Costing a one-year delay to the introduction of mandatory nutrition labelling

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Overall, a delay of one year to the introduction of mandatory nutrition labelling will have significant adverse impacts on health in the community.

- Between **320** and **460 people will die** from diet-related diseases, every year mandatory labelling is delayed.
- The **cost to the health system** – expenditure from all sources – is in the range of **$47 million to $67 million** for every year mandatory labelling is delayed.
- The **value of life**, as measured by health economists, will diminish by **$341 million to $486 million** for every year mandatory labelling is delayed – an immense personal cost.
- This methodology has adopted several **very conservative assumptions**. It indicates the likely minimum costs of delaying mandatory nutrition labelling.
- Diet-related risk factors account for about **25%** of Australia and New Zealand's **burden of disease**.
- From the experience of the US, we expect a **significant proportion of currently unlabelled food products to show some poor nutrition qualities** when nutrition labelling is mandatory.
- From the US experience, we expect **mandatory labelling will result in a significant substitution away from least healthy food products**, towards the most healthy food products.
- In addition, delaying mandatory labelling will mean insufficient warning of **allergens** in food products, placing vulnerable consumers at unnecessary risk.
- Other **warnings and advisory statements** will be more difficult for consumers to interpret.

Methodology

The methodology comprised two steps. First, identifying risk factors of diet-related disease and measuring their impact on health systems expenditure and the value of life. Second, estimating the likely reduction in risk factors associated with the introduction of mandatory nutrition labelling. Data from both steps combine to indicate the health costs from a one-year delay in mandatory labelling.

1. Identifying risk factors and measuring their health impact

Diet-related diseases are principally associated with three risk factors:

- Obesity
- Hypertension
- High blood cholesterol

The Australian Institute of Health and Welfare (AIHW) has calculated the contribution of these risk factors to the burden of disease in Australia.[1] This work identifies the diseases associated with each risk factor, and calculates the impact on Australia's burden of disease in terms of Disability Adjusted Life Years (DALYs). A DALY measures a year of life lost to a person from disability and/or death, as a consequence of each disease. Thirteen diseases were associated with the risk factors. The contribution of the risk factors was calculated as a percentage of total DALYs for each disease. Overall, the diet-related risk factors accounted for 25% of Australia's burden of disease.

Australian data were more comprehensive than that data from New Zealand, hence the analysis was based on this data. Key assumptions were extrapolated to New Zealand, such as it would have the same risk profile and health system costs as Australia.

An issue within the epidemiological and health economist professions is whether DALYs are additive across risk factors, which implies that these calculations over-state the true attributable costs.

> On the one hand, the calculations by the AIHW contain an explicit attempt to de-confound each risk factor from the influence of the others. The AIHW was conservative and it is likely that the calculations understate the contribution of each risk factor. However, for this group of risk factors, it is also likely that the interactions between them were not wholly excluded, leading overall to a modest over-statement where the impact of the three risk factors are combined. The calculations remain a reasonable guide to the combined impact of the three risk factors.
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> On the other hand, the difficulty of distinguishing between these particular risk factors in the primary data means that multiple interactions cannot be eliminated. The risk factors should not be added. The effect of combining the risk factors could lead to an over-statement by a factor of 100%.

Taking a conservative approach to costing, this analysis accepts a possible 100% over-statement of the combined impact of all three risk factors. All totals that derive from the risk factor analysis have been adjusted to remove any suggestion of over-statement.

A further issue within the epidemiological and health economist professions is the robustness of DALYs as a measure the impact of disease. The core of the issue is the extent of subjectivity in estimating disability weights, which means that adding morbidity to a mortality-based measure reduces its overall usefulness. Another view within the profession is that morbidity is a significant impact of disease and should not be ignored; and to adopt better quality data when it becomes available. This analysis accepts the significance of morbidity, and regards the DALY as a reasonable overall measure of the impact of disease. In addition, this analysis uses AIHW data on DALYs that have been discounted at 5% p.a.

Health System Expenditure

The latest expenditure data for Australia was collected by AIHW in 1993-94. Comparable New Zealand data was not available in the short time frame of this paper,

[1] AIHW (1999) *The Burden of Disease and Injury in Australia*.

hence it has been assumed that New Zealand's cost of treating disease is the same as Australia's. The risk profile (DALYs of risk factors as a percentage of total DALYs, for each disease) was applied to the cost of treatment data collected by the AIHW. The total expenditure in 1993-94 was adjusted to 2000-01 expenditure levels, on the basis of the 1998-99 *Health Expenditure Bulletin* and historic growth rates to project expenditure from 1998-99 to 2000-01.

