

# Tackling Obesity

What the UK can learn from other countries

Matt James  
Dr Aaron Parkhurst  
Jon Paxman

April 2018



# Contents

<b>About the authors</b>	<b>4</b>
<b>About this report</b>	<b>5</b>
<b>Executive Summary</b>	<b>6</b>
Context	6
Case studies	6
Evidence	6
Learning	7
Child obesity	8
Conclusion	9
<b>Introduction</b>	<b>10</b>
<b>National intervention</b>	<b>14</b>
<b>1. Taxation policies</b>	<b>15</b>
Evidence from three case studies	
1.1 Mexico	16
Impact	16
1.2 Hungary	17
Impact	17
1.3 Further evidence from Berkeley, USA	18
1.4 Taxation and obesity	19
<b>2. Japan: two national policies</b>	<b>20</b>
2.1 'Metabo' law	20
2.2 <i>Shokuiku</i> school lunch programme	21
2.3 Cultural considerations	23
<b>Regional intervention: examples from the United States</b>	
<b>3. Obesity in the USA</b>	<b>24</b>
3.1 State Initiatives	25
3.1.1 Massachusetts	26
3.1.2 New Hampshire	27
<b>City and town intervention</b>	
<b>4. A tale of two cities: Oklahoma (USA) and Seinäjoki (Finland)</b>	<b>30</b>
4.1 Oklahoma, USA	30
4.1.1 Task	30
4.1.2 Action	30
4.1.3 Result	31
4.2 Seinäjoki, Finland: a city-wide child obesity strategy	32
4.2.1 Effects on overweight and obesity	34
<b>5. EPODE: A local focus on children and families</b>	<b>36</b>
5.1 EPODE: definition, evidence and learning	36
Results of first pilot	37
Key factors for success	38
5.2 EPODE for the Promotion of Health Equity (EPHE)	40
<b>Discussion</b>	
<b>6 Considerations of culture and genetics</b>	<b>42</b>
<b>7. Learning for the UK?</b>	<b>44</b>
6.3.1 Taxation	44
6.3.2 <i>Shokuiku</i> School Lunch Programme	45
6.3.3 Cross-sector intervention at the local level	46
6.3.4 How might EPODE or a similar multi-sector programme work in the UK?	48
<b>8. Summary and final considerations</b>	<b>50</b>
<b>Appendix: Summary of previous obesity research projects</b>	<b>52</b>
i. Project 1: 'Careless eating costs lives' (2014)	52
ii. Project 2: 'Fat chance?' (2015)	53
<b>References</b>	<b>54</b>

## About the authors

### **Matt James**

Matt joined 2020health in 2012 and has particular interest in the intersection of health, values, technology and public policy. He relishes the opportunity to think about what it means to be human in light of technological change and innovation. His wide-ranging portfolio of expertise spans the arenas of public policy, academia and third sector, including previously working in Parliament as a parliamentary researcher for an MP. Matt has co-authored reports on a wide range of topics including public health responses to obesity, reviewing post-transplant care for bone marrow transplant patients and reviewing the quality of care and models of best practice for those living with ankylosing spondylitis (AS). Matt is a Fellow of the Higher Education Academy (HEA) and a Fellow of the RSA.

### **Dr Aaron Parkhurst**

Aaron is a Medical Anthropologist at University College London (UCL). In 2007 Aaron moved to Dubai and began a project with UCL and the Health Authority of Abu Dhabi (HAAD) to study indigenous understandings of health and well-being in the Arabian Gulf. He also worked in clinics to study local conceptions of diabetes and other chronic health conditions. He returned to London in October 2010 and completed his PhD thesis on changing perceptions of the 'self' in Dubai, Abu Dhabi and Oman, cross-cultural understandings of biomedicine and genetics, and humanity's anxieties and struggles with modernity.

Aaron currently lectures in medical anthropology at UCL with a focus on biosocial anthropology, the anthropology of the human body, and the anthropology and bioethics of emerging technology. He also works with men's health issues and the effects of urban life on both physical and mental health, including links between depression, obesity and blood sugar disorders.

### **Jon Paxman**

Jon is a Senior Researcher with 2020health. Much of his work explores ways of improving access and outcomes within specific areas of primary care, with publications including 'Personal Health Budgets: A Revolution in Personalisation'; 'Protecting the Nation: Every Child Matters' (examining the UK's childhood immunisation programme); and 'Whole in One: Achieving equality of status, access and resources for people with depression'. He was lead author and researcher on 2020's Foresight Project Report (2016), considering the future impact of technology on health, business, education and regulation in the optical sector. Jon recently completed two years as Honorary Research Associate at University College London (UCL).

## About this report

This report reviews a number of policy measures and programmes implemented by national and local governments outside of the UK to address rising prevalence of overweight and obesity.

The review is far from exhaustive, but our presented case studies offer a range of learning and outcomes evidence of relevance to policy makers and cross-sector local actors involved in obesity prevention in the UK. This report is our third in a series on overweight and obesity, building on 'Careless eating costs lives' (James & Beer, 2014), which highlighted the importance of a holistic, multi-faceted approach to prevention, and 'Fat chance?' (Parkhurst, 2015), which explored the evidence base on determinants of obesity in the UK (p.12/13 and Appendix).

### Methodology

A literature review of government policy on obesity was undertaken between July and October 2017, principally in Medline, building on searches undertaken for previous projects in our obesity series (see Appendix). Our present search focused on studies published between 2015 and 2017. Keywords included 'overweight' and 'obesity', including variations on 'intervention', 'programme', 'community', 'town', 'state', 'country', and in combination with MESH terms (e.g. 'Overweight -- prevention & control'). We also undertook country-based Google searches using specific keywords according to theme (eg Food/Drink/SSB Tax; 'obesity + school'; 'obesity + success'; 'obesity + community'). Further sources of information consulted included WHO and OECD (online data and case studies).

Adult obesity, as referred to throughout this report, is characterised by a Body Mass Index (BMI) of 30 kg/m<sup>2</sup>, overweight is classified as a BMI of 25 to 30, and a healthy weight as 18.5 to 25, in accordance with WHO guidelines for anthropometry. Since there is no globally agreed standard for classifying child BMI, international comparison data are limited to OECD figures.

**This research was undertaken with the support of an unrestricted educational grant from AB Sugar. The views expressed within this report do not necessarily reflect those of AB Sugar.**

# Executive Summary

In this report, the third in our series on obesity, we examine topical obesity intervention strategies from around the world to frame the question: can the UK learn from policy abroad? This is not to suggest that any country has unequivocally burst the obesity bubble, but there are countries, regions, cities and towns that have explored approaches that the UK has not; we therefore wanted to case-study some of these to inform a discussion on potential insights and transferrable learning.

## Context

The UK has been considering solutions to the obesity crisis for more than 20 years. It is estimated that the government now spends around £600m on obesity prevention programmes annually – a seemingly significant investment, yet roughly equal to one percent of the total health and social cost of obesity in the UK (McKinsey Global Institute, 2014). The prevalence of overweight and obesity among adults and children has never been higher in the UK, so what the country has spent and implemented to date is not nearly enough.

## Case studies

This report presents ten case studies of government obesity intervention in six countries across three continents. This work updates our review of international obesity programmes presented in 'Careless eating costs lives' (James & Beer, 2014) and explores economic, social and cultural themes considered in our follow-up report 'Fat chance?' (Parkhurst, 2015). We start with national level policy, examining evidence from food and beverage taxation in Mexico and Hungary, with further evidence from Berkeley, CA. We also review Japan's controversial 'metabo law' weight intervention, and the same country's pedagogic *Shokuiku* school lunch programme. At the sub-national level we summarise two 5-year programmes of activity, from Massachusetts and New Hampshire (USA); then a large-city campaign in Oklahoma City (USA), and small-city campaign in Seinäjoki, Finland. We conclude the case studies with a review of EPODE at the town-population level, in France.

## Evidence

National and large subnational obesity programmes are very difficult to evaluate, and since not all stem from pilot programmes, there is a lack of associated data to answer the fundamental question: what works? It is not yet known whether taxation policies foster healthier diets overall, although there is evidence of reduced consumption of products high in fat and sugar in Mexico, and also in Hungary, where nutritional literacy appears to have been raised through the policy. Nothing certain can yet be said about the impact of taxation on obesity. Japan's impressive *Shokuiku* school lunch programme is designed to support balanced diets and mindful eating, and there is evidence of dietary improvements, though no obesity-related data. State-wide, cross-sector initiatives of New Hampshire (USA) show possible obesity reduction among children, but funding has not been provided for programme evaluation.

## Executive Summary

We should at the same time recognise that large population-based initiatives are not in themselves expected to produce and sustain weight loss in the general population. For that, multi-level approaches are needed, with a central 'health-in-all-policies' mindset and a range of national policies supporting local programmes to effect lasting change.

It is in localised contexts that impact assessments are more easily undertaken, and where the evidence base is at its strongest. The most striking theme common to the successes highlighted in our case studies is the approach of multi-stakeholder, cross-sector programming across multiple environments, especially those aimed at children and their families. Exemplars are found in EPODE, particularly in the longest running French programmes and the first Belgium pilots, and also in Seinäjoki, Finland. It is possibly significant that in these cases the total town or city populations were 60,000 or less. More work is needed to understand how these programmes can be up-scaled and adapted to diverse contexts, but such a concerted approach enables a detailed understanding of local demographics and population needs, and facilitates targeted and sustainable interventions.

### Learning

Our case studies offer some limited learning for the UK at a national level, and stronger evidence-based learning (as supported by the literature) at the local level:

- A health-in-all-policies approach is vital at both the national and local level.
- Compulsory national policies on school-based education, health and wellbeing can give greater strength and support to local action on obesity prevention.
- Taxation, whether considered, planned or implemented, can encourage manufacturer reformulation of products to healthier options.
- Taxation can create additional revenues for government; the amount will vary according to the extent of product reformulation.
- Strong local leadership on obesity prevention is essential to secure buy-in from local actors and stakeholders and effect lasting change.
- Local actors need a detailed understanding of the social determinants of obesity within their locality to implement relevant and targeted interventions.
- Coordinated, cross-sector local programming across multiple environments shows the strongest outcomes evidence for reducing obesity among children and addressing health inequalities.
- Public-Private Partnerships have a part to play in an obesity strategy.
- Raised health literacy can help improve public dietary habits.
- Improving access to drinking water in schools and workplaces is key to increasing water consumption.

## Executive Summary

At the same time it is important to recognise barriers to obesity prevention in the UK:

- Initiatives undertaken without evaluation processes have limited opportunity to encourage buy-in and support for similar strategies elsewhere.
- A widening price gap between cheap junk food and more expensive healthier options is creating a barrier to healthier diets in the poorest households.
- Obesity prevention with a school-only focus often shows no effect in the long term, leading to stakeholder discouragement and possible disinclination to pursue further strategies.
- Opt-out by many publicly funded schools (mainly academies and free-schools) of health-supporting initiatives, such as food technology (cooking), is a major impediment to health literacy and the implementation of schemes in the vein of EPODE.

### Child obesity

Learning from joined-up programming emphasises the importance of not only improving child nutrition, health education and physical activity, but also water consumption, access to affordable nutritious food, and parent education (for example on nutrition, exercise, screen time and sufficient sleep). Interventions also need to impact the wider obesogenic environment – including the built environment. Such comprehensive and concentrated programming has been little explored and studied in the UK.

We therefore urge the government:

- to help finance Local Authority pilots of EPODE-style programming in a range of communities around the UK, supported by robust academic evaluation to enable learning and effective dissemination (as described in section 6.3.4 of this report);

and with regard to specific policy changes:

- to support healthier food choices among the poorest families by extending the healthy start voucher scheme;
- to introduce a compulsory Ofsted rating scheme of school policy and action on physical and mental health in both primary and secondary schools.

# Executive Summary

## Conclusion

Strong and mandated central policy, supporting bold, holistic local action, is needed to impact what is arguably the greatest health challenge of the 21st century. The UK government has rightly placed principal focus on children, but a health-in-all-policies approach has yet to be realised. Currently, school nutrition and exercise policies are diluted by an opt-in position among academies and free schools (and are not always observed by schools under the Local Authority). Further barriers are presented by school-rating systems that place enormous emphasis on educational attainment, often to the detriment of child (and teacher) physical and mental health.

At a local level, community-based programmes for school-aged children, typically 0–12s, and their families are much more effective than interventions focused on school environments alone. The strongest evidence derives from programmes that traverse childhood and educational settings, the family home, community structures and the built environment.

While local, whole-systems approaches to obesity need to be explored (as being trialled in the London borough of Lewisham), children require special focus. If the UK fails to implement joined-up, multi-sectoral obesity prevention strategies for children and their families across a range of local contexts, it has little hope in ever reversing the obesity epidemic among the wider population.



## Introduction

Our environments and cultural norms are becoming increasingly obesogenic. At the most basic level, as populations experience rising affluence and urbanisation, so the prevalence of obesity increases (Bhurosy & Jeewon, 2014). Obesity is a serious threat to health as it is associated with an increased risk of various chronic diseases and conditions, including type 2 diabetes, coronary heart disease, hypertension and stroke, asthma, metabolic syndrome, certain cancers, gallbladder disease, and reproductive problems (NICE, 2015). The related healthcare costs are substantial: the UK's NHS spent about £5.1 billion on obesity-related ill-health in 2014/2015 (DH, 2017).

Some countries, including the UK, are seeing reduced rises or even a plateauing effect of overweight and obesity among adults and children, but attribution is unclear. For example this may be due to a combination of government policies and programmes, and increased health literacy in the population; or indeed overweight and obesity levels may have reached a point of 'saturation equilibrium' (Olds, 2011).

Understanding why some people become obese and others do not is a complex study, extending well beyond questions of genetic predisposition. In our report *Fat Chance?* (2015) we identified from the literature a wide range of sociocultural and environmental correlates to obesity, including poverty, deprivation and lower socioeconomic positions, employment mobility, physical and mental disability (including common mental illness), neighbourhood characteristics (the built environment, green spaces, pavements), fast food density, food insecurity, poor or insufficient sleep (with strong correlation to screen time) and ethnicity. In many post-industrial economies, pressures of modern living and dependency on technology potentially promote sedentary activity in both work and leisure, creating a yet more obesogenic culture.

That obesity prevention lies largely outside of the health sector is well recognised by the WHO in its advocacy of Health in All Policies (HiAP). This is a national and local government approach on health-related rights and obligations that urges consideration of all policies on health systems and determinants of health and well-being. HiAP also contributes to sustainable development (WHO, 2014).

# Introduction

## The UK context

Overweight and obesity prevalence has been high but almost static in the UK for more than 10 years, at around 61–62% of the adult population (15+ year-olds), although 2015 saw a historic high (for UK countries combined) at 62.9% (OECD, 2017). In England, overweight and obesity rates among primary school-age children have also remained fairly constant for the last 10 years: very small decreases have been recorded among children of reception age (4–5 year-olds), though more significant increases have been recorded for year 6 (10–11 year olds), rising from 31.6% to 34.2% over the period. Thus more than one third of children leave primary school overweight, with one in five (19.8%) obese; 2015 also saw a historic high for this age group (NHS Digital, 2016).

Policy measures and interventions may have contributed to this virtual stasis in overweight and obesity (following rapid rises of the 1990s and early 2000s); but if true, they can hardly be claimed as successful. The goal is to reverse overweight and obesity trends, not to hold them steady at record-breaking, epidemic proportions. Policy is also failing to address health inequalities, particularly among children: the deprivation gap, as measured by the differences in obesity prevalence between the most and least deprived areas, has increased in the UK over time (NHS Digital, 2016). This suggests obesity may still be rising among children in the most deprived areas.

The Global Matrix (2.0) on **Physical Activity of Children and Youth** (2016) showed the UK to be among the least active of 38 surveyed nations across the globe. England and Wales were graded D- (the lower range of 'poor': succeeding with less than half of children and youth (20-39%)', and Scotland graded F ('failing': achieving success with less than 20% of children and youth).

## Ten Case Studies

Given the current crisis, it is vital we understand whether policies and programmes from abroad can help guide action in the UK. This report presents ten case studies to explore learning and outcomes evidence from six countries across three continents. We first consider programmes implemented at the national level, then regional, city and town level. This is followed by a short discussion on cultural and genetic considerations, then a reflection on learning for the UK.

