

Obesity and Policy Regime: The Case of New Zealand

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This paper aims to identify policies intended to reduce the incidence of obesity, discuss the economic theory underpinning such policies, and consider potential problems of implementation for New Zealand. Policy options to reduce the prevalence of obesity were identified from international and New Zealand literature. The options were categorised as; economic and fiscal, regulation and other governmental interventions, education and information, and environmental. Published economic data tended to focus on the price effect on the consumption of food groups but not nutritional components. Altering food taxes and/or prices are ineffective in changing consumption because demand for food is inelastic. However, taxing food is effective in raising revenue, which can be used to fund other policy initiatives.

Field of Research: Policy, economic evaluation, obesity.

1. Introduction

This study aims to; identify public policies that could be used to reduce the incidence of obesity in New Zealand (and other mixed market economies) and discuss the economic theory underpinning such policies and potential problems of implementation.

In most developed countries, the prevalence of obesity is increasing, and in New Zealand the prevalence of obese adults in 2008/09 was estimated to be 27.8%. Māori and Pacific peoples have higher rates of obesity (New Zealand Ministry of Health, 2013b). Obesity is defined as body mass index (BMI) equal to or greater than 30. BMI is calculated by dividing weight in kilograms by height in metres squared (kg/m²) (World Health Organisation, 2013). Obesity is a risk factor for many illnesses. The World Health Organisation (WHO) consider the major life threatening and chronic illnesses related to obesity may be classified under; cardiovascular diseases (mainly heart disease and stroke), muscular skeletal disorders (especially osteoarthritis), and some cancers. In 2008 35% of the world's adults aged 20 and over were overweight and 11% obese (World Health Organisation, 2013). Obesity results in higher health costs, productivity loss, and reduced quality of life. Health costs of obesity-related illnesses generally range between 2% and 7.6% of total health costs of a western country. New Zealand health costs attributable to obesity and overweight were estimated to be between NZ\$539.5 million and \$698.5 million or between 3.5% and 4.5% of total health expenditure in 2006. Lost productivity was estimated to be between NZ\$98 million and NZ\$225 million (Lal *et al.*, 2012).

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The basic cause of obesity is simply an intake of energy in excess of energy consumption. However, the underlying determinants of obesity are complex and interrelated (Howat *et al.*, 2007). These include; genetics, culture, the physical environment, awareness and knowledge of the health risks, socioeconomic (income and education) and behaviour (diet and exercise).

The study presents a fresh analysis of the economic and policy concepts presented in the literature. The methodology describes the structure of the literature review, the search engines used, and the identification and categorisation of the policy options relevant to the New Zealand situation. The advantages /disadvantages of the policies and the data requirements for the design of such policies are discussed. The authors conclude with a recommendation to use a mix of policies and stress that any market intervention will itself cause inefficiency.

2. Literature Review

A review of the literature shows that health professionals and governments in the developed world have been seeking solutions to counter the increase of obesity in their societies. Some focus has been on controlling the free market. The inability of the free market to achieve society's goals of equity and efficiency may be justification for government intervention. Market failure to achieve allocative efficiency may arise out of the presence of market power, asymmetric information, externalities and public goods (Black *et al.*, 2012). Large food suppliers have considerable market power and may possess information that is unavailable to consumers. Obesity also generates externalities (Black *et al.*, 2012) in that the costs of obesity are not confined to the obese individuals but some spill over to the rest of society in the form of reduced economic output and increased public costs (McCormick and Stone, 2007) (Bhattacharya and Sood, 2011) such as health and transport costs. With a publically provided health system there is also the problem of moral hazard (Black *et al.*, 2012) in that individuals may take better care of their health and weight control if they had to pay out-of-pocket for all additional health expenditure accruing from obesity.

However, it could be argued that intervention to discourage purchases of unhealthy food would reduce allocative efficiency as consumers aim to maximise their utility from a range of goods and services; (health services, leisure activities, healthy food, unhealthy food, healthy activities, and unhealthy activities). Thus demanding and consuming fatty, high sugar foods and pursuing sedentary leisure activities could be rational choices for some consumers (Cawley, 2004). Government controls may also jeopardise consumer sovereignty (Sirgy *et al.*, 2011).

