



Reducing obesity and future health costs

A proposal for health related taxes

Irish Heart Foundation and Social Justice Ireland, June 2015

Reducing obesity and future health costs – a proposal for health-related taxes

A review of the evidence by the Irish Heart Foundation and Social Justice Ireland

Obesity and food poverty impact on people's diets and there is a clear relationship between poor diet and disease. Ireland is experiencing high levels of both – 7% of children rising to 36% of older people are obese and food poverty affects almost one in eight citizens. Unless obesity and food poverty rates are reduced it is predicted that there will be a significant impact on quality of life, life expectancy and healthcare costs in Ireland.¹

The Department of the Taoiseach's *National Risk Assessment 2014 and 2015*³ identify the increase in chronic disease as one of the five social risks facing Ireland. Obesity is a major modifiable risk factor for chronic diseases, including cardiovascular disease. The *National Risk Assessment 2015* report notes that the rise in childhood obesity and other trends can be seen as an indicator of future rises in chronic diseases. Government must now plan ahead and initiate change to reduce obesity and food poverty through preventative measures, including health-related taxes⁴.

Recommendations

Projections of obesity costs in Ireland indicate that if present trends continue and no policy interventions are made, the cost of obesity will rise to over €4.3 billion in 2020 and to €5.4 billion in 2030². The Irish Heart Foundation (IHF) and Social Justice Ireland (SJI) propose that Government adopt a target to reduce the body mass index (BMI) of the population by 5 per cent by 2020. A 5 per cent reduction in BMI would significantly reduce the incidence of chronic disease, in particular cardiovascular disease and Type 2 diabetes. Such an improvement in the health of the population would guarantee significant long-term savings to the exchequer. A 5 per cent reduction in BMI by 2020 is estimated to generate savings of €394m by 2020.

Budget 2016

In order to make significant progress towards reducing BMI by 5 per cent by 2020, the Irish Heart Foundation and Social Justice Ireland propose that Government introduce a sugar-sweetened drinks (SSD) tax in Budget 2016 and use a portion of the revenue generated to develop effective obesity prevention programmes and initiatives to eradicate food poverty.

¹ Richard Layte and Cathal McCrory, *Growing Up in Ireland: Overweight and Obesity Amongst Nine-Year-Olds* (Minister for Children and Youth Affairs, 2011).

² Perry, I J., Keaver, L., Dee, A., Shiely, F., Marsh, T. and Balanda, K. (2013) Application of the UK Foresight Obesity Model in Ireland: The Health and Economic Consequences of Projected Obesity Trends in Ireland http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3827424/

³ Department of An Taoiseach (2014) *National Risk Assessment 2014*. Dublin: Stationery Office Department of An Taoiseach (2015) *Draft National Risk Assessment 2015*. Dublin: Stationery Office

⁴ Webber, L., Divajeva, D., Marsh, T., McPherson, K., Brown, M., Galea, G., and Breda, J (2014) *The future burden of obesity-related diseases in the 53 WHO European-Region countries and the impact of effective interventions: a modelling study*. http://bmjopen.bmj.com/content/4/7/e004787.full

Part 1: Obesity and food poverty in Ireland

Obesity is an excess of fatness above the ideal for health. Body mass index (BMI) cut-off points are generally used to identify obesity in individuals and across populations.

Prevalence of obesity in Ireland has increased significantly in the last two decades. Between 1990 and 2011, obesity rose from 8% to 26% in men, and from 13% to 21% in women. Currently, 24% of adults (18-64 years) are obese. Amongst Irish children, rates of obesity accelerated from the 1970s and continued to increase into the 'Celtic Tiger' period.⁸ Depending on the definition of obesity and the cut-off points used, there has been a dramatic two-to-fourfold increase in obesity in Irish children aged 8–12 years since 1990.9

	Age	Obesity rate
Pre-schoolers	2 – 4 years	3%
	3 years	6%
Children	7 – 11 years	7.2%*
Teenagers	12 – 17 years	7.5%
Adults	18 – 64 years	24%
Older people	Over 50's	36%

In 2013, 13.2% (one in eight) of the population were experiencing food poverty. 11 This was an increase from one in ten people in 2010.12 Food poverty is defined as: having missed a meal in the previous fortnight due to lack of money; inability to afford a meal with meat or a vegetarian equivalent every second day; or inability to afford a roast, or vegetarian equivalent once a week.¹³

Table 2: Rising food poverty in Ireland				
2010	2011	2012	2013	
10.0%	11.4%	11.8%	13.2%	
Source: Department of Social Protection (2014) Social Monitor 2013.				

⁵ Waters E., de Silva-Sanigorski A., Hall B.J., Brown T., Campbell K.J., Gao Y., Armstrong R., Prosser L., Summerbell C.D. (2011) 'Interventions for preventing obesity in children (Review)'. Cochrane Database of Systematic Reviews 2011, 12. ⁶ BMI calculates weight in kilogrammes divided by height in metres, squared.

⁷ Irish Universities Nutrition Alliance (IUNA) (2011). National Adult Nutrition Survey.

⁸ Perry, I., Whelton, H., Harrington, J. and Cousins, B. (2009) 'The heights and weights of Irish children from the post-war era to the Celtic tiger'. Journal of Epidemiology and Community Health, 63(3), 262-264.

⁹ O'Neill JL, McCarthy SN, Burke SJ et al (2007). Prevalence of overweight and obesity in Irish schoolchildren, using four different definitions. Eur J Clin Nutr:61(6):743-51.

¹⁰ There is no single source of data on obesity rates in Ireland. Data is available from a number of sources, including the national pre-school nutrition survey, children's food survey, the teen's food survey and the adult's food survey, the Growing up in Ireland Study, the WHO Childhood Obesity Surveillance Initiative, SLÁN and The Irish Longitudinal Study on

¹¹ Department of Social Protection (2014) *Social Inclusion Monitor 2013*. Dublin: Department of Social Protection.

¹² Carney, C. and Maître, B. (2012) Constructing a Food Poverty Indicator for Ireland Department of Social Protection. Dublin: Department of Social Protection. http://www.welfare.ie/en/downloads/dspfoodpovertypaper.pdf

¹³ Carney, C. and Maître, B. (2012) Constructing a Food Poverty Indicator for Ireland Department of Social Protection. Dublin: Department of Social Protection. http://www.welfare.ie/en/downloads/dspfoodpovertypaper.pdf

Obesity trends

Ireland's experience of rising obesity is mirrored across the world. Data from the World Health Organisation shows consistent increases in obesity from 1980 to 2008 in almost all countries. 14

As in many areas of public health, there is a pronounced social gradient in obesity, apparent in Irish children as young as three years of age. 15 People experiencing economic disadvantage are more likely to be an unhealthy weight than more advantaged peers. 16

Childhood obesity

Obesity rates increase with age¹⁷ and obesity in childhood tends to continue into adulthood. There is a significant likelihood that some obese children will have multiple risk factors for cardiovascular diseases, type 2 diabetes and other co-morbidities before or during early adulthood. ¹⁸ The Growing Up in Ireland study shows that social inequalities increase the risk of overweight and obesity from an early age. At 9 years of age, children from disadvantaged areas are much more likely to be obese. 19

The incidence of obesity in Ireland has led the Government's Special Rapporteur on Children to term childhood obesity 'a vital child protection issue and a challenge to implementation of the right of children to the highest attainable standard of health in Ireland'20.