Our choice of case studies has been informed by two earlier projects: 'Careless eating costs lives' (James & Beer, 2014), which highlighted the importance of a holistic approach to prevention, and 'Fat chance?' (Parkhurst, 2015), which detailed some little recognised correlates of obesity. A summary of recommendations and findings from these projects, as relevant to our selected policies of interest, is given overleaf.

## Introduction

Case studies	Recommendations from <i>Careless Eating</i> (2014)	Findings from <i>Fat Chance</i> (2015)
<b>Taxation policies</b> Mexico Hungary Berkeley	A review needs to be undertaken of the economic and societal impacts of a hypothecated tax on a range of food and drink contents at levels which are deemed harmful to health.	Policy decisions need an informed understanding of at-risk (target) populations. [A central policy intervention will not necessarily impact all at-risk groups.]
<b>National cardiovascular screening and education programme</b> Japan	Introduce tax incentives for larger businesses to make wellbeing provision (such as access to occupational health, nutritionist, gym facilities) available to smaller local businesses.	Increasing pressures and stress of the workplace compounded by longer working hours and ready-meal culture may lead to higher BMI for men.
<b>'Shokuiku' school lunch and food education programme</b> Japan	Requirement for all schools to have a meaningful holistic strategy for health and wellbeing with rigorous criteria for assessment.	Holistic strategies in schools need to take into account ethnic diversity and specific cultural considerations.
<b>Sub-national policy</b> Massachusetts (USA) New Hampshire (USA)	Commission a health education and obesity prevention strategy that covers all stages of life.  All new policies to be reviewed and assessed against an 'obesity test'.	Health seeking behaviours can be better understood through a holistic approach that takes into account a wide range of complexities.
<b>Whole-systems approach to obesity, with private sector support</b> Oklahoma City (USA)	Clear disclosure of calories per items on restaurant and cafe menus.  Effective partnerships with the food industry are needed to draw insights on the relationship between marketing and behaviour change.	Lack of green space (parks and recreation grounds) and pavements are correlated with a strong increase in obesity among girls.

## Introduction

Case studies	Recommendations from <i>Careless Eating</i> (2014)	Findings from <i>Fat Chance</i> (2015)
<p><b>Cross-Sector Community Programmes tackling childhood obesity</b></p> <p>Seinäjoki (Finland) 0-12s and their parents</p> <p>EPODE (France and elsewhere) 0-12s and their parents.</p>	<p>Mandatory for all Health and Wellbeing Boards to have professional representation of a nutritionist or obesity specialist. Boards to draw up hard specifications in their Joint Strategic Needs Assessment (JSNA) that help form effective strategies to tackle obesity.</p>	<p>Strategies need to be designed to meet local, specific needs, extending to consideration of the built environment.</p>

## National intervention

National government plays a vital role in population-based obesity prevention. Responsibilities range from programme funding allocations and fiscal policies to nutrition guidelines and marketing regulations. Perhaps most importantly, national policy, programmes and guidance have potential to enhance the effectiveness of more direct policy initiatives and interventions at the local level.

As outlined by the WHO (2012), central government has responsibility across three broad areas in population-based obesity prevention. The first comprises the support structures of prevention policies and interventions, such as leadership, 'health-in-all-policies', dedicated funding for health promotion, health monitoring systems, workforce capacity, and networks and partnerships. A second area is population-wide policies and initiatives that are implemented through such mechanisms as laws and regulations, taxes and subsidies, and social marketing campaigns. The third area is support for community-based interventions, for example through guidance and resources to assist tailored programmes in schools or deprived districts.

A full review of such mechanisms and interventions is far beyond the scope of this report. Moreover, identifying effects and outcomes specific to obesity prevention is very difficult when considering approaches such as 'health-in-all-policies', or policy on workforce capacity or health promotion. There are nevertheless focused, national interventions that have been directly prompted by the obesity crisis, three of which we examine here: (1) unhealthy food and beverage taxation; (2) Japan's 'Metabo' law on adult obesity; and (3) Japan's *Shokuiku* school lunch programme.

# 1. Taxation policies

Hungary, France and Mexico are among a small number of countries to have imposed excise taxes on products high in fat, salt or sugar (HFSS). In the line of fire are non-essential, energy-dense products such as sugar-sweetened beverages (SSBs), sweets, puddings, biscuits and pastries – foods containing high levels of ingredients linked to obesity and increased risk of life-threatening conditions such as coronary heart disease and type 2 diabetes. But the implementation of health-related food tax is far from straight-forward, evidenced by the recent failure and withdrawal of policies in both Denmark and Finland.

Taxes on HFSS products are generally intended to improve population health by reducing product consumption (Wright et al. 2017). Most obviously, taxation is a means to make HFSS products less affordable – assuming the price increase is passed on to consumers – as has been seen with tobacco and alcohol levies. If the tax is not passed on to the consumer, governments can at least collect additional revenues for its health service (offsetting some of the health costs associated with unhealthy lifestyle choices) and obesity prevention and intervention programmes. Further policy success may be realised where manufacturers volunteer to reformulate their products to healthier options, in order to pay less excise tax or none at all.

Opponents of targeted levies argue there is no clear evidence to suggest that taxation is an effective tool for reducing obesity (Butler, 2016). For example, it is not known whether people who avoid taxed products simply substitute one source of calories for another, sustaining energy intake. Some maintain that taxation unfairly affects people who consume such foods in moderation; or that tax is liable to increase expenditure among those of lower socioeconomic status (as the greatest consumers of taxed foods), leaving them worse off (Showley, 2016).

Some of the unintended consequences of food taxes were seen in Denmark following its introduction of a tax targeting saturated fat in 2011, including cross-border shopping, sizeable business administration costs and threat to jobs. The tax was recognised as poorly designed and withdrawn for financial reasons just 15 months after its introduction (Snowdon, 2015; Bødker et al., 2015).

## **Evidence from three case studies**

With taxation of HFSS products still a relatively new concept, studies of impact and outcomes are limited, and to date specific impact on obesity has not been demonstrated. But experience and consumer behaviour is being captured to a point, as we summarise in the following case studies. The first is Mexico, where both SSBs and non-essential energy-dense foods are subject to levies; then Hungary, a country with wide-ranging taxation policies on HFSS. We also include Berkeley, CA, as an example of localised taxation of SSBs, and which, unlike Mexico and Hungary, gives opportunity to assess pre- and post-tax effects in relation to comparison cities.

# 1. Taxation policies

## 1.1 Mexico

Few places in the world match the levels of sugar-sweetened beverage consumption found in Mexico, Central America and the northern most countries of the South American continent. In 2012, Mexico had the highest worldwide consumption, with 71% of added sugar in the diet coming from SSBs; 23% of added sugar in the diet derived from non-basic energy dense foods (WHO 2015a).

Environment and social conditions have a significant impact on the choice of liquid and food intake in Mexico. Water is unsafe to drink in some parts of the country, and bottled water can be more expensive than soda. Many people, including children, hydrate with soft drink (Verza, 2013). But this is only part of the problem. Many Mexicans equate overweight in children as a sign they are well fed (Watson & Treanor, 2016), while for adults, eating sugary foods can be understood as a 'culturally sanctioned' way of dealing with different stresses (Lindberg et al. 2013).

In 2012, approximately 70% of Mexican adults were overweight or obese, a higher proportion than in any other OECD country.

In January 2014, the Mexican government implemented a 1 peso-per-litre tax on SSBs (approximately 10% tax) and an 8% tax on non-essential foods with energy density 275 kcal/100g. Research indicates that the SSB tax has been passed on to consumers in urban areas but only partially elsewhere, while the nonessential energy-dense foods tax has seen inconsistent effect on shelf prices generally (Colchero et al. 2015).

### Impact

Colchero et al. (2016) reported that in 2014 purchases of taxed beverages decreased by an average of 6% (-12mL/capita/day) relative to the pre-tax trend (counterfactual), and decreased at an increasing rate up to a 12% decline by December 2014. Reduced purchasing was seen across all socioeconomic groups, but with higher reductions among households of low socioeconomic status (SES), averaging a 9% decline during 2014, and up to a 17% decrease by December 2014. In year two, Colchero et al. (2017) found a 9.7% decrease of purchases of taxed beverages, yielding an average reduction of 7.6% over the two years since policy implementation. Across the two years, purchases of untaxed beverage increased 2.1%

With a more heterogeneous effect on shelf prices, the tax on nonessential energy-dense foods showed a smaller but still significant impact among lower SES groups in urban areas. Batis et al. (2016) reported a 5.1% reduction in purchases of taxed foods (relative to pre-tax trends), and with no corresponding change in purchases of untaxed foods. Low SES households saw a 10.2% decrease of taxed foods, and medium SES households a 5.8% decrease. No change was found among higher SES households. A two-year study reported overall reductions of 4.8% in year one

#### Categories of Mexico's nonessential foods potentially subject to tax:

- Crisps and snacks
- candies and sweets
- chocolate
- puddings
- peanut and hazelnut butters
- ice cream and ice pops
- cereal-based products with substantial added sugar

# 1. Taxation policies

and 7.4% in year two, yielding a two-year mean decline of 6.0%. Purchasers who only infrequently bought processed goods showed no post-tax change in the percentage of taxed food purchases, while frequent purchasers showed a -12.3% decrease (Taillie et al. 2017).

Evidence from Mexico so far suggests that households with greater preferences for taxed foods and beverages – typically those at the lowest socioeconomic level – show the largest decline in taxed product purchases. This will encourage policy makers, as will evidence that tax policies have (to date) not negatively impacted jobs within food and beverage manufacturing industries or in commercial stores (Guerrero-López et al. 2017). Further research is needed to understand tax impact on overall energy intake, dietary quality, and broader food purchase patterns.

## 1.2 Hungary

In Hungary obesity prevalence rose from 13.2% in 1990 to 28.5% in 2010, this increase constituting one of the fastest developing obesity crises in Europe. Figures from the OECD suggest that around two-thirds of Hungarians are now overweight, with nearly a third obese (OECD, 2017a). Public health concerns are not simply focused on calorie consumption: Hungarians have the highest average per-capita salt consumption in the European Region (WHO, 2015b) and one of the lowest intakes of healthy foods, such as fruit, vegetables, fish and whole grains, of any country in the world (Imamura, 2015). The highest ratio of overweight is found among women with the lowest education level and – unlike trends in many other European countries – men with the highest educational level (Rurik et al. 2016).

In 2011 the government introduced a public health product tax (PHPT) on specific foods with high levels of fat, salt and sugar (HFSS). The policy had several aims (WHO, 2015b):

- promote healthier (non-HFSS) food choices
- create revenue for public health services (helping to offset the health care costs of diet-related illness)
- redistribute responsibility for HFSS food choices
- encourage healthier eating habits
- encourage manufacturers to reformulate recipes to make unhealthy products healthier

Targeted products included a wide range of sugar-sweetened beverages, sweets, biscuits, bakery products and jams, as well as excessively salty snacks.

### Impact

A first-year impact assessment in 2012 found that around 40% of HFSS product manufacturers had changed formulas to either reduce or eliminate FSS ingredients (NIHD, 2013). A year later a second impact assessment found that 16–28% of consumers of taxed products (depending on the product group) had changed their consumption habits due to the introduction of the tax. Moreover, significantly more people had reduced their consumption of taxed products due to learning that the product was unhealthy, rather than due to price increase.



# 1. Taxation policies

Among those who changed their consumption:

- 7–16% chose cheaper products
- 5–16% consumed less
- 5–11% chose another brand of the product
- 2–6% substituted other types of food product

The assessment also found that the most frequent healthier alternatives to PHPTs were mineral water (63%), fresh fruit and vegetables (82–86%), home-made sweets (95%) and green herbs and spices (84%).

*The conclusion that the health literacy of the Hungarian adult population has improved is supported by the finding that more chose healthy alternatives as substitutes for PHPT products.*

**WHO: Assessment of the impact of the PHPT, 2015**

The WHO considers the Hungarian approach particularly successful, not only in terms of impact on manufacturers and reduced public consumption of taxed items, but also in terms of raised health literacy, and some US\$200 million in revenue raised and earmarked for health spending (WHO, 2015c).

Further, evidence from Hungary suggests that lower SES groups are more likely to change consumption in response to taxation. According to the WHO, 'for each product group, a higher proportion of adults with primary education than of those with higher education changed their consumption'; at the same time, 'overweight and obese adults were even more likely (1.5–4.3 times) to reduce their consumption than adults who were underweight or of normal weight' (WHO, 2015c).

## 1.3 Further evidence from Berkeley, USA

In November 2014, Berkeley, California, became the first US jurisdiction to pass a sugar-sweetened beverage (SSB) excise tax for public health purposes. This saw a \$0.01-per-ounce tax on the distribution of SSBs (approximately a 10% tax, as in Mexico), extending beyond sugary fizzy drinks to fruit-flavoured beverages, sweetened water, coffee and tea.

An evaluation was undertaken in 2016 to examine changes in pre- to post-tax beverage consumption in low-income neighbourhoods in Berkeley versus comparison cities of Oakland and San Francisco, California (Falbe, 2016). The study found a 21% decrease in consumption of SSBs in Berkeley and a 4% increase in comparison cities. Water consumption increased more in Berkeley (+63%) than in comparison cities (+19%).

An important finding from the study was that the tax did not produce overall higher grocery bills or revenue declines for retailers. The SSB tax in Berkeley was generally passed through to consumers at the major chain supermarkets (where most SSBs are purchased), small chain supermarkets and chain petrol stations, but not at small stores and independent petrol stations. Whether Berkeley residents purchased SSBs in adjacent cities was not clear.

A more recent study has contested the degree of pass-through of the tax by supermarkets and levels of decreased SSB consumption, and questioned the effectiveness of 'local taxation', where consumers can easily venture outside of the taxed jurisdiction (Bollinger & Sexton, 2018).

# 1. Taxation policies

Results so far indicate that Berkeley's excise tax has probably reduced SSB consumption in low-income neighbourhoods, although causal links between the SSB tax and changes in measured outcomes have not been established. Studies have not recorded whether those reducing SSB intake have reduced calorie consumption overall.

## 1.4 Taxation and obesity: evidence so far

It is important to recognise that evidence from food and beverage taxation is embryonic and review periods have been very short. In Mexico and Berkeley, where taxation has been only recently introduced, it may be unrealistic to expect a perceptible effect on obesity. Researchers of the Berkeley SSB tax impact have stated it could take years before any effect on diabetes or obesity rates will be noticeable (Sifferlin, 2017) – if indeed an effect will be there to measure. To date, while studies on the effects of taxes have analysed consumption patterns, they have not captured changes in calorie intake, allowing little opportunity for any comment on how policies may be impacting obesity.

Hungary, which introduced its HFSS tax three years prior to Mexico and Berkeley, is to a point an exception, in that it has data showing a slowing in the rise of adult obesity following policy introduction in 2011. Two similar-sized population surveys of Hungarian adults suggested a near stasis of overweight and obesity prevalence in Hungary between 2013 and 2015 (Rurik et al. 2013, 2016). Each study involved more than 40,000 participants from all geographical regions of Hungary.<sup>1</sup> Between these years, men saw no change in obesity (32%), and an approximate half-percent drop in the proportion overweight (to 40%); women saw an approximate half percent rise in both overweight (to 32%) and obesity (to 32%).

These results appear encouraging, particularly against the backdrop of sharp rises in obesity in the 1990s and early 2000s, but it is immensely difficult to attribute prevalence stabilisation to the tax. OECD health data indicates that prior to policy introduction the annual rate of rise in overweight and obesity was already reducing (OECD, 2017b). The tax in any case followed other policy initiatives, such as the National Strategy on Physical Activity, 2007, and children's marketing restrictions from 2008.

It should also be noted that a number of European countries without 'junk food' taxation have likewise seen a plateauing of obesity prevalence in recent years, including the UK.<sup>2</sup> The reasons for these effects are complex, and may owe to circumstances outside of policy intervention.<sup>3</sup> Such conditions highlight how difficult it is to attribute prevalence changes to specific policy action at a national level.