An adequate healthy diet may be regarded as a merit good (Ver Eecke, 2007) that should be available to all citizens and public policy intervention may be required to deliver such goods. Low income households may be less able to; access and interpret information that would enable them to lead healthy lives, and may not be able to afford healthy food or a healthy lifestyle.

3. Methodology

The study was based on a disciplined and structured literature review that concentrated on policies and instruments that could be effective and appropriate in a New Zealand setting. The focus was on publications since 2000 in countries considered most relevant to New Zealand (North America, northern Europe and Australia). Key words searched were: “obesity” AND “policy”. Food price and income elasticities of demand were also investigated using the key words “food AND “elasticity”. The literature search used “Discover” (Discover), a tool that when interrogated automatically searches many of the Massey University library’s on-line article databases including Medline Business Source Complete, Web of Science, Science Citation Index, Cinahl Plus, and JSTOR.

Policy options to reduce the prevalence of obesity were identified and categorised as; economic and fiscal, regulation and other government interventions, education and information, and environmental. We have improved on previous studies by considering all potential policies that could be used in New Zealand and have discussed both the advantages and the disadvantages of market intervention. Data essential for the provision of effective policies to reduce obesity prevalence are delineated.

4. Results / Analysis

Public health interventions to reduce the prevalence of obesity generally aim to increase the level of physical activity and improve the quality of the diet (WHO Consultation on Obesity, 2000). A variety of policy instruments to reduce the prevalence of obesity have been suggested (Kopelman, 2011) (Ni Mhurchu and Ogra, 2007) (Shenkin and Jacobson, 2010) (Nestle and Jacobson, 2000) (Alemanno and Carreño, 2013). We have grouped these policies into four categories; economic/ fiscal, regulation and other government intervention, information/ education, and environmental. Some of the policies listed may fit into more than one category but have been assigned to the dominant group (Table 1).

Table 1: A classification of the range of policy options designed to reduce the prevalence of obesity in society

<p>Economic / fiscal:</p> <ul style="list-style-type: none">• Tax energy-dense foods and those foods high in sugar, fat and salt• Remove goods and services taxes (GST) from healthy foods• Subsidise healthy foods• Provide food vouchers for fruit and vegetables to those on low incomes
<hr/> <p>Regulation and other government interventions:</p> <ul style="list-style-type: none">• Labelling of food, in addition to a complete list of all ingredients, provide clear and visible information on quantities of (1) energy, (2) fat, (3) sugar and (4) salt content per 100 grams of food• Use a colour code (green orange, red) for the levels of these four ingredients• Restrict advertising of unhealthy food to children• Restrict points of sale to children• Require food vendors to have healthy options available• Advertising, marketing and sponsorship controls on businesses associating their food products with sporting activities• Encourage healthcare providers to provide advice on nutrition• Incentives to manufacturers to reduce production and supply of unhealthy foods in favour of healthy alternatives• Require schools to include human nutrition and food preparation in their syllabus and provide a minimum time for physical activity per day
<hr/> <p>Information/ education:</p> <ul style="list-style-type: none">• Develop dietary guidelines• Develop campaigns and programmes to foster physical activity and healthy eating
<hr/> <p>Environmental (physical):</p> <ul style="list-style-type: none">• Construct walkways and cycle paths free of motor vehicles• Provide parks and gardens• Improve lighting and policing for safe walking• Provide community recreation facilities• Improve building design to encourage the use of stairs• Provide and maintain national parks and walkways.

Economic policies generally use taxes and subsidies to alter price signals to encourage production, supply, and the consumption of healthy food, and to discourage the consumption and supply of unhealthy food. For example, taxing unhealthy food (energy-dense foods and those foods high in sugar, fat and salt) and removing taxes from or subsidising healthy food. Food stamps or vouchers for fruit and vegetables for those on low incomes also offer targeted intervention by means of subsidies (or negative taxes). These initiatives have been discussed by a number of authors (Smed *et al.*, 2005) (Vartanian *et al.*, 2007) (Gustavsen, 2004) (Ni Mhurchu *et al.*, 2010) (Leicester and Windmeijer, 2004) (Strnad, 2005) (Goodman and Anise, 2006) (Cawley, 2006) (Alemanno and Carreño, 2013).

