



Too little, Too late?

Reducing Childhood Obesity

A Global Review

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Governments worldwide are increasingly seeking to tackle childhood obesity

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EXECUTIVE SUMMARY

Childhood obesity is a global challenge, which governments worldwide are increasingly seeking to tackle, in particular through national policies and initiatives to encourage healthier diets or more physical activity. These may have slowed the rise in obesity rates but have usually not reduced the prevalence of obesity, suggesting additional measures are needed.

Commercially-driven obesogenic environments have become increasingly pervasive but this has often not been recognised, resulting in policies which are usually too little, too late – initially relying on attempts to change behaviour rather than the environment children are growing up in, then recognising the role the food and beverage industry plays but relying on voluntary action rather than regulation or proposing regulation that doesn't go far enough, sometimes due to food industry lobbying.

However, there is promising evidence of community-based interventions which recognise the complex range of factors contributing to the rise in obesity and seek to mobilise the strengths and resources of a range of local stakeholders (usually with national or municipal coordination and support) in a range of local environments (home, school and community). The best examples are probably:

- Ensemble, Prévenons l'Obésité Des Enfants (EPODE) in France, which saw reductions in child obesity of up to 25% in some communities.
- Jongeren op Gezond Gewicht (JOGG) in the Netherlands, which reduced the prevalence of overweight in 29 municipalities.

However, community-based approaches have limited influence over wider aspects of obesogenic environments, such as underlying socio-economic inequalities, the national advertising of highly processed food, or increases in the cost of healthy food. These and other factors often require government action.

Some school-based initiatives have also achieved reductions in body weight. However, they have been vulnerable when funding has been cut. They usually also have limited influence over the wider socio-economic and food industry factors influencing weight.

Governments can learn from the relative success of France and the Netherlands, where the prevalence of childhood overweight and obesity has fallen, including in deprived areas where the problems are usually greatest. Relevant factors here include:

- An early commitment to developing and implementing national obesity plans
- Not relying purely on encouraging individual health behaviour change
- A willingness to tackle obesogenic environments and the role of the food industry
- Unusually extensive and sustained community-based whole systems approaches

This report therefore recommends that governments adopt a pro-active and sustained top-down and bottom-up approach to tackling childhood obesity, with a particular focus on enabling children to grow up in a less obesogenic environment.

INTRODUCTION

Globally, childhood obesity has become a major public health concern. Prevalence of overweight and obesity among children and adolescents aged 5-19 years rose from 4% to 20% between 1975 and 2022. (1) Childhood obesity has increased in every region of the world, with the proportional rise greatest in southern Africa (around 400% per decade) and smallest in high income countries (averaging 30-50% per decade). (2) In 2022, obesity in school-aged children and adolescents was more prevalent than thinness among girls in 133 countries (67%) and boys in 125 countries (63%). (3)

Figure 1 provides an overview of the rise in child obesity by World Health Organisation (WHO) region. However, there are sometimes significant variations within continents. For example, childhood obesity is more than twice as prevalent in the United States as in Guatemala or Colombia.

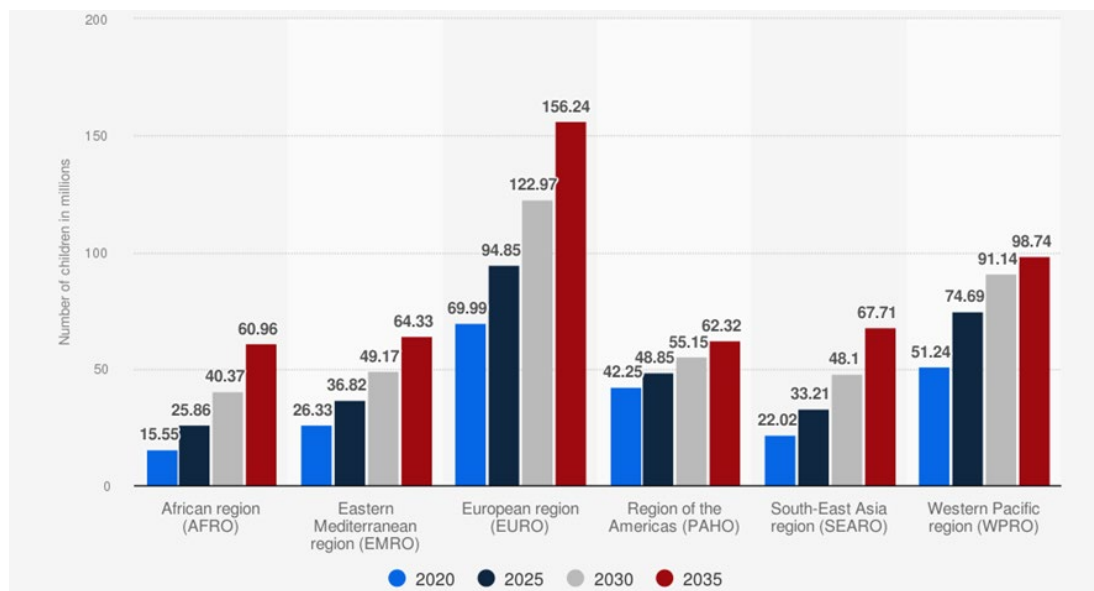


Figure 1: Number of children under 20 years worldwide who were living with obesity (by millions) in 2020 and forecasts to 2035 by WHO region. World Obesity Federation.

CAUSES AND CONSEQUENCES OF OBESITY

Human physiology and psychology are unlikely to have changed significantly in a few generations. However, the environment children are growing up in clearly has. There has been a global rise in the availability, accessibility and affordability of energy-dense, high fat, salt and sugary foods (HFSS), coupled with decreasingly active lifestyles. Over recent decades, environmental changes and technological advancements have led to increased consumption of HFSS foods and beverages, increased use of electronic devices, disruption of the sleep-wake cycle and reduced physical activity. (4,5) This suggests an increasingly obesogenic environment is the primary driver for obesity, in particular for children living in deprived areas. In addition, early life factors, such as maternal overweight, maternal smoking during pregnancy, high birth weight, early introduction of solid food, and rapid infant weight gain, are also significant risk factors for childhood obesity. (6) On the other hand, breastfeeding has been shown to have a protective effect against obesity. (7)

The Covid-19 pandemic had significant impact on obesity levels. School closures and orders to stay indoors led to reduced physical activity, increased screen time and changes in sleep schedules. Eating habits were also negatively impacted. For example, in the UK, obesity among children aged 4-5 years rose from 10% to 14% during the pandemic and among children aged 10-11 years, from 35% to 41%. (8) Whilst rates have returned to expected levels for the younger age group, the rate was higher than the pre-pandemic trend in the older age group.

Obesity poses many significant physical health risks, including cardiovascular disease, Type 2 diabetes, and is linked to at least 13 types of cancer. (9) Children with obesity and overweight are five times more likely to develop obesity in adulthood. (10) Alongside poorer quality of life and premature death from associated conditions, children who are overweight are likely to experience poorer mental health from bullying, low self-esteem, depression and social isolation. (11) Moreso, the economic costs of childhood overweight and obesity are significant. One study found the increase in overweight and obesity prevalence in 10-11-year-olds alone could cost the NHS £800 million, and the cost to wider society could be at least £8.7 billion. (8)

Obesity is a classic example of prevention being better than cure. Less than 3% of adults with obesity currently achieve a healthy weight over a ten-year period, confirming the importance of action to prevent children and young people becoming obese in the first place. (12)

GLOBAL PATTERNS

Socioeconomic status is a strong predictor of obesity. In high income countries, the association between socioeconomic disparities and obesity is widely evident, with children from the lowest socioeconomic groups and disadvantaged areas more likely to be overweight than children from less deprived areas. This may be partly due to food high in sugar, salt and fat being more affordable, more accessible and more convenient. However, the opposite is typically observed in low-middle income countries (LMICs), whereby obesity is more commonly observed among children from higher socioeconomic backgrounds. This is largely a result of rapid urbanisation and nutrition transition, coupled with aspirations to adopt westernised lifestyles. The growing burden of obesity poses further challenge, however, in countries facing existing problems of undernutrition.

The Middle Eastern countries, including Kuwait, the United Arab Emirates (UAE), Qatar, Bahrain, the Kingdom of Saudi Arabia, and Oman have among the highest childhood obesity rates globally, with countries such as Kuwait, Qatar, Bahrain and UAE seeing almost half of all children and adolescents overweight or with obesity (49.4%, 42.7%, 38.6% and 38.4%, respectively). (13) Discovery of oil in the middle of the 20th century led to rapid socioeconomic development and epidemiologic transition. This has been accompanied by rapid increases in household income and associated lifestyle changes, including reduced physical activity and increased consumption of HFSS foods. (14) Another factor is the extreme outdoor temperatures in the Gulf countries that create lack of forestation and vegetation, resulting in many remaining indoors and use of cars to travel short distances. There is also the perception among some parents that overweight a sign of higher social status, beauty, fertility, and prosperity. (15)

Figure 2 presents global overweight prevalence among children and adolescents aged 5-19 years in 2022. (16)

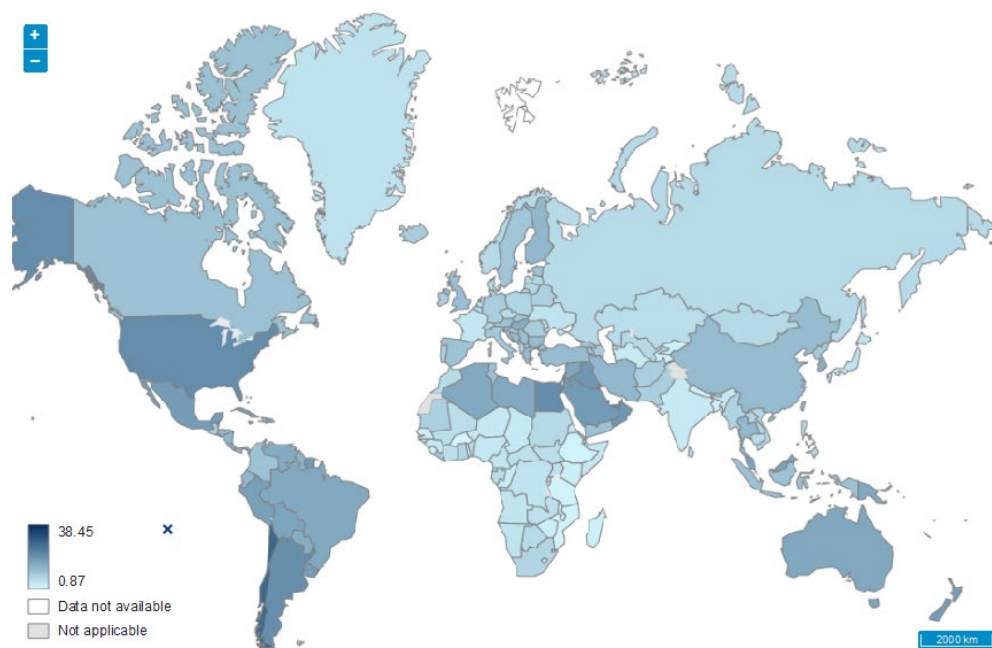


Figure 2: Global prevalence of obesity (BMI > +2 standard deviations above the median) among children and adolescents (5-19yrs), 2022. WHO Global Health Observatory

GLOBAL ACTIONS AND TARGETS

Action on obesity has been recognised as an urgent priority by WHO for many years, although, as of 2024, no country is on track to meet global targets to halt the rise in obesity. The 2016 WHO Commission on Ending Childhood Obesity outlined comprehensive recommendations to address childhood obesity, including multi-sectoral, multi-faceted approaches to prevention. (17) As part of this, community-wide interventions, involving community capacity building and engagement with population-level obesity prevention strategies, have been recognized as promising in achieving modest reductions in population weight gain among children.

At the 75th World Health Assembly in 2022, Member States demanded and adopted new recommendations for the prevention and management of obesity, endorsing the WHO Acceleration plan to stop obesity. (18) A focus on multi-sectoral actions across the life course promoting environmental changes, such as food marketing and pricing, and addressing wider determinants of health, such as poverty and urban planning, are most likely to be successful in halting the rise in child obesity. Obesity interventions seen to be effective in front runner countries include:

- Targeting early food environments
- School nutrition policies
- Fiscal measures, such as a sugar sweetened beverage tax
- Standards, legislation and regulation, including marketing of HFSS products
- Social marketing and communication
- Physical activity

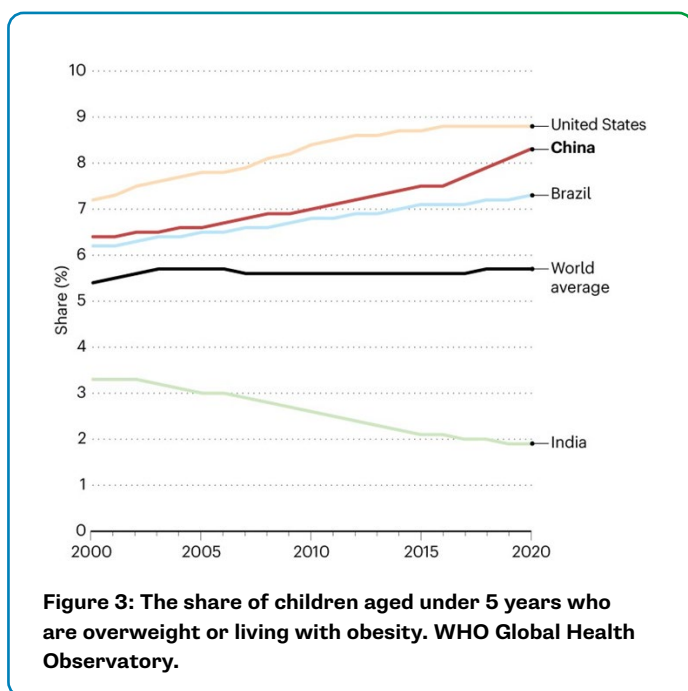
This report provides case studies of what has worked internationally in preventing or reducing obesity and lessons for learning.