1. 2013 survey: 40,331 individuals; 16,544 men, 23,787 women; 2015 survey: 43,287 individuals; 17,901 men, 25,386 women.
2. NHS Digital: Statistics on Obesity, Physical Activity and Diet, published 2012 and 2017. Overall obesity prevalence among adults was 26% in 2010 and 27% in 2015. There was virtually no change in overall proportion of overweight and obese during this time (58% women, 68% men), although health inequalities may have risen during the period.
3. For example, it is possible that obesity levels in Hungary reached 'saturation point' around 2010 – that is, the population susceptible to weight increase had by that time largely absorbed the effects of Hungary's obesogenic environment.

## 2. Japan: two national policies

Japan is famed for its traditional low-fat staple diet of rice, vegetables and fish, and its citizens enjoy greater longevity than those of any other OECD country. Japan is also renowned for its low rates of overweight and obesity, though it was not immune to the obesity epidemic raging in many higher-income countries at the end of the 20th century. Between 1980 and the mid-2000s the adult population (aged 15+) of Japan saw an approximate 30% increase in overweight (including obesity), from around 19% to 25% prevalence (OECD, 2017a), although obesity itself had risen to just 3.4% (OECD, 2009).

In response to rising incidence of overweight and the influence of Western food on the country's diet, the Japanese government devised some targeted interventions. Most radical was the so-called 'Metabo law' of 2008, which supported a new cardiovascular screening and education programme focusing on the detection and control of metabolic syndrome.<sup>4</sup> The same year saw the Basic Law on *Shokuiku* embedded into the country's long-standing School Lunch Act. Translated as 'food and nutrition education', *Shokuiku* is designed to foster good judgments about food among all ages, as well as understanding of traditional food culture, and respect for life and nature.

### 2.1 'Metabo' law

In 2008 the Japanese government introduced a national lifestyle modification project targeting metabolic syndrome in the general adult population, with particular focus on people aged 40–74.

The cardiovascular screening and education programme uses waist circumference as a key measure of metabolic syndrome, with the threshold set at  $\geq 85$  cm (33.5 inches) for men and  $\geq 90$  cm (35.4 inches) for women. A body mass index of  $\geq 25$  is also used as a threshold (Yamagishi & Iso, 2017).

Legislation was introduced in support of the programme. Dubbed the 'Metabo law' (from 'metabolic syndrome'), the legislation requires individuals exceeding the thresholds (or individuals who show signs of weight-related illnesses) to go to dieting classes where they receive motivational or active support. Though individual participation is not mandated, companies and local governments are required to ensure a minimum 65% participation rate with the annual waist examination; failure to sufficiently cut overweight/obesity rates (initially set at 25% reduction by 2015) can result in fines of up to 10% of current health payments into the national health insurance programme (Wylie-Rosett & Jhangiani, 2015).

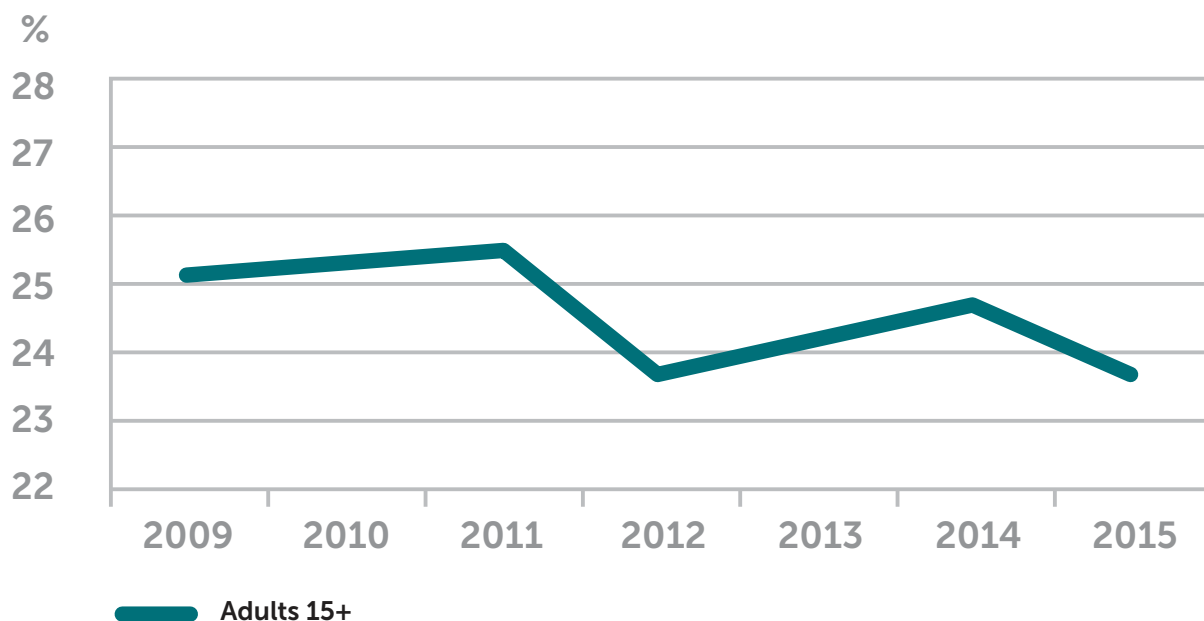
Despite questions raised over the programme's criteria for metabolic syndrome, the programme has been considered beneficial in raising the visibility of metabolic syndrome at the population level, and for the preventive measures and post-screening education it has established (Yamagishi & Iso, 2017).

4. Metabolic syndrome is a group of risk factors that raises risk for heart disease and other health problems, including diabetes. See: <https://www.nhlbi.nih.gov/health/health-topics/topics/ms>

## 2. Japan: two national policies

**Figure 1. Japan overweight and obesity 2009–2015.**  
**% of population aged 15 and over**

Source OECD Country statistical profile: Japan 2017



There are limited findings to report regarding the obesity-reducing effects of the cardiovascular screening and education programme. A four-year study found impact on parameters related to overweight during each of the first three years of evaluation, but no parameters of metabolic syndrome were significantly improved at the four-year evaluation. Links to an apparent overall reduction in overweight and obesity among the adult population since 2011, as shown in Fig 1, are unproven.

### 2.2 *Shokuiku* school lunch programme

School-based food and nutrition education is taken nowhere more seriously than in Japan. The promotion of healthy bodies and minds of school children was enshrined in law more than 60 years ago with Japan's School Lunch Act, which instituted the meal as a key component of the education system.

If Japan by the late 2000s was boasting one of the lowest rates of adult obesity of any OECD country, the same could not be said of its children.<sup>5</sup> Prevalence of overweight and obesity among 5–17 year olds put Japan only just under the OECD average, according to one study, higher than several European countries, including France, Netherlands, Belgium and Norway (OECD, 2014).

5. In Japan, obesity rates among 5–14 year olds appear to have peaked in the late 1990s to early 2000s. By 2007 there was some evidence of decline, though not necessarily among older teens (Yoshinaga, M. et al. 2010).

## 2. Japan: two national policies

Japan's School Lunch Act was revised in 2008 to promote *Shokuiku*. The new emphasis on food and nutrition education was intended to combat rises not just in overweight but also in anorexia (mainly among girls), and to educate against unhealthy dietary habits, such as skipping breakfast. The four principal goals of the school programme are:

- 1) develop a proper understanding of diets and healthy eating habits in daily life
- 2) enrich school life and nurture sociability
- 3) aim at rationalisation of diets, nutritional improvement and health promotion
- 4) enhance a sound understanding on food production, distribution and consumption

Source: Tanaka & Miyoshi , 2012.

Almost 100% of elementary schools and about 80% of junior high schools (to age 15) participate in the school lunch programme (PIIF, 2015). The approach is didactic. Before, during or after most meals, children are educated on the nutritional and health value of meal ingredients, as well as hygiene and culinary culture. Locally-sourced, fresh produce is supported as an integral part of the programme. Children take turns serving lunch to their classmates (who eat in their classrooms), and clearing up afterwards and recycling. Only in exceptional circumstances can food be brought into schools, and vending machines, ubiquitous in Japan, are banished, thereby denying children break-time snacks (Harlan, 2013).

The school lunch programme is not the only cultural mechanism supporting healthy lifestyles among Japan's children. Japan has a highly established 'walking to school practice', implemented since 1953. In most urban areas at least, the typical elementary and junior-high school child walks to school every day; it is much the minority who travel by car, bus or train from home to school (Mori et al. 2012).

In schools with Diet and Nutrition Teachers, a positive impact of *Shokuiku* has been observed in terms of awareness and interest in diet among teachers and guardians. It also reported that fewer children are skipping breakfast, and quality of life has been improved (Tanaka & Miyoshi, 2012). Increased bone growth has been found among elementary school children specifically where milk is served as part of the lunch programme (Kohri et al. 2016). At the time of writing there were no independent published studies identifying impact on weight (overweight or anorexia) of *Shokuiku*.

In 2017 a *Wa-Shokuiku* food education programme began recruiting schools for a US trial in Boston, New York, and Washington D.C. to encourage young children to 'learn, cook and eat Japanese' (PRNewswire, 2017).

## 2. Japan: two national policies

### 2.3 Cultural considerations

In contrast to many Middle Eastern, Latin American and African contexts, obesity in Japan remains intensely taboo. Possible successes of specific programmes and government pressure, as judged by what appears to be declining rates of overweight, may then be informed by the ways in which the moral human body is constructed in Japanese society (Pike & Borovoy, 2004). This perhaps goes some way to explaining how the Japanese government can implement a waist-measurement programme with the threat of financial penalties for non-compliance, a policy many other governments would probably consider draconian and a vote-loser.

Linked to this, it is worth noting that Japan's non-native residents make up less than two percent of the total population, and the majority of them live in Tokyo. The more suburban and rural populations are effectively 100% homogenously Japanese. National government therefore has fewer cultural intricacies to consider – in comparison to the US and many European countries – in devising and implementing policy.

Successes in Japan are also premised upon local systems of social ideology. The *Shokuiku* programme is informed by other successful education movements in Japanese elementary schools, which have in recent times given stronger emphasis to social harmony, social values and moral education (Rohlin & LeTendre 1996). While novel in its approach to food education, *Shokuiku* makes sense in Japan in relation to firmly established national pedagogy.

## Regional intervention: examples from the United States

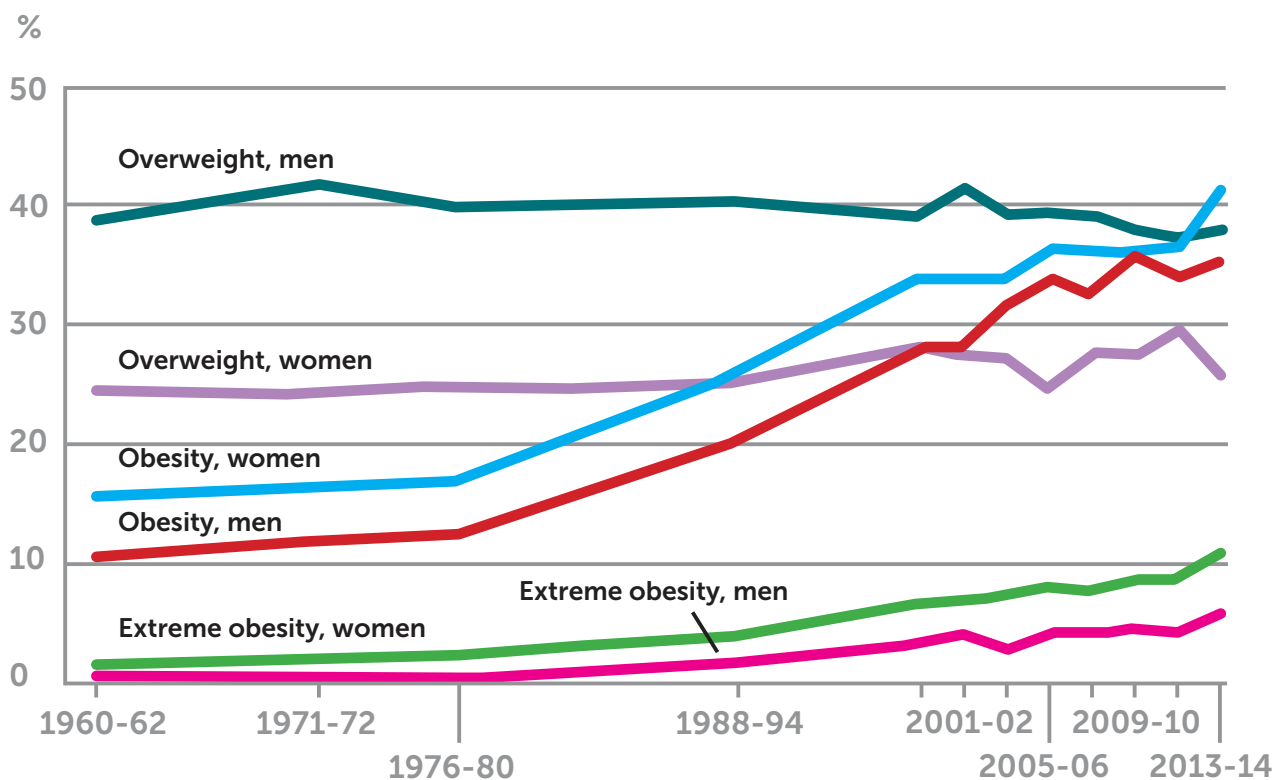
### 3. Obesity in the USA

USA obesity data give a clear picture of a rapid and profound change in the health of the world's richest nation. In 1990, the Behavioral Risk Factor Surveillance System, operated by the Centers for Disease Control and Prevention (CDC), found no state with obesity prevalence greater than 15%. By 2009, 33 states had a prevalence equal to or greater than 25%, and nine of these had a prevalence of obesity equal to or greater than 30% (BRFSS, n.d.).<sup>6</sup> At this time obesity prevalence was roughly 50% higher among African-Caribbeans and 20% higher among Hispanics, compared to the white population.

In 2015–16 the USA saw record levels of obesity, with prevalence at 39.8% in adults and 18.5% in youth (CDC, 2017a).

The US has been attempting to combat obesity at both national and sub-national levels. This has included high profile recommendations, comment and encouragement from the Institute of Medicine, the US Surgeon General and the White House (Ogden et al. 2014). The CDC is at the forefront of obesity intervention in the US, implementing national programmes and also assisting regional departments with training, technical support, data and funds. Acutely aware of health inequalities in the US, the CDC focuses efforts on policy and environmental strategies 'to make healthy eating and active living accessible and affordable for everyone' (CDC, 2017b).

**Figure 2. Trends published by the CDC, highlighting the rapid rise of the obesity epidemic from the 1980s.**



6. This is self-reported data. The Behavioral Risk Factor Surveillance System (BRFSS) is the US's largest system of health-related telephone surveys that collect state data about residents regarding their health-related risk behaviours, chronic health conditions, and use of preventive services. Data available at <http://www.cdc.gov/brfss/>

## 3. Obesity in the USA

### 3.1 State Initiatives

Obesity prevalence varies across US states and territories. Adult obesity levels are now above 20% in all states, and in five states<sup>7</sup> at 35% or more. Four out of five of those states are located in the south of the country. With obesity levels on the increase, the USA may not seem like an obvious place to look for learning. At the same time, the US provides useful context for a description of regional interventions.

In 2008, the CDC awarded a special round of five-year funding through the State Nutrition, Physical Activity and Obesity Programs Cooperative Agreement ('State Program 805') to promote healthy eating and physical activity. Awards were made to 25 states to establish and sustain state-wide capacity and implement evidence-informed strategies and interventions. State programmes were required to develop strategies to leverage resources and coordinate state-wide efforts with multiple partners to address all of the following target areas:

1. increase physical activity
2. increase the consumption of fruits and vegetables
3. decrease the consumption of sugar sweetened beverages
4. increase breastfeeding initiation, duration, and exclusivity
5. reduce the consumption of high energy dense foods
6. decrease television viewing

State grantees were encouraged to leverage additional funds (to those provided by the CDC) from multiple stakeholders and sectors, including foundations and private business.

Accomplishments and outcomes were self-reported by state grantees following the five-year programme. Interventions were most commonly in the form of factsheets, toolkits and training; websites, videos and webinars also featured, though media campaigns were seldom used. Examples of intervention included teacher training in nutrition, healthy eating in local government facilities, and workplace health toolkits.