Table 3:	Childhood	obesity	y in Ireland
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^{*} average over 3 studies of 7; 9 and 11 year olds

In recent years, there is some evidence of a stabilising in childhood obesity rates in Ireland and other developed countries. The Childhood Obesity Surveillance Initiative recorded a stabilising of obesity in Irish primary school children aged 9 (over three waves 2008, 2010, 2012). Among 7-year-old children, prevalence seems to have fallen slightly, although not amongst children in disadvantaged schools.²¹ This trend was also evidenced in a systematic review of studies 2002-12 which found the

¹⁴ European Heart Network and European Society of Cardiology (2012). *European Cardiovascular Disease Statistics*. 2012

¹⁵ Growing Up in Ireland (September 2013) Development from birth to three years. http://www.growingup.ie/fileadmin/user_upload/documents/Second_Infant_Cohort_Reports/ES_Development_from_Birth

16 P. 38, Williams, J., Murray, A., McCrory, C. and McNally, S. (2013) Growing Up in Ireland – development from birth to

three years. Dublin: The Stationery Office.

¹⁷ Irish Universities Nutrition Alliance (IUNA) (2011). National Adult Nutrition Survey

http://www.iuna.net/wp-content/uploads/2010/12/National-Adult-Nutrition-Survey-Summary-Report-March-2011.pdf

 $^{^{\}overline{18}}$ National Heart Forum (2008) Call for evidence – assessing the impact of the commercial world on Children's Wellbeing. ¹⁹ Layte, R. and McCrory, C. (2011) *Growing up in Ireland - Overweight and obesity among 9-year olds.* Dublin: The Stationary Office.

²⁰ P. 48 Shannon, G. (2014) Seventh Report of the Special Rapporteur on Child Protection.

²¹ P.4 Heinen MM, Murrin C, Daly L, O'Brien J, Heavey P, Kilroe J, O'Brien M, Scully H, Mulhern LM, Lynam A, Hayes C, O'Dwyer U, Eldin N, Kelleher CC [2014]. The Childhood Obesity Surveillance Initiative (COSI) in the Republic of Ireland: Findings from 2008, 2010 and 2012. Dublin: Health Service Executive.

prevalence of obesity amongst Irish children – while high – has reached a plateau and may be beginning to fall slightly.²² However, as articulated by the authors of the systematic review:

Although the findings provide some grounds for cautious optimism, one in four Irish children remains overweight or obese. Thus, it is clear that childhood overweight and obesity will remain an urgent priority issue for public policy for the foreseeable future.²³

Childhood obesity is associated with increased cardiovascular risk.²⁴ In the short term, obese children may experience health problems including type 2 diabetes and cardiovascular problems. Long-term, obese children are more likely to be obese in adulthood, with related cardiovascular risk factors.²⁵ Research indicates that some children are already developing signs of coronary heart disease, high blood pressure, high cholesterol, Type 2 diabetes. Eight per cent of the children participating in the Cork Children's Lifestyle Study were classified as having high blood pressure. Twice as many overweight/obese children had high blood pressure when compared to normal weight children.²⁶

Obesity in adults

24% of Irish adults (18-64 years) are obese (men 26%, women 21%). The percentage classified as obese increases with age -13% of both women and men aged 18-35 years were classified as obese, rising to 31% of women and 42% of men aged 51-64 years. The prevalence of obesity in adults (18-64) has increased significantly since 1990 from 8% to 26% in men, and from 13% to 21% in women.

Based on BMI measurements, 36% of over-50s are obese. While based on waist circumference measurements, 52% are 'centrally obese', i.e., with a 'substantially increased' waist circumference.²⁸ Similar to children, social inequalities in the prevalence of obesity are visible in older people. Those with lower incomes and those with lower levels of education have the highest levels of obesity. 38% of adults aged 75 years and older in the lowest wealth quartile are obese, compared to 17% in the highest quartile. ²⁹

Fat in the central area of the body³⁰ is associated with increased risk of cardiovascular disease (CVD). The National Adult Nutrition Survey shows that based on cut-off points for waist circumference and waist to hip ratio, 23% of Irish men and 27% of women are associated with an increased risk of CVD

²² Keane, E., Kearney, P., Perry, I., Kelleher, C. and Harrington, J. (2014) 'Trends and prevalence of overweight and obesity in primary school aged children in the Republic of Ireland from 2002-12: a systematic review'. *BMC Public Health*, 14 (974). http://www.biomedcentral.com/1471-2458/14/974

²³ Keane, E., Kearney, P., Perry, I., Kelleher, C. and Harrington, J. (2014) 'Trends and prevalence of overweight and obesity in primary school aged children in the Republic of Ireland from 2002-12: a systematic review'. *BMC Public Health*, 14 (974). ²⁴ Juonala, M., Magnussen, C., Berenson, G., Venn, A., Burns, T., Sabin, M., Srinivasan, S., Daniels, S., Davis, P., Chen, W., Sun, C., Cheung, C., Viikari, J., Dwyer, T. and Raitakari, O. (2011) 'Childhood Adiposity, Adult Adiposity, and Cardiovascular Risk Factors'. *New England Journal of Medicine*, 365 (20), 1876-1885.

²⁵ Department of Health and Children (2005) *The Report of the National Taskforce on Obesity* and WHO (2014) *Report of the Ad hoc Working Group on Science and Evidence for Ending Childhood Obesity: 18-20 June 2014, Geneva, Switzerland.* http://apps.who.int/iris/bitstream/10665/133545/1/9789241507653 eng.pdf?ua=1

²⁶ Safefood news (2014) 'Cork Children's Lifestyle Survey'. Available at: http://www.safefood.eu/Professional/Nutrition/Nutrition-News/March-2014/Cork-Children%E2%80%99s-Lifestyle-Study acry

²⁷ Irish Universities Nutrition Alliance (IUNA) (2011). National Adult Nutrition Survey http://www.iuna.net/wp-content/uploads/2010/12/National-Adult-Nutrition-Survey-Summary-Report-March-2011.pdf
²⁸ Leahy, S., Nolan, A., O' Connell, J. and Kenny, R. (2014) *Obesity in an Ageing Society Implications for health, physical*

function and health service utilisation. Dublin: The Irish Longitudinal Study on Ageing (TILDA).