Value of Life

The value of life-years lost is a subject of considerable research in the health economics literature. The approach is to estimate the willingness to pay for a year of human life. A recent article published by the Australian Health Economics Society examines international benchmarks, and recommends a conservative valuation of $60,000 per DALY.[2] This valuation is very conservative and a value of around double that is regarded by other health economists as more appropriate. The personal cost of disease arising from the risk factors was obtained by summing the total DALYs associated with them, then applying to the sum the value of $60,000.

2. Estimating the reduction in risk factors

Surveys of Australian consumers show high awareness and use of nutrition information on labels. Nutrition information influences consumer choice. From one major survey, consumers focus on one or two negative nutrition factors, such as sugar and fat content.

These results are reinforced by an American study of the impact of the introduction of mandatory nutrition labelling in 1994.[3] The study examined the composition of consumer purchases of a benchmark product, pre and post implementation. It, too, found that consumers principally respond to negative nutrition information. At pre-implementation, many products voluntarily provided nutrition information, but this information showed the products to be quite healthy (measured by fat content). Of the products that did not voluntarily provide nutrition information, none were in the healthiest quadrant, the majority were in the least healthy category, while there was a sizeable minority in the moderate range. Post-implementation of mandatory labelling, consumers substituted the best and moderate healthy products for the least healthy. Market share of the least healthy products declined by 4.0% in well-educated neighbourhoods, and by 5.7% in the lesser-educated neighbourhoods.

Measurement of actual consumer behaviour is much more robust than surveys of consumer attitudes in assessing how consumers will respond to mandatory nutrition labelling. Hence data in the American study has been used to estimate the reduction in risk factors in Australia and New Zealand. In Australia, most products that voluntarily carry nutrition information on their labels would be regarded as healthy. From the American experience, it would be fair to assume that the majority of products that do not voluntarily disclose nutrition information do so for good reason – it would be negative and reduce sales. Also from the American experience, mandatory labelling would provide important negative information to consumers about the least healthy products and there would be a substitution away from them, towards healthier products.

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[2] Peter Abelson, *Economic Evaluation of Public Health Programs in Australia from 1970 to 2000*, presented to the Australian Health Economics Society, 28 September 2001.

[3] Alan Mathios, *The impact of mandatory disclosure laws on product choices: an analysis of the salad dressing market*, in the Journal of Law & Economics, October 2000.

This analysis assumes that introducing mandatory labelling in Australia and New Zealand would result in the market share of least healthy products declining in the range: 4.0 % to 5.7 %. The extent of substitution depends on the level of education, which is a proxy for the level of awareness of nutrition in food. These rates are drawn from the American study, on the assumption that the US experience is relevant to Australia and New Zealand, and that the results from one product can be generalised to all labelled products, on average. All least-healthy food purchased for cooking and consumption in the home is assumed to lose market share by this amount. The impact on total food consumption will be less that these rates, because about 75% of food is prepared in the home, of which only 80% will be required to carry nutrition labelling. The decline in consumption of least healthy foods is assumed to equal the decline in diet-related risk factors, on average over all labelled foods, in the range 2.4% to 3.5%.

The assumed 1-1 relationship between a decline in consumption of least healthy food, and the decline in diet-related risk factors, is very simple, and reflects an absence of information. It is probable that the impact on hypertension would be less than 1-1, but that the impact on obesity would be greater than 1-1.

3. Impact of Mandatory Labelling

The estimated decline in risk factors is applied to the estimates of annual health system expenditure and value of life. See attached spreadsheet

Consultation

This study has benefited from advice and comments from the Australian Institute of Health and Welfare, the Ministry of Health in New Zealand and the Commonwealth Department of Health and Ageing. The assistance by these agencies was provided informally and on a collegiate basis. Responsibility for the methodology and conclusions remains with ANZFA.