ASIA

CHINA

China was once considered to have one of the leanest populations in the world. However, the incidence of obesity among school-age children in China has risen from 15.5% in 2010 to 29.4% in 2022. (19) A 2% annual growth rate in the number of children with high BMI is estimated between 2020-35. (20) Figure 3 illustrates the increasing share of children under 5 years in China who are overweight or living with obesity. Rapid economic growth, urbanization and migration has contributed to a change in lifestyles. For example, the urban population has increased from 19.4% to 65.2% between 1980 and 2022. (21) Traditional Chinese diets have also shifted towards refined grains, animal-based foods and highly processed foods. (22)



The Chinese government have implemented a number of public health measures to address overweight and obesity, such as (23):

1. National nutrition plan 2017-2030
2. National Healthy Lifestyle Action Plan (2017-2025)
3. Healthy China 2030
4. Physical activity guidelines (Chinese Physical Activity Guidelines, Sunshine Sports programme)
5. Nutrition and school-based interventions (such as China Student Nutrition Day, National Nutrition Campus Programme, Nutrition and Health Action for Early Life 1000 Days, Student

Nutrition Improvement Action, Student Health Education Action, and Healthy Children Action Plan 2018-2020).

In 2020, China launched a strategic plan for controlling and preventing obesity in children and adolescents, with ambition to reduce the annual growth rate of childhood overweight and obesity from 2020-2030 by 70% compared to 2002-2017. The plan requires primary and secondary schools to engage in at least three hours of high-intensity physical activity per week and emphasises the importance of healthy diets and physical activity. It also highlights the responsibilities of parents, schools, medical institutions, and the government. In 2021, the State Council issued the China Children Development Program (2021-2030), and in 2022, the Expert Consensus on the Diagnostic Assessment and Management of Childhood Obesity in China (2022) was published. (24,25)

The China Blue Paper on Obesity Prevention and Control proposed the following recommendations (26):

- Make government responsible and enhance cross-sector collaboration. This includes integrating obesity prevention and control into government mandates and the day-to-day work of relevant government agencies and authorities, improving and completing the nutrition policy system, and fostering the training of nutritional experts and professionals.
- Make better use of health professionals' institutions to promote large-scale, population-level educational programmes and campaigns; to provide individual-level counselling and guidance on obesity prevention, control, and treatment; to implement 360°, multilevel, multicomponent, and multisector prevention and intervention programmes and related research; and to develop and improving surveillance systems at national and local levels.
- Engage families and individuals in obesity prevention and control by making individuals accountable for their health.
- Reduce obesogenic environments by establishing and improving regulations and policies on fast food expansion, marketing, food labelling, and nutrition education; establishing and improving regulations and policies on food storage and restaurant and food wholesale surveillance and management; encouraging healthy food supply and choices in the workplace; improving the school environment; improving land use planning; encouraging public transportation; improving built environments that encourage physical activity; ensuring protected time for adequate physical activity at school; and changing social norms and culture regarding healthy weight and energy balance behaviours through social marketing, traditional mass media, social media, etc.
- Improve obesity treatment by standardising clinical guidelines, practice, and services; enhancing professional training in obesity diagnosis, prevention, and treatment; and promoting self-management of overweight and obese patients.
- Reform health insurance policies to facilitate obesity prevention and treatment.

This is an ambitious suite of proposals. However, how far they will be implemented remains to be seen. There are also indications that the economic problems China is currently experiencing may further increase obesity rates. Reuters reports, 'China is facing a twin challenge that feeds its weight problem: In a modernising economy

underpinned by technological innovation, more jobs have become static or desk-bound, while a prolonged slow-down in growth is forcing people to adopt cheaper, unhealthy diets'. (27)

A recent modelling study indicated that national implementation of five interventions in China (20% excise tax on sugar-sweetened beverages; e-Health breastfeeding promotion through text messages to pregnant women; reductions on marketing unhealthy foods to children and adolescents; combined school interventions and nutrition counselling by physicians) would avert 179.4 million disability adjusted life years (DALYs) and result in CNY 13.1trillion of benefits over the model cohort's lifetime. (28) Implementing fiscal and regulatory policies had the strongest return on investment, with benefits accruing at least 10 years after implementation.

Prevention of child obesity

A 2012-2014 community-based physical activity programme targeting 10,447 children in 4-7th grade across 8 urban districts in Nanjing, China, saw promising results on obesity prevention. (29) The multi-component programme, consisting of school-based interventions and family involvement, was integrated into the routine and normal academic educational system, with support from multilevel stakeholders. Evaluation of the programme found 30% lower risk of new obesity cases among those who took part in the programme and a larger proportion of formerly overweight/obese students having normal weight by study end. (29) The intervention provided many learning opportunities, including that the intervention was feasible and effective in promoting physical activity and preventing obesity among the general student population in a large city in China. Intervention components were delivered to participants without interference in schools' curriculum and academic programmes, with neither complaints nor adverse events reported by students or school staff).

This pilot project raises an interesting question. Was the approach continued in Nanjing and/or was it adopted elsewhere? If so, this suggests a positive model to build on. If not, it illustrates a potential weakness of short-term interventions, which needs to be considered in national obesity plans.

China was also the location of the Chirpy Dragon project (The Chinese Primary School Children Physical Activity and Dietary Behaviour Changes Intervention). (30) A small project team promoted physical activity and healthy eating behaviours through educational and practical workshops, family activities, and supporting the school to improve physical activity and food provision. Researchers concluded this school- and family-based obesity prevention programme was effective and highly cost effective in reducing BMI z scores in primary-school-aged children in China, although more so in girls than boys.

SINGAPORE

Reduction in child obesity

In Singapore the Trim and Fit initiative for children aged 5 – 18, achieved obesity reduction from 16.6% to 14.6% and from 15.5% to 13.1% among 11-12 and 15-16yr olds, respectively. (32) The programme included:

- Integrating nutrition education into the formal school curriculum.
- Controlling the food and drinks sold in school canteens
- Encouraging children to drink plain water by installing water-coolers in the schools in order to give children free access to a good alternative to cold soft drinks from vending machines.
- Annual trim and fit awards to schools achieving good health outcomes.
- Special attention given to students found to be overweight, including participation in special physical exercise programmes, and the reinforcement of messages on healthier nutrition choices.
- Targeting children in the community programmes that promote healthy lifestyle habits in families

INDIA

Reduction in child obesity

In a district in Southern India a small, a school-based intervention reduced mean BMI among the control group and also improved the lifestyle practices and self-esteem of obese children. (31) The intervention consisted of educating children with obesity on lifestyle modification, educating their parents, and increasing the children's physical education activity through aerobics under the supervision of physical education teacher.



AFRICA

SOUTH AFRICA

South Africa is among one of the countries with the highest prevalence of child obesity in Africa. Approximately 13% of children under five years and 18% of children aged 5-17 years are overweight or living with obesity. (33) The National Strategic Plan for the Prevention and Control of Non-Communicable Diseases 2022-2027 features a deliverable to undertake regular screening and awareness campaigns on obesity among children and adults.

Over recent years, the South African government has launched a number of policies to help address child obesity:

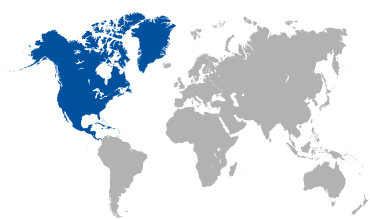
- The sugary beverage levy was introduced in 2018, applying to drinks with more than 4g of sugar per 100ml
- South Africa Pledge on Marketing to Children – companies publicly commit to restrictions on marketing to children under 12 years with a view to promoting healthy dietary choices and healthy lifestyles.

Reduction in child obesity

In 2011, a pilot school breakfast programme was launched in six schools (five primary and one combined school) in Alexandra - one of the poorest areas in Johannesburg, South Africa. The breakfast club was a partnership between government and the private sector in addressing child hunger and investing in human capital development. (34) Evaluation of the programme found improvement in height-for-age and BMI-for-age measurements across all schools. (34) The programme also encouraged school attendance, reduced late coming, and improved concentration in class. It appeared that having breakfast promoted physical activity, with teachers subjectively observing changes in children's levels of activity.

Other interventions to reduce child obesity

HealthKick was a nutrition and physical activity intervention implemented in primary schools across low-income communities in the Western Cape Province of South Africa. (35) The intervention aimed to promote healthful eating habits and increase regular physical activity among children, parents and teachers to prevent overweight, and reduce risk of Type 2 diabetes, alongside promoting environments conducive of healthy lifestyles within the school and community. Evaluation observed that targeting individuals and the school environment did not achieve significant results, as the intervention did not significantly improve children's diet quality or physical fitness. (36) It is thought that the intervention's model applied in low-income settings may not have been effective where schools, children and families are dealing with daily issues of poverty. The intervention also highlighted the importance of engaging and targeting parents also.



NORTH AMERICA

CANADA

Between 1978 and 2017, overweight and obesity among children aged 2-17 years increased from 15% to 30%. (37) The latest data now shows 27.5% of Canadian children 5-17 years are overweight or living with obesity. (38)

In response to the childhood obesity epidemic, a Federal, Provincial and Territorial Framework for action was developed to promote healthy weights among children under 18 years in Canada (37), based on three main strategies:

1. Making childhood overweight and obesity a collective priority for action
2. Coordinating three policy priorities:
 - supportive social and physical environments for physical activity and healthy eating
 - early identification and action for overweight/obese children
3. increasing availability of nutritious foods
4. Measuring and reporting the collective progress

In 2016, Canada published *Obesity in Canada: A Whole-of-Society Approach for a Healthier Canada*. The report provides a list of 21 recommendations, including:

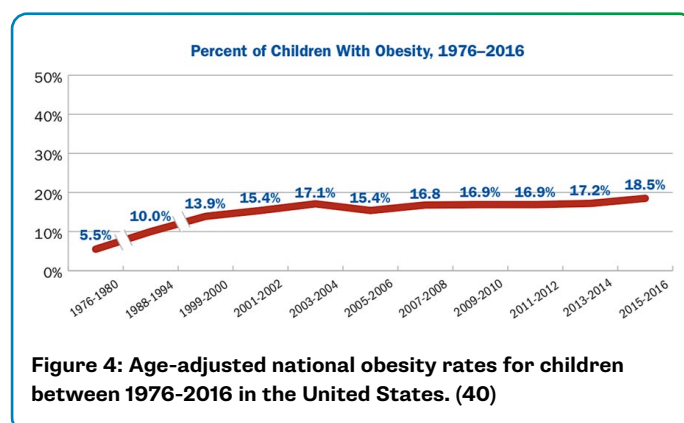
- a ban on advertising food and drink to children
- a potential tax on sugar-sweetened beverages
- a ban on partially hydrogenated oils to minimize trans-fat content in food
- a review of nutrition food labelling
- nutrition labelling on menus
- a public awareness campaign on healthy eating
- a plan for making healthy food more affordable
- promotion of the Canadian Physical Activity Guidelines
- increased funding to ParticipACTION (a non-profit organisation promoting healthy living)
- a public awareness campaign on healthy active lifestyles.

The report was well-intentioned but was subsequently criticised by the Canadian Senate for perpetuating a focus on the individual, thereby failing to recognize the role that governments can play in reducing weight stigma and addressing social determinants of health. It argued that strong science shows the social determinants of health, that is the conditions in which people live, work, learn, and socialize, directly affect health and well-being, and that the powerful negative effects of social exclusion and discrimination cannot be overstated. Research also suggests that societies which have more equitable social determinants of health have better population

health and lower rates of obesity. (39) These are important points, not only for Canada but for countries seeking to reduce obesity internationally.

UNITED STATES OF AMERICA

Childhood obesity has more than tripled in the USA since 1976, from 5.5% to 18.5% in 2015/16 (see Figure 4). (40) From 2017 to March 2020, obesity prevalence was 12.7% among children 2-5 years old, 20.7% among those aged 6-11 years, and 22.2% among adolescents aged 12-19 years. (41) In the USA, obesity is highest in Hispanic children (26.2%) and non-Hispanic Black children (24.8%), followed by non-Hispanic white (16.6%) and non-Hispanic Asian (9.0%) children.



In 1999, the Centre for Disease Control and Prevention (CDC) established the Division of Nutrition, Physical Activity, and Obesity (DNPAO) to address growing obesity and chronic disease rates. CDC-DPAO programmes are based on the 5-level socioecological model, which proposes the interconnected interactions that influence obesity, including intrapersonal, interpersonal, organizational, community and societal factors. Since then, the CDC have published recommended strategies to improve nutrition and physical activity in America, alongside 24 community-based obesity prevention strategies focusing on environmental and policy level change. (11,12)

The following are the current national policies to address the obesity epidemic in America: (44)

Nutrition Assistance Policies

1. Supplemental Nutrition Assistance Program (SNAP) – the nation's largest nutrition assistance program for families not gaining equitable access to affordable food. The program feeds more than 40 million Americans, of which two thirds are children, older adults and people with disabilities.
2. Women, Infants and Children (WIC) Program – this program aids almost 7.3 million low income pregnant, postpartum and breastfeeding women, infants and children up to 5 years of age by providing access to healthy food, nutrition education, breastfeeding promotion, support for nursing mothers and provision of health and social service referrals.
3. Child and Adult Care Food Program – provides state reimbursement to providers supplying nutritious meals and snacks (meeting minimum nutrition standards) to children and adults in their care

4. Health Food Financing Initiative – a public-private partnership providing grants and loans to finance construction and development of grocery stores and other healthy food retailers in ‘food desert’ areas (with no access to grocery stores, supermarkets or farmers markets).

Consumer Information Policies

1. Menu labelling – chain restaurants with more than 20 locations are to provide calorie and nutrition information on menus and menu boards. Retailers with less than 20 location may voluntarily do so
2. Dietary guidelines – the current 2015-2020 dietary guidelines emphasize a combination of nutrient dense foods within meals and moderate saturated fats, added sugar and sodium. The current 2020-2025 guidelines include standards for pregnant women, infants and toddlers. (45)
3. Nutrition facts – from 2020, nutrition labels with a larger font, stating the number of servings, amount and percentage daily value of added sugars, have become mandatory from manufacturers with more than \$10 billion total sales (and from 2021 for all other manufacturers).

