the more likely it will produce more than one type of alcoholic beverage product. Larger companies typically produced spirits, beer, wine and ciders, while smaller brewers, distillers, and wine makers produce specific types of alcoholic beverages. Further, the bigger the company the more likely it imports product as well as produces alcoholic beverage products.

Roughly 20% of product is sold in bars and restaurants across New Zealand and Australia (a slightly higher share in New Zealand than in Australia). This is important from a labelling perspective because labelling is less likely to have an impact on bar sales. This is because the purchasers, in all probability, will not examine the label until after purchase or it is sold in an unmarked glass or container.

One-off costs varied markedly between producers and between Australia and New Zealand. One-off costs involve redesign of labels, retooling of production lines,[11]

[10] The consultation process was in line with project resources.

[11] Retooling would only impact on certain products (e.g. methode champenoise or smaller bottles of wine) that currently have limited label space or no back labels.

marketing costs and possibly rebranding.[12] Wine and spirits are typically sold as single bottles, so wine boxes not for retail display will not require an energy label. Many respondents pointed to the extra marketing costs associated with smaller bottles and rebranding which potentially could be a much larger cost.

The on-going costs were mainly to do with testing of the energy content (particularly for wine which can differ in energy content from vintage to vintage and batch to batch) and the introduction of back-labels for beer in New Zealand (where many bottles do not have such labels and would require additional labelling space for energy information). One point of contention was who would verify the energy content. Companies have assumed that they could do the testing themselves and the test(s) are relatively straightforward.

Depending on the quality of the labels the costs can vary between as little as A$91 (NZ$100) per label (e.g. a small micro brewer using digitally printed labels) to between A$1,818 (NZ$2,000) and A$4,545 (NZ$5,000) per label (using lithograph printing). This included changes made to packaging such as six packs and larger beer cartons. By way of comparison, PWC (2014a) estimated the costs of changing labels on a glass bottle to be in the range of A$1,901 and A$6,998 depending on whether minor or major changes to labels are made.

Most respondents expressed the view that they were unsure of the impact of energy content labels. In the past there had been little demand from consumers for the information these labels would provide.[13]

Respondents were also unsure of the impact on asset utilisation and capital renewal plans because they only had a general idea of what the costs were for a label change. Some respondents thought they may be large and others minimal, reflecting this uncertainty.

While many didn't think other cost categories would be affected, there was general unease among smaller vineyards and brewers that the fixed costs of change introduced unnecessary compliance costs that could be substantial.

3.2.2. Government entities

A sample of government entities and regulators (other than FSANZ) were also invited to respond to questions about the impacts of energy labelling on alcoholic beverages. These included government entities responsible for enforcement of the *Australia New Zealand Food Standards Code* and for international trade agreements relating to food.

Respondents envisaged there may be some additional enforcement in ensuring compliance with a label change, but the cost would be marginal. They could not foresee any implications for international trade agreements, and were not aware of any countries where having energy information on the label of Australian or New Zealand alcoholic beverages would be a barrier to their market access.

[12] It is not clear whether respondents' monetary estimates include rebranding, which in most cases is a commercial decision and not a consequence of adding a single energy item to a label.

[13] One wine industry producer said he had been asked once in thirty years about energy content in wine.

3.2.3. Public health

Public health organisations and advocates were more likely to support the introduction of mandatory labelling. While there was a clear understanding amongst most that there was no evidence to support the introduction of mandatory labelling equally they suggested that there was no evidence that it did not work. Respondents suggested that any measure that may reduce alcohol consumption over the whole population was a good thing and should be supported.

One of the main arguments developed by respondents was that we have energy labelling on food and other drinks, so why not alcoholic beverages? All alcoholic beverages needed to be targeted. Respondents suggested that consumers had a right to know the energy content and regulations needed to be consistent with other food and drink.

Most were not in favour of singling out one alcoholic beverage sector (e.g. such as alcopops) for labelling attention.

3.2.4. Limitations of the consultation

The consultation was of necessity limited in scope and intended as an information gathering process. A number of respondents also expressed opinion, some of it based on uncertainty about how the labelling regulation would affect them, and some of it having a more advocacy role. There is possibility of strategic bias in the responses, so the results need to be viewed in conjunction with other sources of information that may corroborate or refute the figures given.

Some other general caveats on the responses:

- We approached a limited number of enterprises, including large multi-product international companies and small single-product companies – in the event, however, the variation between companies within these broad categories is so wide, the figures obtained cannot be regarded as "statistically representative" of the categories
- The responses indicate some surprising differences : large brewers in New Zealand reported higher implementation costs than large brewers in Australia for ostensibly similar businesses; but large wineries in Australia reported one-off costs an order of magnitude larger than the corresponding group in New Zealand
- The one-off costs are driven by the number of SKUs, while on-going costs will reflect the volume of sales, but consultation did not reveal sufficient information on both of these across all the categories in both countries
- Respondents were uncertain about what the labelling would require, particularly around testing to ensure stated energy is within tolerance limits[14] i.e. they did not know if there would be tolerance limits and what these would be and therefore the size of the issue.

Uncertainty about what the labelling would require of them may cause industry to over-estimate the costs of compliance, compared to how the costs end up once

[14] The term "tolerance limit" refers to a variation permitted between the energy content stated on the label and the actual energy content determined by analysis".

regulation is implemented. Costs can also be reduced by allowing some flexibility in the transition to the regulation's introduction. The industries in both countries have large numbers of small producers of both wine and beer with more limited resources with which to assess likely impacts, and slower stock turnover, than larger producers, and this may add to the uncertainty over future impacts.

The figures obtained from consultation for one-off costs and on-going costs of adding energy content to alcoholic beverage labelling were combined with the number of entities of different types to estimate total costs across different beverage types and divide these by the total volume of alcoholic beverage consumed. The results are summarised in Figure 5, which shows the cost per litre implied for responses on one-off and on-going energy labelling costs for the three main categories of beverage. This shows broad similarity in cost levels between the two countries for spirits and wine, but less so for beer. It also shows the highest cost impact being for wine, in keeping with the fragmented nature of the industries and variability in small batch production in both countries.

Figure 5 Indicative results from the consultation

Implied energy labelling costs per litre of beverage available for consumption

		One-off	On-going
Australia	M litres beverage	A$/ litre	A$/ litre
Beer	1757.8	$ 0.008	$ 0.002
Wine	628.8	$ 0.064	$ 0.046
Spirits based	231.8	$ 0.058	$ 0.007
New Zealand	M litres beverage	A$/ litre	A$/ litre
Beer	279.9	$ 0.082	$ 0.010
Wine	102.2	$ 0.068	$ 0.072
Spirits based	74.9	$ 0.049	$ 0.006

Source: NZIER

4. Costs and benefits of energy labelling of alcoholic beverages

4.1. The counter-factual and the factual

When considering the costs and benefits of energy labelling on alcoholic beverages, a first step is to define the counter-factual situation that is expected to prevail should energy labelling not proceed, against which to consider the change in costs and benefits that are expected to arise as a result of such labelling. The counter-factual is some continuation of current trends with respect to alcohol consumption and weight gain, after adjusting for foreseeable changes that might change that pattern (such as change of age distribution or ethnic mix in the population).

Both Australia and New Zealand have experienced an increasing proportion of adults in the overweight and obese categories over the past two decades: these combined categories now include 64% of Australians and 65% of New Zealanders. As outlined in section 2 above, Australia's total consumption of alcohol has recently been declining but with a slight shift towards higher alcohol content drinks (e.g. less beer, more wine), whereas New Zealand's total consumption has been flatter but with a more pronounced shift in mix towards higher alcohol content wine and spirit-based drinks, and a slight increase in per capita consumption of alcohol in the past 6 years.

The literature suggests that alcohol consumption is likely to have an additive effect to dietary energy intake, and that individuals are unlikely to compensate for the additional energy provided by alcohol by consuming less food (Yarnton 2013). Alcohol consumption is implicated as contributing to excess dietary intake across the population, but there are many other contributing factors and literature does not show a strong determinative relationship between alcohol consumption and weight gain in the population or for individuals.

The beneficial output of energy labelling on alcoholic beverages is provision of information to assist individuals manage their total daily energy intake which may contribute to a reduction in the rate of overweight and obesity. A beneficial outcome would be a reduced rate of overweight and obesity among adults in both countries than would otherwise be the case. The economic impact of such a physiological outcome should be a reduction in the costs associated with overweight and obesity, including lost productivity from days off work, medical expenditures on weight-related conditions and the pure welfare cost to individuals of being unwell or disabled by a weight-related condition.

Since overweight, and particularly obesity, is associated with heightened risk of life-threatening conditions such as cardiovascular disease, diabetes and various cancers, improved weight management could also lead to improvement in longevity and reduction in the economic costs associated with premature death. Increased life expectancy has fiscal implications in creating greater demands in future for public health and aged care services for those whose lives are prolonged, but it also has the

beneficial effect of deferring the date when some of these services will be required, when they will be smaller in present value terms, and it also gains greater productive output and contribution of individuals in the near term.

Formally, a health improvement over the counter-factual can be defined in terms of an increase in life expectancy measured in years for adults of a base age (e.g. 50 years), or an increase in expectancy of healthy years for adults of that age (or an increase in expected disability adjusted life years). An improvement in disability years will reduce the days off work, medical expenditures and human distress caused by disabling conditions, contributing to the economic benefits outlined above.

In a study of medical interventions for obesity, Michaud et al (2012) found bariatric surgery to be most cost effective and beneficial for society at large, as the benefits of surgery were so large and realised immediately that they far outweighed the future cost of added longevity. However, energy labelling of alcoholic beverages is unlikely to have such immediate and apparent effects for most people – it is more a tool to nudge behavioural change towards long term improvement in weight management, delivering future benefits that will be discounted in present value terms. It is conceivable there could be some short term gain if it enables people to improve their weight management and shift to a lower risk category than obese or overweight.

So the balance of short term gain and long term cost will be different from that of other more costly measures with larger short-term paybacks. Even if energy labelling is found to be effective, it is not necessarily the most effective or net beneficial measure for dealing with overweight and obesity problems.

4.2. Potential benefits of energy labelling

The potential benefits of energy labelling of alcoholic beverages stem from improved information and the ability for consumers to make better informed choices about their diet, improving outcomes for weight management across the population. There may be other benefits for consumers if the labelling prompts a more restrained use of alcoholic beverages and reduces the likelihood of harmful drinking behaviour, but this is incidental to the main information purpose: the energy label is not designed to encourage responsible drinking and it is serendipity if some consumers respond to the label as if it is.

4.2.1. The value of information

One matter that is sometimes claimed as a benefit is improving the consistency of treatment of alcoholic and non-alcoholic beverages which have a detailed nutritional information panel. However, whether there is additional economic benefit from having such consistency across different beverage types is debatable. The energy content labelling provides very limited information compared to the nutrient information panel found on non-alcoholic beverages. This may be justified by the sparseness of nutrients in alcoholic beverages but does not add to the consistency of treatment from the consumer's perspective. The benefit of consistency depends on whether it adds to the effectiveness of the label in changing purchase behaviour in ways that support improved weight management, and it is subsumed within the general effectiveness of the label in changing behaviour.

Another claimed benefit is the consumers' right to know about the content of alcoholic beverages. After reviewing systematic studies of the link between alcohol and obesity and finding weak or mixed connection in the literature, Manton (2013) states the reason to give consumers information about energy content on the label of alcoholic beverages is more in terms of consumers' right to know than as a contribution to policy on obesity.