Of the six targeted areas, physical activity and fruit and vegetable consumption were prioritised. Interestingly, not one state reported intervention to decrease television viewing. Two state initiatives are summarised overleaf.

7. Alabama, Arkansas, Louisiana, Mississippi and West Virginia



## 3. Obesity in the USA

### 3.1.1 Massachusetts

Massachusetts has the third lowest adult obesity rate in the nation (SoO, 2017a). Its adult obesity rate is currently 23.6%, up from 15.3% in 2000 and from 10.1% in 1990. Massachusetts is geographically one of the smallest US states, covering an area just under the size of Belgium, but is fairly densely populated by US standards, with 6.8 million inhabitants.

Action on obesity was already embedded across the state when it received additional CDC funding from Program 805.<sup>8</sup> A study published in 2012 found that between 2004 and 2008, obesity prevalence substantially decreased among children under six years of age in the eastern part of the state. The decline in obesity was more pronounced among children insured by non-Medicaid health plans than among those insured by Medicaid, suggesting a widening of socioeconomic disparities (Wen et al. 2012).

Between 2008 and 2013, Massachusetts implemented a wave of new initiatives and activities in multiple settings (community, schools, healthcare, childcare and worksites) in an attempt to address all six target areas delineated in the CDC's cooperative agreement. These initiatives, many ongoing, included the following (CDC, nd):

**Mass in Motion** (MiM), promoting wellness and prevent overweight and obesity in Massachusetts, with a focus on healthy eating and physical activity. Its town planning factsheet, published by local government (Health and Human Services), encourages the opening of schoolyards to the public outside of school hours, walkable neighbourhoods, and easier access to healthy foods. In 2009, to promote nutrition standards, Massachusetts became the first state to enact a state-wide food procurement policy for state agencies responsible for large-scale food purchasing. By 2013, MiM had reached around one third of MA inhabitants across 52 communities.

MA **Working on Wellness** (WOW) Programme, providing employees with increased on-site opportunities for physical activity, increased access to fruits and vegetables, decreased access to sugar sweetened beverages and high energy dense foods, and support for breastfeeding. The programme has reached around 60,000 employees in 48 public and private worksites.

**Children at Play**, a free programme that helps child care providers incorporate active movement and healthy food options into child care settings. A mentor works with child care providers to conduct a self-assessment of the facility, set goals, and create an action plan that works for each child care provider's unique setting.

School initiatives also include the Healthy Students, Healthy Schools: Guidelines for Implementing the Massachusetts School Nutrition Standards for Foods and Beverages, developed by a multi-sectoral and diverse stakeholder group.<sup>9</sup> MA policy ensures the availability of water to pupils throughout the school day, and for fresh fruits and non-fried vegetables to be available wherever food is sold (except vending machines).

8. For example, the 'Shape Up Somerville' programme. See: <https://www.somervillema.gov/departments/health-and-human-services/shape-up-somerville>

9. Contributing parties included MA Public Health, MA Department of Education, School Nutrition Association and MA school nurses.

## 3. Obesity in the USA

### City initiative: Somerville, MA

**Goal:** Increase access to affordable healthier foods.

**Environmental Change:** Implemented a mobile farmers' market that was culturally and economically appropriate for the community.

**Outcomes:**

- Created an incentive program for WIC\* & food stamp beneficiaries to shop at the market
- Instructions for vendors on how to accept food stamps (including from seniors)
- Unlimited 50% discount for residents of selected public housing complexes
- Promotional materials produced in four languages
- Increases in attendance, the percentage of foreign born and low income patrons, & the redemption rate of WIC Special Supplemental Nutrition Program vouchers

\* The Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) provides Federal grants to States for supplemental foods, health care referrals, and nutrition education for low-income pregnant, breastfeeding, and non-breastfeeding postpartum women, and to infants and children up to age five who are found to be at nutritional risk.

Sources: Healthy Communities: What Local Governments Can Do to Reduce and Prevent Obesity, 2010; City of Somerville website [accessed 19.10.2017]

The CDC-supported Massachusetts programme has not itself produced records of impact on obesity. Data collected by the Trust for America's Health and the Robert Wood Johnson Foundation (stateofobesity.org) suggests that adult obesity continued to rise in MA over the 2008–13 period, 21.2% to 23.6%, but has since more or less plateaued; overweight and obesity prevalence may have fallen slightly among 2–4 year olds, and possibly more significantly among 10–17 year olds, from around 30% to 26.6% (by 2016). However the National Survey of Children's Health (NSCH) changed survey methods and sample sizes between 2011–12 and 2016, meaning results across years cannot be compared with confidence (SoO, 2017).

### 3.1.2 New Hampshire

New Hampshire (NH) was another participant in the CDC's Obesity Program 805. A state coalition on obesity had in fact been formed in NH prior to CDC funding, called Healthy Eating Active Living (HEAL). More than 200 individuals from over 45 public and private organisations were engaged in the development of the HEAL Action Plan in 2007/08, with representation including public health, land use and planning, transportation, education, health care and food systems. Thus when the CDC 805 obesity initiative was launched, cross-sector partnerships were already established.

## 3. Obesity in the USA

Like Massachusetts, NH has seen an obesity plateau effect among its adult population since 2013. But more encouraging is its data for third-graders: between 2008–09 and 2013–14 the state recorded a 30% decrease in obesity prevalence among 8–9 year olds (who also saw a 32.5% decrease in immediate dental needs) (NHDHHS, 2010; 2014.) This outcome contrasts with much smaller reductions in obesity rates at the national level for this age group over the same period (CDC, 2016).

NH project leads have not been able to account for this outcome with confidence (since there was no evaluation funding). Success has been generally attributed to obesity and oral health interventions based on the CDC's Obesity Prevention Strategies and Guidelines. More specifically, NH has highlighted the importance of close cross-sector relationships, a key element of which was a central charitable foundation (HNN Foundation) that both funded HEAL and led the effort to converge state level support for obesity prevention among other foundations.

The NH project team selected the following national (federal) initiatives implemented in New Hampshire that they considered potentially critical to reduced obesity rates among young children:

- food package improvements in the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC)
- implementation of the Nutrition and Physical Activity Self-Assessment in Child Care (NAP-SACC)
- school lunch program improvements (including salad bars in schools)
- recess Before Lunch (or 'Play Before Eat') initiatives
- 'Farm to School' initiatives
- 'School Yard Garden' initiatives
- mandatory implementation of wellness policies, including policies regarding daily physical activity, by schools participating in the United States Department of Agriculture (USDA) school lunches

Source: 2020health correspondence with NH CDC 805 grant programme team, October 2017.

### Communal Catering

One of NH's many initiatives is The Fruit and Veggie Quantity Cookbook, Revised Edition, published in November 2011 by the New Hampshire Obesity Prevention Program (OPP). The OPP partnered with New Hampshire Hospital Food and Nutrition Services to test all 31 recipes. Each recipe serves 25, 50, or 100 and is designed for use in schools, child care settings, camps, hospitals, worksite cafeterias, college cafeterias, congregated meal sites, and restaurants.

E-book available at: <https://www.dhhs.nh.gov/dphs/nhp/documents/cookbook.pdf>

## 3. Obesity in the USA

Both the Farm to School and School Yard Garden initiatives have economic, educational, health and nutrition, and community benefits, echoing elements of Japan's school lunch policy, described above. The simplest intervention of this list, in theory at least, is Recess Before Lunch. The US National Education Association (NEA) has cited evidence from elementary schools that when recess is scheduled before (not after) lunch, pupils eat more fruits and vegetables, drink more milk and waste less food; they are also better behaved on the playground, in the dining room and in the classroom. Some schools have noted a decrease in visits to the school nurse as an apparent result of the schedule switch (NEA, n.d.).

## City and town intervention

# 4. A tale of two cities: Oklahoma (USA) and Seinäjoki (Finland)

### 4.1 Oklahoma, USA

Oklahoma City is one of the America's most spread-out urban environments, covering 620 square miles. In 2004, when Mick Cornett was elected mayor, the city did not have a single bike lane and its 600,000 residents were heavily reliant on cars. The city was reputed to have the highest density of fast food outlets in America, with 40 McDonald's restaurants alone (Birrell, 2015).

In 2007, the city appeared on a list that particularly caught the attention of Mayor Cornett. A leading health and fitness magazine ranked Oklahoma City the eighth fattest city in the USA. Almost one-third of adult Oklahomans were obese; the state ranked among the worst in fruit consumption and had one of the lowest life expectancies in America. Diabetes rates had nearly doubled in a decade. More than one in five children aged 10 to 17 suffered from obesity and almost one-third of pre-school infants were overweight (Birrell, 2015).

Cornett took matters into his own hands – and weighed himself. He discovered he was clinically obese. As he began to take steps to lose weight he also began to question what it was about the city's culture and infrastructure that seemed to be raising obesity levels. Cornett's conclusion was that the city's authority had built an incredible quality of life, if you happened to be a car! The infrastructure of the city was not conducive to helping citizens pursue a healthy lifestyle (Cornett, 2013).

#### 4.1.1 Task

Cornett decided that the city needed to start talking about the issue and not ignore it. 'The issue with Oklahoma City and obesity is we're not talking about it ... We're nice people, and it's not nice to talk about the way people look' (Allan, 2010). Standing in front of the elephant enclosure at the Oklahoma City Zoo on New Year's Eve, 2007, he announced that he was putting his city on a diet. He wanted Oklahoma City to lose one million pounds.

Campaign momentum was given a significant boost through substantial funding from a healthcare magnate to create an information website called 'This City Is Going On A Diet' (Birrell 2015). Local media began to back the campaign, encouraging engagement and helping to promote the idea among residents.

#### 4.1.2 Action

As people signed up to the campaign they began to enter into the conversation as to how their city could be improved and redesigned. From families to schools, small companies to large corporates, people began to talk about how they could play their part in bringing down levels of obesity in the city. Churches set up running clubs, schools discussed diet, companies held contests to lose weight, and chefs in restaurants competed to offer healthy meals (Birrell, 2015).

Cornett and his team took economic development models and added some health related infrastructure to the process. A more exercise-conducive infrastructure was imagined for the city, achieved by redesigning downtown streets to make them more pedestrian-friendly, constructing

## 4. A tale of two cities: Oklahoma (USA) and Seinäjoki (Finland)

new gyms in inner-city schools and wellness centres for seniors, and building 50 miles of new jogging and walking paths (Allan 2010). It is estimated about \$3 billion has come from public funds, with up to five times that sum spent by the private sector (Birrell, 2015). Residents voted to help pay for this redevelopment with a 1-cent rise on the local sales tax, which raises about \$100m a year. Other funds have been secured from tobacco settlements and rising income from property taxes as firms and people are drawn back to the city (Birrell, 2015).

Redesigning the infrastructure of the city was only one part of the strategy. A targeted approach was also adopted to help support specific at risk groups. Overweight people were encouraged at home and at work to alter their lifestyles. Outreach officials were appointed from the same communities they seek to change.

Data analytics played a key role in helping to identify the districts with the worst health outcomes. Some disadvantaged parts were seeing five times as many deaths from strokes and cardiovascular conditions as wealthier areas (Birrell, 2015). Funding and resources were therefore used in these areas to help promote and support behaviour change.

Working with rather than against the food and drink industry was also an important element to Cornett's strategy. Despite inciting criticism from some doctors, the soft drinks sector was asked to sponsor health programmes to fight obesity. Low-fat menus were also introduced in many of the fast food chain outlets in the city (Birrell, 2015).

### 4.1.3 Result

Between 2008 and 2010, Oklahoma City dropped from the 8th to 17th fattest city in the USA. In 2013, it was confirmed that 47,116 residents had signed up to the campaign and had collectively lost one million pounds (Kimball, 2012).

In the lowest-income areas, which have the highest rates of diabetes and blood pressure problems along with the worst outcomes, interventions have cut key indicators by between two and ten per cent in five years. Although Oklahoma men live almost six years less than the national average, the city has seen a three per cent fall in mortality rates. The rise in obesity has slowed, down from six per cent a year to one per cent, but is therefore still increasing (Birrell 2015).

In terms of continuing impact, results also appear encouraging. While Oklahoma State saw obesity climb from 32.2% to 33.9% between 2012 and 2015, obesity rates in Oklahoma City dropped from 31.8% to 29.5% during the same period, according to data from the Centers for Disease Control and Prevention (Galvin, 2017).

The campaign has demonstrated what is possible through strong leadership, the willingness of residents to invest in local infrastructure, and public-private partnerships. The longer-term impact of Oklahoma City's initiative remains to be seen, however, and as Mayor Cornett has commented, 'it may be a 20-year process to completely turn the ship in the middle of the sea' (Galvin, 2017).

## 4. A tale of two cities: Oklahoma (USA) and Seinäjoki (Finland)

### 4.2 Seinäjoki, Finland: a city-wide child obesity strategy

In Finland a 'Health and Wellbeing in all Policies' (HWiAP) approach was set out in the country's 2010 Health Care Act. The Act describes how, at the local level, the promotion of citizen health and wellbeing requires co-operation between administrative sectors, other local actors, private enterprise and NGOs. Most of the factors influencing population health, after all, lie outside of the health sector, and local conditions and demand need to be understood. The Act requires yearly reports on the health and welfare of residents, prepared for the city or municipal council (MSAH, 2010).

The City of Seinäjoki (population of 60,000) has created a potential exemplar of the approach described by the Act through its multi-sectoral Overcoming Obesity Programme, with particular emphasis on children from birth through to around 12 years of age. Each sector involved has contributed to the programme through basic work and yearly budgets, not with extra financing or resources.

Launched in 2013 and based on the country's National Obesity Programme 2012–2018, the initiative sits within a wider well-being strategy to decrease obesity, smoking and drug use among children and young people, and more widely to promote the health of the population.

Behind the programme was an understanding of Seinäjoki's obesogenic environment. Strategic planning and decision-making at municipal and regional levels focused on attitudes, education, nutritious food, the built environment and physical activity. Monitoring was to include not just overweight and obesity levels, but also dental health and mothers' breastfeeding activity.

Programme planning and co-ordination has been undertaken by the city's Health and Welfare Promotion Unit. The Unit works to ensure cooperation networks and competences, and provides informational support. Table 1 outlines some of the features of Seinäjoki's programme, which builds on nationally available parent and child support mechanisms.

**Table 1. Features of Seinäjoki's Overcoming Obesity Programme**

Provider	Prevention and encouragement	Target groups
Maternity clinics ('Neuvola')	<ul style="list-style-type: none"> <li>• Encouragement of healthy lifestyle choices</li> <li>• Education on benefits of breast-feeding</li> <li>• Baby box gift (national programme): a starter kit of clothes, baby items and toys, packaged in a box that can be used as a crib.</li> </ul>	Expectant mothers / new mothers Babies
Child Day Care Units	<ul style="list-style-type: none"> <li>• Served food is marked with a nationally-recognised heart symbol, indicating nutrition standards</li> <li>• Cakes and sweets not allowed on premises</li> <li>• Support for learning through creative play &amp; physical activity</li> <li>• Parents encouraged to 'move more and spend less time with gadgets'</li> </ul>	Teachers/assistants 0–6, Parents

## 4. A tale of two cities: Oklahoma (USA) and Seinäjoki (Finland)

Provider	Prevention and encouragement	Target groups
Primary Schools	<ul style="list-style-type: none"> <li>Served food is marked with a nationally-recognised heart symbol, indicating nutrition standards</li> <li>Sweets not allowed on premises</li> <li>'Finnish Schools on the Move' programme, featuring active lessons, reduced sitting time, standing desks and physical activity breaks (indoors or out)</li> <li>Yearly health examinations in schools</li> <li>Parent education on healthy eating</li> </ul>	7–12, Parents
Primary Schools (evening)	School playgrounds and outdoor sport facilities open to local community in the evening	All ages, including special needs
Physical Activity Services	More than 70 sports clubs in the city; includes physical activity services for the disabled	Various (covering all ages)
Third sector, including parish churches	<ul style="list-style-type: none"> <li>Child welfare</li> <li>Sport associations</li> <li>Parish work groups and support for families</li> </ul>	All ages
Municipal infrastructure / Land use planning	Planning, promoting and maintaining places for physical exercise. Yards of schools and day care units must be designed to encourage physical activity, and sport facilities for the disabled must be well maintained.	All ages
Child health clinics / School and Student health care units	Obesity Programme Monitoring	Monitoring ages: 1, 5, 7-8 & 11-12

The programme has seen both the improvement of school playgrounds and an increase of physical activity in schools. The programme's emphasis on families, not just children, resonates with the approach of EPODE (discussed below), with the aim of seeing wider access to motivating, inclusive and empowering lifestyle guidance and health monitoring, as well as support for healthy choices.