School and Early Childhood Policies

1. Head Start – a childhood education program helping to prepare over one million low-income children under 5 to prepare for school by providing education, health and social services. New revised standards require programs to engage in obesity prevention in classrooms and through family partnerships
2. School Meals and Snacks – with over 30 million children participating in the National School Lunch Programme and School Breakfast Programme, nutrition standards for school meal programs have been updated
3. School based physical education – the Comprehensive School Physical Activity Program to encourage children to get the recommended 60 minutes of physical activity daily
4. Safe Routes to School – promotes walking and cycling to and from school by providing communities with resources to build sidewalks, cycle paths, adding crosswalks and improving lighting and signage to ensure safe conditions

Health Coverage and Prevention Policies

1. Medicare, Medicaid and Children’s Health Insurance Program (CHIP)
 - Medicare is a government program for the over 65 years, covering BMI screening and behavioral counselling for patients with obesity, as well as bariatric surgery.
 - Medicaid is a government program aiding more than 67 million low-income Americans and those with disability. 8.2% of Medicaid dollars are spent treating obesity and related conditions, with some states spending more than 20%. For children on Medicaid, states have to cover all medically necessary screenings, diagnostic and treatment services. For adult participants, most states cover at least one obesity-related service such as screening.

- CHIP covers children from low-income families, increasing access to obesity screening, counselling services and referrals to local pediatric weight management programs.

2. Diabetes Prevention Programme- a public-private partnership supporting evidence-based diabetes prevention interventions in communities around the country. The program works to prevent or delay a diagnosis of diabetes and provides participants with practical training on nutrition, physical activity, and weight-control strategies.
3. Prevention and Public Health Fund – a mandatory funding stream to improve public health. Administered by the CDC, the fund supports health initiatives run by states, counties, cities, non-profit organisations and tribal organisations.

Reductions in childhood obesity

Women, Infants and Children Programme

A study found that states implementing the CDC-funded nutrition and physical activity programmes between 2000-2010 had 2.4-3.8% reduction in the odds of obesity among adults compared to states without the programmes. (14) However, the effect of programmes varied by state and duration/length of implementation. From 2010 to 2014, there was a statistically significant decrease in obesity among children 2-4 years participating in WIC, with rates declining from 15.9% to 14.5% nationally and across all racial and ethnic subgroups. (46,47) These reductions were statistically significant in 31 states. The programme has a focus on improving preconception nutrition for women and nutrition for infants, highlighting the importance of this window of opportunity for healthy child growth. The CDC reported the decrease in obesity among the WIC program to have been a result of USDA’s revision of the WIC food package in 2009 (leading to healthier food environments in low-income neighbourhoods), CDC’s Early Childhood Education (ECE) and State Public Health Actions. (48) To further encourage the declining trends, state public health leaders are encouraged to enroll families eligible for WIC. ECE centres serving low-income children are also encouraged to enrol in the Child and Adult Care Food Program to better ensure access and affordability of healthier food and snacks for children.

Unfortunately (with the exception of the WIC programme above) the range of policies outlined appear to have failed to halt the rise in obesity. As a 2024 article in The Lancet observed, ‘existing policies have failed to address overweight and obesity. Without major reform, the forecasted trends will be devastating at the individual and population level, and the associated disease burden and economic costs will continue to escalate. Stronger governance is needed to support and implement a multifaceted whole-system approach to disrupt the structural drivers of overweight and obesity at both national and local levels. Although clinical innovations should be leveraged to treat and manage existing obesity equitably, population-level prevention remains central to any intervention strategies, particularly for children and adolescents.’ (49)

Questions to consider here include:

- How far are existing policies being implemented and monitored?
- Why has there been no national focus on encouraging local, community-based whole systems approaches (of the kind described below)?
- Why has there been a lack of policies addressing the role of the food industry and the products it produces and markets.

Reductions in childhood obesity

As we have seen in other countries, while national policies have often failed to reverse the rise in obesity, local/regional initiatives have sometimes achieved at least a modest reduction in the prevalence of childhood obesity. This is true of the USA as well.

MEND programme in Texas

An intensive, multi-sector project in Texas with a clinical focus was found successful at reducing the weight of overweight/obese children in low-income communities compared to a primary care-centered programme. (50,51) The community-centred Mind, Exercise, Nutrition, Do it (MEND) programme was combined with a Coordinated Approach to Child Health (CATCH) programme, and compared to the primary health care-centred programme Next Steps. MEND/CATCH for children aged 6-12 was more effective at reducing BMI after 3 months (the intensive phase) but not after 12 months (the transition phase) compared to Next Steps. Intervention compliance was inversely associated with change in BMI during the intensive phase. (50) The need for long-term, continued support for low-income families in lifestyle interventions was highlighted for sustained improvements in children's weight.

Other successful interventions

- Anchorage, Alaska achieved a 5.4% decline in overweight and obesity rates amongst children from 2004-2014 through interventions across childcare, school settings and community action plans. (52)
- Healthy Living Cambridge Kids (HLCK) in the US achieved BMI and obesity reductions through a multi-component intervention targeting community, school, family and individuals to mobilise environmental and policy interventions. (53)
- 'Get Healthy Philly' in Philadelphia, an initiative to improve the city's nutrition, physical activity and tobacco environments by making healthy choices easier; achieved a 6.5% reduction in childhood obesity rates for students and greater reductions amongst children from racially and ethnically minoritised ethnic groups. (54)
- New York City (NYC) interventions including food standards, nutrition standards for school meals, daycare regulations and Health Bucks (\$2 coupons used to purchase fresh fruits and vegetables at all NYC farmers markets for every \$5 spent using SNAP) were implemented between 2006-2010, and continued as part of the New York State Prevention Agenda 2012-2018. (55) There were statistically significant reductions in obesity among elementary school children between 2006-2007 (5.5% reduction) and 2010-2011 (20.7% reduction). (56) These changes were found amongst children across all age

and socioeconomic groups. The decline in obesity was smaller among black children (1.9%) and Hispanic children (3.4%) compared to Asian (7.6%) and white (12.5%) children. Health Bucks has increased the availability and accessibility of fresh fruit and vegetables in low-income areas throughout the city. All policies were reinforced at state and local level, helping to ensure the strategies were implemented across all areas of the city and the harder-to-reach children also exposed.

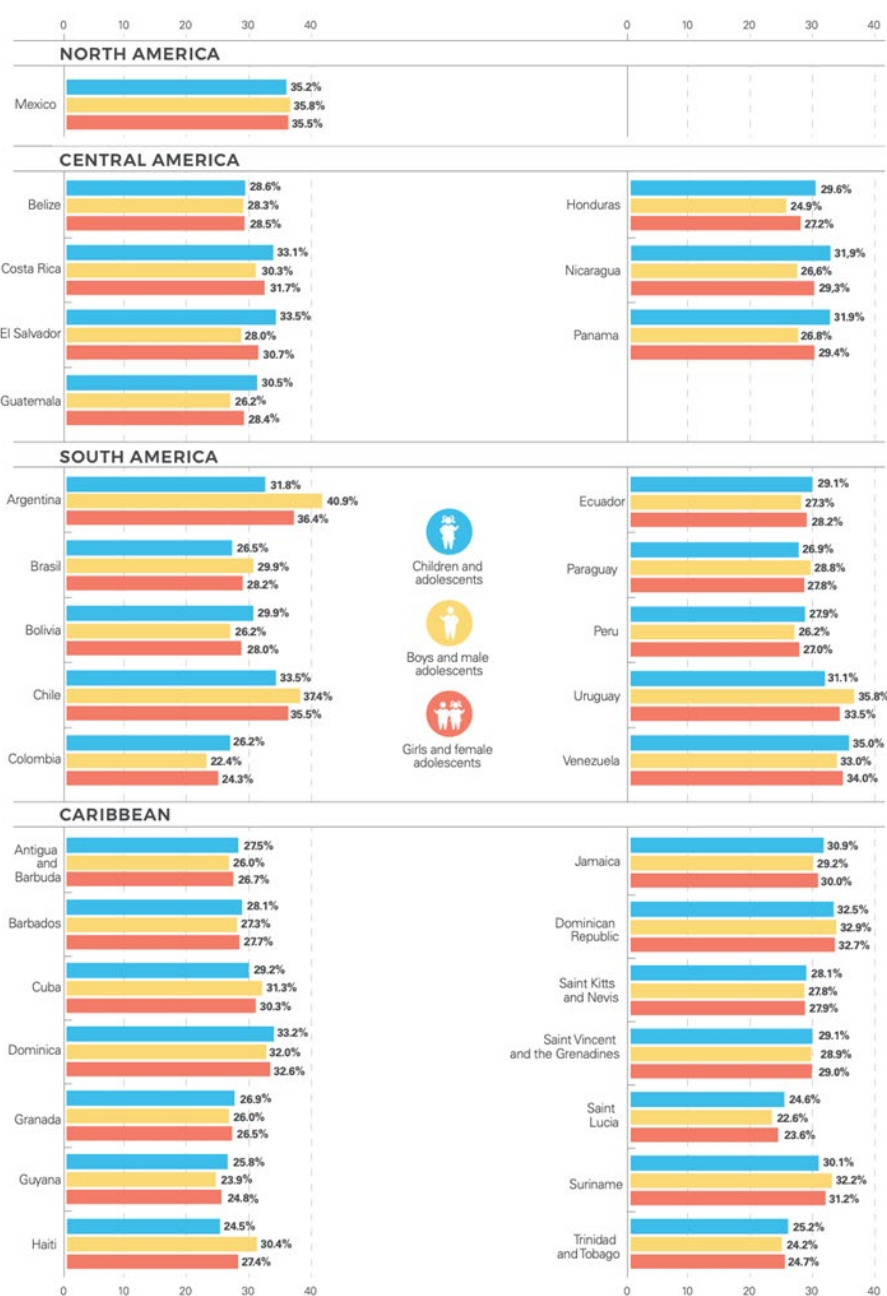
- Shape Up Somerville was a 3-year, CDC-funded randomized control trial from 2003-2005 with 30 elementary schools in Massachusetts. (57) The intervention consisted of updating quality of school lunches, enhancing food options from over 40 restaurants, training local clinicians and school nurses on addressing nutrition and obesity, addition of cycle lanes, renovation of 17 parks plus addition of 4 new parks. In the first year of the intervention, there was a modest statistically significant one-pound decrease in weight and after 2 years, a -0.06 decrease in BMI z-scores among children in the intervention group compared to children in control communities (whose weight actually increased by one pound.) There were also spill over improvements in parents BMI. (58) Following the study, Shape up Somerville has now been expanded and continued by the city of Somerville.
- In 2014, Berkeley, California became the first state to enforce a \$0.34/litre tax (up to 25% tax) on sugar-sweetened beverages, fruit-flavoured drinks, sweetened water, coffee and tea. Evaluation in 2016 showed a 21% reduction in consumption of sweetened beverages in Berkeley, whilst intake increased by 4% in the comparison cities in Oakland and San Francisco. (59) Water consumption increased by 63% in Berkeley, whilst in comparison cities consumption of water increased by 19%. The tax has been a success so far, with consumption of taxed beverages decreasing in low-income neighbourhoods, with no impact on grocery bills or revenue for retailers. Between 2014-2016, six other US cities introduced city-level soda taxes, including Oakland and San Francisco. A 2025 cost effectiveness analysis modelled the effect of the soda tax and concluded that it reduced the number of obesity cases, diabetes cases, and related complications, and was cost-effective most of the time. (60)



SOUTH AMERICA

MEXICO

During the last decade, Mexico has reached alarming rates of childhood obesity, ranking 1st in Latin America between 2020 and 2021 (35.2%), followed by Venezuela (35%), El Salvador (33.5%), Chile (33.5%), Costa Rica (33.1%) and Dominican Republic (32.5%) (Figure 5). (61)



Source: NCD Risc. CHILD & ADOLESCENT BODYMASS INDEX. <https://www.ncdrisc.org/data-downloads-adiposity-ado.html>

Figure 5: Percentage of children and adolescents, aged 5-19, affected by overweight in Latin America and the Caribbean. 2021 (61)

In Mexico, The National Agreement for Nutritional Health - Strategy to Control Overweight and Obesity was signed by 15 government agencies in 2010 to reduce the prevalence of overweight and obesity among children 2-5 years. The agreement also pledged to stop overweight and obesity growing in the 5-19-year age group and to slow the increase of obesity and overweight in adults. (62) Priority objectives were to:

1. Promote physical activity in all settings (school, work, community, and recreational).
2. Increase the availability, accessibility and consumption of water.
3. Reduce sugar and fat in drinks.
4. Increase consumption of vegetables and fruits, legumes, whole grains and fiber.
5. Improve decision-making capacity through labelling and promotion of health and nutrition literacy.
6. Promote exclusive breastfeeding during the first 6 months of life.
7. Reduce the amount of sugar added in food.
8. Decrease the consumption of saturated fats and eliminate trans fats in processed food.
9. Encourage smaller servings in restaurants and food outlets and diminish the portion size of processed food.
10. Limit the amount of sodium added to foods and reduce sodium intake (because of its importance for chronic diseases prevention, especially hypertension and cardiovascular diseases).

In 2012, Mexico had the highest intake of sugar-sweetened beverages globally, at 160 litres per person. With evidence showing 70% of sugar intake coming from sugar-sweetened beverages and 23% from non-essential energy dense foods, the government launched two taxes: a \$1 peso (4p) per litre excise tax (10% pre-tax price) on non-dairy and non-alcohol drinks with added sugar and an 8% tax on non-essential foods with more than 275 calories per 100 grams, including snacks, sweets, nut butters and cereal-based prepared products. The sugar-sweetened beverage tax showed immediate positive benefit by the end of 2014, with a 5.5% reduction in the total amount of taxed drinks purchased and a 9.7% reduction by the second year. (63) The tax has had the largest impact on lower socio-economic households, with a 9% reduction and a reduced purchase of 18.8ml per person per day during 2014 and up to a 17% decrease by the end of the year. Purchases of untaxed drinks increased by 2% over 2014-15, with production of still bottled water increasing. (63,64)

14% of Mexican kilocalories were estimated to come from the unessential energy-dense foods. In the first year of the 8% ad valorem tax, there was a 5.1% reduction in purchase of the targeted foods relative to pre-tax trends, rising to 7% in the second year. Reduced purchases were predominantly found among low-income households who purchased an average of 10.2% less taxed foods. Medium-income households bought on average 5.8% less taxed foods. The fiscal policies in Mexico illustrate that such measures can help to reduce excess energy intake among the population, particularly those at the lowest socioeconomic level.