The consumer's "right to know" may be deemed important enough for political, religious, or ethical beliefs to be used as a justification for regulation. Those in favour of mandatory labelling sometimes argue that its absence is evidence of a market failure. In economic terms, market failure occurs where private suppliers are unable to capture the benefits from their actions to cover the costs of so doing (as in the case of public goods); where property rights are incompletely specified (as in the case of environmental externalities such as pollution); or in the case of market structure imperfections that permit exploitation (as in the case of market dominance and monopolistic behaviour). "Information failure" is a specific case of market failure that occurs where there is incomplete or asymmetric information or uncertainty. This kind of asymmetry can distort people's incentives and result in significant inefficiencies. Information is not supplied because it is costly to supply or independently obtained by consumers, the supplier is unable to recover value from that information or it is seen as likely to reduce the market price if it were disclosed to consumers.

AERF (2011) report that US studies on the effectiveness of health warning labels have shown their implementation has resulted in increased awareness of the health messages used on labels. AERF use this to propose that alcohol health warning labels should be implemented and enforced through mandatory government regulation, with government incurring the cost of designing the labels. However, that literature also shows there is little evidence of warning labels having caused an appreciable change in consumer behaviour. Labels such as those warning of the risks of alcohol consumption during pregnancy have a clear externality justification, as they reflect a wider public concern for the health of the unborn, who are unwitting third parties to the actions of their mothers. Energy labelling does not have such firm externality grounding for intervention, the benefits largely accruing to the individuals who change their behaviour as a result of its influence. Similar conclusions that labelling is more effective in raising awareness than in changing behaviour are drawn in the literature on nutrient labelling (Campos et al 2011). Arsenault (2010) notes that obesity has been rising in the US population despite exposure to nutrition labelling of foods for almost two decades, implying that other factors influence obesity and it is difficult to discern the effect of labelling alone.

4.2.2. Effectiveness of labelling

The effectiveness of the label in changing behaviour depends on a chain of factors influencing consumers' responses:

- The visibility and readability of the label by consumers before purchase
- The consumers' ability to comprehend the information on the label (e.g. how significant is 850 kJ in individual diets?)

- Whether the consumer cares about the information provided (e.g. not all consumers are avid calorie counters or label readers)
- The importance consumers attach to weight management compared to other product attributes, such as price, style/taste, branding etc
- If consumers are influenced to change their purchases, do they:
  - Switch to equivalent volume of lower energy beverage
  - Resolve to drink less alcoholic beverage
  - Exacerbate nutritional management by reducing intake of other foods (including all their nutrients) to make way for alcohol without increasing their energy intake.

On this last point, literature reviewed in this report suggests skipping food to make way for alcohol is unlikely to be a common response (Yarnton 2013). Alcohol consumption is more commonly associated with increase in energy intake, both from the energy in alcohol itself and from increased food intake commonly consumed with it. The more likely responses to the information are switching to lower energy drinks, drinking less alcohol, or no change to current behaviour.

The preceding bullets can be viewed as a chain of causation in reaching that decision. The change in behaviour depends on:

- The probability of consumers reading the label before purchase
- The probability of consumers comprehending the information conveyed
- The probability of consumers being sufficiently concerned about energy intake in weight management to take notice
- The probability of energy considerations outweighing factors such as price, taste, brand/style loyalty in their drinking behaviour
- The probability of a consumer choosing to switch to other drinks, drink less, eat less or do nothing.

The probability of each of these bullets will be less than one, so the combined probability of each of them will be the product of all of them and smaller than the probability of any one link in the chain. This explains why empirical literature has found that food labelling has a stronger demonstrable effect on awareness amongst consumers than on changing their purchase behaviour (Wilkinson et al 2009).

Consumer purchase decisions are also likely to vary according to whether the buyer is making the purchase for their own consumption or buying it for someone else. Those in the latter category are less likely to be influenced by weight management issues than those buying for themselves, adding another point of variation in the purchase decision chain.

Although there is some literature showing the effects of market interventions like price changes on changes in population Body Mass Index (Escobar 2013), this literature review has not come up with robust and generalisable evidence on the effects of energy labelling of alcoholic beverages on consumer behaviour. The energy labelling considered in this analysis is less conspicuous than the front of pack and traffic light styles reported in much of the literature on labelling effectiveness, and may not be enough to change the chain of influences on drinking behaviour. It is not possible to predict or estimate the market effects of mandatory labelling without

more detail on consumer responses to energy labelling in conjunction with other factors in purchase decisions.

This chain of factors in decision purchases reflects a systematic model of information processing which may not reflect actual behaviour. Psychological models also recognise heuristic processes that are typically quicker and demand less cognitive effort, or cue-based models triggered by simple stimuli. The effect of such alternative processes is to reduce the effect of combined probabilities, but it does not remove it entirely as the cue still needs to be noticeable to trigger its effect.

4.2.3. Sales of alcoholic beverages with unseen packaging

For this analysis, it has been assumed that the energy labelling would apply only to alcoholic beverages sold for retail sale in packages (e.g. bottles, cans and cardboard packaging such as six-packs) that are required to bear a label under the *Australia New Zealand Food Standards Code* (the Code). This would principally apply to that sold at retail for private consumption at home. Alcoholic beverages sold in bars and restaurants may be sold in draught form on tap, sold by the glass (both of which do not require labelling in terms of the Code under Standard 1.2.1), or otherwise purchased before the bottle is seen (e.g. table wines). All of these potentially reduce the effectiveness of a container label in informing consumers of the energy content of their purchase decisions.

In volume terms, the share of total alcoholic beverages sold in bars and restaurants is about 20% in Australia, and about 30% in New Zealand. An indeterminate proportion (although not all) of these shares will be sold in ways in which the bottle is not seen before purchase (if at all), so energy labelling can be expected to miss consumers who drink at these outlets.

However, this does not mean a label on a bottle is completely ineffective in these cases. Purchase of alcoholic beverages is not a one-off event but a repeated behaviour, in which consumers can be expected to learn about a product's characteristics in previous encounters with the product in shops or home consumption, and use that learning in purchase decisions in bars. The effectiveness of labelling on sales in bars and restaurants cannot be discounted entirely, but will be weaker than that of shop sales.

4.2.4. Modelling the impact on weight management

Energy labelling cannot be expected to have a large immediate impact on weight management. It is not like other standards that reduce exposure to identified risks that can have immediate effect in reducing the incidence of damage from those risks. Rather it is intended to improve the information around a product to enable better consumer choices that in the long term accumulate to improve weight management, avoidance or deferment of latent long-term problems caused by excessive weight, and prolonging of improved quality of life into the long term future. Because the avoidance of latent problems is in the long term future and may not happen anyway if the beneficial behaviour is not sustained, or confounding factors intervene, the

expected value of these benefits after discounting in a cost benefit analysis will be very small. There may be short term benefits but principally for those people who take sufficient responsive action to move from a higher risk to a lower risk weight category.[15]

Ideally estimating change in benefits between the factual and counter-factual would build on a model of population changes over time, including changes in the rate of overweight and obesity with their associated costs for productivity, health and well-being. An example of such a model is used by Michaud et al (2012), who used a Future Elderly Model to track through micro-simulation the individual health trajectories of those receiving health interventions, from which health and economic outcomes are estimated. Less sophisticated models use average or aggregate health characteristics for a cohort to achieve similar, if more generalised, forecasting of future outcomes from the intervention.

Such modelling is complex and beyond the scope and timing of this current report. Moreover, with little evidence of the effectiveness of energy labelling, simulation modelling could only proceed on the basis of a set of assumptions which cannot be verified from current evidence and risk creating a spurious precision. Such detailed modelling is not feasible in this analysis. Because of this we use a simpler backwards analysis to indicate how much weight improvement would be required to ensure a break-even outcome where costs are matched by benefits.

4.3. Costs of energy labelling of alcoholic beverages

To examine the potential costs of energy labelling of alcoholic beverages, we use the responses for surveyed industry parties (with some adjustment) to apply to estimates of the number of firms of different categories across the two countries. The inputs into the analysis are summarised in Table 5 below.

[15] Because there is a range of conditions with different causal relationships to weight for different individuals any downwards shifts are likely to produce some reduction in risk even if the person remains overweight. However all estimates relating costs to weight status use categories and there is no way of quantifying infra-marginal effects.

Table 5 Reported costs for entities of different types

Costs		One-off *A$'000*	On-going *A$'000/yr*	# entities
Regulatory Adminstration costs	FSANZ	270.0		
	Notification	3.1		
	Gazettal	1.9		
	Total	274.9		1
Business compliance costs	Australia			
	Large Brewers	5,500.0	669.4	2
	Small Brewers	62.9	59.2	35
	Large Winery	3,110.7	1,208.1	5
	Small Winery	26.4	17.6	1860
	Large Spirits/RTD	1,600.0	202.0	5
	Small Spirits/RTD	483.5	61.4	13
	Australia			
	New Zealand			
	Large Brewers	7,200.0	876.4	3
	Small Brewers	21.0	3.8	70
	Large Winery	372.0	38.2	5
	Small Winery	7.3	10.2	700
	Large Spirits/RTD	1,454.5	183.6	1
	Small Spirits/RTD	439.5	55.5	5
	New Zealand			
Allocative costs	Price changes			
	Net trade impacts			

Source: NZIER

Regulatory administration costs are confined to those of FSANZ alone, as no other government entity approached for consultation considered it would have significant additional costs to its current activities. Business compliance costs are broken down into separate categories for different products, size class and country, with some marked differences apparent. Large scale brewer costs in New Zealand are higher than those in Australia, due partly to New Zealand brewers having to introduce back labels to many of their bottled products which are already a standard feature in Australia. Large scale winery costs are also different between countries, partly due to the large numbers of separate SKUs offered by different countries, and partly due to uncertainty about what product testing would be required to ensure energy labels accurately reflect energy content.

A third category of costs results from shifts in resource allocation across the economy. These may fall into two categories. One is net trade impacts that may result from imposition of the energy labelling. As long as the labelling does not discriminate between imported and domestic products, and is notified to World Trade Organisation (WTO) members for comment, it should not infringe any international trade agreements or WTO rules. The WTO notification process allows members to express concerns regarding any possible technical barriers to trade. Imported products would be required to have energy labelling in the same way as domestic products and importers who bear the cost of this would attempt to pass these on to consumers. No significant net trade impact is likely from mandatory energy labelling.

The other potential source of allocative cost arises from changes in prices of alcoholic beverage products that leads to the reduction in physical consumption in the economies and associated welfare derived from it. A price rise itself is a pecuniary transfer effect of no relevance to cost benefit assessment of the energy labelling, but change in the volume of welfare-enhancing consumption is relevant. Consumers may shift their consumption expenditure to other things with little change to the measured economy, but they will be shifting away from their first choice consumption preferences, implying some loss of welfare. Given the low costs per litre implied by these energy labelling costs, and the market power of retailers in both countries who will resist simply passing prices onto consumers if it affects their sales, the effects on consumer prices and purchases are unlikely to be significant.

4.4. Aggregate cost benefit analysis

To examine the aggregate costs and benefits of energy labelling we multiply the per enterprise costs in Table 5 by the number of enterprises in each category, and project the on-going annual costs for 10 years ahead. We discount this at the Office of Best Practice Regulation (OBPR) standard rate of 7% (examining variants at the 4% and 10% rates) to arrive at a present value cost.

Modelling a stream of benefits to match the costs is problematic in this case, where the potential benefits are either intangible (as in the consumer's right to know), unknown (such as the elasticity of obesity prevalence with respect to labelling) or else occur in the long term and heavily discounted future, in which causation would be difficult to establish because of the many intervening influences in the interim. We therefore work backwards from costs to consider what benefits might justify them and consider the likelihood of such benefits being realised.

