

# containing child obesity through the national curriculum: a project blueprint

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evolutionary determinants of health and urban wellbeing

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the national curriculum:  
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**Evolutionary Determinants of Health:      discussion paper**

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# 1 summary

**“The education sector plays a critical role in providing nutrition and health education, increasing the opportunities for physical activity and promoting healthy school environments”**

WHO (2016) *Report of the commission on ending childhood obesity*

1.1 This discussion document presents official guidance and recommendations aimed at providing effective containment of the alarming increase in the incidence of child obesity, now a global pandemic. It then proposes a pilot for a cost-effective schools-based intervention programme for England that addresses the challenge directly, while also considering the associated problem of health inequalities in children. Key documents and studies from a number of countries are referenced to provide a wider context.

1.2 The World Health Organisation (WHO) states that tackling child obesity requires consideration of the environmental context and of three critical time periods in the life-course:

- a) preconception & pregnancy;
- b) infancy and early childhood;
- c) older childhood and adolescence

The proposed pilot project presented for discussion would develop a proactive, upstream methodology, addressing the challenge of childhood obesity in each of those stages, but particularly in b) and c). The methodology would adopt, implement and deliver the detailed recommendations of the UK Government 2017 guidance together with the WHO 2016 report through programmes integrating three project strands, or ‘Protocols’.

## 1.3 Pre-School Protocol

This programme concentrates on early child development (defined as prenatal to five years of age) building on several current educational initiatives. It will be focused on the parents living in the catchment areas of the Primary Schools participating in the Primary Protocol phase (see below).

1.4 The next two strands take a more innovative trajectory. Schools would be invited to participate in a voluntary scheme that sees a reworking of aspects of the UK National Curriculum as the delivery mechanism. Two school-based programmes will run concurrently in an initial pilot project and are called:

- **Primary Protocol**  
Age 5-7: Year 1-2 = *Key Stage 1*; Age 7-11: Year 3-6 = *Key Stage 2*
- **Secondary Protocol**  
Age 11-14: Year 7-9 = *Key Stage 3*; Age 14-16: Year 10-11 = *Key Stage 4*

1.5 The objective of each annual programme is to increase the general health of all pupils, and to reduce the number of children classified as obese during its course. Consequently fewer obese pupils will move forward to each successive year-group, enabling more focused support being devoted to them. Key points in these two pilot protocols are:

- A **Head of Health** would be appointed in each participating school to co-ordinate the delivery of a new programme, involving all pupils in their schools in more daily activity regimes, with a reconsideration of the teaching of nutrition and related subjects, and in the provision and content of school meals;
- All pupils would undertake 60 minutes of supervised physical activity each day, an increase in the current guidance of just 2 hours per week;
- All food and drink sold or provided on school premises would meet the new Food Standards, including Breakfast Clubs and school lunches.
- Consideration would be given to the design and updating of school buildings and facilities to promote the concept of a healthy school.
- All encouragement would be given to facilitate Walk-to-School initiatives.
- Data collection: there will be longitudinal tracking of pupils while within the formal State Education system from Y1 to Y11. BMI measurements will be recorded alongside nutritional, activity and academic attainment data, related to attributes such as social status (eg advantaged/ disadvantaged using provision of free school meals as the proxy).
- The new programmes would be assessed by as part of the UK's new Health Rating system

1.6 The aspiration, after a full eleven-year cycle, would be to significantly contain child obesity for that cohort through increased activity and better dietary advice delivered by a proactive National Curriculum, committed to healthy schooling.

1.7 The cohorts that benefit from the Activated National Curriculum could, in later years, be the first generation in the 21<sup>st</sup> century in which the general levels of adult obesity were significantly reduced, together with the attendant debilitating diseases and conditions.

1.8 There would also be a significant reduction in the demands on the National Health Service (NHS), with considerable cost benefits.

## 2 global challenge

**“Although worldwide obesity has nearly tripled since 1975, the condition is preventable”**

WHO (2016) *Report of the commission on ending childhood obesity*

**2.1 GLOBAL CHALLENGE** The World Health Organisation (WHO) records that obesity has reached epidemic proportions globally, with at least 2.8 million people dying prematurely each year as a result of being overweight or obese. It also demonstrates that although obesity was once associated with high-income countries, it is now also prevalent in low- and middle-income countries. Indeed, most of the world's population live in countries where overweight and obesity kill more people than underweight. There is general consensus that the prime causes are the modern more sedentary lifestyles, often focussed on computers, TVs and cars, and nutritional regimes that incorporate excessive sugars and carbohydrates, with the effects often exacerbated by social and cultural issues. Although for some, pharmaceutical treatments and medical interventions can alleviate the condition and the consequences, major changes in lifestyle choices regarding dietary and daily activity regimes offer the most effective and often the most sustainable remedy.