This represents useful progress. Unfortunately, sugar-sweetened beverages are only one of the factors encouraging obesity and, overall, obesity rates continue to rise in Mexico. As a 2023 review identified, the different causal factors include an unhealthy diet, based on ultra-processed and easily consumed foods, the environment, socioeconomic status, culture, eating patterns, sedentary lifestyles, insufficient sleep, social prejudice, environmental chemical pollutants, reduced physical activity and the media. The review highlighted in particular the pressure to consume more and more industrial foods – including how food industries encourage consumption by children, for instance by using colourful and eye-catching colours and letters, mascots, animated and famous characters (e.g. celebrities or athletes) or cut-out games; it is also common to find inside “gifts” (toys), stickers or other collectible items that encourage continued purchases. (65)

CHILE

Chile provides another case study. A 2012 study reported on lessons from three pilot school-based interventions. (66) These trained teachers to deliver content on healthy eating, increase physical education classes, and, additionally in one pilot, teachers participated in a wellness program. Whilst there was progress for younger children in one pilot, results were mixed. Lessons learned according to the researchers included that participation of parents is very limited; obesity is not recognized as a problem; and increasing physical activity and implementing training programs for teachers is difficult due to an inflexible curriculum and lack of teachers' time. They concluded that unless these barriers are overcome, obesity prevention programs will not produce positive and lasting outcomes.



EUROPE

DENMARK

Though Denmark has one of the lowest childhood obesity rates in Europe, trends have still been increasing nationally across the years. The 2018-20 European Childhood Obesity Surveillance Initiative (COSI) reports 18% of boys aged 7-9 years are overweight and 5% have obesity. Among girls of the same age, 20% are overweight and 5% have obesity. (67)

National Action Plan against Obesity

In 2014, the Danish Ministry of Health launched national guidelines for the population's health, which included goals to reduce social inequalities and the number of overweight children. These guidelines follow on from the National Action Plan against Obesity which included 66 recommendations for the prevention and treatment of obesity. (68) Denmark also has a set of policies to help increase physical activity across the nation, from the City of Cyclists environmental intervention to Get2sport, an ongoing project promoting participation in sports among children from the most deprived areas.

In 2014, Denmark mandated 45 minutes of daily physical activity in schools. A follow up study published in 2024 concluded, 'we did not detect a significant decrease in BMI levels among school-aged children following the introduction of a nationwide school policy specifying daily physical activity in school. If anything, a small positive change in BMI was observed in girls.' (69)

Fat tax experiment

Few countries have introduced an explicit tax on fat. In 2011, Denmark introduced a fat tax, Dkr 16/kg (USD \$2.15) on products containing more than 2.3% saturated fat, plus an additional 25% VAT. This included meat, full-fat dairy, animal fats and edible oils. Although consumption of these products decreased by 10-15% in the first 9 months the tax was ineffective and repealed due to the ease of obtaining untaxed products from neighbouring countries. Reports of the government gaining the income rather than initiatives to improve the nation's health also undermined confidence.

Reduction in childhood obesity

The Children's Obesity Clinic Treatment (TCOCT)

This has been one of the first clinical interventions found to be effective in reducing childhood obesity. TCOCT, developed by Danish paediatrician Dr Jens Christian Holm, is a protocol aimed

at helping clinically obese children achieve weight loss through personalised behaviour change techniques targeted at the child and their family. (70) Children are initially admitted to hospital for 24 hours, having a series of tests and body composition measures. A detailed questionnaire on diet and lifestyle is also completed with the aid of parents. A tailored protocol including a set of rules aimed at improving diet, increasing exercise levels and reducing sedentary time is then provided to the child. From 2008, over 2,300 children and adolescents were enrolled and results published in 2011 found significant reductions in BMI standard deviation scores after 1.5 years, including reduction of several comorbidities. (70)

Adoption of the protocol in another Danish clinic also found a significant reduction in BMI standard deviation scores among children aged 5-18 after one year and even greater reduction after two years. (71) Retention rates were acceptable, at 0.57 after two years of treatment. Similar improvements in BMI were found when the TCOCT protocol was transferred to a community healthcare setting, suggesting that the protocol can be feasible and effective when implemented more widely. (72) These results have led to the Danish clinical guidelines, set in 2014, for examining and treating overweight and obese children and adolescents in paediatric settings. (73)

FINLAND

In Finland, 2022 figures show 23.5% of all children aged 7-12 years to be overweight or living with obesity. (74)

National Obesity Program 2015-2018

To help reduce the incidence of obesity across the nation, The National Institute of Health and Welfare developed the National Obesity Programme 2015-2018. (75) The programme was developed with multi-stakeholder engagement to promote the population's health, with key actors including childcare settings, health settings, sports organisations, employers, trade unions, the food industry, catering service providers, research institutions, public health organisations, defense forces, community planning and municipalities. The targets of the program are:

1. to support the healthy growth of children to reduce the risk of obesity into adulthood
2. to ensure reduction in weight gain during adulthood
3. to reduce inequalities in obesity prevalence among population groups
4. to provide support for people at high risk of obesity

The key themes of the program between were to prevent childhood obesity, increase stakeholder collaboration and increase health equality.

Finland introduced a sweets and soft drink tax in 2011 and 2014 respectively, with the tax levied at €0.95/kg on sweets and ice cream and a €0.11/L on soft drinks. The sweets tax raised the price of confectionary by about 10%, however consumption of taxed sweets remained the same following this price increase. The soft drinks tax has been successful in reducing consumption by 4.2% in comparison to control products unaffected by the tax.

Reduction in childhood obesity

Seinajoki Overcoming Obesity Programme

The City of Seinajoki have been the first to see improvements in childhood obesity. Seinajoki launched the Overcoming Obesity Programme in 2013-2020, based on the National Obesity Programme. (76,77) The programme involves collaboration with childcare settings, education, nutrition, recreation and urban planning departments to promote healthier environments, access to healthy dietary choices and information and encourage physical activity among children 0-12 years of age. Key actions taken have included:

- improvement in school playgrounds by the urban planning department
- the recreation department implementing more physical activity in schools
- sugary snacks eliminated and healthier lunches provided by the nutrition department working within day care centres
- the health department introducing annual health checks in schools, including parent education on healthy eating

Among children aged 5 years in Seinajoki, overweight and obesity reduced from 17% in 2009 to 10% in 2015. Similar reductions in overweight and obesity were also observed among primary school children, with a 5.3% reduction in first graders and 7.9% reduction in fifth graders. Whilst the overall proportion of children overweight and obese aged one and five years has decreased since 2009, there was a small increase between 2012-2015 among these age groups (see Figure 6). (76) The programme illustrates the potential success possible through high-quality delivery of a multi-scale intervention in a city, integrating all sectors involved in influencing children's health from an early age. It is also important to note that health education, nutrition and cooking lessons are mandatory in all schools in Finland. Data collection on obesity rates throughout the duration of programme has been through routine surveys and evaluations are yet to be published in peer reviewed literature.

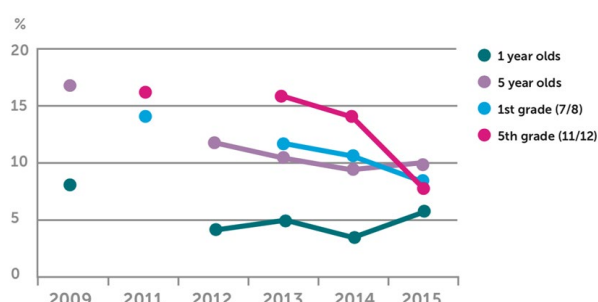


Figure 6: The proportion (%) of overweight and obese children monitored in Seinajoki between 2009-2015. (76)

FRANCE

National Health and Nutrition Program (Programme National Nutrition Santé, PNNS)

The French Ministry of Health launched the programme in 2001 as a multi-sectorial attempt to reduce obesity, increase physical activity, improve eating habits and reduce the prevalence of nutritional disorders. The program was intended for 2001-2006 but extended to 2010. To target children's diets, the Ministry of Education published guidelines on school meal nutrition standards, freshwater fountains were installed in schools and vending machines selling unhealthy snacks were also banned in schools. A 1.5% tax was also imposed on the advertising budgets of food companies not encouraging healthy eating. (78) TV and radio adverts for sugar-sweetened beverages, added salt, artificial sweeteners and manufactured food products had to contain health messages such as: "for the sake of your health, do not eat foods that contain too much fat, sugar or salt". (79)

Whilst some initial goals were achieved as regards reducing overweight and obesity among children, as well as reducing sodium and sugar consumption and increasing the consumption of fruit; the improvements did not affect all population groups equally and heightened health inequalities. (80)

Fiscal measures

France has also implemented fiscal measures to help reduce overconsumption of sugar-sweetened beverages, linked to overweight and obesity. Introduced in 2011, the French soda tax was set at €0.07 per litre (corresponding to a 6% price increase) for all non-alcoholic, sweetened drinks. The tax applies to manufacturers, processors and importers. The tax has had a positive effect in reducing soda consumption, with a 6.7% decline in demand for regular soda in the first 2 years, with the greatest reduction among young people, households with adolescents and low-income groups. (81)

Overall, France appears to have had some success in addressing childhood obesity. A study published in 2022 reported that the prevalence of overweight and obesity was lower in 2018 than in 2008 in both sexes, with some evidence of an increase in underweight. (82)

It may be that the relatively comprehensive nature of the National Health and Nutrition Programme is relevant here. However, a French paediatrician has argued that other factors may be at work, from a lower predisposition to obesity in French people to French culture (e.g. an obsession with thinness, and regular meals, with children less likely to snack between meals). (83)

Another potential factor is the high level of adoption of the Ensemble, Prévenons l'Obésité Des Enfants programme (EPODE) in French towns. This is described in more detail below. What potentially distinguishes this from local initiatives in other countries is the scale and duration of implementation.

Reduction in Childhood Obesity

Ensemble, Prévenons l'Obésité Des Enfants (EPODE)

In 2004, ten French communities launched a community-based approach, implementing strategies to promote healthier lifestyles and prevent childhood obesity. Ensemble, Prévenons l'Obésité Des Enfants (Together Let's Prevent Childhood Obesity) targeted children aged 0-12 with the aim of reducing obesity through a whole-community approach - whereby children's settings, local environments and family norms encouraged the adoption of healthier lifestyles in line with French guidelines on diet and physical activity. The design of EPODE was based on results from a 1992 study in two French towns, Fleurbaix and Laventie (FLVS), which found school-based interventions were ineffective on their own in significantly reducing childhood overweight and obesity. (84) Improvements in weight outcomes were best achieved from the subsequent community-based intervention within the study. Based on the FLVS study findings, a range of stakeholders are involved in EPODE at two levels: bottom-up (local community stakeholders who determine the social, cultural and physical adaption of actions in the local context) and top-down stakeholders, providing resources and support at a central level. (85)

In most countries we tend to see national obesity policies and local initiatives working independently. One distinguishing characteristic of EPODE has been described as fostering both 'top-down' leadership and a 'bottom-up' mobilization of support. This combination of the national and the local may help explain EPODE's relative success

For example, at a central level EPODE methodology promotes the involvement of multiple stakeholders (including endorsement from ministries, and support from health groups, NGOs and private partners) and the programme benefits from the expertise and guidance of an independent expert advisory committee. A Central Coordination Team (CCT) using social marketing and organizational techniques, trains and coaches local project managers appointed in each community by the mayor (or other local champion). The local project manager (with support from a local steering committee of relevant stakeholders) mobilizes a wide range of local stakeholders, especially in schools, pre-schools, extra-curricular organizations and any local associations and networks. Together these provide key settings to implement activities with children and families.

The EPODE program has been successful at reducing obesity rates, with a reduction of up to 25% in some communities. EPODE for Promotion of Health Equity (EPHE) was launched in 2012 with the aim of evaluating the impact and sustainability of EPODE-based community programmes in reducing inequalities in diet and physical activity. An evaluation study observed 1,062 children aged 6-8 years and their families across 7 European communities over 2 years. (86) The study found that following the EPODE interventions, children from lower socioeconomic groups improved fruit and vegetable consumption and reduced sugar-sweetened beverage consumption and screen exposure compared to other socioeconomic groups. (86) EPODE has not only had the capacity to reduce childhood obesity but also to reduce health inequalities. Initiatives are adapted to socioeconomic groups, increasing community acceptance. A critique of the programme is the partial funding from industry, but some argue this has contributed to the programme's success. More than 5 years after initial implementation, EPODE was still active in over 90% of the original pilot communities and active in over 500 communities globally.

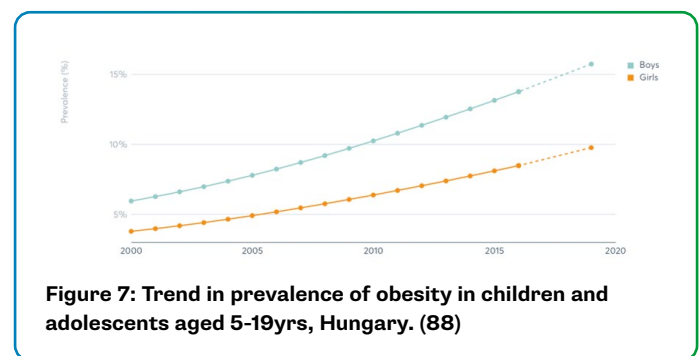
Vivons en Forme (VIF, "Live in Shape")

VIF is a community-based programme tackling overweight and obesity through prevention and health promotion activities. The programme expanded beyond EPODE's focus on diet and physical activity to include action to improve sleep and wellbeing. VIF employs a non-stigmatizing approach to obesity and combines social marketing, nudging and collective impact to promote sustainable behavioural change.