An economic benefit for weight management would arise if the social costs imposed by overweight and obesity could be reduced by an amount commensurate with the cost of implementing the labelling requirement. Estimates of such costs for Australia are reproduced earlier in Table 3 of this report and used as the starting point of our cost benefit assessment, as explained in more detail in Appendix A. Because the coverage of these cost estimates is stronger for obesity than for the overweight, the following calculations concentrate on the obese populations only.

To illustrate the potential cost savings required, we use a break-even analysis which estimates how many people would need to change behaviour sufficiently to avoid the costs of ill-health associated with obesity to offset the costs of the labelling. To the extent that any reduction in dietary energy intake contributes to reduction in weight towards more healthy levels, benefits can accrue to individuals who either move out of obesity into a healthier weight category, or who achieve infra-marginal improvements within the obese category. The backward estimation procedure simply expresses this as equivalent to the number of people incurring obesity costs that would need to improve their weight sufficiently so as to avoid these costs.

The calculation process can be summarised as:

- Labelling costs, both up-front and on-going, from Table 5 above are combined into a 10 year implementation cost
- Using one of the per person costs of obesity from Table 4 above as the per unit benefit, we calculate the number of people who would have to save

these costs for the benefit to equal the costs, discounted into present values at 7% discount rate.

Because of uncertainty over both the cost and benefit values, we present a range of scenarios with varying input assumptions.

4.4.1. Scenarios examined in analysis

For the value of health benefit we use in each of the scenarios the following financial and economic cost values (in 2014 Australian $ terms):

- Low financial cost: - $1,852 per person per year (from Medibank 2010)
- High financial cost - $3,488 per person per year (Colagiuri et al 2010)
- Low economic cost - $9,000 per person per year (Medibank 2010, rounded)
- High economic cost - $14,000 per person per year (Access 2008a, rounded).

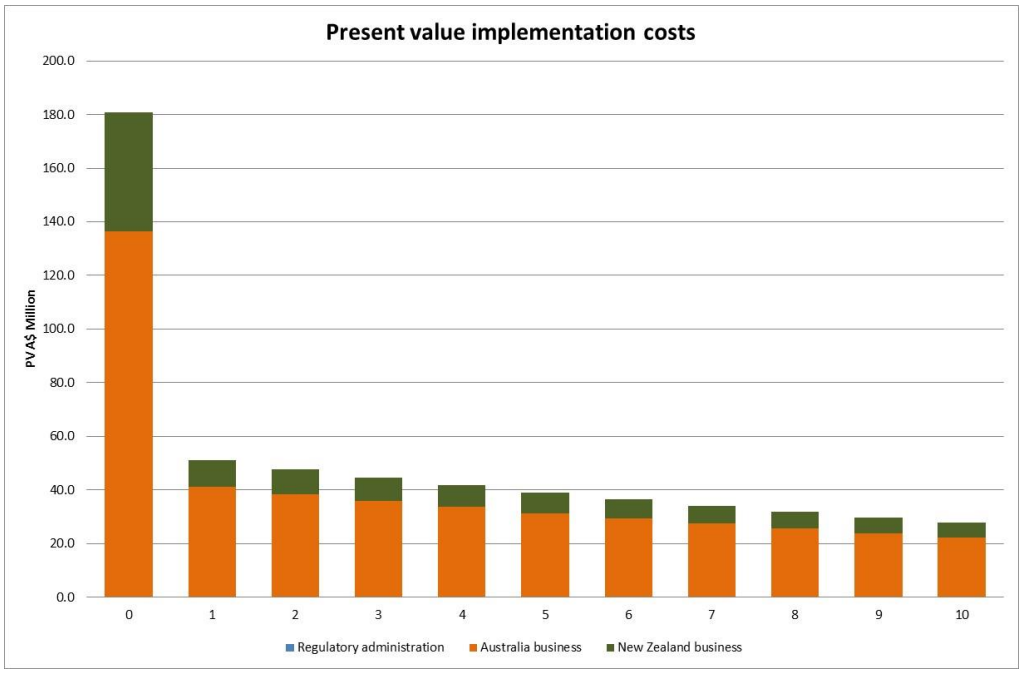
On the cost side we present four separate scenarios reflecting changes in industry up-front and on-going costs and implementation timing as the only varying inputs.

- Scenario 1 is a high up-front and high on-going cost scenario, using industry cost estimates derived from Table 5 and assuming instant implementation with no transition period
- Scenario 2 has lower up-front costs but high on-going costs, assuming a two year transition period to enable labelling changes to be introduced in line with normal cyclical refreshing of labels, which would reduce the marginal cost per item. On the assumption that most producers refresh their labels on a three year cycle, two thirds of the up-front costs of energy labelling would be absorbed in normal relabelling cost, leaving one third of the up-front cost in Scenario 1 to be spread equally over the first two years. On-going costs and benefits achieved are as for scenario 1 but pro-rated in the first two years
- Scenario 3 has high up-front cost as in Scenario 1 but lower on-going costs reduced by an assumed 80%, on the assumption that product testing and product/label write-off costs which loomed large in industry consultation turn out to be less than expected. There is no transition period and no delay in benefits being realised
- Scenario 4 has no up-front costs (assuming a three year transition period that eliminates costs additional to voluntary cyclical refreshing of labels) and low on-going costs the same as in Scenario 3, with both on-going costs and benefits phased in in equal instalments over the first three years.

The cost profile of Scenario 1 results of the cost calculation in present value Australian dollars is presented in Figure 6.

On the basis of industry estimates, overall Australia incurs about four times the cost that New Zealand does, in keeping with the relative size of the two economies. The respective present value costs (at 7% discount rate) are A$423 million for Australia and A$114 million for New Zealand, over a 10 year period from introduction. Regulatory administration costs pale into insignificance alongside the industry estimated compliance costs for businesses on both sides of the Tasman which largely drive the outcome of the analysis.

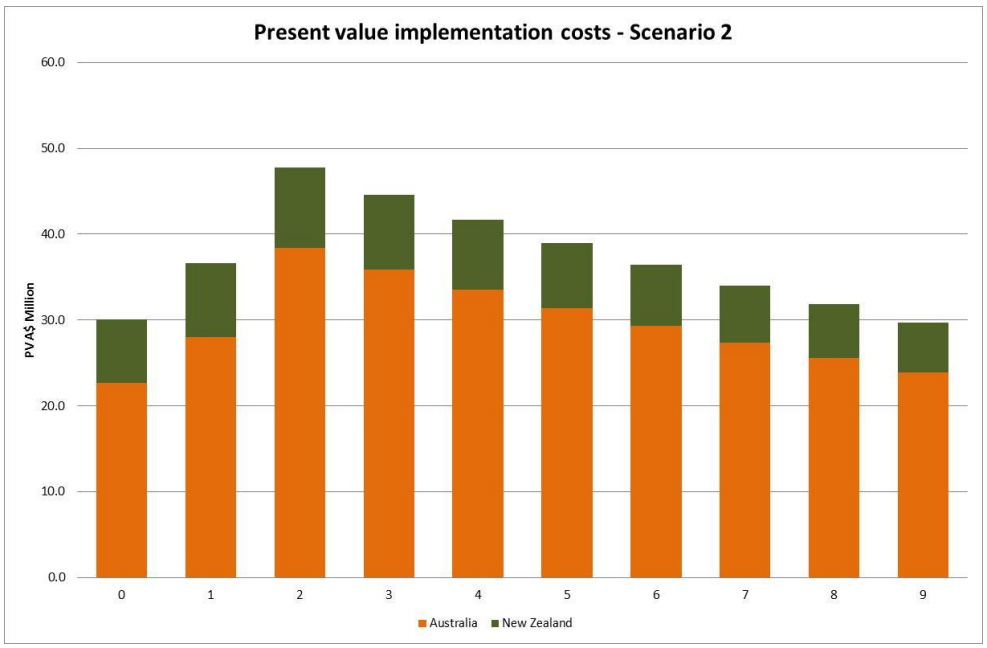
Figure 6 Costs of implementation - Scenario 1



Source: NZIER

Scenario 2 assumes the up-front costs are reduced by the two year transition and phased in over that period (Figure 7). Over 10 years of implementation the present value cost is A$296 million for Australia and A$76 million for New Zealand.

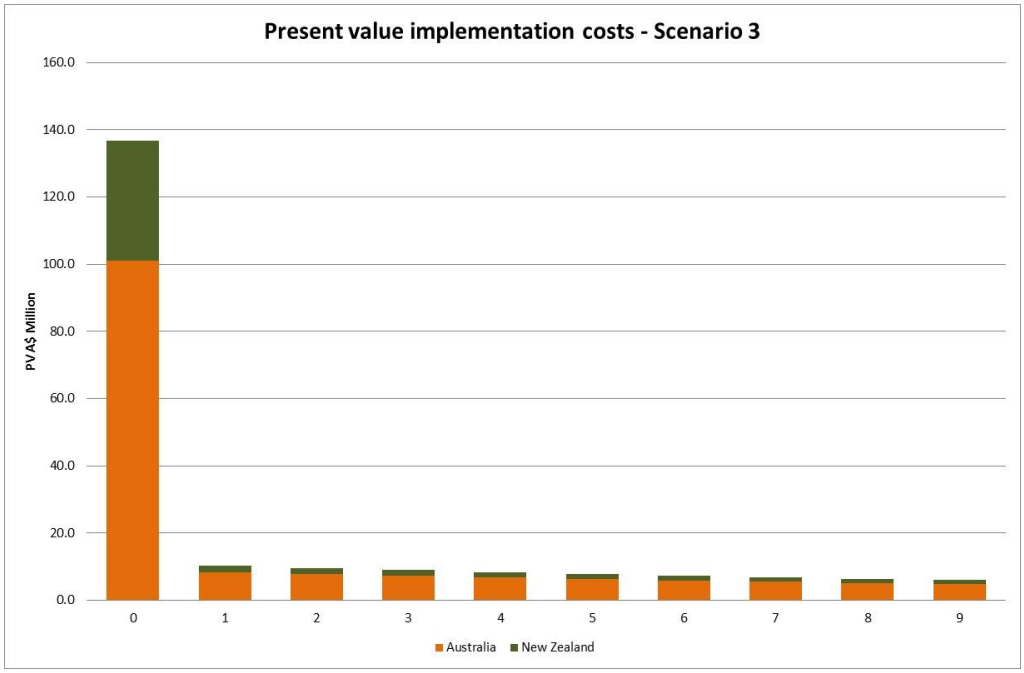
Figure 7 Costs of implementation - Scenario 2



Source: NZIER

For Scenario 3 the up-front costs are the same as Scenario 1 but the on-going costs are substantially smaller due to lower testing and stock write-off costs (Figure 8). The present value cost of implementation over 10 years would be A$158 million for Australia and A$50 million for New Zealand, (a higher relative share of combined cost across countries for New Zealand because of heavier weighting on up-front costs).