National school policies have played an important part of Seinäjoki's obesity programme, with free lunches provided to all children, and a core curriculum including health education, physical education, and nutrition and cooking (WHO, 2015d; ELO, 2015).



## 4. A tale of two cities: Oklahoma (USA) and Seinäjoki (Finland)

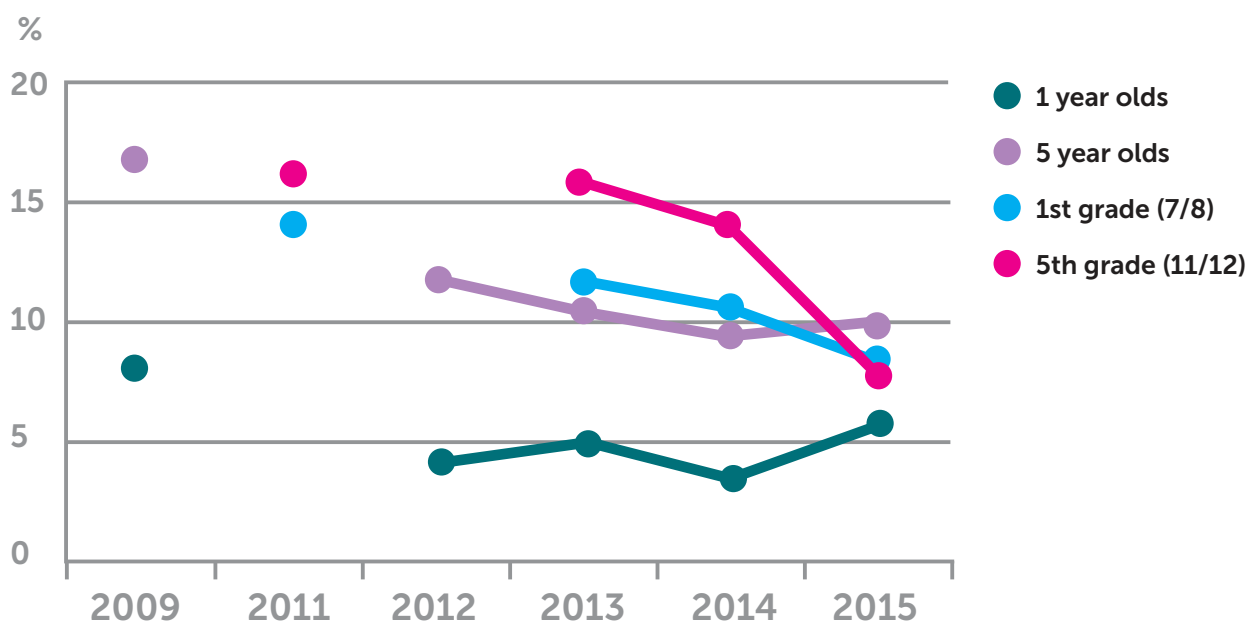
### 4.2.1 Effects on overweight and obesity

In 2009, around one in six (17%) five year-olds in Seinäjoki was overweight or obese; by 2015, this had dropped to one in ten (10.1%). This favourable weight development continued to later years. In 2011, 14% of 1st grade students (age 7/8) and 16.1% of 5th grade students (age 11/12) were overweight or obese; four years later, 8.7 % of 1st grade students and 8.2 % of 5th grade students were overweight or obese. Results have not all been positive: whilst overweight has decreased among one year olds overall since 2009, the period of 2012–15 saw a rise from 4.3 to 5.5% prevalence. Since programme commencement, the most consistent overweight and obesity decreases have been seen amongst 1st and 5th graders, as shown in Fig. 3.

*Results did not happen overnight. It took time for all the different departments to understand how each influences health and the role each must play to promote it.*

**WHO: Health in all Policies feature, Seinäjoki, 2015**

**Figure 3. Proportion (%) of obese and overweight children in monitored age groups in Seinäjoki, 2009–15 (Source: Effica / City of Seinäjoki, Overcoming Obesity Programme 2013–2020).**



It should be noted that apart from the 5th grade group, a decreasing overweight and obesity trend was evident in Seinäjoki prior to the programme's official launch in 2013 (Fig. 3). Continued adherence to national policies may have therefore produced similar outcomes. At the same time, preparations for and awareness of the multi-sectoral initiative may have begun to focus efforts and raise health literacy prior to 2013.

## 4. A tale of two cities: Oklahoma (USA) and Seinäjoki (Finland)

There is no comparator data available from identical age groups in Southern Ostrobothnia, the region in which Seinäjoki is located, although between 2010 and 2013 the proportion of overweight students in the 1st and 2nd grade of high school and 1st and 2nd grade of vocational school increased by 3–4%.<sup>10</sup>

A delegation from the South Korean capital, Seoul, visited Seinäjoki in 2016 with the aim of starting a similar programme in the city's Gangdong district (Frantti-Malinen, 2017).

10. For further context and information on Seinäjoki's longer-term health and well-being programme see: City of Seinäjoki, Overcoming Obesity Programme 2013–2020. Available: <https://bit.ly/2H86Dvp>

## 5. EPODE

### A local focus on children and families

Evidence from high-income countries has suggested that school-based interventions are most effective where these combine both exercise and diet, and include home and community components (Wang et al. 2015), as seen in Seinäjoki (above).

One particularly successful example of a community-based intervention is Ensemble, Prévenons l'Obésité Des Enfants (EPODE) (Together let's beat childhood obesity). Originating in France, EPODE is a multi-sectoral approach that has been piloted in more than 17 countries (Borys et al. 2013).

Uptake has been supported by the EPODE International Network (EIN), created in Brussels in 2011. EIN recognises there is no one-size-fits-all approach to EPODE, since implementation needs to adapt to local cultural, social and political contexts (Pettigrew et al. 2014). EIN's capacity to collect and disseminate evidence across a diverse range of cultural and social contexts has made it the world's largest obesity prevention network and a vitally important repository of learning.

#### 5.1 EPODE: definition, evidence and learning

EPODE has been described as 'a coordinated, capacity-building approach aimed at reducing childhood obesity through a societal process in which local environments, childhood settings and family norms are directed and encouraged to facilitate the adoption of healthy lifestyles in children' (Borys et al. 2013). It is therefore considered a 'community programme', reaching well beyond the school environment.

The key target groups are children from 0 to 12 years old and their families. Defining characteristics of EPODE strategy include:

- a long-term approach aimed at changing the environment and promoting healthy behaviours
- a positive approach to healthy eating: no one culture, individual, food habit or behaviour is stigmatised
- tailored messages and actions to the target population
- a sustained community-based approach

Crucial to the success of EPODE, the programme is developed in agreement with community members and takes into account needs and available resources. Whilst guidelines do exist to provide information and guidance on implementation and evaluation, the programme differs across communities with modifications made according to age, socioeconomic group, cultural mix and even different geographical areas (Borys et al. 2013). Consequently, whilst attempts have been made to construct one logic model for EPODE, it is not possible to construct one logic model that is an exact fit to all EPODE communities (Van Koperen et al. 2013).

## 5. EPODE

### A local focus on children and families

#### Results of first pilot

The EPODE methodology has its origins in a study initiated in 1992 in two towns in northern France, Fleurbaix and Laventie (FL). The study was based around a two-pronged approach: a long-term school-based intervention followed by a community-based programme, with actions designed to improve eating and physical activity habits among children (Borys et al. 2013).

A key finding from the study was that focusing solely on interventions based within schools was not sufficient to reduce the prevalence of obesity and overweight (Borys et al 2013). Pairing school based interventions with community-based interventions, using many local stakeholders, made a crucial difference.

In 1992 the childhood obesity prevalence in Fleurbaix and Laventie (FL) was 11.4% (combined), and in comparison towns (Bois-Grenier and Violaines) 12.6%. In the first eight years of the programme a schools-based approach was used only: obesity rose in both FL and comparison towns virtually in parallel (reaching 14.3% in FL). In 2000, a community-based, multi-stakeholder approach was introduced: by 2004 obesity had fallen to 8.8% in FL, while rising in the comparison towns to 17.8% (Borys et al 2013). Furthermore, the programme proved to be efficient across all socioeconomic levels. Data collected in 2004 indicates the prevalence of obesity and overweight according to socioeconomic groups in EPODE towns was significantly less in middle class and lower class groups compared to comparison towns (see Table 2) (Borys et al. 2015).

**Table 2. Obesity and overweight prevalence (%) according to socioeconomic groups in 2004 (Borys et al. 2015)**

	Upper class	Middle class	Lower class
EPODE towns	5.6	7.0 *	15.2 *
Comparison towns	5.7	16.9	26.9

\* = p-value <0.01

Following this 10-year study of two towns, a five-year study was undertaken in 10 pilot towns across France employing EPODE methodology. Between 2004–2009, a 10% downward trend in the prevalence of childhood overweight and obesity was recorded in these communities (EIN, 2016).

## 5. EPODE

### A local focus on children and families

#### Key factors for success

Subsequent evaluation of the results of this study has helped to identify four key 'pillars' that help to make the EPODE methodology such a success:

**Political commitment.** From the outset, formal commitment is secured from political representatives at the local, state and federal levels. Politicians play an important role as strong advocates of the programme, helping to mobilise partners and foster strategic alliances and partnerships.

**Public-private partnerships.** Securing sufficient resources is key in terms of sustainability. Public-private partnerships (PPPs) have been found to be an effective mechanism through which childhood obesity can be addressed on a worldwide basis. In the case of EPODE this has been realised through 'organisational cooperation projects', which help to bring together different skill sets and build trust amongst consumers and political authorities (Borys et al 2012). On the downside, the public sector can often be concerned about losing integrity and independence by engaging with the private sector. It is clear there are opportunities and risks to both parties, but where these can be navigated effectively great benefits can be realised. The value of collaboration with public partners, particularly in terms of knowledge and expertise, should not be underestimated.

**Support and marketing.** Effective action needs to be taken at the local level, supported by appropriate social marketing and support services, to develop and disseminate health messages to different target groups. The EPODE programme demonstrates the effectiveness of concentrating on one target behaviour at a time and reinforcing it with practical activities and resources (Van Koperen et al. 2013). There are a range of support services that EPODE employs both at a central level (advocacy, partnership management, training and coaching of local project managers, development of social marketing campaigns, press relations, monitoring and evaluation, etc.) and at local level (political leadership, steering of projects, coordination of actions, data collection, communication, etc.). Social marketing has been found to be key and effective in making messages personal, popular and sometimes humorous (Borys et al 2012).

**A strong evidence base.** This helps to guide the implementation of EPODE and to evaluate outcomes. To monitor EPODE as a standardised approach, the future aim for EPODE communities is to have as a minimum a standardised set of questions in an EPODE questionnaire on energy-balance-related behaviours and determinants. This will be critical in helping establish a standardised approach for EPODE and the monitoring process (Borys et al. 2012).

## 5. EPODE

### A local focus on children and families

These four pillars have been further subdivided into ten EPODE implementation principles, which help to describe the essence of the EPODE methodology. In terms of leadership, the EPODE programme is established on a 'top-down' leadership and a 'bottom-up' mobilisation of support (Borys et al. 2012).

1. Each country or region commits to a central coordination team.
2. Each local community has a formal political commitment for several years from the outset.
3. Each local community has a dedicated local project manager with sufficient capacity and cross-sectoral mandate for action.
4. Each community has a multi-stakeholder approach involving both central and local actors.
5. Social marketing campaigns and materials are used for creating positive behavioural and environmental change.
6. Local stakeholders are involved in the planning processes and are trusted with sufficient flexibility to adapt actions to local context.
7. The 'right message' is defined for the whole community. However, getting the message 'right' means tailoring for different stakeholders and audiences.
8. Messages and actions are solution orientated and designed to motivate positive changes and not to stigmatise any culture or behaviours.
9. Strategies and support services are designed to be sustainable and backed by policies and environmental changes.
10. Evaluation and monitoring are implemented at various levels. This is achieved through the collection of information on process, output and outcome indicators, and informs the future development of the programme.

From the initial group of 10 EPODE communities, the programme has grown nationally and internationally. Pilot results from two towns in Belgium running the EPODE-based VIASANO programme found a 22% reduction in overweight and obesity over a three-year period among 3–6 year olds, while prevalence remained stable in the comparison population (Vinck, 2016).

Not all country pilots have reported downward trends however: in its first four years, Spain's EPODE-based THAO Programme saw a 1% increase of overweight prevalence across 10 municipalities (6,697 children, ages 3–12), although this near stabilisation of overweight and obesity prevalence in THAO communities was considered encouraging in relation to trends elsewhere (Gómez et al. 2015).

Other countries to have recently adapted the EPODE approach to local contexts include Greece (PAIDEAITROFI), The Netherlands (JOGG), Romania (SETS), and also Italy, Hungary, Australia and Mexico.

## 5. EPODE

### A local focus on children and families

#### 5.2 EPODE for the Promotion of Health Equity (EPHE)

The EPODE for the Promotion of Health Equity (EPHE) project was launched in 2012 and endorsed by the European Commission. The goal of the project was to reduce socioeconomic inequities linked to health-related behaviour of families in seven European countries over three years. This goal would be achieved by evaluating the added value of community-based programmes, based on EPODE methodology, to reduce health inequalities linked to diet and physical activity (Borys et al. 2016; Mantziki et al. 2014).

The EPHE interventions focused on four themes:

1. The promotion of water consumption
2. An active lifestyle
3. Fruit and vegetable consumption
4. Adequate sleeping behaviour <sup>11</sup>

A total of 1,266 children and their families were included in the study. The response rate was more than 85% in all countries (Borys et al. 2016).

Initially the evaluation study found that:

- Children from seven European communities of relatively high socioeconomic status (SES) consumed fruits and/or vegetables more frequently than their peers of lower SES.
- The lower SES group of children had a higher intake of fruit juices and/or soft drinks and had greater screen time (i.e. television, video games and computer).
- Important differences between the two socioeconomic groups were observed in the determinants of the social and physical family environment of the child.

No common pattern for the determinants in all behaviours was found in all countries; what was found to be consistently different between the two socioeconomic groups were parental rules and home availability of, for example, fruit, vegetables, soft drinks and TV in the child's bedroom (Borys et al. 2016). The family environment, related to socioeconomic inequalities, therefore appears to play an important factor in childhood obesity. Country-specific inequalities were also identified through the fact that differences in the determinants varied to a large extent across countries (Borys et al. 2016).

In response to baseline measurements, community based interventions were developed and adopted by the EPHE communities in order to meet the needs of their low socioeconomic group. For instance, in France the campaign 'water at school' was designed to improve water availability (see Table 3).

11. This is one of the few initiatives to emphasise the importance of sleep for health.

## 5. EPODE

### A local focus on children and families

**Table 3**

#### France: 'Water at school' campaign (Borys et al. 2016)

- The campaign was designed to improve water availability.
- Two-thirds of children showed a lack of water consumption.
- The community-based programme evaluated the change of behavior when 33cl bottles of water were distributed every morning to 120 children for 3 weeks.
- All the children improved their water consumption from the beginning (100%) to the end of the study (95.5%).
- This showed that water accessibility was the first step for sustainable change behaviours amongst children.

A total of 1,061 children (aged 6–8 years) and their families were observed for two years. Changes were observed in fruit and vegetable consumption, sugary sweetened beverage consumption and screen exposure, and their related determinants associated with inequity gaps at baseline. Although in most cases statistical significance was not reached, greater improvements in behaviours were evident within the low socioeconomic groups (Borys et al. 2016).

Further research is needed with larger cohorts to achieve persuasive statistical power, but this evidence supports other research we highlighted in our 2014 report 'Careless eating costs lives' (James & Beer, 2014), that holistic, community-based programmes offer the most promising opportunity to reduce rates of childhood obesity while at the same time tackling the effects of social and economic inequality.