VIF cities initiate and coordinate the programme at the local level, relying on the continuous training of professionals and local city actors. Its aim is to support local authorities by providing them with concrete solutions to implement public health actions. Among children taking part in the programme, prevalence of overweight and obesity decreased significantly between 2008 and 2015 in children from pre-schools (18.1% vs 13.0%) and primary schools (20.9% vs 16.9%). (87) There are now over 200 VIF cities.

HUNGARY

The trends of overweight and obesity among children in Hungary follow those seen globally (see Figure 7). In 2016, 32.8% of boys and 23.9% of girls aged 5-19 years were overweight. In the same year, 13.7% of boys and 8.5% of girls were living with obesity. (88)



Public health product tax

In 2011, Hungary introduced a public health product tax on non-staple, pre-packaged foods with high levels of sugar, salt and other ingredients with proven health risks. This included confectionary, salty snacks, fruit jams, soft drinks and energy drinks. (89) The first impact assessment found a 26-32% reduction in intake of the products subject to the tax, with price increase driving the shift amongst consumers. Interestingly, 22-38% of consumers did however reduce their intake due to increased health consciousness, with those having higher perceived health status less likely to decrease consumption of products subject to the tax than those with perceived poorer health status. (81) Food manufacturers also begun reformulation efforts. 40% reformulated their products, with 70% reducing the quantity of targeted ingredients in their products and 30% completely removing them. (90) The second impact assessment showed 7-16% of consumers chose cheaper, healthier products, 5-16% of consumers consumed less of the unhealthy products and 5-11% changed to alternative brands or substituted with other food products (often healthier). (91) Consumption of unhealthier food has been sustained, with 59-73% consuming less of the taxed products in 2014 than in the initial years.

There is some data showing a slower rise in obesity following the tax introduction in 2011. Two population surveys each with over 40,000 Hungarian adults showed a 0.5% reduction in the proportion of men overweight between 2013-15, no change in the proportion on men obese and a 0.5% rise in women overweight and obese. (92) Though these results were promising, the effects are likely to have also been from a combination of other nutrition and physical activity initiatives across the country. Overall, the Hungarian approach has been supported by WHO, as the tax has not only reduced public consumption of taxed items and impacted manufacturers, but also increased health literacy across the population.

As regards to children living with obesity, a mixed picture has emerged since 2011. A 2018 study in the city of Szolnok, detected no changes in overweight and obesity in the age group 3–9 years and a significant decrease in the age group 7–14 years. (93) And despite the public health product tax, childhood obesity rates have been identified as being above average, with a 2020 study identifying parents’ attitudes and family conventions as contributory factors. (94) This suggests that further research is needed here, to enable an accurate assessment of childhood obesity trends in Hungary.

There also appears to be significant differences between different regions in Hungary. Indeed a 2018 article described ‘remarkable differences’ observed in the prevalence of childhood obesity by geographic regions – with rates roughly twice as high in Northern Hungary as Central Hungary and tending to be higher in rural than urban areas. (95) This is a dimension that may benefit from closer analysis in other countries. As described earlier in this report, we know that childhood obesity tends to be higher in deprived areas in developed countries. There may also be other dimensions (e.g. urban versus rural) which could usefully be explored.

GERMANY

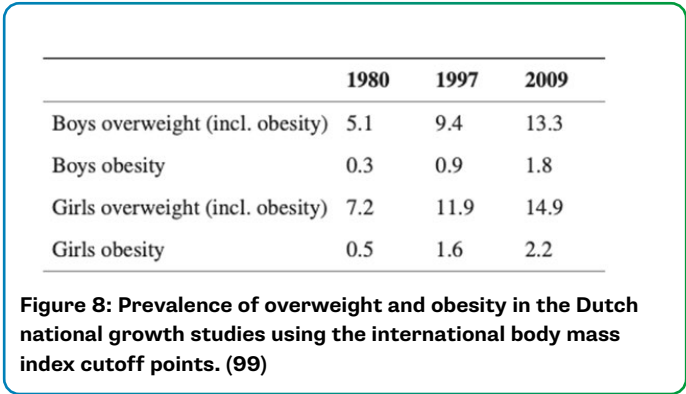
As early as 2003, Germany launched a ‘growing up healthy’ public health initiative, to encourage exercise and a healthy diet and thereby reduce the risk of obesity. Further initiatives have followed, including a national strategy to promote breastfeeding; a National Action Plan IN FORM (a central nationwide strategy to improve the eating habits of children and young people); a national strategy to reduce sugar, unsaturated fatty acids and salt in processed food, and initiatives to encourage healthy lifestyles and healthy nutrition for young people (including the STAY HEALTHY move, relax, eat! campaign). (96) In addition, preventing overweightness among children and young people is a key funding priority in the policy work of the Federal Ministry of Health.

These continued initiatives may have been one of the factors which had contributed to a reported stabilization and even decrease in childhood obesity rates by 2015 – although a similar pattern has been observed in some other developed countries. (97) However, the pattern is not uniform within Germany. A study of data on preschoolers in one district from 2009 to 2019 concluded that overall there was an increase over time, particularly in children from low status backgrounds. (98)

THE NETHERLANDS

Since 1980, there had been a steady increase in childhood obesity in the Netherlands (see Figure 8). (99) Although compared to other European countries, prevalence in the Netherlands was relatively low.

However, the increase seems to have been halted and even slightly reversed in recent years. For example, the Global Obesity Observatory reports that the percentage of children living with overweight and obesity in the Netherlands had reduced very slightly by 2023 compared with 2020 (despite a short term rise in 2021, perhaps due to more sedentary lifestyles during the pandemic) and was a little below 12%. (100)



This coincides with the Netherlands employing a preventative approach to reduce overweight and obesity, with the National Prevention Agreement including a number of measures against overweight and obesity. (101) The ambition of the agreement was to reduce the prevalence of childhood overweight (including obesity) from 13.5% in 2018 to 9.1% in 2040 and childhood obesity from 2.8 to 2.3%. Some of the measures outlined in the agreement include:

- In 2020, a minimum of 2,500 sports clubs will provide members and visitors with healthier foods and drinks
- In 2020, at least 950 school canteens will offer healthier foods and drinks to staff and students.
- In 2025, at least half of the hospitals will provide healthier foods to patients, personnel, and visitors.
- Food manufacturers will reformulate products by adding less sugar and reducing portion size.
- Starting in 2019, the national government and supermarkets will intensify spreading knowledge related to dietary recommendations.
- In 2020, the government will introduce a new front-of-pack logo for foods and drinks that will aid consumers to make healthier choices.
- Integrated care with tailored support for healthier lifestyles will be available for children with overweight or obesity in 35 municipalities in 2020 and in all municipalities in 2030.
- Drinking water will be made more readily available, e.g., trough water taps in public places and schools.

- The use of licensed media characters aimed at children under 13 years will be reduced on packaging of foods and on point of sales material.

The Ministry of Health, Welfare and Sport finances programmes to support local authorities and organisations working to reduce overweight and obesity. The Netherlands approaches have had success, with more than 30 municipalities reducing childhood obesity.

The main programmes in the Netherlands targeting childhood obesity are Jongeren op Gezond Gewicht (JOGG); healthy school; healthy day-care and care for obesity.

Childhood obesity rates are below average compared with most other developed countries. This suggests the value of the approaches adopted by the Netherlands. However, analysis for 2018-2021 found three times more obesity among 2 to 11-year-olds with lower educated parents compared with those with higher educated parents. (102) This suggests that further work is needed here.

Progress in halting and slightly reversing the rise in childhood obesity has probably also been due to two specific initiatives:

Jongeren op Gezond Gewicht (JOGG - Young People at a Healthy Weight)

JOGG is a programme coordinated at national level targeting maintenance of healthy weight for children and adolescents aged 0-19. (103) JOGG encourages healthy eating and exercise within cities, town and neighbourhoods. The local approach targets health professionals, shopkeepers, schools, companies and local authorities to help children and families attain and maintain a healthy weight. Over 84 municipalities in the Netherlands are now using JOGG. The programme is based on the French EPODE programme, with five main pillars which each town and city plans activities around:

- Political and governmental support
- Public-private partnership
- Social marketing
- Scientific coaching and evaluation
- Linking prevention and health care

The five pillars aim to enable intersectoral collaboration and capacity building within communities, leading to an increase in nutrition and physical activity initiatives within local environments. The objectives for 2010-2014 were to halt the rise in overweight and obesity among children aged 0-19 and for JOGG to be implemented in 75 municipalities. In 2020, 144 municipalities implemented the JOGG approach, reaching over 1 million children. In 29 of these the prevalence of overweight in children was decreasing. (104) As of 2024, 220 municipalities implement the JOGG approach.

Although JOGG is based on the French EPODE model the decision to brand it with a Dutch name may also have helped create a local identity and increased local engagement and support. This is a point to consider when seeking to translate initiatives which have worked in one country to another.

Amsterdam Healthy Weight Programme (AAGG)

With Amsterdam having higher childhood overweight and obesity rates than the national average (21% and 15%, respectively), the Amsterdam Healthy Weight Programme (AAGG) was established in 2013 by the Amsterdam Municipality. The objective of AAGG is to “give every child a healthy childhood and future, regardless of their start in life”. (105) Socioeconomic disparities were widely evident, with 21.8% of children from very low socioeconomic status overweight or obese, in contrast to 9.6% of children from very high socioeconomic status. Tackling these inequalities was the basis for AAGG. Interventions enabling healthier food choices, increasing physical activity and attaining better quality sleep were targeted in neighbourhoods, schools and children of non-Dutch origin with the highest prevalence of overweight and obesity. AAGG was designed as an urban-level policy, managed by the city’s authority. Five, ten and twenty-year targets were set, with recognition that time and patience is needed to assess change and impact:

- 2018: a healthy weight for all 0-5-year-olds in Amsterdam
- 2023: a healthy weight for all 0-10-year-olds in Amsterdam
- 2033: a healthy weight for all young people in Amsterdam

The Rainbow model (see Figure 9) inspired AAGG’s guidelines, drawing on Dahlgren and Whitehead’s social determinants of health model. (106) The Rainbow model outlines the numerous factors influential to children’s health and development, and thus the need to engage all sectors to achieve healthy weight children.



Figure 9: The Amsterdam Rainbow Model on Childhood Obesity 2018. (106)

To achieve the 2015-18 targets, less focus was placed on the outer ring of the model as these macro-economic factors were deemed more difficult to influence. The programme emphasized prevention efforts, overlapping with two other clusters, on curative care and facilitation. As initiatives in a number of countries, including the Netherlands, have had some success in reducing childhood obesity but it remains a significant issue, this suggests the value of moving on to the outer ring, in particular to the role of the Food Industry, to the potential for a cross-government approach, and to insights from international research.

UNITED KINGDOM

Across the UK, a number of policies and initiatives have been implemented over the years in efforts to reduce childhood obesity:

- UK Code of Broadcast Advertising (BCAP Code) – statutory rules on advertisements for high fat, salt and sugary foods (HFSS) on TV channels targeted at children. Advertising of HFSS products, classified by the nutrient profiling model, is banned during television programmes that appeal to children under 16 years of age, also applying to social media and advertisers' own websites.
- School Food Regulations – in effect from 2015, these regulations are mandatory nutrition standards for school lunches and food provided to children/students on school premises.
- Soft Drinks Industry Levy – launched in 2018 to encourage reformulation by manufacturers to reduce added sugar in drinks, market low sugar alternatives and reduce portion sizes. Drinks with sugar content 5-8g/100ml are subject to a 18p/litre tax, and drinks with more than 8g/100ml are subject to a 24p/litre tax. The tax has achieved a 28.8% sugar reduction per 100ml in beverages from retailers and manufacturers' own-brand products and a 27.2% reduction per 100ml in drinks from the out of home sector.
- The School Fruit and Vegetable Scheme is a government scheme launched in 2004 and entitles children aged 4-6 years in fully state-funded schools to a piece of fruit or vegetable each school day.
- Change4Life – a social marketing campaign to encourage improvements in diet, activity level and alcohol consumption, targeted at parents of children 1-4 years (Early Years), new parents with babies (Start4Life) and children aged 5-11 years.
- Healthy Start Scheme – free vouchers for milk, fruit, vegetables and vitamins for pregnant women, pregnant girls under 18 and women with a child under 4 receiving income support.
- Physical activity guidelines set by the UK Chief Medical Officers, with recent guidelines published for babies, infants and children.

The initial AAGG approach had three main themes – prevention, cure and facilitation:

Prevention

1. The first 1000 days approach
2. Schools approach
3. Neighbourhood and community approach
4. Healthy environment approach (healthy urban design, healthy food environment)
5. Focus on teens
6. Focus on children with special needs

Curative

7. Efforts to combat overweight and obesity in children, helping children regain a healthier weight

Facilitative

8. Learning approach
9. Digital facilities
10. Use of communications and methods for behavioural insights

Overall, it is reported that between 2012 and 2017 the estimated prevalence of 2-18-year-olds with overweight or obesity in Amsterdam declined from 21% to 18.7%, suggesting the value of this approach. (107)

More specifically, between 2012 and 2015, the programme reported a decrease in obesity from 8% to 6% among all children 0-18 years, with an 11% decline among low and 9% very low socioeconomic groups (Figure 10). (108,109) The combined prevalence of overweight and obesity fell from 21% to 18.5%. Alongside Dutch children, there were significant reductions in obesity among children from other ethnic groups, including Turkish and Moroccan. Of the 11 neighbourhoods with highest obesity rates, 9 have now improved. Sugar sweetened beverage consumption among children decreased and the proportion of children exercising increased. Exclusive breastfeeding rates also increased by 4% at 3 months and 5% at 6 months. Though there have been improvements amongst most age groups, there have been mixed results in younger children 2-4 years, with no clear reason as to why. Much can be learnt from this multi-level intervention, particularly regarding the focus and impact on lower socioeconomic groups.