²⁹ Barrett, A., Savva, G., Timonen, V. and Kenny, R. eds (2011) Fifty Plus in Ireland 2011. Dublin: The Irish Longitudinal Study on Ageing, Trinity College Dublin. http://tilda.tcd.ie/assets/pdf/glossy/Tilda Master First Findings Report.pdf

³⁰ Measured by waist circumference and waist to hip ratio.

and 31% of men and 37% of women were shown to be at a high risk for CVD risk factors. ³¹ Amongst the over-50's, the Irish Longitudinal Study on Ageing (TILDA) found that a higher proportion of men and women with central obesity had a doctor's diagnosis of at least one cardiovascular disease (e.g. angina, heart attack, heart failure, stroke), compared to those with a normal waist circumference. Central obesity was also associated with a higher prevalence of risk factors for cardiovascular disease - high blood pressure is diagnosed in twice as many older adults with central obesity compared to those with a normal waist circumference, while diabetes is over four times more common.³²

Health inequity, obesity and cardiovascular disease

Health inequity means that Irish people on lower incomes are sicker and die earlier than those with higher incomes. Mortality from cardiovascular disease is a major element of health inequity in Ireland. As the social gradient in health means that obesity is more prevalent in disadvantaged communities, we are likely to see an increase in socio-economic inequalities in deaths from cardiovascular disease.33

Table 4: Health inequity and cardiovascular disease in Ireland

- People in the most deprived areas have the lowest life expectancy. 34
- Coronary heart disease is 2.5 times more prevalent and stroke 2.2 times more prevalent in the most deprived areas than in the least deprived areas. 35

In society, there is a tendency to blame poor lifestyle behaviours for ill-health, sometimes leading to a blame culture directed at those who are obese. Yet, individuals cannot be solely responsible for lifestyle factors which lead to ill-health. These lifestyle factors – including poor diet – are influenced by social, economic, cultural and political factors. Unequal experience of the social determinants of health across the population impacts on the distribution of poor health, including obesity. ³⁶ To tackle the health inequity in obesity and CVD, Government should address the accumulation of disadvantage across people's lives in the conditions in which they live, work and age.³⁷

³¹ P. 27, Irish Universities Nutrition Alliance (IUNA) (2011). National Adult Nutrition Survey http://www.iuna.net/wp-content/uploads/2010/12/National-Adult-Nutrition-Survey-Summary-Report-March-2011.pdf ³² Leahy, S., Nolan, A., O' Connell, J. and Kenny, R. (2014) Obesity in an Ageing Society Implications for health, physical

function and health service utilisation. Dublin: The Irish Longitudinal Study on Ageing (TILDA).

33 For a discussion of obesity rates and inequality in coronary heart disease mortality in England see Bell, R., Allen, J.,

Geddes, I., Goldblatt, P. and Marmot, M. (2012) 'A social determinants approach to CVD prevention in England. University College London Institute of Health Equity. http://www.instituteofhealthequity.org/projects/a-social-determinants-basedapproach-to-cvd-prevention-in-england
34 Life expectancy is correlated with a person's social class, the affluence of the area in which they live and educational

attainment. People with disabilities and carers also die younger, as do single persons and those who are widowed and divorced. CSO (2010) 'Mortality Differentials in Ireland'

http://www.cso.ie/en/media/csoie/census/documents/Mortality Differentials in Ireland.pdf

³⁵ Balanda, K. et al. (2010). Making Chronic Conditions Count: Hypertension, Stroke, Coronary Heart Disease and Diabetes. Dublin: Institute of Public Health in Ireland.

³⁶ Bell, R., Allen, J., Geddes, I., Goldblatt, P. and Marmot, M. (2012) 'A social determinants approach to CVD prevention in England. University College London Institute of Health Equity. http://www.instituteofhealthequity.org/projects/a-social- determinants-based-approach-to-cvd-prevention-in-england

For a discussion of obesity rates and inequality in coronary heart disease mortality in England see Bell, R., Allen, J., Geddes, I., Goldblatt, P. and Marmot, M. (2012) 'A social determinants approach to CVD prevention in England. University

Food poverty

In addition to high levels of obesity among all ages, a considerable proportion of the Irish population is living in food poverty. Food poverty is the inability to have a nutritious diet due to affordability or accessibility. It is primarily the result of low incomes. The immediate impact of food poverty is poor diet and lack of nutrients. In the longer term, food poverty may lead to diet-related diseases, including obesity. The connection between diet and health may explain why people with a chronic illness in 2010 were more likely to be experiencing food poverty (14%) than those without a chronic illness (9%).³⁸

Social stress, such as unemployment, and cost of food are barriers to healthy eating for Irish people with lower socio-economic status.³⁹ Healthy food is more expensive, with healthier diets, such as Mediterranean diets high in fruits, vegetables, fish and nuts tending to be more expensive than less healthy diets, high in processed foods and refined grains.⁴⁰ As a result, people living in food poverty tend to spend a higher proportion of their income on food, yet due to the high cost of healthy food find it difficult to meet healthy eating guidance.⁴¹

Table 5: Food poverty in Ireland

- 13.2% of the population are living in food poverty.
- 1 in 5 children go to school or bed hungry because there is not enough food in the home.
- 1 in 6 children never have breakfast on weekdays.

Research in Ireland has found that low-income households in Ireland are most at risk of inadequate diet and its negative effects on health and well-being. ⁴⁴ People in low-income households know the foods which are healthy, but are restricted by financial and physical constraints in following such a diet. ⁴⁵ Research shows that calories from healthy foods (fruit, vegetables, lean meats, etc.) are up to ten times more expensive than from foods high in fat, sugar and salt. ⁴⁶ Research from the UK shows that over the period of the recession from 2008, households cut real expenditure on food and substituted to cheaper, processed sweet and savoury food and away from fruit and vegetables. ⁴⁷

College London Institute of Health Equity. http://www.instituteofhealthequity.org/projects/a-social-determinants-based-approach-to-cvd-prevention-in-england

38 December 1 (2011) 1

³⁸ Department of Social Protection (2014) *Social Inclusion Monitor 2013*.

³⁹ safefood (2008) 'Food and nutrient intake and attitudes among disadvantaged groups on the island of Ireland – summary report'.

⁴⁰ See Rao, M., Afshin, A., Singh, G. and Mozaffarian, D. (2013) 'Do healthier foods and diet patterns cost more than less healthy options? A systematic review and meta-analysis'. *BMJ Open,* 3, doi:10.1136/bmjopen-2013-004277 and Morris, M., Hulme, C., Clarke, G., Edwards, K. and Cade, J. (2014) 'What is the cost of a healthy diet? Using diet data from the UK Women's Cohort Study'. *Journal Epidemiology Community Health, doi:10.1136/jech-2014-204039*.

⁴¹ See, Friel, S. and Conlon, C. (2004) *Food poverty and policy*. Dublin: Combat Poverty Agency, Cross Care and St. Vincent de Paul.