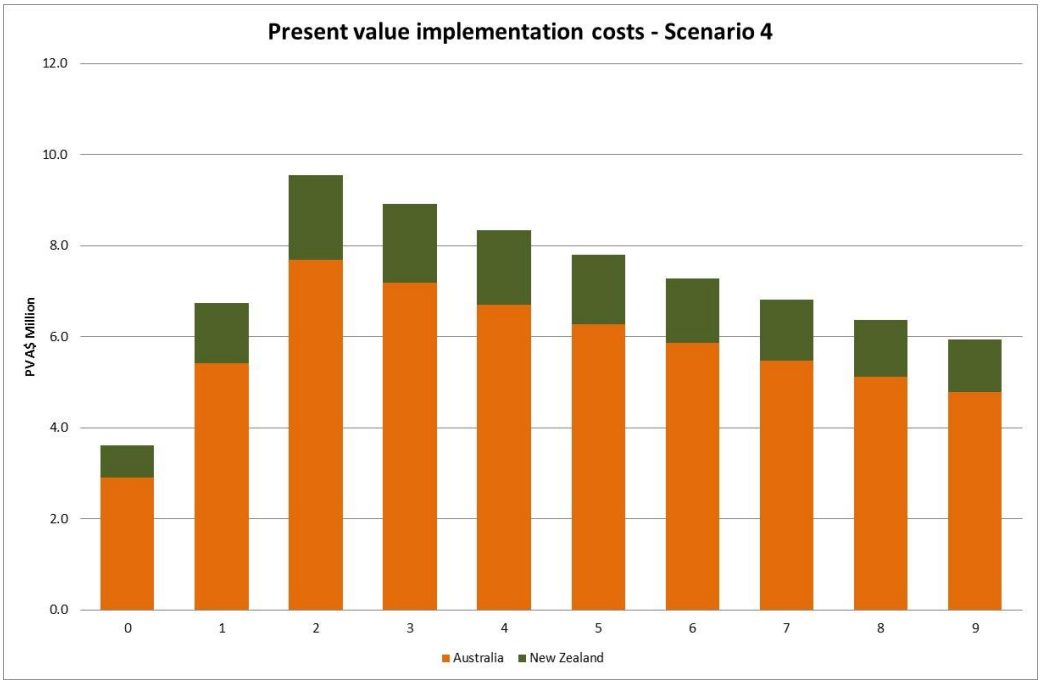
Figure 8 Costs of implementation - Scenario 3



Source: NZIER

In Scenario 4 a three year transition absorbs all up-front costs into the normal relabelling cycle and phases in the on-going costs (Figure 9). The present value cost of implementation over 10 years would be A$57 million for Australia and A$14 million for New Zealand.

Figure 9 Costs of implementation - Scenario 4



Source: NZIER

These variations in inputs in the different scenarios have been made to illustrate how results change with different cost profiles, given uncertainty in the likely scale and impact of labelling on industry. It reflects some difference in views about the likely impacts between industry and regulators, and provides some counter to the possibility that industry figures used in the report are over-stated due to confusion around implementation and enforcement requirements, the capacity for transition periods to reduce labelling change costs if they aligned with cycles of voluntary label renewal, the possibility that energy testing could be much lower than anticipated in the estimates, and possible strategic bias in responding to consultation. Costs could be much lower than those in the industry estimates, with optimised implementation and regulatory design. However, optimising the options for implementation of labelling is beyond the scope of this report.

4.4.2. Results of scenarios

The results of these scenarios and benefit value assumptions are outlined in Table 6.

At the start of 2013, there were about 5.3 million adult Australians and 1.1 million adult New Zealanders categorised as obese, and contributing to the additional financial and economic costs of the sort calculated above. Assuming Australian costs of obesity also apply to New Zealanders, to avoid costs of the magnitude equivalent to the implementation costs of energy labelling in Scenario 1 would require between 5,100 and 38,550 of the obese in both countries to avoid the costs of obesity each year over the 10 year implementation period, when that cost is assessed as total economic cost or total financial cost respectively.

Table 6 Break-even point under various cost scenarios

All values in A$ 2014 terms

	Scenario 1	Scenario 2	Scenario 3	Scenario 4
PV Up-front costs	**126 m**	**41 m**	**126 m**	**0**
PV On-going costs summed over 10 years discounted at 7% rate	**411 m**	**331 m**	**82 m**	**71 m**
Low financial cost/year	**$1,852**			
Required reduction of obese (person year equivalents)	38,549	30,703	14,940	5,910
Reduction required per year (percentage of obese)	0.60%	0.48%	0.23%	0.09%
High financial cost/year	**$3,488**			
Required reduction of obese (person year equivalents)	20,471	16,304	7,934	3,112
Reduction required per year (percentage of obese)	0.32%	0.25%	0.12%	0.05%
Low economic cost/year	**$9,000**			
Required reduction of obese (person year equivalents)	7,933	6,318	3,074	1,206
Reduction required (percentage of obese)	0.12%	0.10%	0.05%	0.02%
High economic cost/year	**$14,000**			
Required reduction of obese (person year equivalents)	5,100	4,062	1,976	775
Reduction required per year (percentage of obese)	0.08%	0.06%	0.03%	0.012%

Source: NZIER

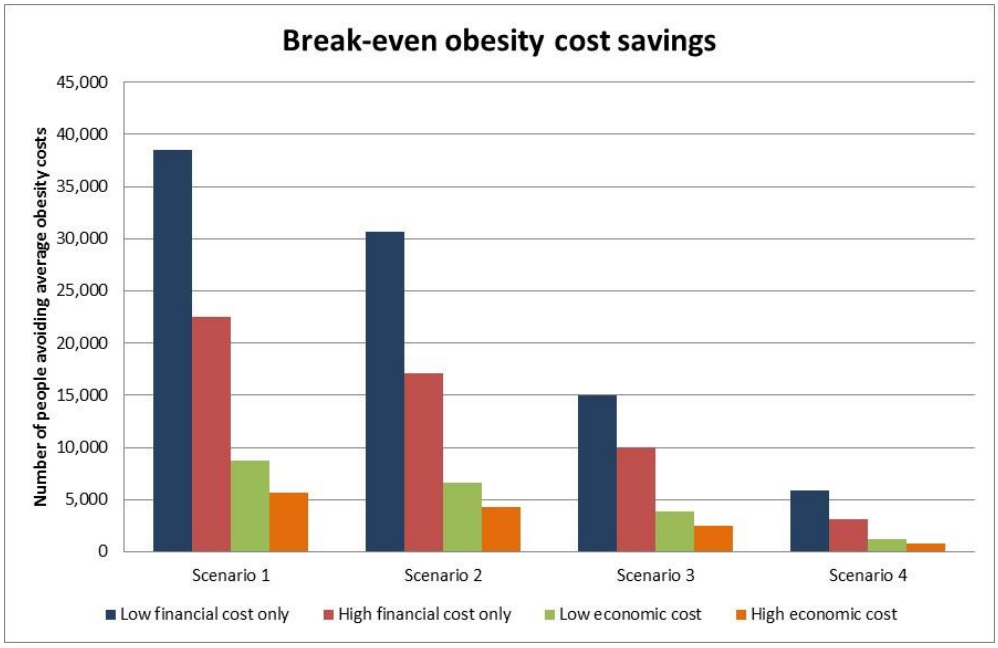
This is equivalent to between 0.08% and 0.60% of the 2014 total of obese in both countries effecting a weight improvement because of the labelling in Scenario 1.

Allowing for growth in the numbers of obese in both countries by extrapolating recent trends, the range would be 0.06% and 0.41% of the 2023 total of obese in both countries.

The analysis showed that the required reduction of obese people as a percentage of obese people per year to break-even ranged across the four scenarios from a low of 0.012% to a high of 0.6%, depending on the values chosen to represent the value of obesity cost savings.

Figure 10 compares results across the 4 scenarios. Scenario 1 has the highest break-even and Scenario 4 the lowest break-even. Relative to Scenario 1, the Scenario 2 result shows the effect of accounting for transition periods in lowering up-front costs, while Scenario 3 shows bigger effect in allowing for lower on-going costs with reduced testing and label write-off costs.

Figure 10 Break-even across implementation cost scenarios



Source: NZIER

The break-even benefits may be thought of as the number of obese people who save the annual costs of obesity as a result of improved weight management enabled by energy labelling of alcoholic beverages. Those costs have to be saved each year over the 10 year implementation period, which can either be done by the same people sustaining the saving over each of the 10 years, or by different people moving between obese and healthier weight categories over that period. The break-even numbers are also likely to be lower bound figures for the number of people that would need to improve weight management. This is because each of the benefit values is based on an average cost calculated for the category of obese adults which will include people incurring different levels of cost, so it will require more people to break-even if those who incur less than average obesity cost are better able to achieve weight improvements. (More discussion in Appendix A.5)

The potential public benefit is the value of information and its contribution to alleviating costs of excess weight across the population. These results show the break-even over 10 years with respect to avoidance of health costs alone, but if a positive value of information could be taken into account the break-even levels would be lower. Although surveys suggest some public preference for nutritional information on alcoholic beverages, suppliers consulted for this study stated they very rarely received enquiries about the energy content of their products. Energy labelling imposes some cost on suppliers which they are reluctant to incur voluntarily, because they see little likelihood of recovering those costs in sales and may disadvantage themselves with those consumers who view energy content as a negative attribute.

Identifying a market failure in information is not sufficient to conclude that it is socially efficient to rectify it, if the costs of so doing are unreasonably large. Motivated consumers who want to know the energy content of different alcoholic beverages can obtain information on the broad classes of drink from other sources than product labelling, for instance information put out by Weightwatchers and public health agencies. That may be a less costly way of addressing information deficiency in the market than imposing additional cost on every packaged alcoholic beverage in the market.

4.4.3. Sensitivity to key variables

The above discussion has referred to application of three different discount rates to the implementation cost estimates. While different rates change the present value estimates, they do not substantially change the results that implementation costs that need to be matched by demonstrable benefits to justify the labelling.

There is a risk with the consultation of businesses that costs could be overstated, because business just does not know what costs might be, or responds strategically or because of some other bias in the businesses selected for consultation. If costs are only half those stated, the number of weight-improving people needed to match implementation costs is simply half that of the combined population of obese adults in both countries.

Changing costs has a linear and directly proportional effect on the results in the procedure used here. For instance, if the costs are thought to be overstated by 100%, the “actual” costs would be 50% of those stated and the break-even savings in obesity costs would simply be halved. Change in the relativity of up-front and on-going costs would change the linearity, and this is reflected in differences between Scenarios 1 and 3 and 2 and 4, as the latter two substantially change the up-front costs with their assumptions on transition and incorporation of energy labelling with other voluntary labelling changes. The current analysis is more sensitive to changes in the on-going cost than the up-front cost of implementation: a 20% reduction in on-going costs per year reduces the break-even number by 15%, whereas a 20% reduction in up-front cost reduces the break-even point by only 5%.

Some results of variation in discount rate and input assumptions are tabled below. Compared to using a 7% discount rate, break-even using a 4% rate would require a barely discernible lower proportion of the obese to avoid obesity costs in Scenarios 1 and 3 (Figure 11), and a 10% rate would require a slightly higher proportion (Figure 12). The proportions (to 2 decimal places) do not change in the other scenarios.