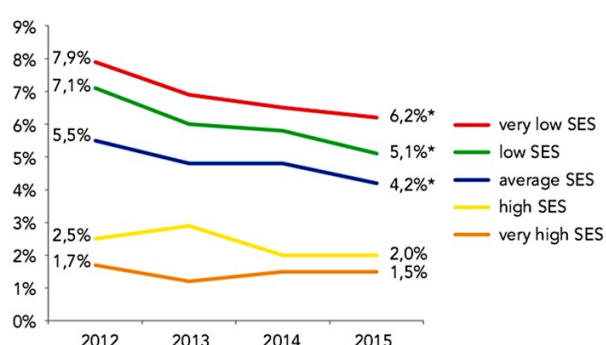
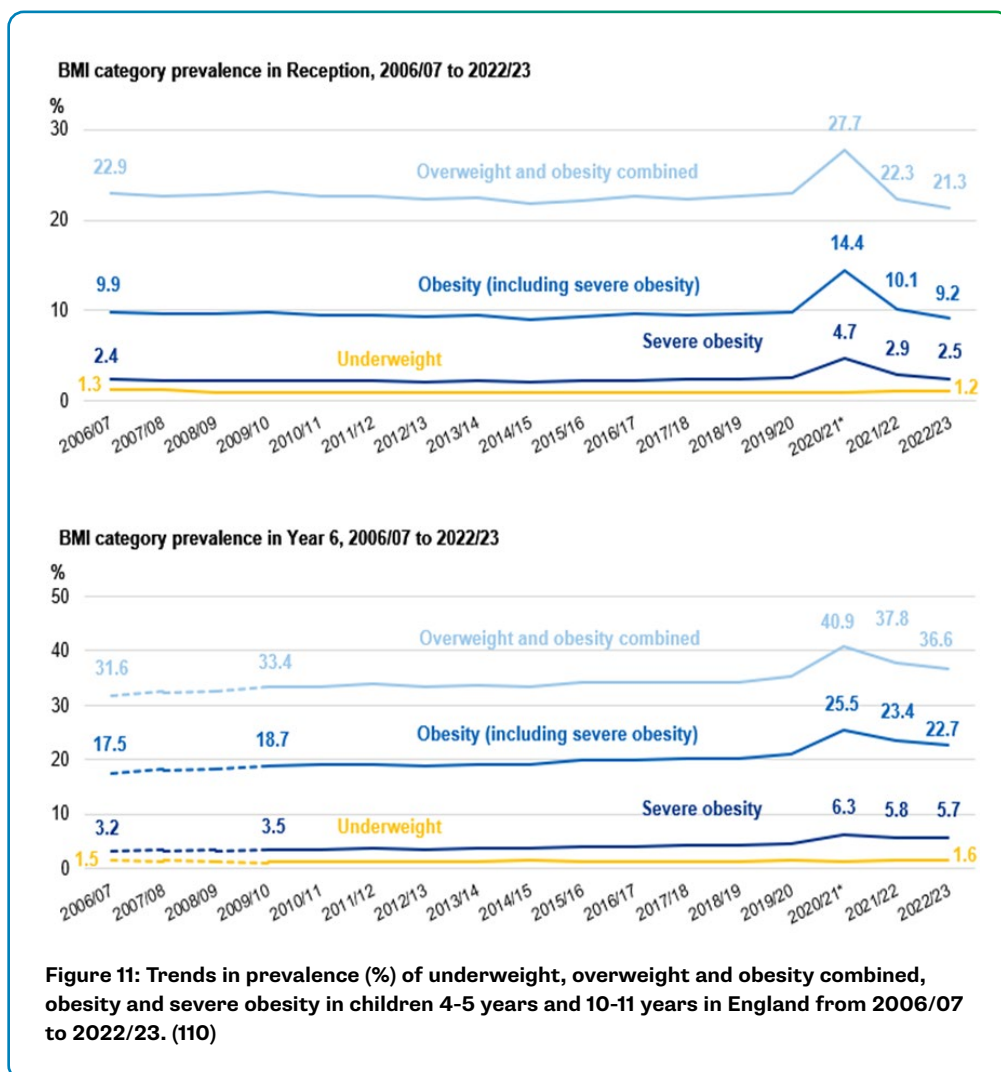


Figure 10: Trends in the prevalence of obesity, by socioeconomic status, for 5- and 10-year olds in Amsterdam between 2012-2015. (108)

England

Whilst obesity among children had remained stable for over a decade, the inequality gap in obesity between children from the least deprived and most deprived areas has remained prominent. Moreover, the Covid-19 pandemic saw a sharp increase in prevalence, with children staying at home and eating habits negatively impacted (Figure 11). (110)



Childhood Obesity Plans

The government launched its first Childhood Obesity plan in 2016, followed by subsequent chapters in 2018 and 2019, with bold ambitions to halve childhood obesity by 2030 and significantly reduce the gap in obesity between children from the most and least deprived areas. (111-113) The plans centered on proposals for the food industry to reduce sugar and calories in popular children's products by 2020 and 2024, respectively. (114)

Many of the measures were criticized for being weak, with modest progress towards the sugar reduction targets and no progress towards advertising restrictions. A review of 30 years of the English government's obesity policies highlighted overreliance of policies focusing on individual agency for behavior change, most of which are not effective to address obesity. (115)

A further strategy was published in 2020. (116) Legislation of food promotions and placement and calorie labelling in the out of home sector was introduced in 2022. However anticipated restrictions on volume price promotions and the 9pm watershed on HFSS food advertising were delayed. The new Labour government have recommitted to enforcing the policies, but not to implementing more ambitious proposals from the House of Lords Food, Diet and Obesity Committee, including a new comprehensive, integrated food strategy and to tackle the

influence of the food industry, which the Committee considered 'bears major responsibility for the obesity public health emergency.' (117)

This is regrettable, as living in a deprived area significantly increases exposure to ads and outlets for unhealthy food – six times more than in if you live in a wealthy area, according to research by Adfree Cities in 2024. (118)

Incidentally, systematic reviews of the evidence had concluded that school-based diet and physical activity (PA) interventions had limited effects. A 2015 review of the Active for Life Year 5 (AFLY5) study in 60 UK primary schools, therefore sought to identify how effectiveness might be increased. (119) They suggested that future primary school diet and physical activity programmes should find ways to increase child engagement in the programme content, identify programme champions, encourage teachers to work as role models, engage parents and embed diet and physical behaviour change across the curriculum. However, they noted this would require adequate funding and cost-effectiveness would need to be established.

School-based initiatives should also be seen in context. As the House of Lords report identified, there is a bigger picture that needs to be addressed, including the role of the food industry.

London Child Obesity Taskforce

With London having one of the highest childhood obesity rates in Europe, the London Mayor established the London Child Obesity Taskforce in 2018, with the The Mayor's Advisory Group on Child Healthy Weight (MAGCHW) subsequently convened in 2022. The taskforce has recently set 10 ambitions, including to: end child poverty; support women to breastfeed for longer; skill up early years professionals; use child measurement to better support parents; ensure nurseries and schools are enabling health for life; make free water available everywhere; create more active, playful streets and public spaces; stop unhealthy marketing influencing what children eat; transform fast-food businesses and harness the power of investment to create good food.

Reductions in childhood obesity

Health, Exercise, Nutrition for the Really Young (HENRY), Leeds

HENRY is an evidence-based intervention to support young children from an early stage to help prevent obesity. The early years are considered the key window of opportunity as children develop food and lifestyle habits which can track into later childhood and adulthood. On this basis, HENRY supports families, early years practitioners, communities and local authorities to make positive lifestyle changes which can have positive impact on children. These include improved nutrition, parenting skills, breastfeeding support and physical activity. HENRY has been credited with helping successfully reduce obesity among children aged 4-5 years in Leeds, where the programme has been running across the city for over 8 years. The proportion of children who are obese fell from 9.4% in 2009/10 to 8.8% in 2016/17, with this reduction predominantly among the most deprived children. (120) In children aged 10-11 years, prevalence of obesity increased in other cities during this time but remained unchanged in Leeds. At the time there had been no other similar reductions seen in other cities across England as a whole. In 2008, Leeds made the early years their priority approach in their long-term child obesity strategy, embedding HENRY at the core of family support and workforce development. The delivery of the programme through community-based children's centres in the most deprived communities is also likely to have had positive impact on the improvements seen.

Brighton and Hove whole system approach to obesity

More recently, Brighton and Hove observed a downward trend in child obesity in comparison to national trends through a whole systems approach. (121) Alongside sustained commitment to early years and school-based interventions in more deprived areas, a city-wide approach was taken in tackling broader food issues, including a local food strategy which facilitated cross-sector partnership and city-wide commitment.

Universal Free School Meals

Recent evidence highlighted that universal free school meals (FSM) can help to reduce obesity (reductions of 7-11% observed among children in reception in four London boroughs that have adopted the policy), supporting the agenda for the Government to roll out FSM to all primary school children in England (Wales and Scotland are implementing from 2024). (122)

Scotland

The 2022 Scottish Health Survey 2022 shows that 18% of children aged 2-15 are at risk of developing obesity, whilst the 2030 ambition is a prevalence of 7% (Figure 12). (123) Data from the 2022/23 school year revealed the percentage of Primary 1 children in Scotland at risk of obesity is 10.5%, a decrease from 11.7% in the year before (Figure 13). (124) This decrease may be explained by the Covid-19 pandemic which resulted in smaller samples sizes, alongside a spike in higher weights. There have been many policies in place in Scotland with potential to prevent increase in obesity.

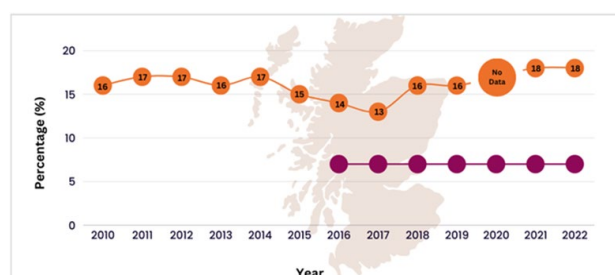


Figure 12: Child obesity prevalence reported in Scottish Health Surveys since 2010 (orange) and the prevalence target of 7% set from a 2016 baseline (purple). (123)

P1 Children in Scotland - % at risk of obesity (Pandemic years removed)

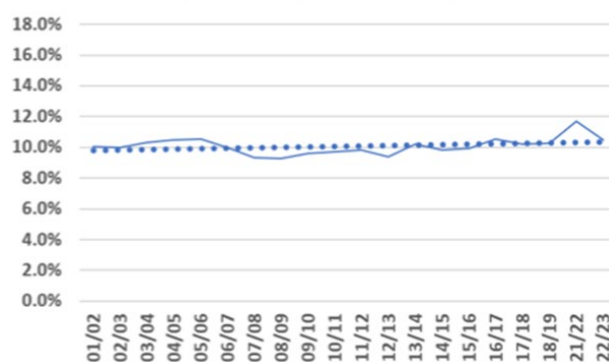


Figure 13: Percentage of Primary 1 children at risk of overweight and obesity from school years 2001/2-2022/23, with pandemic years removed. (124)

A Healthier Future - Scotland's Diet and Healthy Weight Delivery Plan

Scotland has a track record of developing plans to seek to reduce childhood obesity. These have included:

Healthy Weight Communities: In 2009, eight local areas were invited to be pathfinder projects, through programmes in which local communities, families and young people were engaged in healthy eating, physical activity and healthy weight initiatives from a range of delivery partners. The programmes took inspiration from the French EPODE programme. Immediate changes in BMI were not seen as realistic. Instead HWC was seen as an opportunity to develop partnership working and joining up services for greater reach and impact. (125)

The Route Map for Preventing Overweight and Obesity:

Launched by the Scottish government in 2010 this contained a 20-year commitment to reduce overweight and obesity in children. (126) It included provision of child healthy weight programmes integrating diet and physical activity and behaviour change components, involving children and their parents. From 2011-2014, there was a slight decrease in the average BMI standard deviation scores of children receiving the child healthy weight interventions, with the greatest decrease among children attending group interventions and the smallest decrease from school-based interventions. (127)

However, it was concluded that if the aim was to further reduce obesity in Scotland, a higher number of interventions needed to be delivered via group and one-to-one interventions. These needed to include highly motivated delivery staff capable of building good rapport with children and families; interventions that take place on a weekly basis, where families can stay involved longer term to help maintain changes; supported access to facilities and activities in the local area; high engagement from parents and children; and active parental motivation and engagement.

A Healthier Future – Scotland's Diet and Healthy Weight

Delivery Plan: With over 60 actions, this 2018 plan aimed to take a primary prevention approach, aiming to halve childhood obesity by 2030 and significantly reduce health inequalities with five key focus areas:

- Tackling weight-related issues from an early stage by helping ensure children have the best start in life
- A food environment supportive of healthier food choices
- Access to effective weight management services
- Leaders across all sectors promote healthy weight and diet
- Reduction of diet-related health inequalities

The Plan also included the introduction of restrictions on promotions of discretionary high fat, salt and sugar (HFSS) products, restricting the advertising of these products – especially to children, and improving the out of home (OOH) food environment including introducing a new OOH framework. This could have made a good start in addressing the issue of unhealthy discretionary food and drink products high in fat, salt and sugar (HFSS).

However, in 2023 Obesity Action Scotland reported concerns about the lack of progress, particularly in relation to action in relation to the food industry, commenting, 'We need bold and urgent policy action from the Scottish Government to deliver on the commitments within the Diet and Healthy Weight Delivery Plan to improve child health and weight outcomes. Industry interests cannot be allowed to take priority above children's health.' (128)

Wales

The proportion of children with obesity in Wales is higher than that reported for England and Scotland. According to the latest Child Measurement Programme for 2022/23, the proportion of children with overweight or obesity were 13.4% and 11.4% respectively, both statistically significantly lower than pre-pandemic. (129)

The All Wales Obesity Pathway

This was established in 2010 as a tool for Health Boards working jointly with Local Authorities and other key stakeholders to map local policies, services and activity for both children and adults against four tiers of intervention. The four-level approach consists of:

1. Level 1: community-based prevention to ensure opportunities are available for people to achieve and help maintain a healthy body weight
2. Level 2: early intervention services for people who wish to lose weight and have been identified at an increased risk by a doctor.
3. Level 3: specialist weight management services for people who are obese and have tried several methods of losing weight without success.
4. Level 4: bariatric surgery, specialist medical and surgical services for those people who have not managed to lose weight through conventional methods

A review found that all health boards were providing level one and level two services, with other boards developing their level three specifications – but that not all areas of Wales had access to a range of services for children and adults at each level. Evidence did not appear to be readily available as to whether the services were achieving the desired reduction in the prevalence of obesity.