## Discussion

# 6. Considerations of culture and genetics

It is important to recognise that different cultures may have very different approaches to named categories of health, or they may have unique socio-cultural constructs of the human body. Thus an intervention that influences behaviour change in one population may not be appropriate or effective for another. This not only highlights challenges in understanding transferrable learning, but also the complexities facing governments devising policy for culturally diverse populations.

Of particular importance is the understanding that overweight – even obesity – is not universally understood as an unhealthy body category. This is a pervasive view in parts of Latin America, various places in the Middle East, and in many African communities (Randall, 2011; Yates-Doerr, 2014). Where food is or has been a scarce commodity, overweight is often equated with higher socioeconomic status and better health, and such views may not be abandoned by emigrants to more food-secure locations.

A growing body of biosocial research into non-communicable health conditions and diseases further complicates the role of culture and society in influencing obesity, and in turn prevention and intervention. Under these biosocial rubrics, genetics and society are intimately interwoven. Obesity in different regions of the world can be seen through evolutionary perspectives as socially induced biological programming, such as 'Thrifty Genes' that work against systems of globalisation (originally proposed by Neel, 1962) and other forms of evolutionary influence (Speakman, 2013). Recent studies have pivoted biology against processes of capitalism and colonisation (Leatherman & Goodman, 2004; Diamond, 2003), and epigenetic science has shown links between environmental stressors and inheritable gene expressions, with a specific focus on obesity and diabetes (Swinburn et al, 2011; Ling & Groop, 2009). These biosocial perspectives are important for obesity policy initiatives as they suggest that successful intervention strategies may not necessarily be visible in the short term, and furthermore, the potential for short term change is highly dependent on local biologies and social contexts (Martorell & Zongrone, 2012.)

Though the architects of obesity prevention programmes face many challenges, within the last two decades research has demonstrated how the prevention of obesity in children is possible via cross-sector interventions aimed at the environment, physical activity and diet (Borys et al. 2016).

Cross-sector co-operation appears to have been critical to the success of the EPODE programmes in France and Belgium, the city-wide initiative of Seinäjoki (Finland) and possibly also New Hampshire, USA. In EPODE pilots and Seinäjoki, initiatives encompassing exercise and diet, school-home-community components, even the built environment, accord with systematic reviews of evidence which suggest programmes need to reach beyond behavioural approaches to incorporate upstream interventions that address the limited control children have over their food and physical activity choices (Bleich et al. 2013; Wang et al. 2015).

Another key feature for EPODE and New Hampshire, and indeed the whole-systems approach of Oklahoma City, were public-private partnerships (PPPs), which potentially ensure stronger accountability structures and sustainable programming. Some later EPODE programmers have however reported challenges in the securing of ongoing funding (Pettigrew et al. 2014).

## Discussion

# 6. Considerations of culture and genetics

It is also important to recognise that the EPODE pilots benefitted from an evaluation framework designed by a central coordination team, with the expertise of a scientific committee and feedback from local stakeholders (Borys et al. 2013).

The challenge for local stakeholders is how to continue prevention in older children: many of the interventions are designed specifically around young children and may not engage the hearts and minds of teenagers.

## 7. Learning for the UK?

As our case studies indicate, many government initiatives lack robust evaluation, in some cases because they have been deployed at a national level without prior pilot evaluation. In other cases barriers to evaluation may have included austerity conditions and the significant work needed to analyse interventions and compare effects.<sup>12</sup> We therefore need to consider evidence from these case studies with caution, and with reference to other evidence described in the literature.

We also need to be mindful that national policies are not generally capable of producing and maintaining significant weight loss in large numbers of overweight and obese individuals. This is because prevention and reduction of overweight and obesity depend largely on individual lifestyle choices and changes made and supported within local contexts (Chan & Woo, 2010).

### 6.3.1 Taxation

The UK government introduced its Soft Drinks Industry Levy (SDIL) in April 2018. The policy is part of the government's 'plan of action' on childhood obesity, as soft drinks are the largest source of sugar in the diets of 11–18 year-olds, at 24% of total intake (SACN, 2015). The levy, applying to producers and importers of soft drinks containing added sugar, will impose 18p per litre on drinks of 5g of sugar or more per 100ml, and 24p per litre on drinks of 8g of sugar or more per 100ml (HM Revenue & Customs, 2017). Significant revenues are expected from the SDIL, intended for programmes that promote physical activity and balanced diets in school-age children (PHE, 2017).

The government is also encouraging a 20% reduction in sugar levels in nine categories of food by 2020. Salt reduction targets have previously been set, and targets to reduce levels of saturated fat in foods will be introduced in 2018. Industry levies could follow if food manufacturers do not meet government targets.

Government messaging around the SDIL has placed emphasis on industry taxation and product reformulation, rather than consumer taxation (DH, 2017). This represents a different approach to Hungary, Berkeley and Mexico, where tax has been aimed directly at consumers to encourage lower consumption. Some shelf-price increases are however expected in the UK, since not all producers have reformulated their products (Gerrard, 2018).

In terms of the desired effect of taxation on target populations, UK policy makers need to understand a range of socioeconomic and cultural complexities. Evidence suggests that higher-earners are not necessarily affected by tax increases. The Hungarian obesity epidemic provides an interesting context, with highest rates of male obesity among the most educated, a comparatively affluent group that has been largely impervious to the tax. Our previous research into obesity profiles in the UK (Parkurst, 2015) suggests a correlation between increasing rates of obesity in men and economic mobility, perhaps even wealth. Among women, downward social mobility and social accumulation of disadvantage is strongly correlated to obesity (Heraclides et al, 2010).

12. It has been suggested that 10–15% of any programme budget should be directed to evaluation (Kopczynski and Pritchard, 2004; WHO, 1998).

## 7. Learning for the UK?

All three case studies (Mexico, Hungary and Berkeley) suggest that where levies are passed on to consumers, tax policies most radically affect the consumption habits of those of lower socio-economic status – typically the greatest consumers of SSBs and the people who therefore stand to ‘gain the highest health benefits’ (WHO, 2016). However, small changes in unit costs of favourite beverages may not significantly deter consumption in any SES group (WHO 2016).

That significantly more people in Hungary reduced energy-dense food and drink consumption due to learning that products were unhealthy, rather than due to price increase, shows the impact of raised health literacy. It is interesting that the very introduction of the tax appears to have created public discourse and increased awareness. Health literacy may not be significantly raised in the UK context, however, given the limited application of the SDIL and with less effect of the tax on shelf prices.

Research specific to the three regions cites little evidence of job losses in manufacturing due to taxation, though job losses could still follow in time. In the UK, job losses may be less likely since many companies have already reformulated products to avoid the SDIL and may not see much change in sales.

Looking ahead, in the event of wider UK industry levies targeting products high in sugar, saturated fat and salt, consideration needs to be given to improved access to healthy foods, most importantly fresh fruits and vegetables.<sup>13</sup> This could be implemented through an expansion of the Healthy Start Scheme to families with children of primary school age, or through fruit and vegetable voucher schemes for residents of selected public housing complexes,, as introduced for Somerville’s mobile farmer’s market in Massachusetts, USA.

Even without tax increases on specific foods, policy makers need to be mindful of the widening price gap between cheap junk food and more expensive healthier options (Jones et al., 2014). This is creating a barrier to healthier diets in the UK’s poorest households.

### 6.3.2 *Shokuiku* School Lunch Programme

As noted above, the *Shokuiku* programme is currently being trialled in a small number of schools in the US – Boston, New York, and Washington D.C. – as ‘*Wa-Shokuiku: Learn. Cook. Eat Japanese!*’. It will be interesting to see how the programme is adjusted to a US context, and this may well create valuable insights for the UK.

Japan has an advantage over the UK in that school-lunch participation is virtually mandatory across the country (parents or guardians are directly charged for it, though some receive subsidies). The design of the programme targets several health-equity barriers, namely: household food insecurity, education on healthy eating and nutrition, and social stigma – since children are themselves unaware who receives subsidised lunches (Moffat & Thrasher, 2016).

Elements of the *Wa-Shokuiku* programme could nonetheless be adopted by UK schools. These include educational elements of understanding the nutritional value of specific school meals

13. Subsidies need to reduce prices by up to 30% in order to increase fruit and vegetable consumption, according to the World Health Organisation.

## 7. Learning for the UK?

(Japanese influenced or not), not being wasteful, having appropriate portion size ('eat until 80% full'), how to use ingredients efficiently, and recycling. Education can also extend to issues of food justice: food work, food waste, unwholesome eating and food insecurity. Pupil teams themselves serve food, clear up and recycle, supporting community values and service to others.<sup>14</sup>

Some schools will be able to source food locally through Farm to School Programmes, and even from their own school vegetable gardens. As well as building community relationships, Farm to School Programmes offer valuable opportunities for field trips, enabling pupils to learn how nutritious food is grown and harvested – all very much in the spirit of *Shokuiku*.

### 6.3.3 Cross-sector intervention at the local level

Can the experience of culturally homogeneous communities offer learning for the UK? Ninety-eight per cent of Seinäjoki's 60,000 residents are native Finnish. By contrast, less than half of London's residents are white-British, and in most boroughs more than 100 languages are spoken (ONS, 2011). Many cities in England, including Birmingham, Leicester, Manchester, Wolverhampton and Bradford, are home to a wide diversity of ethnic groups. Obesity intervention strategists face great challenges in developing skills and discourse that speak effectively through socio-cultural barriers.

But what the UK can learn from Seinäjoki, as well as from Oklahoma City, New Hampshire and EPODE, is the approach of cross-sector co-operation. Seinäjoki managed this without (it is claimed) additional financial input from any local government department. Where Seinäjoki may have the advantage over UK towns and cities is in its observance of national education policy, since it is obligatory in Finland that schools provide health education classes, and nutrition and cooking lessons (WHO, 2015d). In the UK, the number of academies and free schools is growing,<sup>15</sup> which means increasing autonomy for schools and arguably greater difficulty in the coordination of town or city-wide school policy with united agreement over curriculum priorities. Only in secondary-level Local Authority schools is the teaching of cooking (Food Technology) mandatory for years 7 and 8, for instance, and these schools have already become the minority.

The 'top-down, bottom-up' structural design of EPODE offers significant promise for the UK. Similar to *Shokuiku* approaches in Japan, EPODE offers the opportunity to affect behaviour change through value system and practice, tailored to specific communities. Through EPODE methodology, Local Authorities could create prevention strategies that draw largely on already piloted or established structures and programmes in the UK targeting 0-11 year olds (see following page), notwithstanding necessary changes to the built environment.

14. Other elements of the *Wa-Shokuiku* programme are described on a dedicated website: [www.wa-shokuiku.org](http://www.wa-shokuiku.org).

15. As of January 2016, 65.5 per cent of secondary pupils and 19.5 per cent of primary pupils in England were attending academies. [House of Commons Briefing Paper. 2017. FAQs: Academies and free schools]

## 7. Learning for the UK?

### Potential for coordinated, cross-sector action: recent UK programmes and guidance

NICE first issued obesity guidance in 2006, and the government followed with a substantial 'toolkit' ('Healthy Weight, Healthy Lives') for Primary Care Trusts and Local Authorities in 2008; but at a time of budget cuts and rising social care bills, evidence-based guidance has not always translated into local action due to workforce limitations and commissioner disinclination to invest in long-term solutions. Coordinated and continuing action at the local level is however paramount in order to address our obesogenic environments.

UK programmes showing particular promise for children include HENRY (see insert) for early years obesity prevention, and Premiership Rugby's 'Something to Chew On'<sup>16</sup> and the Daily Mile at primary school level. 'Walking school buses' is another exercise initiative, where groups of children walk to and from school chaperoned by responsible adults, usually a group of parents.

A key institution in sport promotion is Sport England (SE), sponsored by UK government, which helps schools, and people and communities generally, to develop a sporting habit for life. It works with other national partners and the Government to support the Primary PE and Sport Premium fund, and helps protect existing sports provision.

Healthy eating and nutrition has been promoted through marketing campaigns, notably Change4Life, which launched in 2009 targeting young families with children aged 5-11 years. It now also targets parents of 1-4 years olds (Early Years) and new parents with babies (Start4Life).

The National Institute for Health and Care Excellence (NICE) has produced guidelines for a range of sectors and actors, including Local Authority and Head Teachers, to support children, young people and adults from becoming overweight. Recent guidance has included social prescribing interventions on weight reduction, such as GP referral of obese people to cookery classes to learn healthy meal making (Times, 2017), an intervention that could see benefit not just to adults but also children of obese parents.

#### The HENRY approach to obesity prevention in the UK

Health Exercise Nutrition for the Really Young (HENRY) trains practitioners to work more effectively with parents of preschool children around obesity and lifestyle issues. In Leeds, where HENRY is embedded in the city-wide obesity strategy, all health and early years practitioners have been HENRY-trained and parent programmes are run in every children's centre cluster. NCMP data shows that obesity rates at Reception have fallen across the city from 10.3% to 8.7% over a five-year period, whilst national trends have remained almost static. Outcomes for health equity also appear promising: the gap between obesity rates at age five in the least deprived and most deprived areas of Leeds is narrowing, with obesity rates dropping from 13.8% to 10.9% in the most deprived areas over the five years (Roberts, 2015).

16. Premiership Rugby's Something to Chew On programme targets the top 20% of the most deprived schools in England using the influence of Premiership Rugby's 12 clubs to tackle the obesity epidemic through activity and nutrition education. Professional sports leagues and clubs are delivering similar programmes aimed at promoting healthy lifestyles in schools, including the English Football League (EFL) Trust through its 72 clubs.

## 7. Learning for the UK?

### 6.3.4 How might EPODE or a similar multi-sector programme work in the UK?

The 10 key elements for EPODE success have been outlined above (see Section 5), and many of these are also evident in Seinäjoki's initiative.

A UK EPODE-style model would require a dedicated local project manager with sufficient capacity and cross-sectoral mandate for action. Operating at city, town or borough level, a coordinating organisational structure would be created through the Local Authority, which is well placed to form a comprehensive view of local problems and identify levers (EEN, 2011). Local needs and health inequalities should be identified with the help of community focus groups, for example through Healthwatch.<sup>17</sup> Adolescent, youth and parent feedback mechanisms have been shown as valuable to guiding intervention strategy (Smith et al. 2017), and these should ensure minority group representation. Such mechanisms increase chances of sustained public participation in programmes and initiatives.

Early engagement of policy makers at the local level is essential to help mobilise target populations and change local environments (Borys et al. 2013). Strategic planning and coordination could be realised through special meetings of the local Health & Wellbeing Board (HWB), augmented to include education and town planning sectors, early years and primary school principals, community focus group representatives, NGOs and also the private sector.

Public-Private Partnerships (PPPs) should be created strategically to support sustainability and complement skill sets. It is an approach not only recommended in EPODE policy, but also by the CDC in the USA, which has encouraged such partnerships to help fund state-wide obesity initiatives. It has been argued that private sector contributors should include the food and drink industry, which has considerable knowledge and expertise in marketing and behaviour change through community-based interventions (Borys et al. 2013).

Successful optimisation of a community-based programme is reliant upon actions that meet local need and are sustainable. These will be therefore tailored to the community, but may variously include: agreement to ban sweets and cake (including birthday cake) in all nurseries and primary schools; mentor partnership with child care providers (facility assessment, goal setting, tailored action plan); recess before lunch (primary schools); ensuring equitable implementation of third-party sports provision across all schools; ensuring schools have 'walking buses', where practical; implementation of daily mile at start of school day; mandatory food and nutrition education; 'Healthy Living' social marketing campaigns (e.g. SnackRight, Change4Life); compulsory 'child health and wellbeing' talks (nutrition, portion size, sleep, screen time, etc.) for parents of children enrolling at primary and secondary school; after-school access to playgrounds. Other community interventions may include fruit and vegetable vouchers for residents living in deprived wards (as in Somerville, USA, for example), new park facilities aimed at older adolescents, increase of cycle paths and healthy cooking workshops.

17. Healthwatch are independent organisations in many regions of the UK who listen to the views of local residents on health and social care and share them with those with the power to make local services better.

## 7. Learning for the UK?

Any local, multi-sector pilot would require robust evaluation, which remains an essential thread running through EPODE methodology. This requires buy-in from both parents and children who will participate in surveys on eating and activity behaviours, attitudes and knowledge, as well as agree to physical measurement (child), at baseline and follow-up, across pilot site(s) and comparison site(s). Evaluation can be expensive and time-consuming, requiring at least 15% of the programme budget (Borys et al 2013), but without which learning for the UK and elsewhere cannot be disseminated.