⁴² Department of Social Protection (2014) *Social Inclusion Monitor 2013*. Dublin: Department of Social Protection. http://www.socialinclusion.ie/documents/2015-03 SIM2013 rpt Final 000.pdf

⁴³ Kelly, C., Gavin, A., Molcho, M. & Nic Gabhainn, S. (2012). *The Irish Health Behaviours in School-aged Children (HBSC) study 2010*. Dublin: Department of Health.

⁴⁴ Friel, S. and Conlon, C. (2004) *Food poverty and policy*. Dublin: Combat Poverty Agency, Cross Care and St. Vincent de Paul and Harrington, J., Fitzgerald, P., Layte, R., Lutomski, J., Molcho, M. and Perry, I. (2011) 'Sociodemographic, health and lifestyle predictors of poor diets'. *Public Health Nutrition*, doi:10.1017/S136898001100098X.

⁴⁵ P. 11, Friel, S. and Conlon, C. (2004) *Food poverty and policy*. Dublin: Combat Poverty Agency, Cross Care and St. Vincent de Paul.

⁴⁶ Food Safety Authority of Ireland (2011) *Scientific Recommendations for Healthy Eating in Ireland*. Dublin: FSAI.

⁴⁷ Griffith, R., O'Connell, M. and Smith, K. (2013) *Food expenditure and nutritional quality over the Great Recession.* Institute for Fiscal Studies.

Families with children in Ireland are three times as likely as those without children to be affected by food poverty. 48 People are experiencing food poverty in every County – an estimated 14,000 people in Mayo experience food poverty; 50,500 in Cork City and County; 112,300 in Dublin; and 18,700 in Donegal.⁴⁹ The high rate of food poverty in Ireland is further reflected in the growing demand for charitable food provision. The Society of St Vincent de Paul now spends €7 million per year on food for those in need⁵⁰, while the Cork Penny Dinners, one of oldest soup kitchens, feeds 1,400 people per week, an increase of 55% since the start of the recession.⁵¹

In addition to lacking the money to purchase food and facilities to prepare it, people experiencing food poverty may also have difficulty accessing affordable healthy foods in shops in their neighbourhood. Even the arrival of discount supermarkets in Ireland in recent years may not have improved access to fresh produce for many people on low incomes. These supermarkets are often located out of town, requiring transport and have further led to the demise of local food shops.⁵² Research examining the impact of food environments and the availability of healthy foods for 10,000 people living in Ireland found that lack of available healthy food in disadvantaged areas may further impede disadvantaged groups from following a healthy diet.⁵³ Further research examining the difference between the cost of food for rural and urban dwellers in Ireland found that rural dwellers often do not have equal access to large supermarkets, or to 'own brand', value-for-money brands, making the cost of a basket of goods significantly higher.⁵⁴

Madden (2013) outlines the link between dietary energy density and dietary energy cost for people living in Ireland. 55 Refined grains, added sugars and added fats are amongst the cheapest sources of dietary energy, whereas the more nutrient dense foods such as lean meats, fish, vegetables and fruit are more expensive. The impact of low incomes on dietary choice is that low income consumers with limited resources are more likely to select diets with high contents of refined grains, added sugars and added fats as the most cost-effective way to meet daily calorific requirements. In his paper examining nutrition-related taxation, Madden finds that a "fat-tax" accompanied by a subsidy on healthy food such as fruit and vegetables would have a neutral or negligible poverty impact and could address the problem of food poverty and obesity simultaneously by making a healthy diet more affordable to low income groups.

⁴⁸ Carney, C. and Maître, B. (2012) Constructing a Food Poverty Indicator for Ireland Department of Social Protection. Dublin: Department of Social Protection.

⁴⁹ Mandate Trade Union and Unite (2013) *Hungry for Action – mapping food poverty in Ireland.*

https://unitetheunionireland.files.wordpress.com/2013/12/hungry-for-action1.pdf 50 Society of St. Vincent de Paul 2013 Pre-Budget Submission. Available at: http://www.oireachtas.ie/parliament/oireachtasbusiness/committees list/fper-committee/2015prebudgetsubmissions/2013pre-budgetsubmissions/

⁵¹ Mandate Trade Union and Unite (2013) Hungry for Action – mapping food poverty in Ireland. https://unitetheunionireland.files.wordpress.com/2013/12/hungry-for-action1.pdf

² Safefood (2011) Food on a low income. Dublin: safefood.

⁵³ Layte, R., Harrington, J., Sexton, E., Perry, I., Lyons, S. (2010) 'Local food environments and dietary quality'. *Journal* Epidemiology Community Health, doi:10.1136/jech.2010.120477.40

MacMahon, B., Weld, G., Thornton, R. and Collins, M. (2012) The Cost of a Child - a consensual budget standards study examining the direct cost of a child across childhood. Dublin: The Vincentian Partnership for Social Justice.

⁵⁵ Madden, D. (2013) The Poverty Effects of a "Fat-Tax" in Ireland. Dublin: UCD.

Government polices to address obesity and food poverty – the weight of policy documents

The government's first national obesity policy, *The Report of the National Taskforce on Obesity* ⁵⁶, was published in 2005. A 2009 review ⁵⁷ of the policy's implementation criticised the lack of progress in implementing many of the report's 93 recommendations. Almost a decade after the publication of the obesity policy, the Department of Health established the Special Action Group on Obesity (SAGO). SAGO has focused on discrete issues such as the inclusion of calories on menus and development of healthy eating guidelines. ⁵⁸ The Department of Health is expected to publish a new national obesity policy in 2015. Government has never developed a national food policy, or a specific food poverty policy.

Actions to reduce obesity rates have been included in a number of recent Government policies, including the *Cardiovascular Health Policy 2010-2019* which sets out 10-year targets for healthy body weight; healthy eating and physical activity and *Better Outcomes, Brighter Futures* 2014-2020, the national policy for children and young people, which sets targets for childhood obesity levels and food poverty among children. Under the cross-Government public health framework, *Healthy Ireland*⁵⁹, the Government is committed to increasing the number of children with a healthy weight by 6% by 2019.

Despite Government commitments to address obesity and to a lesser extent food poverty, action and results have been limited. Over the last decade, the State has focused on encouraging individual behaviour change through education and awareness campaigns targeted at children and parents but has failed to tackle the societal causes of obesity, including the greater availability of and intense marketing of cheaper, tastier, higher calorie food and drinks and drivers of food poverty, including low incomes and the high cost of food.

⁵⁶ Department of Health and Children (2005) *The Report of the National Taskforce on Obesity.* Dublin: The Stationery Office.

⁵⁷ Department of Health and Children (2009) Report of Inter-sectoral Group on the Implementation of the Recommendations of the National Task Force on Obesity. Dublin: The Stationery Office.