Table 1: Impact of diet-related risks on disease

(Australia)

	Diet Risk Factors						
	Obesity	Hyper-tension	High Blood Choles'ol	Diet Risks - total	Diet Risks adjusted*	All risk factors (diet & non-diet)	Share of Diet Risks to All Risks
	(DALYs)	(DALYs)	(DALYs)	(DALYs)	(DALYs)	(DALYs)	(%)
Ischaemic heart disease	33,458	71,923	61,150	166,531	71,923	311,330	23%
Hypertensive heart disease		13,041		13,041	13,041	13,041	100%
Peripheral arterial disease		1,730	3,472	5,202	3,472	18,333	19%
Stroke	5,743	43,730		49,473	43,730	136,579	32%
Colorectal cancer	10,221			10,221	10,221	66,951	15%
Uterus cancer	742			742	371	4,866	8%
Kidney cancer	511			511	511	11,412	4%
Type 2 diabetes meliltus	30,729			30,729	15,365	67,487	23%
Osteoarthritis	18,038			18,038	18,038	56,305	32%
Post-men. breast cancer	3,550			3,550	3,550	32,157	11%
Nephritis and nephrosis		5,646		5,646	5,646	12,503	45%
Gall bladder disease	1,023			1,023	1,023	3,239	32%
Back problems	981			981	981	7,324	13%
TOTAL	**104,996**	**136,070**	**64,622**	**305,688**	**187,872**	**741,527**	
Weighted Average							**25%**

* Total Diet Risks were adjusted to avoid double counting of multiple interactions, where this occurred.
DALYs = Disability adjusted life years, affected by rates of morbidity and mortality.
Source: AIHW (1999) "The Burden of Disease and Injury in Australia"

Table 2: Impact of diet-related disease on health system costs

(Australia)

	Health system costs 1993-94	Impact attributable to diet-risks	Health costs atributable to risks: 1993-94	Growth in health costs: 1993-94 to 00-01	Health system costs 2000-01
	($m)	(%)	($m)	(%)	($m)
Ischaemic heart disease	894	23%	207		
Hypertensive heart disease	16	100%	16		
Peripheral arterial disease	*131*	19%	25		
Stroke	630	32%	202		
Colorectal cancer	205	15%	31		
Uterus cancer	86	8%	7		
Kidney cancer	26	4%	1		
Type 2 diabetes meliltus	217	23%	49		
Osteoarthritis	624	32%	200		
Post-men. breast cancer	*109*	11%	12		
Nephritis and nephrosis	*335*	45%	151		
Gall bladder disease	*187*	32%	59		
Back problems	552	13%	74		
TOTAL	**4,012**	**25%**	**1,034**	**51%**	**1,556**

Table 3: Extension to New Zealand*

Impact of all risks on selected diseases - New Zealand (DALYs)**	175,355
Impact of all risks on selected diseases - Australia (DALYs)	741,527
Share of disease impact in New Zealand (reflects relative population to Australia) (%)	24%
Australian attributable health system costs ($m)	1,556
Estimated New Zealand attributable costs ($m)	368
Total attributable costs - Australia & New Zealand ($m)	**1,924**

* Australian data was more comprehensive that from New Zealand, hence the analysis was based on this data and key assumptions were extrapolated to New Zealand; i.e. that it would have the same risk profile and health system costs as Australia.

** Source: NZ MoH (1999) "Our Health, Our Future". Data for some minor diseases were unavailable, and had to be estimated.

Table 4: Personal cost of diet-related diseases*

Diet Risks, adjusted - Australia (DALYs)	187,872
% total disease impact in New Zealand (reflects relative population to Australia) (%)	24%
Diet Risks, adjusted - New Zealand (DALYs)	44,428
Diet Risks, adjusted - Australia & New Zealand (DALYs)	232,299
Value of life years lost to disability or death ($m per DALY)	0.060
Total value of life years lost from diet-related diseases ($m)	**13,938**

* The personal cost of years of life lost as a result of disability or death is a real cost to the individual. It is quite proper to estimate this cost, based on the health economics literature.

Table 5: Impact of labeling

	Change in market share of unhealthy products*	Share of labelled products in total food consumed**	Reduction: unhealthy foods consumed	Reduction in diet-risks	**Health Cost**	**Personal Cost**
	(%)	(%)	(%)	(%)	($m)	($m)
Nutritionally aware*	4.0%	61.2%	2.4%	2.4%	**47**	**341**
Less nutritionally aware*	5.7%	61.2%	3.5%	3.5%	**67**	**486**

* Drawn from A. Mathios, "The impact of mandatory disclosure laws on products choices: an analysis of the salad dressing market" in Journal of Law & Economics, Oct 2000.

** Source: National Nutrition Survey, 1995. Combination of: 75.6% of food prepared in the home and 80.9% of such food being subject to nutrition labeling.