**2.2 INCREASING PREVALENCE OF CHILD OBESITY** Twenty-five years ago, it was estimated that 10% of the world's school-aged children were carrying excess body fat, and consequently were at an increased risk of developing chronic disease. That figure has now more than doubled. The WHO reports that, globally in 2016, more than 1.9 billion adults were overweight or obese, as were 340m children and adolescents aged 5-19 and 41m children under the age of five. To focus on the latter figures, childhood obesity is one of the most serious public health challenges of the 21st century, since overweight children are more likely to become obese adults. They are also more likely than non-overweight children to develop diabetes and cardiovascular diseases at a younger age, conditions associated with a higher chance of premature death and disability.

**2.3 OBESITY IN THE WEST** In the United States of America, for example, it has been recorded that childhood obesity has dramatically multiplied in the previous 30 years, according to the *Journal of Childhood Obesity* website. In 1980, some 7% of children aged 6-11 were classified as obese. By 2012, that figure had more than doubled, increasing to 18%. The statistics have been compiled, but the problem remains, since by 2012 more than 33% of infants and adolescents were either overweight or obese. In the age group of 6 to 11, just 49% of boys and only 35% of girls undertook the recommended amount of 60 minutes of physical activity per day, while a mere 8% of adolescents ages 12 to 15 reach that goal.

**2.4 OBESITY IN DEVELOPING COUNTRIES** But the challenge presented by rising obesity levels is no longer just in the affluent west. Rapidly changing dietary practices and a sedentary lifestyle have led to increasing prevalence of obesity in developing countries too. In India from 2006-9, the rate rose from c.10% to c.12%, in Thailand from 1991-3, from c.12% to c.16%, while in Brazil from 1974-1997, the prevalence of obesity rose from c. 4% to c.14%. A recent study records that levels of child obesity have also risen, to over 19% in Argentina, 22% in Brazil and India, while in Mexico the level is now 42%. Important determinants of childhood obesity include living in metropolitan cities, high socioeconomic status, female gender, unawareness and false beliefs about nutrition, marketing by transnational food companies and poor facilities for physical activity. Childhood obesity has been associated with Type 2 diabetes mellitus, the early-onset metabolic syndrome, subclinical inflammation, dyslipidemia, coronary artery diseases, and adulthood obesity. Changes in lifestyle and regular physical activity are suggested as the most beneficial strategies to contain child obesity, but require parental and social support as well as effective health education programmes (Gupta et al 2012).

**2.5 Study of child obesity in New Delhi, India** has shown an increase from 16% in 2002 to about 24% in 2006-2007. The prevalence among adolescent children was 29% in private schools and 11.3% in government funded schools. While India already has the highest number of patients with Type 2 diabetes mellitus globally, the rapid rise of obesity in children is the prime reason for increasing insulin resistance, the metabolic syndrome, dyslipidemia, polycystic ovarian syndrome and raised levels of C-reactive protein. Excess body fat, thick truncal subcutaneous fat, and abdominal adiposity are important predisposing factors for the development of insulin resistance in Asian Indian children. As compared to other ethnic groups, children with ancestral origin in South Asia manifest adiposity, insulin resistance and metabolic perturbations earlier in life and these derangements are of higher magnitude than white Caucasian children. The metabolic syndrome and obesity track into adulthood, and thus need to be recognized early for effective prevention of diabetes and coronary heart disease. Therapeutic lifestyle changes and maintenance of high levels of physical activity are seen as important prevention strategies (Bhardwaj et al 2008).

**2.5 SOCIAL DETERMINANTS OF OBESITY** The health impact of increasing prevalence of obesity among children is a serious concern. Heart diseases and diabetes were rare among children and young adults in the previous century but today, are frequently occurring in the younger generation. Studies such as one in Lagos Nigeria have highlighted the need to not only improve the awareness on prevention of obesity among children but the need to motivate them to adopt a healthier life style (Johnson et al 2014). In India, the prevalence of obesity in pre-adolescent and adolescent children was demonstrated by a major study involving some 2000 school-children aged 9-15 years. Half the subjects were from well to do families while the rest belonged to two schools from middle and lower socio-economic background. Weight and height were taken for all children and the body mass index (BMI) calculated. The overall prevalence of obesity and overweight was 11% and 14% respectively. The prevalence of obesity was higher in boys than girls (c.12% v 10%) and similar ratio for overweight pupils (16% vs 13%) was recorded. Significantly more children from higher socio-economic status groups were obese and overweight than those from lower socio-economic status groups (the reverse of the trend seen currently in the UK). Although no significant gender difference for obesity prevalence was seen among Indian children from a less privileged background, amongst children from affluent families, significantly more boys were obese as compared to girls (Chatwal et al 2004).