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Own price elasticities of demand for all foods are generally less than one (inelastic) which means that substantial changes in price are required to significantly change consumption patterns. In New Zealand price discounts of 12.5% on healthy food resulted in an increase in purchases of healthier foods of 11% and a 0.02% reduction in saturated fat (Ni Mhurchu *et al.*, 2010). Cross price elasticities of demand were not available for New Zealand, but using US data nonfood would fall by 3% and beef consumption would rise by 1%. (United States Department of Agriculture Economic Research Service Department of Agriculture Economic Research Service, 2012).

Regulation and government interventions include a wide range of initiatives concerned with controls on advertising, labelling, and food marketing. Such policies are designed to correct for imperfect information (Cawley, 2006). Labels, in addition to a list of all ingredients, should provide clear and visible (suitable font type and size) information on the energy, fat, sugar and salt content per 100 grams of food (Food Standards Australia New Zealand (FSANZ), 2013).

New Zealand Parliament's Health Select Committee recommended that manufacturers use a traffic light system on packaging to signal healthy, in-between or unhealthy food (New Zealand House of Representatives Health Select Committee, 2006). An example of an incentive to manufacturers to reduce production and supply of unhealthy foods in favour of healthy food is the Heart Foundation Tick which is a front-of-pack labelling system. "The aim of the Tick is to allow consumers to identify the healthier choice within that food category" (National Heart Foundation, 2013).

The advertising Standards Authority (ASA) code for advertising food (Advertising Standards Authority (ASA), 2013) states that "...advertisements should not undermine the food and nutrition policies of Government, the Ministry of Health 'Food and Nutrition Guidelines' nor the health and wellbeing of individuals. Advertisements for nutritious foods important for a healthy diet are encouraged to help increase the consumption of such foods. However, no advertisement should encourage over-consumption of any food."

Education and guidelines promote healthy food and nutrition for all children (New Zealand Ministry of Education, 2011) and the Ministry of Health through a number of programmes aims to improve nutrition, increase physical activity and reduce obesity in the community (New Zealand Ministry of Health, 2013a).

Environmental initiatives designed to make physical exercise safer, more enjoyable and easier to access are also relevant. These include; the provision and maintenance of walkways and cycle paths free of motor vehicles, parks and gardens, good lighting and policing for safe walking, community recreation facilities, indoor and outdoor facilities for a variety of activities, and national parks.

Impediments to a healthy lifestyle fall into two broad categories: behavioural, and socio-economic. Behavioural hindrances to wholesome eating include; will power, self-control, level of addiction, and individual tastes and preferences. Economic barriers of cost and household income also determine the quantity and mix of food demanded. Social barriers to a healthy diet include peer pressure and cultural and religious backgrounds. As the focus of

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this paper is on economic and market-based policies most of the discussion has been devoted to these policies.

Although population-based policies may have little impact on each individual they are effective in changing health outcomes over a whole population (Powell and Chaloupka, 2009) (Swinburn and Egger, 2002). As most of the societal disease burden is generated by the relatively large number of people with only moderately raised levels of risk factors, and not among the smaller number with risk levels above commonly used cut-points (Rodgers *et al.*, 2004), the greatest societal gain may be achieved from total population initiatives. Another reason for adopting a public health population perspective is that the benefits of a reduction in the prevalence of obesity-related diseases may take 10 years or more to materialise (Branca *et al.*, 2007, p. 186).

The advantages and disadvantages of the range of policies discussed are summarised in Table 2. Although various economic policies have been suggested and implemented both the policy and those the policy/ies were intended to assist react in different and often conflicting ways. Consumers base their purchasing decisions on the total price of the final product (not the prices of the ingredients making up the food). Thus, a tax on sugar and/ or fat will not be as effective as a tax on the consumer selling prices of energy dense products.

The impact of a price change of one food also effects the quantity demanded of other foods (complements and substitutes). Accordingly, when evaluating policies designed to change prices of specific foods it is important to have information on the impact on substitutes and complements (Andreyeva *et al.*, 2010). For example, substitution effects dictate that taxes on sugar and fat be implemented together.