⁵⁸ For detail on SAGO see, http://health.gov.ie/healthy-ireland/obesity/sago/ (Accessed 13th March 2015).

⁵⁹ Government of Ireland (2013) *Healthy Ireland Framework for Improved Health and Wellbeing 2013-25.* http://www.dohc.ie/publications/Healthy_Ireland_Framework.html

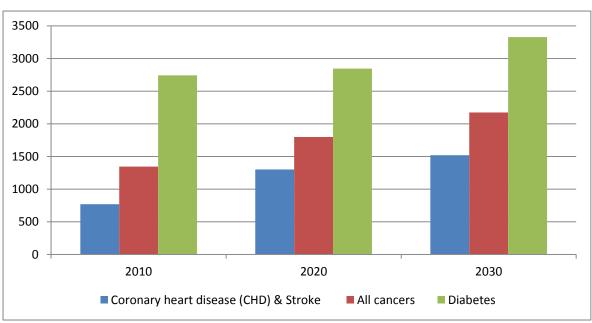
Part 2: The impact of obesity on the health service – now and into the future

The example of cardiovascular disease and obesity

Obesity and food poverty impact on people's diets and there is a clear relationship between poor diet and disease. Obesity is a major contributor to chronic diseases, particularly cardiovascular (CVD) disease. Cardiovascular disease remains the leading cause of mortality in Ireland. There is now real concern that high obesity rates will contribute to higher mortality from heart disease and stroke in the future. Overweight, obesity and excess abdominal fat are related to the main risk factors for coronary heart disease, including hypertension, insulin and cholesterol. Overweight and obesity are independent risk factors for congestive heart failure and obesity is a risk factor for ischaemic strokes.⁶⁰

Research⁶¹ predicts that the burden of chronic diseases will increase dramatically in Ireland. By 2020, the number of adults with chronic diseases will increase by around 40%. In 2007 nearly 131,000 adults in the Republic of Ireland (3.8%) had ever had coronary heart disease. By 2020 this is expected to rise to over 195,000 (4.6%). This represents a 50% increase – an additional 65,000 adults – in less than 15 years. By 2020 the number of people who have had a stroke is expected to rise to almost 87,000 (2.1%), a 48% increase – an additional 28,000 adults.

Chart 1: Ireland 2030 - Projected prevalence of cancers, diabetes, coronary heart disease (CHD) & Stroke per 100,000 of the population



Source: Perry and Keaver et al (2013)

Over the past three decades, Ireland has experienced a rapid decline in mortality from cardiovascular disease. In particular, there has been an accelerated decrease in coronary heart

⁶⁰ Department of Health and Children (2005) *The Report of the National Taskforce on Obesity.* Dublin: The Stationery Office.

⁶¹ Balanda, K., Barron, S., Fahy, L. and McLaughlin, A. (2010) *Making chronic conditions count – hypertension, stroke, coronary heart disease, diabetes.* Dublin: Institute of Public Health.

disease (CHD) mortality since the late 1990s up to 2006. Research has shown that most of the decline in Irish CHD deaths between 1985 and 2000 was the result of improvements in risk factors. However, risk factors for cardiovascular disease, including obesity have worsened since 2000. Death rates from CHD have also started to 'flatten', possibly due to this increase in risk factors. This has led to concerns that we will soon see a reversal of the positive trend of reductions in premature deaths and disability from CHD.

Obesity projections

Projected obesity and trends in Ireland 2030

Chart 2 below gives the projected obesity rate for twenty seven European Union countries in 2030. Ireland is projected to have the highest percentage of population who are obese, at just under 45 per cent.

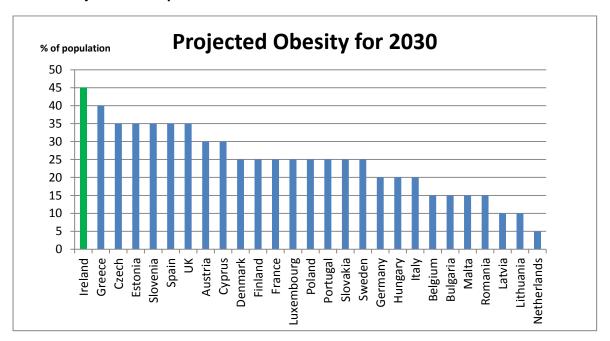


Chart 2: Projected Obesity Levels for 2030*

Source: Breda, J (2013): Prevention and Control of Noncommunicable Diseases in the WHO European Region - policy developments in nutrition and physical activity 66

* The projected obesity rate for each country in 2030 has been approximated to the nearest 5% for visualization purposes, author calculations

This projection is alarming and highlights the huge challenge that obesity presents to Irish policy makers. Chronic diseases are now the biggest cause of death in Europe, putting an unsustainable

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⁶² Bennett, K., Hughes, J., Jennings, S., Kee, F. and Shelley, E. (2013) 'Comparing the decline in coronary heart disease and stroke mortality in neighbouring countries with different healthcare systems'. *Heart,* doi:10.1136/heartjnl-2013-303921 ⁶³ Kabir, Z., Bennett, K., Shelley, E., Critchley, J., Feely, J. and Capewell, S. (2007) 'Life-years-gained from population risk factor changes and modern cardiology treatments in Ireland', *European Journal of Public Health,* 17 (2), 193-8.

⁶⁴ Layte, R. (2010) 'Explaining structural change in cardiovascular mortality in Ireland 1995–2005: a time series analysis'. *European Journal of Public Health*, 21 (5), 597-602.

⁶⁵ Bennett, K., Hughes, J., Jennings, S., Kee, F. and Shelley, E. (2013) 'Comparing the decline in coronary heart disease and stroke mortality in neighbouring countries with different healthcare systems'. *Heart*, doi:10.1136/heartjnl-2013-303921 http://img.ivz.si/janez/2366-7185.pdf

burden on already struggling health systems. Research shows that increases in obesity are a major cause of chronic diseases⁶⁷. The budget allocated to the health system in Ireland does not reflect the increasing number of people with chronic diseases. An international review of the Irish healthcare system in 2012⁶⁸ concluded it was not possible to have a sustainable and effective health system with 3% reduction in expenditure year on year. Furthermore certain groups who relied more heavily on health services would not be able to access the necessary care. The health budget in Ireland was reduced in 2013 and 2014 despite the findings of this report. From 2009-2014 there have been significant reductions to the health budget with knock-on effects on the delivery of services. In Budget 2015, an extra €635m was allocated to health. However, according to the Health Service Executive National Service Plan for 2015, this only allows net costs to increase by €115m when the 2014 net expenditure deficit and the 2015 minimum savings target are taken into account.

The direct cost of overweight and obesity to the Irish health service is already almost €400m⁶⁹ every year. This cost, which is driven mainly by obesity related issues, is projected to increase significantly as the percentage of the population who are obese continues to rise. Webber et al (2014) also note that while there has been a reduction in the burden of chronic disease across countries over the past decade, the increase in obesity is now threatening these gains.