Figure 11 Four scenario break-even results at 4% discount rate

	Scenario 1	Scenario 2	Scenario 3	Scenario 4
	A$m	*A$m*	*A$m*	*A$m*
Up-front costs (Present Value)	125.8	41.1	125.8	0.0
On-going costs (PV over 10 years)	461.0	380.5	92.2	81.3
Unit value of benefit/person-year				
Low financial cost only	$1,852	$1,852	$1,852	$1,852
Number of obese people per year	37,564	30,562	13,955	5,910
% of obese population in 2014	0.59%	0.48%	0.22%	0.09%
High financial cost only	$3,488	$3,488	$3,488	$3,488
Number of obese people per year	20,471	16,304	7,934	3,112
% of obese population in 2014	0.32%	0.25%	0.12%	0.05%
Low economic cost	$9,000	$9,000	$9,000	$9,000
Number of obese people per year	7,933	6,318	3,074	1,206
% of obese population in 2014	0.12%	0.10%	0.05%	0.02%
High economic cost	$14,000	$14,000	$14,000	$14,000
Number of obese people per year	5,100	4,062	1,976	775
% of obese population in 2014	0.08%	0.06%	0.03%	0.012%

Source: NZIER

Figure 12 Four scenario break-even results at 10% discount rate

	Scenario 1	Scenario 2	Scenario 3	Scenario 4
	A$m	*A$m*	*A$m*	*A$m*
Up-front costs (Present Value)	125.8	40.0	125.8	0.0
On-going costs (PV over 10 years)	369.4	290.7	73.9	63.2
Unit value of benefit/person-year				
Low financial cost only	$1,852	$1,852	$1,852	$1,852
Number of obese people per year	39,561	30,850	15,952	5,911
% of obese population in 2014	0.62%	0.48%	0.25%	0.09%
High financial cost only	$3,488	$3,488	$3,488	$3,488
Number of obese people per year	20,471	16,304	7,934	3,112
% of obese population in 2014	0.32%	0.25%	0.12%	0.05%
Low economic cost	$9,000	$9,000	$9,000	$9,000
Number of obese people per year	7,933	6,318	3,074	1,206
% of obese population in 2014	0.12%	0.10%	0.05%	0.02%
High economic cost	$14,000	$14,000	$14,000	$14,000
Number of obese people per year	5,100	4,062	1,976	775
% of obese population in 2014	0.08%	0.06%	0.03%	0.012%

Source: NZIER

4.4.4. Updated labelling costs

During the preparation of this report PriceWaterhouseCoopers (PWC) produced a second report on industry labelling costs (PWC 2014a) that included substantially

reduced estimates from its earlier 2008 report.[16] Our cost analysis has not relied on the 2008 report because its costs were high and did not bear any relation to costs being supplied by the wine, beer and spirits industries. The industry has undergone major change since the first PWC report (2008). It has become more competitive and prices have dropped substantially. The second PWC report (2014a) reflects these industry changes. Its estimates for relabelling a glass bottle range between A$1,900 for a minor change and $A7,000 for a major change.[17]

The information collected from the beer, wine and spirits industries by NZIER are at the lower end of the range collected by PWC (2014a): between A$1,818 and A$4,545. Consequently there is no need to revise down our cost estimates in line with the PWC 2014a report.

One possible source of anomalies in responses was uncertainty by some in industry about whether a tolerance for the energy content declaration on alcoholic beverages would be provided. No tolerance for energy labelling was specified in the consultation with industry, which could lead to some industry overstating their costs. This raises the question of whether providing some accommodation similar to the tolerance limits provided for alcohol content declaration in Australia and New Zealand would alleviate this uncertainty and lower costs. Relative to the PWC (2014a) report it is not obvious that the costs given in consultation are overstated or that this is a source of distortion, and there is no basis for quantifying incremental change in responses that would be received from providing an accommodation. The results of halving implementation costs in the analysis are outlined above. However, it may be possible to further reduce these costs through well designed regulation and implementation.

4.4.5. Health Star Rating labelling

In 2014 PWC issued a cost benefit analysis of a Health Star Rating System (HSRS) to be applied to food packaging in Australia (PWC 2014b). This used an assessment of the break-even point of the number of overweight and obese adults to be moved into healthy weight categories to produce health cost savings that would cover the costs incurred in implementing the system.

Although similar in approach to the NZIER assessment of energy labelling of alcoholic beverages, the HSRS cost benefit analysis has several significant differences. The HSRS involves a star symbol rating and a box of "icons" listing energy content, saturated fat, sugars and sodium content per 100 grams, to be located on the front of packaged food. It has been designed specifically to overcome the difficulty that consumers may have in interpreting information in a standard nutrition information panel, providing a health star rating to aid simple heuristic responses. The HSRS recognises that labelling alone may have limited effectiveness, so includes a number of promotional activities by government and NGOs to reinforce the message. It is not mandatory and depends on voluntary uptake by industry, so the modelling includes a

[16] http://www.foodstandards.govt.nz/publications/documents/Final%20report-%20FSANZ%20-%207%20March%202008%20%282%29.pdf

[17] Based on labelling changes to glass bottles. http://www.health.gov.au/internet/main/publishing.nsf/Content/CF7E670597F383ADCA257BF0001BAFF5/$File/2014%20Cost%20Schedule%20for%20Food%20Labelling%20Changes%20.pdf

range of assumptions about inputs that could be varied with implementation of varying complexity.

The central estimate envisages a cost over five years of A$60 million, or A$12 million per year, 67% covered by industry, 10% by NGOs and 23% by government. Basing avoidable costs of obesity and overweight on the 2005 estimates of Colagiuri et al (2010), adjusted for inflation and assuming current trends in overweight and obesity in Australia continue, PWC expect the associated health cost to reach A$106.5 billion by the end of the decade, with an average cost across the two weight categories of A$7,931. To cover the cost of the HSRS will require a 0.04% reduction in the population that is either overweight or obese by 2019-2020, implying a decrease of 7,565 persons over a five year period or around 1,513 individuals per year. The annual figures are all 1/5th of the five year figures, so there is no annualisation into present values to allow for the time value of money.

Labelling costs for the HSRS are smaller than those for energy labelling alone. This is to be expected, as HSRS is a voluntary scheme, the PWC analysis covers only around 15% of potentially affected SKUs, and participation is likely to be from those who can do so at least cost. The break-even share of populations for HSRS is also lower than for energy labelling alone for some scenarios and benefit values used, but this is to be expected because of lower costs to cover and the wider pool of obese and overweight populations targeted by the HSRS.

Although the HSRS is dissimilar to mandatory energy labelling of alcoholic beverages, in reviewing evidence of the effectiveness of interpretative labelling in helping people make better food choices, and how the HSRS would operate in practice to reduce the growth in people being classed as overweight or obese, PWC identify a number of findings that could be relevant to energy labelling of alcoholic beverages. These include the observation that labelling on its own does not necessarily lead to a healthy diet, that consumers are less interested in nutrition information for indulgence type products, and that self-reported use of labelling schemes is higher than what was observed in monitoring buyer behaviour. This suggests a degree of over-claiming with respect to the consciousness raised by labelling, with other influences taking precedence in purchasing decisions. These reinforce the likelihood that consumer response to energy labelling alone will be small.

4.4.6. Risks and uncertainties of the estimates

All figures in this analysis are open to challenge. Costs rely heavily on the responses to consultation which may be subject to strategic bias. Because business compliance costs dominate the other categories the bias is approximately linear – e.g. if it is thought respondents over-stated costs by 100%, the present value cost will be half those cited above.

The small winery categories in both countries comprise a large portion of costs, driven partly by the large number of wineries and partly by the unit costs per enterprise. Reasons given for that include the large number of separate SKUs produced by wineries and the expected need for testing to determine the energy content and uncertainty on what, if any, tolerance limits would be.

In basing the benefits of avoided financial costs on the Australian studies by Access Economics, Medibank, and Colagiuri, the backward estimates based on financial costs

may be considered conservative in omitting the welfare value and the value of information additional to the avoided costs of ill-health associated with obesity. Anything that raises the value per individual implies fewer individuals need to respond positively for the labelling to break-even. Given the uncertainties around the calculation of welfare value there are risks in relying on any of the currently available estimates of total economic cost of obesity. There are difficulties with reconciling all the three major studies and the estimates they come up with, so the numbers presented should be regarded as indicative rather than precise.

Had the lower financial costs of the New Zealand estimates been used, a larger number of people would be required to attain healthier weight and realise benefits sufficient to outweigh the costs of labelling. It should be stressed, however, that the procedure used results in cost equivalents rather than actual people, and hence they are a lower bound to the numbers needing to respond to energy labelling to achieve benefits to break-even with costs.

5. Conclusions

This report has assessed the costs, benefits and net impacts of requiring energy content on the label of packaged alcoholic beverages for retail sale. The benefits consideration has focused on the role of labelling in weight management, because of alcohol's energy density and risk that consumption contributes to higher energy intakes and weight gain and heightened risk of overweight, obesity and associated risks to health.

Alcoholic beverages contribute to an individual's dietary energy intake, through both the energy content of alcohol and other nutrients like carbohydrates. However, the evidence on the relationship between alcohol consumption and weight gain is mixed and the effect of alcohol consumption on weight gain is not readily predictable due to other confounding factors.

The literature on labelling effectiveness in general shows it can raise awareness and aid recall, but there is less evidence conclusively linking it to changes in behaviour. There are currently very few instances internationally of mandatory energy labelling on alcoholic beverages and there is no empirical evidence on effectiveness specific to this sort of labelling. This report provides estimates of costs which are admittedly rough but at least provide magnitudes around the issue which have previously been lacking. Business compliance costs dominate the estimates, both because of large numbers of potentially affected suppliers and because of high unit costs per enterprise, reflecting the high diversity of SKUs offered by suppliers and concerns around testing batches for often small product runs. Regulatory administration costs are small by comparison and the labelling is unlikely to significantly distort resource allocation across Australia and New Zealand. The costs for Australia would be about four times those of New Zealand, reflecting the relative scales of the two economies.

The labelling costs could be justified if labelling resulted in behaviour changes that shifted sufficient people in both countries out of the overweight and obese categories into a healthier weight category, or if they make weight improvements within those categories that reduce the costs of their condition. Because of data availability, this report focuses on obesity only. The obese create financial costs for the economy, including direct medical expenditures and indirect costs of reduced productivity. Total financial costs start at a low of about A$1852/person/year. Total economic costs, combining the financial cost with estimates of human welfare costs of pain and suffering caused by premature death and morbidity, have been estimated as high as A$14,000/person/year.

If such costs could be saved then across four scenarios of varying implementation cost examined here the labelling would break-even with the equivalent of between 0.012% and 0.6% of currently obese people in Australia and New Zealand attaining healthy weight per year. This is equivalent to 775 people (at the high economic cost and lowest implementation cost) or 38,550 people (at the low financial cost and highest implementation cost) moving out of obesity into healthy weight in a year, and this level of improvement being sustained over a 10 year implementation period. However, if the people most likely to make such weight improvement are those already close to healthier weight, the marginal cost saving will be smaller and more people would need to shift across the weight categories towards healthier weight for the labelling to break-even.

Other potential benefits include the achievement of consistency with labelling with other non-alcoholic drinks, and the consumers' right to know what is in the food and drink they consume, which has value irrespective of whether they achieve weight improvement. A positive information value would increase the value of labelling, and lower the number of equivalent adults moving to healthier weight from the quantified estimates used here. However there are no practical estimates that can be used to value information of energy labelling of the sort considered here.

The results of the break-even analysis are critically dependent on the value attached to benefits of weight improvement i.e. the avoided cost of obesity. Whereas the financial costs are grounded in national accounting procedures and statistics, the welfare figures used to estimate total economic costs rely on non-market valuation techniques and a calculation of value per life year that has weak support in theoretical and empirical literature but nonetheless is recommended by the Australian Government as a consistent and plausible approach.

What this report cannot do is indicate how likely it is that energy labelling of the sort considered will prompt the changes in weight management necessary to achieve the costs savings of the sort used in this analysis. There are no close analogues in the international literature to indicate what the response is likely to be, or how feasible it is to achieve the break-even levels.