As income elasticities of demand for food are normally positive and less than one in developed countries substantial price changes would be necessary to alter consumption patterns for individual households. Price reductions on healthy foods (either by lower taxes or increased subsidies) have little impact on the quantity of food demanded by low income households (Huang and Lin, 2000) as the increased disposable income may be spent on convenience foods and food away from home. Reed (Reed *et al.*, 2005) found that healthy food purchased for meals prepared at home may be substituted for less healthy take-away food and restaurant meals that are typically more energy dense. Take-away food may also be associated with lack of physical activity, for example, a video may be watched while consuming popcorn and chips.

Decreasing sugar and fat consumption by applying additional taxes, in the same way as taxes are levied on alcohol and cigarettes, is an inefficient option as foods in general have a low price elasticity of demand. Although taxes may not greatly influence consumption they do enable revenue to be collected and this may be used to fund other initiatives. A small tax could raise considerable revenue (Nestle and Jacobson, 2000).

Food vouchers and food stamps for low income households may be more effective than lower prices in improving nutritional status because they could be restricted to certain foods (and unable to be used for other purposes). But food vouchers increase disposable income

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some of which may be used to purchase unhealthy food and are both difficult and costly to administer.

Low income households spend a greater proportion of their incomes on food, [Engle's law (Steven N. Durlauf and Lawrence E. Blume, 2008)] and income elasticities of demand for food decrease as income rises (Regmi *et al.*, 2001). Accordingly, taxes on food are regressive and have greater impact on low income households compared with high income households. Taxing unhealthy food not accompanied by income assistance to low income households is inequitable (Marmot and Wilkinson, 2006).

A major impediment to a healthy diet is that healthy food is often more expensive than unhealthy food [UK (Cade *et al.*, 1999)] [USA (Jetter and Cassady, 2006; Cassady *et al.*, 2007)]. Cummins (Cummins *et al.*, 2010) found that availability of fruit and vegetables increases with increasing store size, and that deprived areas in Scotland appeared to have smaller stores. However, a New Zealand study found that healthy alternative foods were available at the same or lower costs (Ni Mhurchu and Ogra, 2007; Ni Mhurchu *et al.*, 2010).

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Table 2: Some advantages and disadvantages of a range of possible policy interventions to reduce obesity in society are listed

Advantages	Disadvantages
Price measures: Tax unhealthy foods and subsidise healthy foods	
<ul style="list-style-type: none"> ● Ability to alter consumption patterns 	<ul style="list-style-type: none"> ● Potential to increase income disparities unless income transfers are included ● Administratively complicated ● Reduces market efficiency ● Difficulty in defining healthy versus unhealthy foods ● Sales tax changes may introduce inefficiencies into the tax system ● Poor evidence on consumption responses ● Tax regimes on sugar and fat need to be harmonised because of substitution effects ● Subsidies on healthy food raise disposable income that may be spent on less healthy pre-prepared, takeaway or meals out ● Income and price elasticities for food are low and substantial changes are necessary to influence food consumption patterns enough to influence health
Regulation and other government interventions: Labelling, advertising and regulation at point of sale	
<ul style="list-style-type: none"> ● Potentially effective in changing behaviour 	<ul style="list-style-type: none"> ● Costs of enforcement and monitoring ● Reduction in consumer choice
Information/ educative measures	
<ul style="list-style-type: none"> ● Encourage healthy lifestyle choices ● Support other policies 	<ul style="list-style-type: none"> ● Cost of implementation ● Ineffective unless part of a package of other policies
Environmental interventions (physical)	
<ul style="list-style-type: none"> ● Enhance the quality of life and needed to encourage increased physical activity 	<ul style="list-style-type: none"> ● Unlikely to be effective on its own in targeting obesity

Market intervention will cause inefficiency and may reduce equity. Accordingly, the intended benefits accruing from improved health and greater equity gains must be offset against reductions in efficiency and equity. For example, if the single rate of GST was altered to exempt healthy food and increase taxes on unhealthy food the reduction in the efficiency of the tax system may negate any efficiency gains from the a reduction in obesity and create categorization difficulties. While both taxes and subsidies would decrease market efficiency a well-designed subsidy would be the least costly to administer. However, a potential offset of a subsidy on healthy food would increase disposable income part of which could be spent on additional restaurant and takeaway meals, and convenience foods.