Every Child

This was launched in 2017 to improve the health and well-being of children. The programme includes 10 Steps to a Healthy Weight, which outline the key factors that increase the likelihood of a child being a healthy weight when they start school. The advice focuses on three age ranges: pre conception and pregnancy, 0-2 years and 2-5 years. Wales also has mandatory nutrition standards, with regulations setting out the types of food and drink that can/cannot be provided during the school day and define the nutrient content of school lunches.

Public Health Wales has reported that, at least for children in reception classes, the proportion of children with overweight or with obesity were 13.4% and 11.4% respectively, both statistically significantly lower than pre-pandemic. This suggests that Every Child may be making a difference. (130)

Healthy Weight Healthy Wales

Wales' long term strategy to prevent and reduce child obesity, Healthy Weight: Health Wales 2019, is based on four national themes: healthy environments, healthy settings, healthy people, leadership and enabling change. (131) The strategy emphasizes a whole government approach in delivery of the four themes, working with public bodies to influence policy change. The current delivery plan (2022-2024) recognises the importance of pregnancy and the early years, and includes a focus on supporting families to provide the best start in life. (131) The Welsh Government have expressed continued investment in the Nutrition Skills for Life and Healthy Start programmes. The plan also includes a priority area in shaping the food and drink environment towards sustainable and healthier options. Regulations to restrict the placement and price promotion of products high in fat, sugar, and salt (including meal deals) are to be enforced in autumn 2024.

Evidence does not appear to be readily available as to whether the strategy is beginning to achieve the desired reduction in the prevalence of obesity.

Northern Ireland

The Health Survey Northern Ireland 2019/2020 reported that 20% of children aged 2-15 years were overweight and 6% with obesity. (132) The proportion of children classed as overweight or obese has remained at relatively similar levels since 2010/11. Amongst adults aged over 16 years, 36% were overweight and 23% obese. The Department for Health, Social Services and Public Safety (DHSSPS) has therefore developed a coordinated, integrated and cross-sectoral framework aiming to prevent overweight and obesity in Northern Ireland over 10 years.

The Framework for Preventing and Addressing Overweight and Obesity in Northern Ireland 2012-2022: A Fitter Future for All (AFFA)

The Framework aimed to address all inter-connected and related factors involved in the obesogenic environment, creating environments that promote a healthy diet and active lifestyle. There was useful progress from the framework, including the launch of a breastfeeding strategy, piloting of a weight management programme for pregnant women, the launch of a new food labelling scheme in 2013 by the Food Standards Agency, catering menus showing calories and updates on early years resources. (133)

However, obesity continues to rise, and inequalities have widened. As a 2022 report identified, 'The framework 'AFFFA' aims to reduce the rate of adults living with obesity by 4% and achieve a 3% reduction in obesity rates for children. As this framework comes to an end, the targets set out for reducing obesity rates have not been met...Between 2011/12 and 2018/19, rates of overweight or obesity in primary Year 1 children rose by 0.9%.' (134)

To replace the AFFA, the Department of Health in Northern Ireland is developing a new obesity prevention strategy.

THE REPUBLIC OF IRELAND

In Ireland, one in six school children are overweight or living with obesity. The 2019 National Children's Food Survey (NCFS II) suggests a possible decline in overweight and obesity among children aged 5-12 years from 2003/04-2017/18 (Figure 14). (135) Though these results are positive, the sample size of 600 school children may not be representative, hence it is unclear whether there has been a reduction in overweight and obesity nationwide.

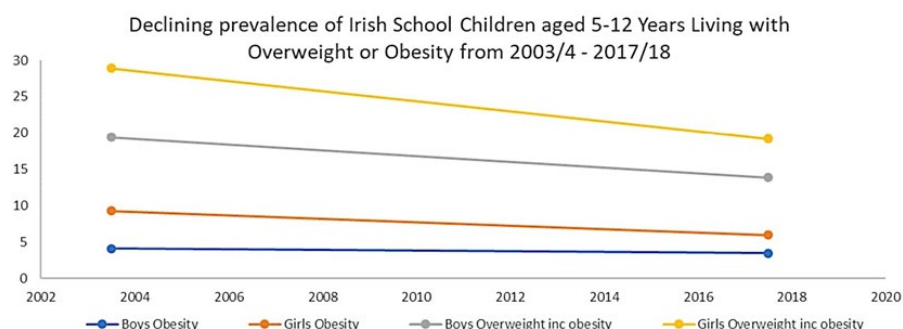


Figure 14: Prevalence of overweight or obesity in Irish school children 5-12 years from 2003/4-2017/18. (135)

The Healthy Child Programme 5-19 years follows on from the Healthy Child Programme for pregnancy to 5 years. It makes recommendations for optimal health, education and wellbeing for all children and young people, with guidance for health practitioners, children's service practitioners, education providers and others working with children and young people. Overall, it sets out the good practice framework for prevention and early intervention and is designed to help local children's services planners effectively use their resources.

A Healthy Weight for Ireland: Obesity Policy and Action Plan 2016-2025 was launched to help reduce childhood obesity. The plan emphasizes the need for multi-sectoral contributions to help reduce the burden of childhood overweight and obesity, whilst also acknowledging the importance of empowering individuals, families and communities to make healthier food choices and improve physical activity to attain a healthy weight.

The overall aim of the plan is to increase the number of children and adults with a healthy weight, making healthy weight the norm and removing the stigma associated with obesity, particularly among children. 10 action plans are proposed, ranging from short-term and intermediate to long-term sustainable solutions, recognising the complexity of behaviour change. Using international evidence, the plan aims to combine upstream and downstream interventions in order to achieve multilevel change and impact on the nation's weight.

The two main approaches are:

- Top-down measures - sectors playing a role in creating an obesity prevention environment
- Bottom-up approaches - empowering individuals, families and communities to make healthier choices and/or to inform sectors of future strategies.

Ireland's 2022-2023 Childhood Obesity Surveillance Initiative (COSI) concluded, 'the results suggest the plateau in rates of childhood overweight including obesity appears to be continuing. However, a more nuanced examination shows that prevalence remains greater in girls than boys, older than younger children, and in children attending disadvantaged schools.' (136)

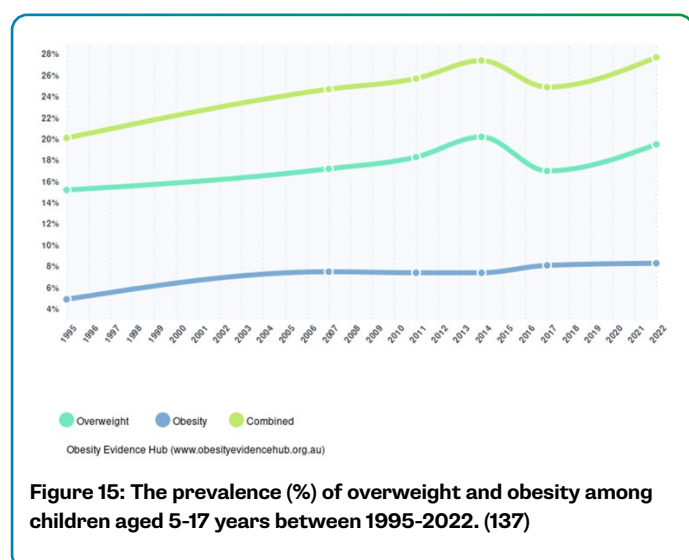
The plateauing in Ireland correlates with a similar picture in a number of other countries. The exact causes remain unclear. It may, for instance, be that the heightened awareness of obesity and its health risks and the range of initiatives to tackle it, is leading those families and young people who are both financially able and willing to pursue healthier lifestyles to do so, despite the obesogenic environments they are living in.



AUSTRALIA & OCEANIA

AUSTRALIA

The prevalence of Australian children aged 5-17 years with overweight and obesity increased from 15.2% and 4.9% in 1995, respectively, to 19.5% and 8.3% in 2022-23, respectively. (137) Whilst obesity levels have become relatively stable, rates of overweight continue to rise (see Figure 15).



Australia's latest **National Obesity Strategy 2022-2032** has ambition to reduce overweight and obesity in children and adolescents aged 2-17yrs by at least 5% by 2030. The strategy places strong emphasis on prevention and four main principles for implementation: creating equity; tackling weight stigma and discrimination; addressing wider determinants of health and sustainability and empowering personal responsibility.

Local initiatives to reduce childhood obesity

As in a number of other countries, local/regional initiatives have sometimes shown promise.

Reductions in childhood obesity

Obesity Prevention and Lifestyle Programme (OPAL)

The South Australian government launched the Obesity Prevention

and Lifestyle (OPAL) 2009-2017 programme in response to a high prevalence of childhood obesity. (138) OPAL was developed on the basis of EPODE, a French program designed to prevent obesity at community level (see page 27). Programme aims were to increase the proportion of 0-18 years olds in the healthy weight range by improving eating and physical activity habits across 20 metropolitan and regional communities for 5 years. Behaviour change was to be influenced by availability of healthier food choices from food outlets, healthy meals produced at home, access and distribution of local healthy food, active travel, active leisure participation and use of open spaces. Evaluation of the programme found a 12.2% reduction in the extent to which overweight and obesity would have been expected to rise among children aged 4-5 years within the time frame. The greatest reductions were observed 2 years after the programme's conclusion. (139) Greater programme response and impact was seen among higher socioeconomic status areas.

Romp & Chomp

'Romp & Chomp' was a community-wide, multi-setting programme targeting 12,000 children in early childhood settings in Australia from 2004 to 2008. (140) The programme focused on community capacity building and environmental (political, sociocultural, and physical) changes to increase healthy eating and active play in early-childhood care and educational settings. The programme achieved a significant difference in BMI (-0.06 kg/m^2) among 3½ year-olds between the intervention and comparator groups. If Romp & Chomp was scaled across Australia, a 2022 study found a 64% probability of Romp & Chomp being cost-effective. (141)

Good for Kids, Good for Life Program

Originating in New South Wales (NSW), the "Good for Kids, Good for Life Program" is a multi-setting approach to healthy eating and physical activity for children, aiming to reduce child overweight and obesity and build evidence for policy and practice. The programme involves implementation of context and setting-specific evidence-based capacity building programmes or services and supportive organisational policies, systems and procedures, working across the first 2000 days, early childhood services, primary schools, secondary schools and community sport. Good for Kids increased the proportion of NSW schools implementing evidence-based healthy eating and physical activity practices from 32% to 84%, and the model informed the government's Healthy Children's Initiative - the approach to childhood overweight prevention across the state. (142) Internationally, the programme has influenced policies in countries including Australia, the UK, Europe and North America as well as the WHO, United Nations and UNICEF. (143)

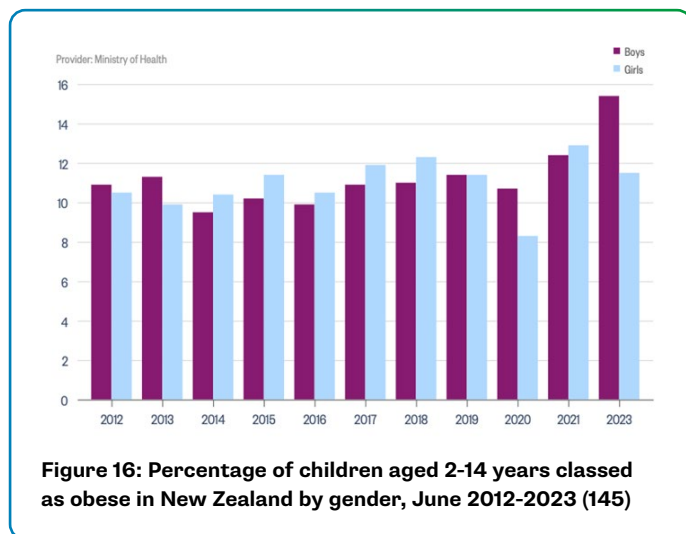
Be Active Eat Well

The Be Active Eat Well intervention was also a multi-setting, community-based obesity prevention programme targeting primary school children. The programme was informed by community and stakeholder workshops, alongside input from steering committees, expert advisory groups and a project board. Communities created individual intervention objectives including fruit and vegetable consumption; decreasing SSB consumption and support for policy development within schools regarding canteen menu. The programme resulted in lower child BMI z-scored compared to the comparison group and highlighted the importance of targeting household environment and family practices. (144)

The local/regional initiatives described provide useful learning opportunities – but where funding is not maintained their effectiveness is obviously limited.

NEW ZEALAND

Around 30% of children aged 2-14yrs in New Zealand are overweight or living with obesity (Figure 16). (145) Obesity disproportionately affects Māori and Pacific children and adolescents, as well as those of lower socioeconomic status.



In 2015, the Ministry of Health launched a package of 22 initiatives as part of its Childhood Obesity Plan. (146) These include targeted interventions for children with obesity and increased support for those at high risk of becoming obese, plus broader approaches to make healthier choices easier for the general population. The initiatives have multi-sectoral engagement and place importance on food, the environment and keeping active across the life course. Building on the 2015 plan, the government has focused on the following actions:

- Healthy Active Learning - an initiative promoting and improving healthy eating and physical activity in all schools
- Working with Health New Zealand (previously district health boards) to implement the National Healthy Food and Drink Policy, across a range of settings
- Co-leading with Sport New Zealand on New Zealand's response to the World Health Organization's Global Action Plan on Physical Activity
- Supporting implementation of the Clinical Guidelines for Weight Management in New Zealand Children and Young People
- Working with the food and beverage industry sector to identify actions to create healthier food environments.