The scope of this analysis is limited in examining the effect of energy labelling on alcoholic beverages alone, not in conjunction with other measures that might be used to improve public weight management. It is also limited to the same mandatory energy labelling requirements that currently exist in Australia and New Zealand for other food products, not the more visible front of pack or traffic light symbols examined in much of the literature. It also does not consider how energy labelling ranks alongside other measures that might be used to improve the weight and health of the population (e.g. exercise promotion). Nor does the analysis explore any potential synergistic effect of combining mandatory energy labelling on alcohol with other policy initiatives. If the problem to be addressed is weight management there may be better ways of addressing it than through energy labelling on alcoholic beverages alone.

6. References

Abelson (2008), "Establishing a Monetary Value for Lives Saved: Issues and Controversies", Office of Best Practice Regulation, Australia. (http://www.dpmc.gov.au/deregulation/obpr/docs/Working-paper-2-Peter-Abelson.pdf)

ABS (2014) Australian Health Survey: Nutrition First Results – Foods & Nutrients 2011-2012, Table 2.1; Australian Bureau of Statistics, Canberra http://www.abs.gov.au/ausstats/abs@.nsf/Lookup/4364.0.55.007main+features22011-12

Access Economics (2006), *The Economic Costs of Obesity*, Report to Diabetes Australia, Canberra, www.accesseconomics.com.au/publicationsreports/showreport.php

—— (2008a), *The Growing Cost of Obesity in 2008: Three Years On*, Canberra, www.accesseconomics.com.au/publicationsreports/showreport.php

--. (2008b), *The Health of Nations: The value of a statistical life* (Report prepared for Australian Safety and Compensation Committee). 2008. Retrieved from http://www.safeworkaustralia.gov.au/sites/swa/about/publications/Documents/330/TheHealthOfNations_Value_StatisticalLife_2008_PDF.pdf

ACIL Tasman (2013) *Australian brewing industry*

AHES (2011) Australian Household Expenditure Survey; http://www.abs.gov.au/ausstats/abs@.nsf/mf/6530.0/

Alcohol Education and Rehabilitation Foundation (AERF 2011) "Alcohol product labelling – Health warning labels and consumer information"

Arsenault J (2010) "Can nutritional labelling affect obesity?" *Choices* 25(3)

BERL (2009) "Costs of harmful alcohol and other drug use", report to Ministry of Health and Accident Compensation Corporation, Business and Economic Research Ltd (BERL), Wellington

Blewett N, Goddard N, Pettigrew S, Reynolds C & Yeatman H (2011) "Labelling Logic – Review of Food Labelling Law and Policy"

Bui M, Burton S, Howlett E & Kozup J (2008) "What am I drinking? The effects of serving facts information on alcohol beverage containers"; *J Consumer Affairs*, 42(1) 81-99

Campos S, Doxey J & Hammond D (2011) "Nutrition labels on pre-packaged foods – a systematic review"; *Public Health Nutr* 14(8) 1496-1506 http://www.ncbi.nlm.nih.gov/pubmed/21241532

Centre for International Economics (CIE 2014) "Impact analysis of the Health Star Rating system for small businesses"; Report to Department of Environment and Primary Industry (Victoria), http://www.health.gov.au/internet/main/publishing.nsf/Content/foodsecretariat-front-of-pack-labelling-1

Colagiuri, S., Lee, C.M.Y., Colagiuri, R., Magliano, D., Shaw, J.D., Zimmet, P.Z. and Caterson, I. 2010, "The cost of overweight and obesity in Australia", *Medical Journal of Australia*, vol. 192, no. 5, pp. 260–4, www.mja.com.au/public/issues/192_05_010310/col10841_fm.html

Connor J, Kydd R, Shield K, Rehm J (2013) "Alcohol-attributable burden of disease and injury in New Zealand: 2004 and 2007", Research report commissioned by the Health Promotion Agency, Wellington

Crowle, J. and Turner, E. 2010, *Childhood Obesity: An Economic Perspective*, Productivity Commission Staff Working Paper, Melbourne http://www.pc.gov.au/__data/assets/pdf_file/0015/103308/childhood-obesity.pdf

Cutler, D.M., Glaeser, E.L. and Shapiro, J.M. 2003, 'Why have Americans become more obese?', *Journal of Economic Perspectives*, vol. 17, no. 3, pp. 93–118, www.faculty.chicagobooth.edu/jesse.shapiro/research/obesity.pdf

Department of Health and Ageing (DoHA) 2009, "Promoting Healthy Weight", www.health.gov.au/internet/main/publishing.nsf/content/health-pubhlth-strateg-hlthwt-obesity.htm

Drichoutis AC, Lazardis P and Nayga RM Ur (2009) "On consumers' valuation of nutrition information", *Bulletin of Economic Research* 61(3) 223-247

Economist, The (2012 Nov 17) "Danish Government rescinds its unwieldy fat tax"

Escobar MAC, Veerman JL, Tollman SM, Bertram MY & Hoffman KJ (2013) "Evidence that a tax on sugar sweetened beverages reduces the obesity rate: a meta-analysis"; *BMC Public Health 13*:1072

Forum on Food Regulation (FOFR 2011) Response to the recommendations of Labelling Logic: Review of Food Labelling Law and Policy

Hammond RA & Levine R (2010) "The economic impact of obesity in the United States" Brookings Institute, Washington DC http://www.brookings.edu/~/media/research/files/articles/2010/9/14%20obesity%20cost%20hammond%20levine/0914_obesity_cost_hammond_levine.pdf

Harnack LJ, French SA: "Effect of point-of-purchase calorie labelling on restaurant and cafeteria food choices: review of the literature". *Int J Behav Nutr Phys Act* 2008, 5:51.

International Centre for Alcohol Policies (ICAP 2013) Companion table to ICAP Report 20: "Informing Consumers about Beverage Alcohol"; http://www.icap.org/Table/AlcoholBeverageLabelling

Jéquier E (1999) "The alcohol paradox" *Am J Clin Nutr 70: 940-941*

Johannesson M & Johansson P-O (1995) "Quality of life and the willingness to pay for an increased life expectancy at an advanced age", *Working Papers in Economics and Finance, 85,* Stockholm School of Economics

Kiesel, K., McCluskey, J. J., & Villas-Boas, S. B. (2011). "Nutritional labelling and consumer choices". *Annual Review of Resource Economics*, *3*(1), 141-158

Lakdawalla, D. and Philipson, T. (2002), *The Growth of Obesity and Technological Change: A Theoretical and Empirical Explanation*, Working Paper,

www.harrisschool.uchicago.edu/About/publications/workingpapers/pdf/wp_02_03.pdf

Lal A, Moodie M, Ashton T, Siapush M & Swinburn B (2012) "Health care and lost productivity costs of overweight and obesity in New Zealand" *Australian and New Zealand Journal of Public Health*, 36(6) 550-556

Laslett AM et al. (2010). "The range and magnitude of alcohol's harm to others". Fitzroy, Victoria, Turning Point Alcohol & Drug Centre.

Manton E (2013) "Alcohol & obesity – a systematic review scoping study" Centre for Alcohol Policy Research

Martin-Moreno JM, Harris ME, Breda J, Møller L, Alfonso-Sanchez JL & Gorgojo L (2013) "Enhanced labelling on alcoholic drinks: reviewing the evidence to guide alcohol policy"; *Eur J Public Health* 23(6): 1082-1087

Mathios AD (2000) "The impact of mandatory disclosure laws on product choices: an analysis of the salad dressing market"; *Journal of Law and Economics*, XLIII, 651-677

Medibank Health Solutions (2010) "Obesity in Australia: financial and cost benefits of intervention", www.medibank.com.au/About-us/Publications/aspx

Michaud P-C, Goldman D, Lakdawalla D, Zheng Y and Gailey AH (2012) "The value of medical and pharmaceutical interventions for reducing obesity"; *J Health Econ*, 31(4) 630-643

Ministry of Health and Auckland University 2013. *Nutrition and the burden of disease: New Zealand 1997-2011*; Wellington: Ministry of Health

Ministry of Health. 2009. *Report on New Zealand Cost-of-Illness Studies on Long-Term Conditions*. Wellington: Ministry of Health

Ministry of Health. 2008. *A Portrait of Health. Key Results of the 2006/07 New Zealand Health Survey*. Wellington: Ministry of Health

Ministry of Health (2014). *Food and Nutrition Guidelines*. Wellington: Ministry of Health
http://www.health.govt.nz/our-work/preventative-health-wellness/nutrition/food-and-nutrition-guidelines

Nelson JP (2013) "Meta-analysis of alcohol price and income elasticities – with corrections for publication bias"; *Health Economics Review*, 3:17

NHMRC & MOH (2006) "Nutrient Reference Values for Australia and New Zealand"; National Health and Medical Research Council and New Zealand Ministry of Health, Commonwealth of Australia, Canberra

NHMRC (2013) *Australian Dietary Guidelines*, National Health and Medical Research Council, Commonwealth of Australia, Canberra
http://www.nhmrc.gov.au/guidelines/publications/n55

NZHES (2013) New Zealand Household Economic Survey, Statistics New Zealand
http://www.stats.govt.nz/browse_for_stats/people_and_communities/Households/HouseholdEconomicSurvey_HOTPYeJun13.aspx

New Zealand Government. 2007. *Government Response to the Inquiry into Obesity and Type 2 Diabetes 2007*. Wellington: New Zealand Government.

http://www.obesityaction.org.nz/docs/GovernmentResponsetotheInquiryintoObesityandType2Diabetes.pdf

New Zealand Law Commission (2010) "Alcohol in our lives: Curbing the harm"; New Zealand Law Commission; Wellington

OECD (2014) "The cost of air pollution – Health impacts of road transport" OECD Paris

PWC (2008) "Cost scheduling for food labelling changes"; Report to Food Standards Australia New Zealand, PriceWaterhouseCoopers

PWC (2014a) "Cost scheduling for food labelling changes"; Report to Department of Health, PriceWaterhouseCoopers

PWC (2014b) "Health Star Rating System – Cost Benefit Analysis" Report to Department of Health, PriceWaterhouseCoopers

Richardson D (2012) "The Liquor Industry"; Technical Brief No 14, The Australian Institute

Shereen D (2011) "Recent developments in alcoholic beverage regulation" http://dash.harvard.edu/bitstream/handle/1/8589348/Sheeren_Alcoholic%20Beverage%20Labelling.pdf?sequence=1

Suter PM (2005) "Is alcohol a consumption risk factor for weight gain and obesity?"; *Critical Reviews in Clinical Laboratory Sciences*, 42(3) 197-227

Swartz JJ, Braxton D, Viera AJ (2011): "Calorie menu labelling on quick-service restaurant menus: an updated systematic review of the literature". *Int J Behav Nutr Phys Act*, 8:135.

Swinburn B, Ashton T, Gillespie J, et al. 1997. "Health care costs of obesity in New Zealand". *International Journal of Obesity* 21(10): 891–6.