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If a healthy identification system is used for food a manufacturer who achieves a desired coding will have a potential marketing advantage over manufacturers of similar products. This should encourage manufacturers to reduce or remove salt, sugar and fat from their products. Potentially, this could be the most effective policy to follow. A serious criticism of a tick programme is that some foods that should be limited in the diet may still receive a tick if they are judged to be healthier than less healthy alternatives. This pitfall would be avoided with a colour coding scheme with green (eat lots), amber (eat moderately) and red (eat occasionally as a treat or avoid).

The existing initiatives of promoting physical activity for both adults and children should continue as it is recognised that such campaigns need to be sustained to establish awareness, change behaviour and achieve practical results. Education and the provision of information about healthy eating is a vital component of any policy package but on its own is ineffective (Branca *et al.*, 2007). Providing information about the benefits of a healthy diet should reduce obesity but it was found that altering prices was more effective in changing food consumption patterns (Ni Mhurchu *et al.*, 2010). However, we consider that withdrawal of health promotion activities without a more thorough investigation would be ill advised.

New policies or alterations to existing policies are designed to change BMI and ultimately health outcomes. The slight change induced in BMI per person could have a large effect on health outcomes in the total population (Powell and Chaloupka, 2009). Although there is general agreement that obesity raises health costs and reduces productivity the literature provides conflicting evidence on the effectiveness of policies to reduce the prevalence of obesity. International literature also suggests that no policy implemented in isolation is likely to be effective (Mohebati *et al.*, 2007) (Alemanno and Carreño, 2013). A comprehensive mix of policies was favoured by European policy makers and other obesity stakeholders (Lobstein and Millstone, 2006, p1). A potential implementation problem is that the range of policies would need to be successfully integrated across government agencies (Mohebati *et al.*, 2007).

It is unlikely that market failure could be eliminated by correcting each market imperfection in turn, but a “second-best” solution that alters some other equilibrium conditions away from situations that would normally be regarded as optimal may improve allocative efficiency (Black *et al.*, 2012) (Lipsey and Lancaster, 1956). Thus, it may be better, not to ban advertising of unhealthy food but counter advertising by intensive health promotion campaigns or introduce a Pigouvian tax (Black *et al.*, 2012) on unhealthy food.

If the prevalence of obesity could be reduced, health expenditure and production loss would potentially fall and quality of life increase. However, future health expenditure may well increase as a result (because people will live longer).

5. Conclusion

The study identified public policies that could be used to reduce the incidence of obesity in New Zealand and in discussing the economic theory underpinning such policies drew attention to the problems of implementation. In New Zealand’s recent past some rather simplistic policy suggestions have been made and the authors consider that a deeper

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insight has been provided into what is a highly complex web of action and reaction as decisions taken may have many unintended consequences.

To effectively assess the impact of public policies to reduce obesity requires more robust data on; price elasticities of demand for foods (own and cross), income elasticities of demand for foods and linkages between food consumption on BMI and on health outcomes. In addition, data that are available tend to relate to the price effect on the consumption of food groups not necessarily nutritional components.

Altering food taxes and/or prices are ineffective in changing consumption because demand for food is inelastic. However, taxing food is effective in raising revenue, which can be used to fund other policy initiatives. Any market intervention will itself cause inefficiency. Intended gains in efficiency must be traded off against potential efficiency losses and possible equity changes. New Zealand government officials and most politicians are very reluctant to introduce policies that interfere with market prices, and sales tax changes would complicate the current flat-rate-value added tax system.

The authors' recommended policy mix is; maintain a public health population based approach with an emphasis on children, strengthen controls on advertising and marketing unhealthy food to children, introduce a compulsory food identification system (colour coding or similar) to indicate healthy/unhealthy food, continue promotion of healthy food and exercise, but do not alter the common flat rate of GST. Any market intervention will itself cause inefficiency and intended gains in efficiency must be traded off against potential efficiency losses. To prevent obesity becoming a major population problem it is important to target children and adolescents because obese children often develop into obese adults and once established, excess weight is difficult to reduce.

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