## 8. Summary and final considerations

The lack of evaluation of so many government initiatives on obesity prevention is a major omission. Whilst changing the health outcomes of a population will never be a short-term endeavour, it is remarkable that so little data is being collected, even when significant investment has been made. It is only logical that in order to see a reduction in the prevalence of obesity, which has been rising over several decades, a long-term, evidence-based commitment is required.

Notwithstanding the limited evidence surrounding most of the initiatives noted in this report, we can use these international approaches to reinforce the conclusion of our first report on obesity, 'Careless eating costs lives' (James & Beer, 2014), which emphasised the need for a multi-sectoral, multi-faceted coordinated approach (see Appendix for report summary). Our conclusions from the presented case studies, as supported by the literature, are as follows:

- A health-in-all-policies approach is vital at both the national and local level.
- Compulsory national policies on school-based education, health and wellbeing can give greater strength and support to local action on obesity prevention.
- Taxation, whether considered, planned or implemented, can encourage manufacturer reformulation of products to healthier options.
- Taxation can create additional revenues for government; the amount will vary according to the extent of product reformulation.
- Strong local leadership on obesity prevention is essential to secure buy-in from local actors and stakeholders and effect lasting change.
- Local actors need a detailed understanding of the social determinants of obesity within their locality to implement relevant and targeted interventions.
- Coordinated, cross-sector local programming across multiple environments shows the strongest outcomes evidence for reducing obesity among children and addressing health inequalities.
- Public-Private Partnerships have a part to play in an obesity strategy.
- Raised health literacy can help improve public dietary habits.
- Improved access to drinking water in schools (and workplaces) is key to increasing consumption.

## 8. Summary and final considerations

At the same time it is important to recognise barriers to obesity prevention in the UK:

- Initiatives undertaken without evaluation processes have limited opportunity to encourage buy-in and support for similar strategies elsewhere.
- A widening price gap between cheap junk food and more expensive healthier options is creating a barrier to healthier diets in the poorest households.
- Obesity prevention with a school-only focus often shows no effect in the long term, leading to stakeholder discouragement and possible disinclination to pursue further strategies.
- Opt-out by many publicly funded schools (mainly academies and free-schools) of health-supporting initiatives, such as food technology (cooking), is a major impediment to health literacy and the implementation of schemes in the vein of EPODE.

### Childhood obesity strategy

Much of this report has been about children, since this is an age-group where prevention has the greatest chance of success. The government is aware that physical activity and obesity statistics do not bode well – as outlined in the Introduction – and that what has been implemented to date is not nearly enough.

Responding to the government's 'Childhood Obesity: A Plan for Action' (last updated 2017), the UK's Health and Social Care Committee has called for stronger, more decisive measures to tackle the obesity crisis (Health Select Committee, 2017). Many of the Committee's latest recommendations accord with those of our first project, 'Careless eating costs lives' (2014), which include a ban on television advertising of unhealthy foods before the 9pm watershed, and changes to planning legislation to make it easier for local authorities to limit the proliferation of junk food outlets in their areas.

We believe stronger policy measures also need to extend to school accountability structures. Mandatory monitoring and reporting (publishing) of school policies on health and wellbeing may well see a significant recalibration of priorities in both primary and secondary schools. The drive for academic attainment has far outstripped consideration of pupil physical and mental health in many schools, and yet school policy on these issues is surely as important as SAT, GCSE and A level results.

The Plan of Action describes support of healthier food choices and children's access to 'high quality sport and physical activity programmes', but it is unclear as to how this will translate at the local level. Evidence from our case studies, and the literature more widely, indicates that unless central funding and support is channelled through coordinated, multi-sectoral programmes extending across a range of local environments, a lasting downward trend in childhood obesity is unlikely to be realised. Joined-up, multi-sectoral programming is by no means currently embedded at the local level.

The government is confident that actions outlined in its Childhood Obesity Plan 'will significantly reduce England's rate of childhood obesity within the next 10 years'. If limited to the present strategy, this outcome is by no means certain.

## Appendix: Summary of previous obesity research projects

### i. Project 1: 'Careless Eating Costs Lives' (2014)

Considering both education and regulation, the project aimed to (i) highlight the extent of the obesity explosion and (ii) set out the essential responses to halting progression and reversing the drastic effects of overweight/obesity on individual health, employment, social care and the wider economy.

#### Methodology

**Desk-based literature review and research.** Reviewing and evaluating theories of behaviour change; review of national (UK) policy and activity on correlates of obesity; evaluating various international responses to tackling obesity through both regulatory and education interventions.

**Series of expert telephone interviews.** In-depth telephone interviews (unattributable) conducted with 14 key stakeholders from across the UK. Participants included public policy experts, academics, nutritionists, industry representatives and healthcare professionals. A semi-structured schedule was used to establish a basic interview framework, whilst also allowing opportunities for respondents to explore specific issues in depth, drawing upon their areas of expertise and experience.

**Polling.** ComRes interviewed 2,039 adults in Great Britain online between 6th and 8th June 2014. Data were weighted to be representative of all adults in Great Britain aged 18+. Five questions were posed which covered the themes of healthy eating, behaviour and the role and responsibilities that individuals, government and the food and drink industry should have in helping to shape healthy choices.

**Roundtable discussion.** This discussion was convened to gather different perspectives on how the challenge of obesity should be tackled in order to build real traction for the future and see improvement in the nation's health. With a variety of key stakeholders in attendance (including academics, third sector, healthcare, public policy and industry), space was given for open dialogue and the exchange of ideas and opinions.

#### Summary

Policy has so far failed to turn the rising obesity tide, in part due to a lack of strong, coordinated, cross-departmental action at the national level, also due to a lack of prioritisation at the local level.

A formal, national, multi-departmental framework is imperative to ensure that obesity receives priority and sufficient funding as well as the focus and support necessary to make fundamental change. New policies across all departments should be reviewed and assessed to understand how they can help improve the nation's health ('Health in All Policies'). Cross-departmental cooperation is needed for a truly joined-up approach to obesity, both at a national and local level. A cross-departmental, permanent government task force on obesity should be created to inform and guide policy.

Stronger mandated action is needed from government in conjunction with appropriate "nudging" to achieve "health in the round". Recommendations for central government include the introduction of licensing for fast food outlets to control the location and numbers of outlets in a local community; extension of the ban on television advertising of unhealthy foods aimed at children to 9pm watershed; improved screening and normalisation of discussion about diet and weight at medical appointments; and tax incentives for larger businesses to make wellbeing provision (such as access to occupational health, nutritionist, gym facilities) available to smaller local businesses.

## Appendix: Summary of previous obesity research projects

### ii. Project 2: 'Fat Chance?' (2015)

The project set out to answer the question: *'Who is affected by obesity in Britain?'*

#### Methodology

**Desk-based literature review and research.** A review of literature on correlations between obesity and a wide range of specific socio-demographic data sets. In order to research the complexity of these associations in Britain, searches were conducted, primarily through PubMed, across 16 potential factors. These searches included, in no particular order: age, gender, divorce rates, green space, housing and property value, crime rates, employment/unemployment, salary, fast food density, geographic location, ethnicity, mental illness, religion, sleep behaviour, bullying, and smoking. In addition, we conducted a general search for "obesity in the UK" for an overview of demographic information within the country. Preference was given to meta-studies that provided statistical and analytical summaries within the categories listed above. Since a goal of this research was to assess changes in demographic knowledge of obesity over the last decade, preference was given to very recent literature (published 2014 and 2015).

#### Summary

The report acknowledged that people of low socioeconomic status (SES) are highly vulnerable to obesity, but it also demonstrated that focus on such generalisations can be unhelpful to tackling the obesity epidemic. For example, the research found that it was younger, socially deprived women most at risk. Living in an environment that has a high density of fast food outlets, poor pavements, insufficient green space and a perceived fear of crime all correlated with an increase in obesity in females. For men, obesity is more likely if their place of work has a high density of surrounding fast food outlets. Economic instability is now associated with some of the most rapidly rising rates of obesity in the UK, which constitutes a massive challenge as we anticipate greater automation of the workplace and fewer middle class jobs. 'Uncertainty' was found to be a habit-forming structure that undermines the individual's ability to manage sustainable health. For the stable poor, obesity is much higher in women, for the stable wealthy, obesity is higher for men; and for the economically mobile (upward/downward), obesity rises for both men and women.

The report emphasised that we cannot follow past policy action on obesity and expect outcomes to improve. We have to understand exactly who we are targeting and discard any notion of a one-size-fits-all approach. Population demographics differ significantly from one region, city, town, to the next. Solutions require cross-departmental commitments to obesity strategies, and we have to insist on some environmental changes if people are ever to stand a chance of making healthy choices.

## References

- Allen, N. 2010. The Mayor of Oklahoma City Talks Obesity. The Atlantic. 23rd June 2010. <https://www.theatlantic.com/politics/archive/2010/06/the-mayor-of-oklahoma-city-talks-obesity/58624/>
- Barron T. Oda, 2011. An Alternative Perspective to Battling The Bulge: The Social and Legal Fallout of Japan’s Anti-Obesity Legislation.
- Becker AE. 2004. Television, disordered eating, and young women in Fiji: negotiating body image and identity during rapid social change. *Cult Med Psychiatry*. 2004 Dec;28(4):533-59.
- Birrell, I. 2015. The fat city that declared war on obesity. *Huffington Post*. 15th October 2015. [https://www.huffingtonpost.com/entry/oklahoma-obesity\\_us\\_562002e1e4b050c6c4a4eb75](https://www.huffingtonpost.com/entry/oklahoma-obesity_us_562002e1e4b050c6c4a4eb75)
- Bhurosy T, Jeewon R. 2014. Overweight and Obesity Epidemic in Developing Countries: A Problem with Diet, Physical Activity, or Socioeconomic Status? *The Scientific World Journal*. 2014;2014:964236. doi:10.1155/2014/964236
- Bleich, Sara N. et al. 2013. Systematic Review of Community-Based Childhood Obesity Prevention Studies. *Pediatrics* 132.1 (2013): e201–e210.
- Bødker, M., Pisinger, C., Toft, U., & Jørgensen, T. (2015). The rise and fall of the world’s first fat tax. *Health Policy (Amsterdam, Netherlands)*, 119(6), 737-42.
- Bollinger, B. Sexton, S. 2018. Local Excise Taxes, Sticky Prices, and Spillovers: Evidence from Berkeley’s Soda Tax (January 12, 2018). Available: <http://dx.doi.org/10.2139/ssrn.3087966>
- Borys, J-M. et al (and the EEN study group). 2012. EPODE approach for childhood obesity prevention: methods, progress and international development. *Obesity Reviews*, 13, 299-315.
- Borys, J-M. et al. 2013. EPODE – A model for reducing the incidence of obesity and weight-related comorbidities. *European Endocrinology*, 2013;9(2):116–20 DOI:10.17925/EE.2013.09.02.116
- Borys, J-M. et al. 2016. Tackling health inequities and reducing obesity prevalence: The EPODE Community-based approach. *Ann Nutr Metab* 2016;68(suppl 2):35–38 DOI: 10.1159/000446223
- Butler S. 2016. The Guardian. Article: <https://www.theguardian.com/business/2016/mar/17/coca-cola-hits-back-at-sugar-tax-plan>
- CDC, nd. Massachusetts Obesity Prevention Efforts (2008–2013). Available: [https://www.cdc.gov/nccdphp/dnpao/state-local-programs/pdf/massachusetts\\_web\\_508tagged.pdf](https://www.cdc.gov/nccdphp/dnpao/state-local-programs/pdf/massachusetts_web_508tagged.pdf)
- CDC, 2016. Prevalence of Overweight and Obesity Among Children and Adolescents Aged 2–19 Years: United States, 1963–1965 Through 2013–2014. Available: [https://www.cdc.gov/nchs/data/hestat/obesity\\_child\\_13\\_14/obesity\\_child\\_13\\_14.htm](https://www.cdc.gov/nchs/data/hestat/obesity_child_13_14/obesity_child_13_14.htm)
- CDC, 2017a. Prevalence of Obesity Among Adults and Youth: United States, 2015–2016. NCHS Data Brief no.288.
- CDC, 2017b. Overweight and Obesity. Webpage: <https://www.cdc.gov/obesity/> [Accessed 19 October 2017]
- Chan R. and Woo J. 2010. Prevention of Overweight and Obesity: How Effective is the Current Public Health Approach. *International Journal of Environmental Research and Public Health*. 2010;7(3):765-783. doi:10.3390/ijerph7030765.

## References

- Colchero et al. 2015. Preliminary results of the effect of the taxes implemented in Mexico in 2014 on prices. 16 Congreso de Investigación en Salud Pública; National Institute of Public Health, Cuernavaca. 2015.
- Colchero et al. 2016. Beverage purchases from stores in Mexico under the excise tax on sugar sweetened beverages: observational study *BMJ* 2016; 352 doi: <https://doi.org/10.1136/bmj.h6704>
- Cornett, M. 2013. How an obese town lost a million pounds [video online]. Available at: [https://www.ted.com/talks/mick\\_cornett\\_how\\_an\\_obese\\_town\\_lost\\_a\\_million\\_pounds](https://www.ted.com/talks/mick_cornett_how_an_obese_town_lost_a_million_pounds) [Accessed 13 October 2017]
- DH. 2017. Department of Health (UK). Childhood obesity: a plan for action. <https://www.gov.uk/government/publications/childhood-obesity-a-plan-for-action/childhood-obesity-a-plan-for-action>
- Diamond, J. 2003. The double puzzle of diabetes. *Nature* 423, 599-602.
- Dinsa G. et al. 2017. Obesity and Socioeconomic Status in Developing Countries: A Systematic Review. *Obesity Reviews* 13.11 (2012): 1067–1079. PMC. Web. 7 Nov. 2017.
- EEN, 2011. EPODE European Network. 'Preventing childhood obesity'. EPODE European Network recommendations
- EIN, 2016. EPODE International Network. Information sheet. Available: <http://www.fao.org/fsnforum/sites/default/files/discussions/contributions/EIN%20EPODE%20information%20sheet%20June%202016.pdf>
- ELO, 2015. ELO Foundation for the Promotion of Finnish Food Culture. <http://www.elo-saatio.fi/finnish-free-school-meals>
- Falbe J. 2016. Impact of the Berkeley Excise Tax on Sugar-Sweetened Beverage Consumption. *Am J Public Health*. 2016;106: 1865–1871.
- Frantti-Malinen U, 2017. Overcoming obesity - wellbeing from healthy nutrition and physical activity. SlideShare available: <https://www.slideshare.net/THLfi/ulla-franttimalinen-overcoming-obesity-welbeing-from-healthy-nutrition-and-physical-activity>
- Galvin, 2017. U. S. News. Oklahoma City's Renaissance <https://www.usnews.com/news/healthiest-communities/articles/2017-11-01/oklahoma-citys-road-from-fat-to-fit>
- Gerrard, B. 2018. Telegraph Article: Coca-Cola launches three new drinks ahead of UK sugar tax. <https://www.telegraph.co.uk/business/2018/01/29/coca-cola-launches-three-new-drinks-ahead-uk-sugar-tax/>
- Gómez S. et al, 2015. Thao-Child Health Programme: community based intervention for healthy lifestyles promotion to children and families: results of a cohort study. *Nutr Hosp*. 2015;32(6):2584-2587
- Harlan C. 2013. On Japan's school lunch menu: A healthy meal, made from scratch. Available: <http://wapo.st/2iklgi1> [Accessed 31.10.17]
- Health Foundation, 2017. Healthy lives for people in the UK. Strategic plan.
- Health Select Committee, 2017. House of Commons Health Committee Childhood obesity: follow-up Seventh Report of Session 2016–17. Available: <https://publications.parliament.uk/pa/cm201617/cmselect/cmhealth/928/928.pdf>
- HM Revenue & Customs, 2017. Soft Drinks Industry Levy. Updated 22 January 2018. <https://www.gov.uk/guidance/soft-drinks-industry-levy>