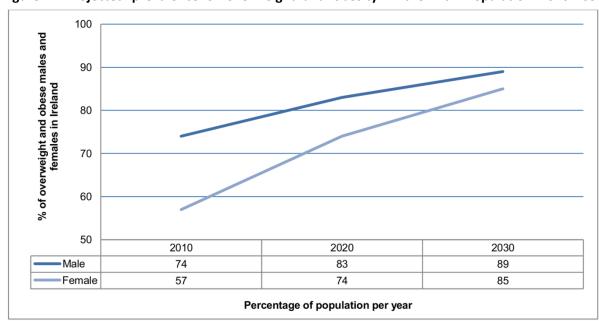


Figure 1: Projected prevalence of overweight and obesity in the Irish Population 2010-2030

Source: Perry and Keaver et al (2013)

Without any policy intervention it is projected that there will be an additional 717 950 overweight or obese adults in 2030 when compared to 2010 (see Figure 1). If this projected trend becomes reality, it will result in a significant increase in the number of people with chronic diseases and a knock-on impact in a significant increase in direct healthcare costs. These include GP visits, drug costs and inpatient costs among others. As noted earlier, the burden of chronic disease that is primarily associated with and driven by obesity is CVD, type 2 diabetes and some forms of cancer.

⁶⁷ Webber, L., Divajeva, D., Marsh, T., McPherson, K., Brown, M., Galea, G., and Breda, J (2014) *The future burden of obesity-related diseases in the 53 WHO European-Region countries and the impact of effective interventions: a modelling study*. http://bmjopen.bmj.com/content/4/7/e004787.full

⁶⁸ WHO Regional Office for Europe and European Observatory on Health Systems and Policy (2012) *Health system responses to financial pressures in Ireland: policy options in an international context.* http://health.gov.ie/wp-content/uploads/2014/03/Observatory_WHO_2012.pdf

⁶⁹ Safefood (2012) *The Cost of Overweight and Obesity on the Island of Ireland.* Dublin: Safefood

Projected direct cost of obesity in Ireland in 2020 and 2030

As previously noted, the direct cost of overweight and obesity in Ireland is almost €400 million per annum. The indirect cost of obesity is €728 million per annum. Direct costs of obesity are the costs to the healthcare system in terms of chronic diseases as a result of the levels of obesity across the population. The indirect costs of obesity are associated with reduced productivity, due to premature mortality, work absenteeism and a reduced effective labour force. This indirect cost does not fully capture the social and economic cost to society and to the individual of obesity related illnesses, low self-esteem and mental health issues.

As chart 2 and figure 1 both show, obesity levels in Ireland are projected to increase dramatically, and so will the direct obesity related costs to the healthcare system. The main drivers of increased healthcare costs as a result of obesity related diseases are the increased number of CVD cases. Chart 3 below shows the projected cost in 2020 and 2030 if the present trends continue.

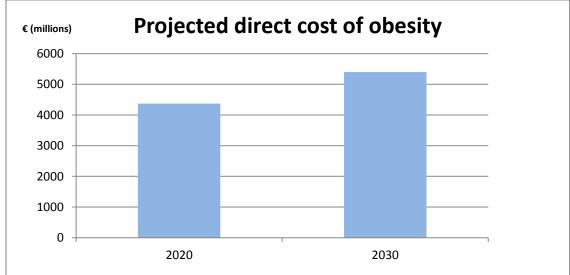


Chart 3: Projected cost of obesity in 2020 and 2030 if present trends continue

Source: Perry and Keaver et al (2013)⁷⁰

As chart 3 shows, if present trends continue and no policy interventions are made the cost of obesity will rise to over €4.3 billion in 2020 and to €5.4 billion in 2030⁷¹. The increased costs of CHD and stroke are projected to account for 92 per cent of obesity related costs in 2030 (Perry, Keaver et al, 2013⁷²). When the indirect costs (reduced productivity, due to premature mortality, work absenteeism and a reduced effective labour force) are included (projected to be €9.88 billion in 2030), obesity will cost the state more than €15 billion by 2030. These projected costs represent a huge social and economic burden to the state.

72 ibid

⁷⁰ Perry, I J., Keaver, L., Dee, A., Shiely, F., Marsh, T. and Balanda, K. (2013) Application of the UK Foresight Obesity Model in Ireland: The Health and Economic Consequences of Projected Obesity Trends in Ireland http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3827424/

⁷¹ ibid

The projected impact of reducing BMI on obesity costs

Reducing body mass index (BMI) of a population can substantially reduce the health burden of obesity, and in turn reduce the cost of CVD and chronic diseases on the health system. A micro simulation model showing the impact of a 1 per cent and a 5 per cent reduction in BMI show that this would substantially reduce the health burden in terms of the reduction of cases of CVD, type 2 diabetes and chronic diseases⁷³. Some immediate and simple gains that would result from a reduction in BMI would be a reduction in medical card costs; a reduction in drug costs for chronic illnesses; and a reduction in prescription costs.

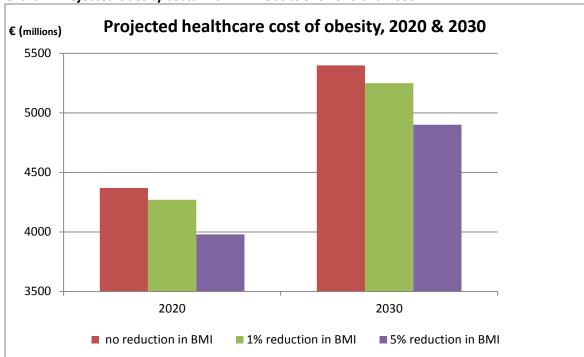


Chart 4: Projected obesity costs with BMI reductions 2020 and 2030

Source: Perry and Keaver et al (2013)

that the indirect costs of obesity as outlined above would also fall if BMI were reduced. Alongside the savings from reducing direct and indirect costs, there would be productivity gains to the state in terms of population wellbeing, a productive and effective labour force and active and participatory citizens.

As chart 4 shows, reducing BMI can have a significant impact on the direct cost of obesity. It follows

⁷³ Webber, L., Divajeva, D., Marsh, T., McPherson, K., Brown, M., Galea, G., and Breda, J (2014) *The future burden of obesity-related diseases in the 53 WHO European-Region countries and the impact of effective interventions: a modelling study.* http://bmjopen.bmj.com/content/4/7/e004787.full

Total projected savings of BMI reduction scenarios,

€ (millions)

2020 & 2030

600

400

300

200

1% reduction in BMI

5% reduction in BMI

2020 ■ 2030

Chart 5: Projected savings with BMI reductions 2020 and 2030

Source: Perry and Keaver et al (2013)

Chart 5 projects the savings to direct healthcare costs that would be generated by a 1 per cent reduction in BMI and a 5 per cent reduction in BMI respectively. A 1 per cent reduction in BMI is estimated to lead to €104m in direct healthcare cost savings by 2020 and €143m in savings by 2030. A 5 per cent reduction in BMI has a much more significant impact by 2020. It would lead to €394m savings in direct healthcare costs by 2020 and €495m savings by 2030. The reason for this is that a 5 per cent reduction in BMI would significantly reduce the incidence of chronic disease, in particular CVD and Type 2 diabetes. It would reduce the number of CHD & stroke cases by 35,984 by 2030⁷⁴.