Todd JE & Variyam JN (2008) "The decline in consumer use of food nutrition labels 1995-2006" http://www.ers.usda.gov/media/205554/err63_1_.pdf

University of Otago and Ministry of Health. 2011. *A Focus on Nutrition: Key findings of the 2008/09 New Zealand Adult Nutrition Survey*. Wellington: Ministry of Health

Variyam, J. N., & Cawley, J. (2006). *Nutrition labels and obesity* (No. w11956). National Bureau of Economic Research

Vic Health (2009) Alcohol health information labels – report of qualitative research into health information labels on alcoholic beverages http://www.vichealth.vic.gov.au/~/media/ProgramsandProjects/ReducingAlcoholMisuse/Attachments/Background%20Paper%20Labels_FINAL.ashx

Wagenaar AC, Salois MJ & Komro KA (2009) "Effects of beverage alcohol price and tax levels on drinking: a meta-analysis of 1003 estimates from 112 studies", *Addiction* 104, 179-190

Wannamethee G, Shaper AG (2003) "Alcohol, body weight and weight gain in middle-aged British men". *Am J Clin Nutr*.;77(5):1312-7

Westerterp-Plantenga MS, Verwegen CRT (1999). "The appetizing effect of an aperitif in overweight and normal-weight humans"; *Am J Clin Nutr;69:205–12.*

Wilkinson C, Allsop S, Cail D, Chikritzhs T, Daube M, Kirby G and Mattick R (2009) "Alcohol warning labels: Evidence of effectiveness on risky alcohol consumption and short term outcomes";

World Health Organization (2011). *Global status report on alcohol and health*; Geneva

World Health Organisation (2014) *Physical activity: a global public health problem*; http://www.who.int/dietphysicalactivity/factsheet_inactivity/en/

Yarnton CA (2013) "Alcohol consumption and its association with energy and macronutrient intakes in the diets of New Zealand adults"; Master of Dietetics thesis, University of Otago

Appendix A Economic costs of obesity and overweight

A.1 The avoidable costs of overweight and obesity

Three major Australian studies and two New Zealand ones have estimated the economic costs of obese people (BMI > 30) and (in two cases) overweight people (BMI 25-30). These are referred to as the best available estimates at this time, with some caveats on aspects of their calculation and use. Detailed results of these and an earlier study are summarised in Table 7 and Table 8 which present them in both their original values and converted to common values in 2014 A$ terms.

The studies use different methodologies and produce different results from different methodologies that are difficult to reconcile, but two use a conventional cost of illness framework and have similar results (Access 2008a and Medibank 2010).

Colagiuri et al 2010 produce larger results and could be picking up items missing from the other studies, and they provide separate estimates for the overweight; but results could be biased upwards by surveying respondents of 30 years or older, and the inclusion of subsidies is not consistent with economic valuation.

The two New Zealand studies have partial coverage and productivity loss estimates that are smaller than direct health costs.

Faced with the differences in methods used and results obtained by the various studies it would be misleading to select a single result as definitive. Rather we present results across a range of different values for direct health system costs, total financial costs and total economic costs which are broadly consistent with the published papers but without selecting any one as the correct value. The estimates of Access Economics, Medibank and Colagiuri et al provide most guidance on a range of plausible values or avoidable costs of obesity with which to examine the effect of energy labelling on alcoholic beverages.

The estimates of the Access Economics (2006 and 2008a) in Australia are the most comprehensive in the sense of covering all the major categories of costs expected in a health cost study: the direct costs of medical expenditures and ancillary activities (carer costs), indirect costs of reduced productivity, the deadweight loss of taxation raised to cover public costs, and welfare costs known as the “burden of disease”, including the disutility of physical impairment caused by obesity, the shortening of lifespans and the pain, grief and suffering of the obese and their friends and family. These welfare costs are borne principally by the obese and their families and have less obvious externality justification for intervention than financial cost categories. However, individuals do attach a value to a reduction in such risks. A reduction in weight is likely to have additional value to many individuals relating to aesthetic, social and lifestyle reasons

These estimates are for the obese population alone, excluding the overweight who also could benefit from improvements in weight management.

Table 7 Estimates of weight-related costs in Australia

Results from sources, A$

Source & publication date	Date of estimate	Subject	Condition	Direct health system costs	Productivity losses (absenteeism, presenteeism etc)	Carer costs	Deadweight loss	Other costs	Total financial costs	Gov't subsidies	Burden of disease borne by individuals (welfare cost)	Total economic costs
				A$m	*A$m*	*A$m*	*A$m*	*A$m*	***A$m***	*A$m*	*A$m*	***A$m***
Medibank 2010	**2008-2009**	**Obese**		**1,300**				**6,400**	**7,700**		**30,000**	**37,700**
Access Economics 2008	2008	Obese	Type 2 diabetes	301	1,173	1,270	200	18	**2,962**		5,289	**8,251**
Access Economics 2008	2008	Obese	Cardiovascular disease	978	899	584	345	0	**2,806**		31,760	**34,566**
Access Economics 2008	2008	Obese	Osteoarthritis	490	1,180	33	99	19	**1,821**		3,841	**5,662**
Access Economics 2008	2008	Obese	Cancers	190	377	6	83	39	**695**		9,007	**9,702**
Access Economics	**2008**	**Obese**	**Combined diseases**	**1,959**	**3,629**	**1,893**	**727**	**76**	**8,284**		**49,897**	**58,181**
Colagiuri et al 2010	2007-2008	Overweight	BMI & Waist-based	6,500					**6,500**	12,800		**19,300**
Colagiuri et al 2010	2007-2008	Obese	BMI & Waist-based	14,500					**14,500**	22,800		**37,300**
Colagiuri et al 2010	**2007-2008**	**Overweight+Obese**	**Combined conditions**	**21,000**	**0**	**0**	**0**	**0**	**21,000**	**35,600**	**0**	**56,600**
Colagiuri et al 2010	2007-2008	Overweight+Obese	BMI-based	18,300					**18,300**	31,200		**49,500**
Colagiuri et al 2010	2007-2008	Overweight+Obese	Waist-based	17,100					**17,100**	28,500		**45,600**
Access Economics 2006	2005	Obese	Type 2 diabetes	116	442	479	76	7	**1,120**		1,269	**2,389**
Access Economics 2006	2005	Obese	Cardiovascular disease	428	472	306	184	0	**1,390**		11,263	**12,653**
Access Economics 2006	2005	Obese	Osteoarthritis	221	561	15	47	9	**853**		1,172	**2,025**
Access Economics 2006	2005	Obese	Cancers	107	218	3	51	24	**403**		3,542	**3,945**
Access Economics	**2005**	**Obese**	**Combined diseases**	**872**	**1,693**	**803**	**358**	**40**	**3,766**		**17,246**	**21,012**
Colagiuri et al 2010	2005	Overweight	BMI-based	7,800				2,700	**10,500**	18,700		**29,200**
Colagiuri et al 2010	2005	Obese	BMI-based	6,600				1,700	**8,300**	13,600		**21,900**
Colagiuri et al 2010	**2005**	**Overweight+Obese**	**Combined conditions**	**14,400**	**0**	**0**	**0**	**4,400**	**18,800**	**32,300**	**0**	**51,100**
New Zealand Govt 2007	2004	Obese	NZ$	**460**	370				**830**			**830**
			A$	**409**	329				**739**			**739**
Lal et al 2012 NZ	2006	Overweight+Obese	NZ$	**686**	98	226			**912**			**912**
NZ$/A$	0.89		A$	**611**	87	201			**812**			**812**

Source: NZIER

Table 8 Estimates of weight-related costs in Australia in 2014 dollar terms

Results from sources, A$, converted to March 2014 values with ABS Consumer Price Index (A2325846C)

Source & publication date	Date of estimate	Subject	Condition	Direct health system costs	Productivity losses (absenteeism, presenteeism etc)	Carer costs	Deadweight loss	Other costs	Total financial costs	Gov't subsidies	Burden of disease borne by individuals (welfare cost)	Total economic costs
				A$m	*A$m*	*A$m*	*A$m*	*A$m*	***A$m***	*A$m*	*A$m*	***A$m***
Medibank 2010	**2008-2009**	**Obese**		**1,517**				**7,470**	**8,988**		**35,017**	**44,004**
Access Economics 2008	2008	Obese	Type 2 diabetes	351	1,369	1,482	233	21	**3,457**		6,173	**9,631**
Access Economics 2008	2008	Obese	Cardiovascular disease	1,142	1,049	682	403	0	**3,275**		37,071	**40,346**
Access Economics 2008	2008	Obese	Osteoarthritis	572	1,377	39	116	22	**2,126**		4,483	**6,609**
Access Economics 2008	2008	Obese	Cancers	222	440	7	97	46	**811**		10,513	**11,324**
Access Economics	**2008**	Obese	**Combined diseases**	**2,287**	**4,236**	**2,210**	**849**	**89**	**9,669**		**58,241**	**67,910**
Colagiuri et al 2010	2007-2008	Overweight	BMI & Waist-based	7,587					**7,587**	14,940		**22,527**
Colagiuri et al 2010	2007-2008	Obese	BMI & Waist-based	16,925					**16,925**	26,613		**43,537**
Colagiuri et al 2010	**2007-2008**	**Overweight+Obese**	**Combined conditions**	**24,512**	**0**	**0**	**0**	**0**	**24,512**	**41,553**	**0**	**66,065**
Colagiuri et al 2010	2007-2008	Overweight+Obese	BMI-based	21,360					**21,360**	36,417		**57,777**
Colagiuri et al 2010	2007-2008	Overweight+Obese	Waist-based	19,959					**19,959**	33,266		**53,225**
Access Economics 2006	2005	Obese	Type 2 diabetes	148	564	611	97	9	**1,429**		1,619	**3,048**
Access Economics 2006	2005	Obese	Cardiovascular disease	546	602	390	235	0	**1,774**		14,372	**16,146**
Access Economics 2006	2005	Obese	Osteoarthritis	282	716	19	60	11	**1,088**		1,496	**2,584**
Access Economics 2006	2005	Obese	Cancers	137	278	4	65	31	**514**		4,520	**5,034**
Access Economics	2005	Obese	**Combined diseases**	**1,113**	**2,160**	**1,025**	**457**	**51**	**4,806**		**22,006**	**26,812**
Colagiuri et al 2010	2005	Overweight	BMI-based	9,953				3,445	**13,398**	23,862		**37,260**
Colagiuri et al 2010	2005	Obese	BMI-based	8,422				2,169	**10,591**	17,354		**27,945**
Colagiuri et al 2010	**2005**	**Overweight+Obese**	**Combined conditions**	**18,375**	**0**	**0**	**0**	**5,615**	**23,989**	**41,216**	**0**	**65,205**
New Zealand Govt 2007	2004	Obese	NZ$	**553**	**445**				**998**			**998**
			A$	**492**	**396**				**888**			**888**
Lal et al 2012 NZ	2006	Overweight+Obese	NZ$	**842**	**120**	**277**			**1,119**			**1,119**
NZ$/A$	0.89		A$	**749**	107	247			**996**			**996**

Source: NZIER

A.2 Calculation of the base measure of benefit (avoided cost) achieved

Benefit is represented by the cost of overweight and obesity that might be avoided with better weight management due to energy labelling of alcoholic beverages. A first step is to establish the extent of overweight and obesity in the population and associate this with cost estimates to arrive at a cost per overweight or obese person. Table 9 shows the shares of population in Australia and New Zealand who were obese and overweight in 2013, and also for Australia in 2008 when most of its cost estimates were prepared.

Table 9 Population who are obese or overweight

Adults aged 15 or older

	Australia		New Zealand		Australia & New Zealand	
	m		*m*		*m*	
Population > 15 years old in 2008	17.148					
Obese share of population	4.853					
Overweight share of population	6.053					
Combined obese & overweight	**10.906**					
Population > 15 years old in 2013	18.763		3.580		22.343	
Obese share of population	5.310	28%	1.110	31%	6.420	29%
Overweight share of population	6.623	35%	1.217	34%	7.840	35%
Combined obese & overweight	**11.933**	**64%**	**2.327**	**65%**	**14.260**	**64%**

Source: NZIER

When the Access and Medibank estimates are divided by the number of Australian adults (aged 15 or older) in 2008 the total financial costs per year are around A$1,590 to A$1,710 per obese adult, similar to the Colagiuri estimates for obese and overweight combined on the BMI and Waist Circumference measures (A$1,570 to A$1,680). The Colagiuri estimates also show that costs per obese person are more than double those for an overweight person, so its combined figures contain a higher average obesity cost and lower average overweight cost. Adding welfare costs brings the Access estimate of total economic cost to nearly A$11,990 per obese person per year, and that of Medibank to A$7,770 per year. Whichever calculation method is used, it is likely that obesity has financial costs of at least around A$1,570 per year and may be substantially higher depending on the size of the welfare cost. The results are shown in Table 10.