## References

- Imamura, F. et al. 2015. Dietary quality among men and women in 187 countries in 1990 and 2010: a systematic assessment. *The Lancet Global Health*, Volume 3, Issue 3, e132 – e142
- James M. & Beer G. 2014. Careless Eating Costs Lives. 2020health. Available: <http://www.2020health.org/2020health/Publications/Publications-2014/CarelessEatingCostsLives.html>
- Jones, N. et al. 2014. The Growing Price Gap between More and Less Healthy Foods: Analysis of a Novel Longitudinal UK Dataset. *PLoS ONE* 9(10): e109343.
- Kimball, M. 2012. Oklahoma City loses 1 million pounds. NewsOK. 13 January 2012. <http://newsok.com/article/3639842>
- Knapton, S. 2017. Child obesity crisis will get far worse without tougher measures, warn MPs <https://www.telegraph.co.uk/science/2017/03/26/child-obesity-crisis-will-get-far-worse-without-tougher-measures/>
- Kohri T. et al. 2016. Effects of the National School Lunch Program on Bone Growth in Japanese Elementary School Children. *NLM. Journal of nutritional science and vitaminology* 62.5: 303-309. (2016)
- Leber J. 2014. This City Lost 1 million pounds – now it's redesigning itself to keep them off. Fast Company. 24th September 2014. <https://www.fastcompany.com/3035899/this-city-lost-1-million-pounds-now-its-redesigning-itself-to-keep-them-off>
- Lindberg N, et al. 2013. Weight-Loss Interventions for Hispanic Populations: The Role of Culture. *Journal of Obesity*. Volume 2013 (2013), Article ID 542736. <http://dx.doi.org/10.1155/2013/542736>
- Ling C. and Groop L. 2009. Epigenetics: A Molecular Link Between Environmental Factors and Type 2 Diabetes. *Diabetes* December 2009 vol. 58 no. 12 2718-2725
- Mantziki et al. 2014. Promoting health equity in European children: Design and methodology of the prospective EPHE (Epoque for the Promotion of Health Equity) evaluation study. *BMC Public Health* 2014, 14:303
- Martorell, R. and Zongrone, A. 2012. Intergenerational Influences on Child Growth and Undernutrition. *Paediatric and Perinatal Epidemiology*, 26: 302–314. doi:10.1111/j.1365-3016.2012.01298.x
- Moffat T, Thrasher D. 2016. School meal programs and their potential to operate as school-based obesity prevention and nutrition interventions: case studies from France and Japan Moffat, Tina ; Thrasher, Danielle. *Critical Public Health* 26.2 (Mar 14, 2016): 133-146.
- Mori, N. et al. (2012). Walking to School in Japan and Childhood Obesity Prevention: New Lessons From an Old Policy. *American Journal of Public Health*, 102(11), 2068–2073. <http://doi.org/10.2105/AJPH.2012.300913>
- MSAH, 2010. Ministry of Social Affairs and Health (MSAH), Finland, December 2010. English translation available at: <http://www.finlex.fi/en/laki/kaannokset/2010/en20101326.pdf>
- Nakano, T. et al. 2010. Tracking overweight and obesity in Japanese children; a six years longitudinal study. *J Med Invest*. 2010 Feb;57(1-2):114-23.
- Napier A. et al. 2014. The Lancet Commission on Culture and Health. *The Lancet*, Volume 384, Issue 9954, 1607 - 1639
- NCMP, 2017. National Child Measurement Programme England, 2016/17 school year.



## References

- NEA, nd. National Education Association (USA). Recess Before Lunch. Web article: <http://www.nea.org/home/43158.htm> [Accessed 16.10.17]
- Neel JV. 1962. "Diabetes Mellitus: A "Thrifty" Genotype Rendered Detrimental by "Progress"?". *Am. J. Hum. Genet.* 14 (4): 353–62. PMC 1932342 Freely accessible. PMID 13937884.
- NHDHHS, 2010. New Hampshire Department of Health and Human Services 2008/09. New Hampshire Third Grade Healthy Smiles – Healthy Growth Survey: 2008-09. Available: <https://www.dhhs.nh.gov/dphs/nhp/documents/thirdgradeoralhealth.pdf>
- NHDHHS, 2014. New Hampshire Department of Health and Human Services 2013/14. Available: <https://www.dhhs.nh.gov/dphs/bchs/oral/documents/thirdgradesurvey2014.pdf>
- NHS Digital, November 2016. National Child Measurement Programme England, 2015/16 school year
- NICE, 2015. Clinical knowledge summaries: Obesity. Available: <https://cks.nice.org.uk/obesity#!topicsummary>
- O'Connor et al. 2017. Screening for Obesity and Intervention for Weight Management in Children and Adolescents: Evidence Report and Systematic Review for the US Preventive Services Task Force. *Jama* Volume 317 Issue 23.
- OECD, 2009. Health at a glance. Overweight and obesity among adults. [www.oecd.org/health/health-systems/44117530.pdf](http://www.oecd.org/health/health-systems/44117530.pdf)
- OECD, 2014. Obesity Update, 2014. Available: <http://www.oecd.org/health/Obesity-Update-2014.pdf> [Accessed 31.10.17]
- OECD 2017a. Overweight or obese population (indicator). doi: 10.1787/86583552-en [Accessed on various dates during October 2017]
- OECD, 2017b. Obesity Update 2017. <http://www.oecd.org/els/health-systems/Obesity-Update-2017.pdf>
- Ogden C et al. 2014. Prevalence of Childhood and Adult Obesity in the United States, 2011–2012. *JAMA.* 2014;311(8):806–814. doi:10.1001/jama.2014.732
- Olds T, Maher C, Zumin S, et al. Evidence that the prevalence of childhood overweight is plateauing: data from nine countries. *Int J Pediatr Obes* 2011;6:342–60. doi:10.3109/17477166.2011.605895
- ONS. 2011. Office for National Statistics, 2011 Census. Available: <https://www.ons.gov.uk/census/2011census>
- Parkhurst A. 2015. Fat Chance? Exploring the evidence on who becomes obese. 2020health. Available: <http://www.2020health.org/2020health/Publications/Publications-2015/Fat-chance.html>
- PHE, 2017. Public Health England: Sugar reduction and wider reformulation programme: interim review. 14 September, 2017. Available: <https://www.gov.uk/government/publications/sugar-reduction-and-wider-reformulation-interim-review/sugar-reduction-and-wider-reformulation-programme-interim-review>
- PIIF. 2015. Public Interest Incorporated Foundation. Japan Association for Improving School Lunch, 2015. <http://www.gakkyu.or.jp/overview/pdf/SUKOYAKA-SLE.pdf> [Accessed 29 September, 2017]
- Pike, K.M. & Borovoy, A. 2004. The Rise of Eating Disorders in Japan: Issues of Culture and Limitations of the Model of "westernization" *Cult Med Psychiatry* 28: 493. <https://doi.org/10.1007/s11013-004-1066-6>



## References

- PRNewswire. 2017. PR Newswire article. The Wa-Shokuiku Pilot Programme: Learn. Cook. Eat Japanese! Available: <http://prn.to/2z4U0zt> [Accessed 11.10.17]
- Randall, SC. 2011. Fat and fertility, mobility and slaves: long-term perspectives on Tuareg obesity and reproduction. In: Unnithan-Kumar, M and Tremayne, S, (eds.): *Fatness and the maternal body: women's experiences of corporeality and the shaping of social policy.* (pp. 43-70). Berghahn: Oxford.
- Roberts K. 2015. Growing up not out: The HENRY approach to preventing childhood obesity. *British Journal of Obesity* 1: 87–92
- Robertson A. et al. 2007. Obesity and socioeconomic groups in Europe: Evidence review and implications for action (available at: [http://ec.europa.eu/health/ph\\_determinants/life\\_style/nutrition/documents/ev20081028\\_rep\\_en.pdf](http://ec.europa.eu/health/ph_determinants/life_style/nutrition/documents/ev20081028_rep_en.pdf)) 2007.
- Rohlen, T. and LeTendre, G. 1996. *Teaching and Learning in Japan.* Cambridge: Cambridge University Press.
- Rurik, I. et al. 2013 A public health threat in Hungary: obesity, 2013. *BMC Public Health.* 2014;14:798. doi:10.1186/1471-2458-14-798.
- Rurik, I. et al. 2016. Obese Hungary. Trend and prevalence of overweight and obesity in Hungary, 2015. *Orvosi Hetilap,* 157(31), 1248-55. doi:<http://dx.doi.org.rsm.idm.oclc.org/10.1556/650.2016.30389>
- SACN, 2015. Scientific Advisory Committee on Nutrition's (SACN's) carbohydrates and health, 2015. Available: [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/445503/SACN\\_Carbohydrates\\_and\\_Health.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/445503/SACN_Carbohydrates_and_Health.pdf)
- Showley, R, 2016. San Diego Union-Tribune. Article: Taxing sugary drinks: Good for health and city budgets? Available: <http://www.sandiegouniontribune.com/business/economy/sdut-econometer-soda-tax-2016jun27-story.html>
- Sifferlin, A. 2017. Do soda taxes really work? *Time Magazine,* April 18, 2017 Available: <http://time.com/4743286/berkeley-soda-tax/>
- Smith, Kyla L et al. 2017. "Barriers and Enablers for Participation in Healthy Lifestyle Programs by Adolescents Who Are Overweight: A Qualitative Study of the Opinions of Adolescents, Their Parents and Community Stakeholders." *BMC Pediatrics* 14 (2014): 53. PMC. Web. 1 Nov. 2017.
- Snowdon C. 2015. *Spectator Health.* Article: Denmark's fat tax was a failure — but revisionists are trying to rewrite the story. <https://health.spectator.co.uk/revisionists-are-trying-to-turn-denmarks-failed-fat-tax-into-a-great-success-dont-be-fooled/>
- SoO, 2017a. *The State of Obesity: Better Policies for a Healthier America.* Released August 2017
- SoO, 2017b. *Study of Children ages 10-17.* <https://stateofobesity.org/children1017>
- Taillie L, et al. 2017 Do high vs. low purchasers respond differently to a nonessential energy-dense food tax? Two-year evaluation of Mexico's 8% nonessential food tax. DOI:10.1016/j.jpmed.2017.07.009
- Tanaka N, Miyoshi M. 2012. School lunch program for health promotion among children in Japan. *Asia Pac J Clin Nutr.* 2012;21(1):155-8.
- Tavernise S. 2014 *New York Times.* Article: Obesity Rate for Young Children Plummets 43% in a Decade. Available: <https://www.nytimes.com/2014/02/26/health/obesity-rate-for-young-children-plummets-43-in-a-decade.html> [Accessed 30 October 2017]

## References

- The Times, 2017. GPs told to send obese for lessons in cookery. Available: <https://www.thetimes.co.uk/article/gps-told-to-send-obese-for-lessons-in-cookery-jlplmp6cs> [Accessed 28.10.17]
- Van Koperen, T.M. et al. 2013. Characterizing the EPODE logic model: unraveling the past and informing the future. *Obesity Reviews*, 14, 162-170.
- Verza, María, 2013. The “Coca-Colization” of Mexico, the Spark of Obesity. Article. Available: <http://english.periodismohumano.com/2013/03/05/the-coca-colization-of-mexico-the-spark-of-obesity/> [Accessed 29.10.17]
- Vinck, J. et al. 2016. Downward trends in the prevalence of childhood overweight in two pilot towns taking part in the VIASANO community-based programme in Belgium: Data from a national school health monitoring system. *Pediatric Obesity*, 11(1), 61-67.
- Wang et al., 2015. What childhood obesity prevention programmes work? A systematic review and meta-analysis. *Obes Rev.* 2015 July ; 16(7): 547–565. doi:10.1111/obr.12277.
- Watson K., Treanor S. 2016. The Mexicans dying for a fizzy drink. *BBC online Magazine*, 2 February 2016. Available: <http://www.bbc.co.uk/news/magazine-35461270>
- Wen X, et al. 2012. Decreasing prevalence of obesity among young children in Massachusetts from 2004 to 2008. *Pediatrics* 2012;129:823–31.
- WHO, 2012. Population-based approaches to childhood obesity prevention
- WHO, 2014. Health in all policies. Available: <http://www.who.int/healthpromotion/frameworkforcountryaction/en/>
- WHO, 2015a. Fiscal Policies for Diet and Prevention of Noncommunicable Diseases. Technical meeting report.
- WHO, 2015b. Good Practice Brief, 2015. Public Health Product Tax in Hungary: An example of successful intersectoral action using a fiscal tool to promote healthier food choices and raise revenues for public health
- WHO, 2015c. Assessment of the impact of a public health product tax - WHO/Europe; Budapest, Nov 2015
- WHO, 2015d. Finland curbs childhood obesity by integrating health in all policies <http://www.who.int/features/2015/finland-health-in-all-policies/en/> [Accessed 16.10.17]
- WHO 2016. WHO urges global action to curtail consumption and health impacts of sugary drinks <http://www.who.int/mediacentre/news/releases/2016/curtail-sugary-drinks/en/>
- Wright et al. 2017. Policy lessons from health taxes: a systematic review of empirical studies. *BMC Public Health* (2017) 17:583
- Wylie-Rosett J. & Jhangiani S. 2015. Obesity and Disease in an Interconnected World: A Systems Approach to Turn Huge Challenges into Amazing Opportunities [e-book]
- Yamagishi, K., & Iso, H. (2017). The criteria for metabolic syndrome and the national health screening and education system in Japan. *Epidemiology and Health*, 39, e2017003. <http://doi.org/10.4178/epih.e2017003>
- Yates-Doerr, Emily. 2014. Obesity Science and Health Translations in Guatemala: Engagement in Practice. *Anthropology Now*. Vol. 6, No. 1 (April 2014), pp. 3-14
- Yoshinaga, M. et al. 2010. Prevalence of childhood obesity from 1978 to 2007 in Japan. *Paediatrics international : official journal of the Japan Paediatric Society* 52.2: 213-7.

# 2020health's mission

## Making health personal

2020health is an independent, social enterprise think tank whose mission is to "Make Health Personal"- giving people the information, understanding and confidence to take a meaningful role in their health and wellbeing, and creating the conditions for a healthy society.

Recent work includes "The Foresight Project Report", for the UK optical sector; "Learning from Connections: Lessons from the NHS-VHA Leadership Exchange on the adoption of digital health"; "Head of Wellbeing: An essential post for secondary schools?" and "Whole in One: Achieving equality of status, access and resources for people with depression".

### Endorsements of 2020health's work

#### **The Fear of Finding Out: identifying psychological barriers to symptom presentation and diagnosis in the UK (2017) [in partnership with Abbvie]**

*"With 15 million people living with a long-term health condition, there are huge implications to delaying seeking medical advice. Delayed diagnosis means more complicated and costly treatment and can ultimately lead to more deaths. In today's ageing society it has never been more important to address the barriers preventing people from accessing medical support."*

#### **The Rt. Hon. Alan Milburn Former Secretary of State for Health**

*"We're increasingly seeing evidence which shows that people respond far better to positive health messages, which in turn means they are more likely to engage with the health service. I'm a firm believer that healthcare is what you do for yourself and through the work we're doing with Live:LabTM, we're hoping to devise a solution which will help people feel empowered and in control of their health and wellbeing."*

#### **Prof Sir Muir Gray, Director, Better Value Healthcare Consultant in Public Health in Oxford University Hospital NHS Trust**

#### **Head of Wellbeing: An essential post for secondary schools? (2015)**

*"The central recommendation of the recent parliamentary Health Committee inquiry into Children and Adolescents' Mental Health Services, was the value of investing in prevention and early intervention for mental illness in young people. I welcome this thoughtful report and support the proposal to pilot Heads of Wellbeing within secondary schools and to explore their potential to improve wellbeing across the whole school community."*

#### **Dr Sarah Wollaston MP Chairman, Health Select Committee**

*"This report begins to form an evidence base about an issue rarely high up the national agenda - the wellbeing of pupils and staff. As such, it makes a valuable contribution to this debate and raises issues that teachers and school leaders will want to consider."*

#### **Baroness Morris of Yardley Former Secretary of State for Education**

2020health.org  
1st Floor, Devon House, 171-177 Great Portland Street,  
London W1W 5PQ T 077 2020 6910 E admin@2020health.org

Published by  
2020health.org  
© 2018 2020health

ISBN 978-1-907635-63-2



9 781907 635632 >