Achieving a 5 per cent reduction in BMI by 2020 would achieve significant savings of €394m and would have an immediate and direct impact on the health of the population and the cost to the health service. It would also have long term social and economic benefits. The level of savings and the health benefits to the population are substantial. These savings should be directed into improving the health service and other public services, which in turn will improve economic performance and quality of life.

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⁷⁴ P. 4: Perry, I J., Keaver, L., Dee, A., Shiely, F., Marsh, T. and Balanda, K. (2013) Application of the UK Foresight Obesity Model in Ireland: The Health and Economic Consequences of Projected Obesity Trends in Ireland

Part 3: Policy implications and recommendations

Policy implications

Chronic diseases, such as heart disease and cancer, are the leading cause of death and morbidity in developed countries. The rise in childhood obesity and other trends can be seen as an indicator of future rises in chronic diseases. By 2020, the number of adults with chronic diseases will increase by around 40%, with relatively more of the conditions affecting those in the older age groups.31 For example, the obesity levels for both men and women aged over 20 years old in Ireland are higher than the Western European average. It is estimated that 75% of healthcare expenditure relates to chronic diseases. The economic burden is considerable not only for the health system but also in terms of families and society as a result of reduced income, early retirement, an increased reliance on social care and welfare support and diminished productivity and absenteeism. The World Health Organisation in Europe has estimated that the 10 - 15% increase in chronic diseases will reduce a country's GDP by an order of 1% over the next decade.⁷⁵

The above is an extract from the *National Risk Assessment 2015* published by the Department of An Taoiseach. This document identifies the increase in chronic disease as one of the five social risks facing Ireland. The policy implications of having such high levels of obesity are clear. Without policy intervention there will be a significant increase in chronic diseases and the gains made in terms of reducing CVD over previous decades will be lost. A generation of children could grow up with higher levels of chronic disease, a situation that will have a hugely negative impact on their lives and a very large economic and social cost to the state.

The Irish Heart Foundation and Social Justice Ireland are concerned that the increasing cost to the state of obesity has not been factored into the projections for the health budget. Research and literature⁷⁶ shows however that although the level of obesity in Ireland is stabilising among some groups, it is not reducing in the population overall. This would indicate that the present policies being pursued in terms of reducing obesity levels are not working. Increased levels of obesity will require increased levels of expenditure by the health service. This is unavoidable due to the links between obesity and chronic diseases. Therefore in order for the Government to ensure it meets its projected expenditure new policy proposals should be considered.

Policy proposals

The implications of obesity and projected future levels of obesity are significant and daunting. Policies to address this challenge must be developed now. The IHF and SJI propose that Government adopt a target to reduce the BMI of the population by 5 per cent by 2020 in order to significantly improve the health of the population and to guarantee significant long-term savings to the exchequer. Such a target would require a change in strategy, but it would also yield significant results in terms of exchequer savings in the short to medium term and have immediate social and economic benefits.

To reach this target by 2020 will require a concerted whole-of-Government approach to improve the health of the population requiring significant commitment and cross departmental responsibility. The remainder of this paper will examine the issue of health related taxation as a means of reducing obesity and of providing Government with the means to address obesity and food poverty. The

⁷⁵ Department of An Taoiseach (2015) *National Risk Assessment 2015*. Dublin: Stationery Office

⁷⁶ OECD (2011) Obesity Update 2012. Paris: OECD Publishing http://www.oecd.org/health/49716427.pdf

broad policy issues raised above need further elaboration and research and should form a core part of a whole-of-Government response to obesity.

Health related taxation

As noted earlier chronic diseases, including cardiovascular disease, are the biggest cause of death in Ireland. Obesity is one of the major modifiable risk factors for chronic diseases, and as such Governments should plan ahead and initiate change to reduce obesity through preventative measures such as price policies⁷⁷. Primary prevention is crucial if increasing obesity trends are to be averted⁷⁸.

In order to make significant progress towards reducing BMI by 5 per cent by 2020 the IHF and SJI propose that Government introduce a sugar-sweetened drinks (SSD) tax and use the revenue generated to address food poverty and promote health policies to prevent and reduce obesity. Such forms of health related taxation are entirely justifiable in order to recover the costs of obesity to the state⁷⁹. Ireland has a reputation as a world leader in the implementation of behavioural taxes and for best practise in this area (plastic bag tax for example⁸⁰). The 2011 report⁸¹ of the secretary general of the United Nations General Assembly on the prevention and control of noncommunicable diseases (NCDs) states that there are many cost effective and low cost population wide interventions that can reduce risk factors for NCDs, including the introduction of food taxes and subsidies to promote a healthy diet⁸².

A significant amount of research has been done on the impact of SSDs in an Irish context (see Madden, D (2013), Collins, M (2012) and Briggs, A (2013))⁸³. Therefore the IHF and SJI will not repeat all of the findings in this paper. Madden notes that a sugar tax (which is a health related tax) when combined with an accompanying subsidy to fruit and vegetables would lead to a reduction in consumption of the food product that is subject to the higher tax, and an increased consumption of the food product that is subsidised. This would have a progressive outcome as substitution would be greater among lower-income groups where obesity is more concentrated⁸⁴. This calculation does not include the health benefits that should also be observed by substituting certain food products that are high in sugar by fruit and vegetables. As discussed earlier in the paper, a notable feature of obesity is the pronounced socio-economic gradient, which is worryingly evident in the latest figures for children. Thus obesity is linked to food poverty, as lower income households with limited resources are more likely to select diets with high contents of refined grains, added sugars and added fats in order to meet daily calorie requirements⁸⁵. Madden concludes that a health related tax (such as a sugar tax or a fat tax) in conjunction with a subsidy on selected foods is likely to have a negligible or neutral impact on poverty whilst achieving progressive gains in terms of improved

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⁷⁷ Webber, L., Divajeva, D., Marsh, T., McPherson, K., Brown, M., Galea, G., and Breda, J (2014) *The future burden of obesity-related diseases in the 53 WHO European-Region countries and the impact of effective interventions: a modelling study*. http://bmjopen.bmj.com/content/4/7/e004787.full ⁷⁸ ibid

⁷⁹ Yale Rudd Center for Food Policy & Obesity (2012) *Sugar-Sweetened Beverage Taxes: An Updated Policy Brief*. http://www.uconnruddcenter.org/resources/upload/docs/what/reports/Rudd_Policy_Brief_Sugar_Sweetened_Beverage_