Table 10 Overweight and obesity costs per affected adult in 2008

Data drawn from Table 7

2008 A$ terms				*Direct cost*	*Total Financial Cost*	*Total Economic Cost*
Costs per person in affected group				*$/person/yr*	*$/person/yr*	*$/person/yr*
Medibank (2010)	**2008-2009**	**Obese**		**268**	**1,587**	**7,769**
Access Economics	**2008**	Obese	**Combined**	**404**	**1,707**	**11,989**
Colagiuri et al 2010	2007-2008	Obese	BMI & Waist-based	**2,988**	**2,988**	**7,686**
Colagiuri et al 2010	2007-2008	Overweight	BMI & Waist-based	**1,074**	**1,074**	**3,188**
Colagiuri et al 2010	**2007-2008**	**Overweight+Obese**	**Combined**	**1,926**	**1,926**	**5,190**
Colagiuri et al 2010	2007-2008	Overweight+Obese	BMI-based	**1,678**	**1,678**	**4,539**
Colagiuri et al 2010	2007-2008	Overweight+Obese	Waist-based	**1,568**	**1,568**	**4,181**

Source: NZIER

We then update these figures with the ABS CPI, converting from March 2008 values to March 2014 values (increasing prices by 1.167). The results are shown in Table 11.

Table 11 Overweight and obese costs per affected adult in 2014

2014 A$ terms Costs per person in affected group				*Direct cost* *$/person/yr*	*Total Financial Cost* *$/person/yr*	*Total Economic Cost* *$/person/yr*
Medibank 2010	**2008-2009**	**Obese**		**313**	**1,852**	**9,068**
Access Economics	**2008**	Obese	**Combined**	**471**	**1,992**	**13,994**
Colagiuri et al 2010	2007-2008	Obese	BMI & Waist-based	**3,488**	**3,488**	**8,971**
Colagiuri et al 2010	2007-2008	Overweight	BMI & Waist-based	**1,253**	**1,253**	**3,722**
Colagiuri et al 2010	**2007-2008**	**Overweight+Obese**	**Combined**	**2,247**	**2,247**	**6,058**
Colagiuri et al 2010	2007-2008	Overweight+Obese	BMI-based	**1,959**	**1,959**	**5,298**
Colagiuri et al 2010	2007-2008	Overweight+Obese	Waist-based	**1,830**	**1,830**	**4,880**

Source: NZIER

This table suggests that, notwithstanding differences in estimation methods, the cost of obesity per person per year is unlikely to be below $1,830 and unlikely to exceed the maximum of $14,000 (including the welfare cost). The lower welfare cost of Medibank translates to about $9,000 per year, coincidently similar to an estimate of Colagiuri. To illustrate the effect of values of these magnitudes, we use these approximations to estimate the equivalent number of people who would have to cease incurring costs of obesity to produce a social benefit that breaks even with the cost estimated for energy labelling of alcoholic beverages.

A.3 Interpretation of the welfare effects

As Access Economics and Medibank use similar frameworks for their estimates, we use the Medibank-based figure of A$1,852/person/year for the low financial cost of obesity, covering direct health expenditures and indirect effects such as lost productivity and deadweight costs of tax. The direct health expenditures are most defensible as they are compatible with the national accounting framework. The indirect effects rely on estimates of opportunity cost of things that did not happen so are more difficult to confirm, but nevertheless are still generally prepared according to national accounting principles.

Both Access Economics and Medibank also estimate substantial welfare effects as part of their Total Economic Cost estimates. As the scenario results above show, the effect of including them substantially reduces the number of people who need to avoid obesity costs for the labelling to break-even in social net benefit terms. However, apart from questions of their calculation method they are also difficult to defend as they rely in large part on concepts that are not part of the national accounting framework, and hence may not be compatible with other components of the cost estimates.

Access Economics (2008b) bases its value of welfare loss due to obesity on an average value of statistical life (VSL) saved divided by the years of remaining life expectancy forgone by premature death. This is a common technique used for pragmatic reasons which even those that use it acknowledge does not have strong theoretical or empirical support (Abelson 2008). Direct estimation of people's willingness to pay for increasing longevity into the distant future has been rarely undertaken, but where it has it suggests the welfare benefit has substantially lower

value than that implied by the annualisation of VSL (Johanneson & Johansson 1995). More recent literature arising from a major review and meta-analysis of estimates of VSL emphasises that the standard method of deriving VSL is based on an aggregation of individuals' willingness to pay for reductions in risk of premature death, and that alternative methods of calculating a mortality cost cannot be simply combined with the standard method (OECD 2014 pp17-19). The VSL is estimated as a willingness to pay to reduce the risk of immediate fatality and does not depend on how long a person expects to live after averting the immediate risk, and it is not a capitalised value of foregone future life expectancy that can be simply annualised in the way described by Access Economics (2008b). A value per life year should be estimated directly in a similar way to the VSL, and there are a few studies that do this in the international literature.

This is not to say that welfare costs are not important, but it is questionable whether they are as large as 4-7 times the financial costs as suggested by these estimates.[18]

A.4 The value of information

An alternative to estimating the values of energy labelling through the avoided cost of ill-health associated with obesity is to consider the value of information provided. Various studies have estimated consumer benefits from the value of information approach that are substantially higher than the lower bound estimates for benefits using a cost of ill-health approach.

Information has value even if it does not result in changed behaviour. If a value of information can be estimated it would add to the avoided costs of ill-health and have similar effect to the enlargement of value through the addition of welfare benefit estimates. However, we have found no literature that would assist the quantification of information value in this case. Energy labelling of alcoholic beverages of the form considered for this analysis is a limited form of information provision, and is less conspicuous compared to other labelling schemes. As indicated in section 4.2.1 above there is little evidence of a demand pull for alcohol energy information from either consumers or gatekeepers like the large retailers. Beyond noting that the information value would add to the benefit of avoided costs provided by labelling, and not be dependent on observed behavioural change (information is still useful for decisions that decide on no change), it is not possible to make defensible quantified estimates of this information value.

A.5 Why break-even estimates may understate the number of people

Our estimation of the value of potential benefits of energy labelling of alcoholic beverages uses a backwards analysis to identify how many people would need to avoid the costs of obesity to outweigh the present value costs of implementing the labelling, i.e. how many people would have to change behaviour and reduce weight

[18] The Access Economics study discounts a VSL at 3% over an estimated 40 years remaining life expectancy, to arrive at an annual average VSLY in 2006 dollars of $252,014. After updating for its 2008 study this results in a base case of $266,843 with lower and upper bounds of $164,553 and $360,238. Multiplying the number of Disability Adjusted Life Years by the VSLY provides an estimate of the gross dollar value of the loss of wellbeing due to obesity.

for “savings” in the per person obesity costs to break-even against the present value costs of labelling. This figure is then compared with the number of obese in the population to give indication of the level of market response to energy labelling of alcoholic beverages that would be required for benefits to cover costs.

These figures are not estimates of people but rather of obesity costs per person per year avoided, which could be achieved by individuals achieving sustained weight loss or by shifting of people in and out of the obese weight category. The cost of obesity figures are averages across a broad category of people with a certain health status. There can be improvements in weight management if people move out of the obese category into healthier and lower cost weight categories but they may also come from people making incremental weight improvements within the obese category.

In the break-even analysis the group obesity costs are used to determine the number of people who need to save those costs for labelling to break-even. But if the cost distribution is uneven and people closer to the margin of healthier weight with lower obesity costs can most easily move across categories, the break-even behaviour change will require more of such people achieving favourable weight change than is indicated by the group obesity costs. It is possible that labelling will have higher salience for people with pre-existing health conditions making them more likely to read and act upon it, so people currently incurring more than group obesity costs could also achieve large savings, but given their respective starting positions they are less likely to do so than those closer to the margin with healthy weight.

In this report we use four different estimates of obesity costs per obese person, ranging from a low financial cost of A$1,852 to a high economic cost of A$14,000 per year. The distribution of costs across people in the obese weight category is unknown, but it could be distributed in a number of different ways. On the information available it is not possible to estimate a distribution of costs within the category or postulate how it affects the numbers needing to change behaviour to achieve benefits.

Appendix B Interviews

As part of the project the NZIER developed a consultation plan. This included:

- identifying potential stakeholders who could provide relevant material
- developing questions for each group of stakeholders
- working collaboratively with FSANZ on identifying stakeholders and constructing the questionnaires.

Set out below are many of those contacted by NZIER as part of the consultation for the alcohol energy labelling project. All interviews were conducted over the phone and took approximately 30 to 45 minutes.

In each case the participants were emailed the questions in advance to give them time to prepare their answers. Generally:

- government and public health entities provided information from published papers and documents prepared by various organisations and researchers
- industry provided data on label and carton costings and general observations on industry and consumer behaviour.

At the time of writing the first PWC report (2008)[19] on label costings had been in the public domain for some time. These costings were much higher than those given to us by industry. Estimates ranged between A$3,950 for a minor change and A$12,800 for a major change. These costs were disregarded because they did not bear any relation to costs being supplied by the wine, beer and spirits industries.

It is our understanding that the industry had undergone major change since the first PWC report (2008). The industry has become a lot more competitive and prices have dropped substantially. The second PWC report (2014) produced substantially reduced estimates reflecting these industry changes. Estimates range between A$1,900 for a minor change and $A7,000 for a major change for a glass bottle.[20]

The information collected from the beer, wine and spirits industries by the NZIER are at the lower end of the range collected by PWC: between $A 1,818 and $A 4,545.

[19] http://www.foodstandards.govt.nz/publications/documents/Final%20report-%20FSANZ%20-%207%20March%202008%20%282%29.pdf

[20] Based on labelling changes to glass bottles. http://www.health.gov.au/internet/main/publishing.nsf/Content/CF7E670597F383ADCA257BF0001BAFF5/$File/2014%20Cost%20Schedule%20for%20Food%20Labelling%20Changes%20.pdf

Table 12 Contacts list

Entities contacted	
Government entities	
NSW Food Authority	
NZ Ministry for Primary Industries	
Australian Department of Foreign Affairs and Trade	
Ministry of Foreign Affairs and Trade	
Public Health	
Australian Chronic Disease Prevention Alliance including the National Alliance for Action on Alcohol	
Foundation for Alcohol Research and Education (Australia)	
Heath Promotion Agency (New Zealand)	
Australian Wine Industry	**New Zealand Wine Industry**
Large	*Large*
Lion	Pernod Ricard
Medium	Lion
Peter Lehmann Wines	*Medium*
Accolade Wines	Spy Valley
Voyager Estates	*Small*
Small	Destiny Bay
Internode	Mishas Vineyard
Packager (Australia)	Kono
McPherson Wines	**New Zealand Beer**
Australian Beer	*Large*
Large	Lion
Lion	DB
Small	*Small*
Moondog Brewing	McCashins
Birbicks	Garage Project
Others contacted	**Spirits (NZ)**
NZ & A Brewers Association	Lion
Winemakers' Federation of Australia	Pernod Ricard
New Zealand Wine	McCashins

Source: NZIER