Data on children's obesity trends in New Zealand is mixed, so it is difficult to assess the effectiveness of the Childhood Obesity Plan. A national screening programme found a decline in BMI among 4 year olds between 2017 and 2019. (147) A later study found an increase in 4 year old's BMI following COVID lockdowns. (148) The impact of COVID may also help explain why The Global Obesity Observatory reports that the proportion of children with overweight or obesity rose from just under 30% in 2019 to around 33% in 2022.

Project Energize

This was a region-wide whole-school nutrition and physical activity programme, which began as a randomised controlled trial (RCT) in 2004-6 in 124 schools in Waikato, New Zealand. (149) Further schools then joined the programme, so that by 2011, all but two of the 235 schools in the region were engaged. Energizers (trained nutrition and physical activity specialists) worked with 8-12 schools each to encourage healthier eating and enhanced physical activity. After adjusting for age, sex, ethnicity, socio-economic status (SES) and school cluster effects, the combined prevalence of obesity and overweight among younger and older children in 2011 was lower by 31% and 15 %, respectively, than that among 'unEnergized' children in the 2004 to 2006 RCT. (150) This is part of a trend we have seen in other countries, where individual local/regional initiatives show evidence of reducing overweight and obesity. Project Energize operated successfully for sixteen years, which is longer than many such programmes. However, in 2020 the programme was ended, following restructuring – a move criticised by some school leaders, who had valued its positive impact. (151)

LESSONS FROM SCHOOL-BASED INTERVENTIONS

As this review has identified, a number of local school-based interventions have helped achieve weight improvements (in Chile, China, Greece, Germany, India, New Zealand, Singapore and the UK). It may therefore be helpful to consider which factors appear to help facilitate this.

Multi-component school-based interventions, i.e. environmental, and educational components covering nutrition and physical activity; have been found most effective in improving weight and adiposity indicators among children compared to single-component interventions. In a review of international school-based interventions aiming to prevent child obesity among primary school children, strategies implemented in effective interventions were found to be: (152)

- School policies supporting the availability of healthy food and beverage choices and limiting unhealthy snacks.
- Changes in the schoolyard, in break time rules and in physical education classes to increase physical activity.
- Involving parents in the intervention via assignments, meetings, informative material and encouraging them to improve the home environment. This is supported by an earlier review on school-based interventions which found that all interventions that documented parental involvement successfully influenced obesity indices. (153)
- Teachers acting as role-models and being actively involved in the delivery of the intervention.
- Adapting interventions to the targeted population group(s)
- In low-SES areas or in migrant population groups, a focus on school policy and environmental changes, parental engagement, and interactive team activities, rather than educational parts of the intervention alone.

Social marketing has also been shown to be a key factor in successful school-based obesity interventions. For example, a systematic review found inclusion of at least 5 Social Marketing Benchmarking Criteria (SMBC) domains in school-based interventions resulted in a reduction of BMI and reduced prevalence of overweight and obesity among children and adolescents. (154)

Most interventions have targeted primary-school age children rather than older children, likely due to dietary and physical activity behaviours forming in earlier years and thus a better time to influence behaviours. A 2011 Cochrane review concluded that interventions in schools were effective for BMI, particularly for children aged 6–12 years old. (155)

Programme components which were most promising included the following approaches:

- A school curriculum that includes healthy eating, physical activity and body image
- Increased sessions for physical activity and the development of fundamental movement skills throughout the school week
- Improvements in the nutritional quality of the food supply in schools
- Environments and cultural practices that support children eating healthier foods and being active throughout each day
- Support for teachers and other staff to implement health promotion strategies and activities (e.g. professional development, and capacity building activities)
- Parent support and home activities that encourage children to be more active, eat more nutritious foods, and spend less time in screen-based activities.

Community involvement and collaboration with community stakeholders can help to increase the acceptability and sustainability of school interventions and encourage increased physical activity and improved dietary habits out of school. Table 1 on pages 32–33 summarises common components of successful school-based obesity interventions.

DISCUSSION

Worldwide, childhood obesity has become a significant health challenge, with a rapid rise in low-middle income countries, alongside continued high prevalence in higher income countries. Government bodies have increasingly responded through national policies and guidelines targeting obesity risk factors, such as unhealthy diet and insufficient physical activity. They have often adopted similar approaches. These include:

- Measures to encourage healthier food and physical activity in schools
- Improved food and menu labelling to help consumers make informed choices
- Higher taxes on HFSS food and beverage and restrictions on marketing to children
- National dietary and physical activity guidelines
- Social marketing campaigns to encourage healthier eating and physical activity.

These top-down initiatives often appear to produce health benefits by encouraging healthier diets or more physical activity (particularly beneficial when this occurs in more deprived areas). However, their impact on overall obesity prevalence has often been limited.

There are a number of possible explanations for this, including not enough approaches being taken; seeking to discourage HFSS consumption but not taking enough action to make healthier food affordable, accessible and attractive; relying on voluntary action by food companies rather than regulation; or setting tax levels on HFSS products too low to achieve significant change.

One factor has been a reluctance to tackle the role the food industry has often played in creating an obesogenic environment. For instance, even where soda taxes have been introduced or marketing to children limited, these measures have often been limited, delayed and diluted following lobbying by the food industry.

The most successful obesity interventions have often been local or regional and adapted to local contexts, taking account of existing social, environmental and cultural factors (Table 2 on pages 34-35). Successful examples include local/community-based initiatives in parts of France, the Netherlands, the USA, Finland and South Australia. Key features of these programmes include:

- addressing the wider influences on children's diets and physical activity by incorporating initiatives throughout school, home and community environments.
- support for parents, families and early years professionals as children's food preferences and lifestyle choices are established in the early years.
- engagement of influential stakeholders from central to local level, such as businesses, local government, schools, early years centres, communities, families and parents.
- empowering and enabling the capacity-building of local communities to help improve environments for children

Engaging with and empowering local stakeholders and children/families within communities can help ensure sustainable, inclusive and equitable lifestyle and behaviour change. The UK's National Institute for Health and Care Excellence (NICE) has provided recommendations for the development of sustainable, community-wide obesity approaches, including recommendations on strategic leadership and coordinating local action; involving the community, local businesses, and social enterprises and planning and implementing systems for monitoring and evaluation. (156)

A concern with community-based approaches, however, is the limited influence they have over wider aspects of the environment, such as underlying socio-economic inequalities, media advertising of highly processed food, or the recent rapid increase in the cost of healthy food. These and other factors often require government action. Building on existing national/regional frameworks and policies, developing community ownership and influencing social norms can help support the sustainability of community programmes

Around the world a number of school-based initiatives have also achieved reductions in body weight. These have typically taken a reasonably holistic approach including all or most of the following: healthier school food, nutrition and/or health education, parental and home involvement, greater physical activity, and social marketing. However, such initiatives have often relied on short term funding and have been vulnerable when funding has been cut. As with community-based initiatives they usually also have limited influence over the wider socio-economic and food industry factors influencing weight.

Interestingly, a number of Western European countries have seen the prevalence of childhood overweight and obesity plateau and even fall slightly, with France and the Netherlands good examples here. Relevant factors here appear to have included:

- An early commitment to national obesity plans
- A willingness to tackle obesogenic environments and the role of the food industry
- Not relying purely on encouraging individual health behaviour change
- Unusually extensive and sustained community-based whole systems approaches (such as EPODE and JOGG), which combine top-down and bottom-up commitment.
- National cultures which tend to encourage healthier eating and/or physical activity.

This report therefore supports evidence and recommendations that multiple approaches are required to reduce childhood obesity, achieving more health gains and greater cost-effectiveness than individual interventions.

CONCLUSION

This report suggests that to have optimal impact on reducing child obesity, top-down policies from governments need to combine with bottom up, community-based approaches. This helps to create a holistic, 'whole systems' response on the scale needed to begin to combat the otherwise pervasive effects of modern obesogenic environments. This can prove particularly effective when targeting more deprived areas, which are otherwise usually at greatest risk of obesity.

Table 1: Summary of common components of successful school-based obesity interventions

Name, location	Target age	Obesity-related outcomes	Measures to improve the local environment					
			School food	Nutrition and/or health education	Parental/home involvement	Physical activity	Social marketing	Additional factors
Kiel Obesity Prevention Study (KOPS), Germany ⁶	5-7yrs	Less increase in % fat mass		✓	✓	✓		
StEP TWO programme, Germany ²	7-9yrs	Increase in BMI was lower	✓	✓	✓	✓		
James's study, UK ⁸	7-11yrs	0.2% reduction in # of children with obesity/ overweight, however, the difference with control did not remain after an additional two years' follow-up	Y – SSBs only	✓				
Cretan Health and Nutrition Programme, Greece ⁴	6-15yrs	Less increase in BMI		✓	✓	✓		Applied Social cognitive theory
Diet and Nutrition Intervention, Chile ¹⁰	5-15yrs	Significant improvement in BMI and WC for boys only		✓	✓	✓		
Trim and Fit, Singapore ¹¹	5-18yrs	Obesity reduction from 16.6% to 14.6% from 15.5% to 13.1% among 11-12 and 15-16yr olds, respectively	✓	✓		✓		Policy restriction of sale of HFSS foods at school
Children study, Greece ¹²	5 th grade	Significant favourable effect on BMI	✓		✓	✓		Teachers acting as role models. Applied Theory of Planned Behaviour framework
POP project ¹³	3-6yrs	Significant favourable effect on BMI Z-score in the low SES groups			✓	✓		
AFLY5, Philadelphia ¹⁴	4-6 th grade	50% reduction in incidence of overweight	✓	✓	✓		✓	Removal of school vending machines
The Baden- Wurttemberg Study “Join the Healthy Boat” programme, Germany ¹⁵	7yrs	Significant favourable effect on abdominal obesity		✓	✓			Translation of materials to also reach parents with migration background. Social cognitive theory & socio-ecological model applied
Project Energize, New Zealand ¹⁶	6-11yrs	Significant favourable effect on combined prevalence of obesity + overweight and BMI	✓		✓	✓	✓	Consistent nutrition messages in all aspects of school and community interaction e.g., healthy fundraising options

Table 1: Summary of common components of successful school-based obesity interventions

Name, location	Target age	Obesity-related outcomes	Measures to improve the local environment					
			School food	Nutrition and/or health education	Parental/home involvement	Physical activity	Social marketing	Additional factors
CHIRPY DRAGON, China ¹⁷	6yrs	Mean difference in BMI z scores (intervention – control) –0.13, with effect greater in girls and in children with overweight or obesity at baseline	✓	✓	✓	✓		
Udupi, India ¹⁸	10-16yrs	Mean BMI reduced among intervention group from 24.9 to 22.8 and in the control group increased from 24.2 to 25.1		✓		✓		

BMI – body mass index. SSBs – sugar sweetened beverages.

Table 2: Summary of successful local and regional approaches to reducing child obesity

Programme and target age group	Impact on children/ families in deprived areas	Multi-setting interventions (e.g. home, school, community)	Measures to improve the local environment	Public, private and community sector partnership	Community engagement and capacity building	National coordination and support for local delivery	Funding – a combination of public and private sector	Other key features
Ensemble Prévenons l'Obésité Des Enfants' (EPODE) France Children 0-12 years	Universal provision – but impact greater in deprived areas	✓	e.g. including catering structures and family norms	✓	✓	Central Coordination Team/ local programme managers	Yes – where no conflict of interest re private funding	Yes – where no conflict of interest re private funding
Vivons en Forme (VIF) France Children 0-11 years	Greater focus on deprived areas	✓	e.g. school canteens in particular (and not just what food is eaten and how much but also how it is eaten)	Mainly public and community	Uses tools co-constructed and tested according to social marketing principles	Municipal service/ local coordinators	Public funding	Assumes experience has more impact on behaviour than information
Jongeren op Gezond Gewicht (JOGG) Netherlands Children 0-23 years	Universal provision – but pays special attention to those who live in disadvantaged areas	✓	e.g. including shopkeepers and supermarkets	✓	✓	National JOGG Foundation/ local project managers	Yes – where no conflict of interest re private funding	Local political commitment Links prevention and healthcare
Amsterdam Healthy Weight Programme Netherlands Children 0-19 years	Universal provision – but priority neighbourhoods identified and a community manager assigned to each	✓	e.g. including healthy urban design and healthy food environment	✓	✓	Led by the Deputy Mayor for healthcare and sport/Programme Manager and inter-departmental team	Primarily public (City Council) with selected supportive business partners	Health in all policies approach Focus on sleep alongside diet and physical activity
Seinajoki City Overcoming Obesity Programme Finland Children 0-12 years	Universal approach	✓	e.g. including recreation and urban planning	Public sector partnerships/ Health in all Policies		The City's Director of Health Promotion/ focus within all departments	Primarily public (City Council) with some NGO collaboration	Based on Finland's National Obesity Programme Integrates health in all local policies

Table 2: Summary of successful local and regional approaches to reducing child obesity

Programme and target age group	Impact on children/ families in deprived areas	Multi-setting interventions (e.g. home, school, community)	Measures to improve the local environment	Public, private and community sector partnership	Community engagement and capacity building	National coordination and support for local delivery	Funding – a combination of public and private sector	Other key features
Health, Exercise and Nutrition for the Really Young(HENRY) Leeds Mainly pre-school children	Technically universal but the Children's Centres are typically located in more deprived areas	Focus on parents e.g. via community-based pre-school centres	More focus on family behaviour change	Early years/family partnership in community-based children's centres	✓	The charity HENRY trains local health and early years practitioners	HENRY, a national charity, in partnership with Leeds City Council	HENRY was founded by a Professor in Child Health and a parenting educator/ behaviour change specialist
Brighton and Hove whole system approach to obesity UK Children 0-11 years	Universal approach, though areas of deprivation were specifically acknowledged	✓	e.g. championing the Sugar Smart campaign, active travel	✓	✓	Local coordination and delivery Strategy supported by national policy context	Public funding	A local Food Strategy. Partnership with a local supermarket chain to improve accessibility of fruit and vegetables for low-income families

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