⁸⁰ See https://www.ucd.ie/gpep/research/workingpapers/2003/03-01.pdf and

http://www.economicinstruments.com/index.php/solid-waste/charges-and-taxes-/article/214-

⁸¹ http://www.ghd-net.org/sites/default/files/UN%20Secretary-General%27s%20Report%20on%20NCDs.pdf

Madden, D. (2013) The Poverty Effects of a "Fat Tax" In Ireland. Dublin: UCD; Collins, M. (2012) Modelling the Structure and Distributive Impact of a Fat Tax for Ireland. Dublin: NERI; Briggs, A. (2013) The potential impact on obesity of a 10% tax on sugar-sweetened beverages in Ireland, an effect assessment modelling study. BMC: Public Health

⁸⁴ Madden, P. (2013) The Poverty Effects of a "Fat Tax" In Ireland. Dublin: UCD

⁸⁵ ibid

health outcomes. The Irish Heart Foundation has done significant work on the design and implementation of an SSD tax, the revenue from which should be used to address food poverty and promote policies to reduce and prevent obesity. Table 6 below outlines Department of Finance calculations on predicted revenue from the introduction of an SSD in Ireland.

Table 6: Department of Finance - predicted revenue from sugar-sweetened drink tax*			
Yield at €7.16 per hl	Yield at €14.36 per hl	Yield at €25.54 per hl	
€37.6m	€75.2m	€134.2m	
*Assumes no behaviour chance			
	(2014) Tax Strategy Group 14/2 'Gen-	eral Excise Duties (Tobacco, Alcohol, Betting and	
Others)' ⁸⁶			

The implementation of an SSD as a form of health related taxation would show leadership by Ireland in the fight against obesity and chronic disease. It would also be a policy instrument aimed at reducing the social risk of chronic disease and a step towards addressing those issues highlighted by the Department of the Taoiseach in the National Risk Assessments 2014 and 2015. In order to achieve immediate progress towards a 5 per cent reduction in BMI by 2020 and the related savings and health benefits the IHF and SJI propose that Government introduce a sugar-sweetened drinks tax in Budget 2016 and ring fence a portion of the revenue generated for programmes to address food poverty and obesity.

Consensus position on policies to prevent childhood obesity

- Food and health education: Include food and health in the school curriculum
- Controlling sales of foods in public institutions: Limit the provision and sale of fatty snacks, confectionery and sweet drinks in public institutions such as schools and hospitals
- Controls on food and drink advertising: Controls on the advertising and promotion of food and drink products
- Subsidies on healthy foods: Public subsidies on healthy foods to improve patterns of food consumption
- Change planning and transport policies: Encourage more physical activity by changing planning and transport policies
- Improve communal sports facilities: Improve provision of sports and recreational facilities in schools and communities
- Improve training for health professionals: Improve training of health professionals in obesity prevention and diagnosing and counselling those at risk of obesity
- Improved health education: Improved health education to enable citizens to make informed choices.
- Common Agricultural Policy reform: Reform of the EU's Common Agricultural Policy to help achieve nutritional targets
- Mandatory nutritional information labelling: Mandatory nutritional information labelling for all processed food, for example using energy density traffic light system.

Source: European Heart Network (2006) Policy options to prevent child obesity – Children, obesity and associated avoidable chronic diseases.⁸⁷

⁸⁷ European Heart Network (2006) *Policy options to prevent child obesity*. http://www.ehnheart.org/projects/children-a-obesity/publication/52.html

⁸⁶ Available at: http://www.finance.gov.ie/sites/default/files/14.02%20General%20Excise%20Duties.pdf

Conclusion

Without policy intervention to address obesity and food poverty there will be a significant increase in chronic diseases in Ireland. The increased costs of coronary heart disease and stroke are projected to account for 92 per cent of obesity related costs in 2030. Reducing body mass index (BMI) of a population can substantially reduce the health burden of obesity. In order to make significant progress towards reducing BMI by 5 per cent by 2020, the IHF and SJI propose that Government introduce a sugar-sweetened drinks (SSD) tax and use the revenue generated to address food poverty and promote health policies to prevent and reduce obesity. Such forms of health related taxation are entirely justifiable in order to recover the costs of obesity to the state Reference of the

Obesity and food poverty require an integrated, whole-of-Government, long-term policy response. Such a response requires policies targeted at children and young people, at adults of working age and at older people. The IHF and SJI intend this paper as a guide to ensure that the policy focus on obesity and food poverty considers both the long and short term policies that are needed to address these connected issues in the coming years. The introduction of a sugar-sweetened drinks tax combined with a use of revenue to address food poverty and obesity would enable Government to make an immediate move towards reducing BMI and obesity levels whilst simultaneously ensuring an economic benefit to the state.

Recommendations

Projections of obesity costs in Ireland indicate that if present trends continue and no policy interventions are made, the cost of obesity will rise to over €4.3 billion in 2020 and to €5.4 billion in 2030⁹⁰.

The IHF and SJI propose that Government adopt a target to reduce the body mass index (BMI) of the population by 5 per cent by 2020. A 5 per cent reduction in BMI would significantly reduce the incidence of chronic disease, in particular cardiovascular disease and Type 2 diabetes. Such an improvement in the health of the population would guarantee significant long-term savings to the exchequer. A 5 per cent reduction in BMI by 2020 is estimated to generate savings of €394m by 2020⁹¹.

Budget 2016

In order to make significant progress towards reducing BMI by 5 per cent by 2020, the IHF and SJI propose that Government introduce a sugar-sweetened drinks (SSD) tax in Budget 2016 and use a portion of the revenue generated to develop effective obesity prevention programmes and initiatives to eradicate food poverty.

Research should be undertaken to fully understand the direct and indirect costs of obesity in an Irish context, and also in a life cycle context. This research should examine the health and poverty

91 Ibid

⁸⁸ Perry, I J., Keaver, L., Dee, A., Shiely, F., Marsh, T. and Balanda, K. (2013) Application of the UK Foresight Obesity Model in Ireland: The Health and Economic Consequences of Projected Obesity Trends in Ireland

⁸⁹ Yale Rudd Center for Food Policy & Obesity (2012) *Sugar-Sweetened Beverage Taxes: An Updated Policy Brief*. http://www.uconnruddcenter.org/resources/upload/docs/what/reports/Rudd_Policy_Brief_Sugar_Sweetened_Beverage_Taxes.pdf

⁹⁰ Perry, I J., Keaver, L., Dee, A., Shiely, F., Marsh, T. and Balanda, K. (2013) Application of the UK Foresight Obesity Model in Ireland: The Health and Economic Consequences of Projected Obesity Trends in Ireland http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3827424/

implications of obesity on children and the implication adulthood. It should also examine the impact of account the age dependency ratio.		
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