2.6 CAUSES OF OBESITY A country like India is facing a double burden of poor nutrition, since it must deal with underweight as well as overweight populations. Nevertheless, it recognizes that childhood obesity is one of the most serious public health challenges of the 21st century, emerging among all ages and socio-economic groups. The cause is multi-factorial, including environmental, social and genetic issues, and recent research has been conducted to determine the range and relative significance of the factors contributing to overweight/obesity, before the most appropriate interventions can be developed (Mahendra & Harish 2015).

2.7 SOLUTIONS? For children, neither surgery nor drug therapy can be recommended to contain that condition, unless within a closely monitored research study. Of the remaining choices, no single method guarantees success. Nevertheless there is a clear consensus that reduction in time engaged in sedentary activities would be beneficial. Dietary interventions in combination with exercise programmes are reported to have better outcomes than just changing the diet, but exercise programmes without dietary modification are unlikely to be as effective as they could be, since the extra energy expended is likely to be matched by increased consumption of energy-rich foods.

2.8 In addition, a whole-family approach also appears to be vital, with several studies showing that outcomes are improved (at least for younger children) if the parents are the key instigators of the process, or are genuinely engaged in it (Lobstein et al 2004).

2.9 Few would disagree with that statement, but the school system also has a major role to play. In Pakistan, for example, obesity prevalence was found to be highest among boys, particularly children from the middle income families, who were spending an alarmingly large part of their lives in sedentary activities, such as watching television. But the determinants of obesity lay not just within the home, but also in the school environment, where there was minimal opportunity for physical activity: an obvious remedy would be more sports provision (Ahme et al 2012).

2,10 A major publication over ten years ago had already recorded the increasingly sedentary trend in the lifestyles of school-age children. Based on the literature analysed, it was nevertheless suggested that a programme with a sufficient quantity of a quality physical education contributes significantly to the overall amount of moderate-to-intense physical activity of school-age children. Schools also have the potential to influence the habitual physical activity of children by encouraging increased participation in extracurricular sports activities, promoting active commuting to school and by providing exercise equipment and appropriate supervision. In addition to offering a quality physical education programme, schools should ensure that the total weekly amount of exercise is sufficient not only to maintain but also to enhance a child's physical fitness. This requires careful consideration of strategies needed to make optimal use of the curricular time allocated to physical education, given the heavy academic demands on it (Trudeau & Shephard 2005).

## 3 evolutionary determinants of health

3.0 There has been considerable research on aspects of urban health, as the World Health Organisation and recent reviews show (eg von Szombathely et al 2017). Some studies have considered relationships between individuals and society as well as between the natural and the built environment, and the complex web of interactions that resulted. To these were added the challenges posed by the Social Determinants of Health (Marmot & Wilkinson 2006; Wells 2016) and other differentials (Liddle 2017) to further the complexity. That issues such as building design (eg Smith et al 2013), access to green space (eg Mitchell & Popham 2008), air quality (eg DEFRA 2015) and excessive car use (eg Hynes 2017) also have a profound impact on urban wellbeing is increasingly evident. Effective remedies to improve urban wellbeing need to take account of such complex interactions. In this section, it is argued that a better understanding of our basic biology and of our long human evolution underpin both the pressing problem of child obesity and suggested dietary and activity-based solutions.

### 3.01 THE URBAN PARADOX

For the first time in human history, more people now live in towns than in rural communities. The march of modernity has urbanisation at its core, and to cope with a projected global population increase from 7.2bn to 9.6bn by 2050, many more cities must be (and are being) built.

3.02 But the town is not our natural habitat. Some 7m years ago, our human lineage began diverging from that of the chimpanzee, with whom we still share 98% of our genome and thus a common Miocene ancestor (Stringer & Andrews 2011). For the majority of the subsequent period, our basic biology gradually evolved, as our various direct ancestors lived off the land, developing into tribally-based 'hunter-gatherer-style' communities. Each day every day, we needed to go out and actively forage for fresh food and fresh water in the fresh air. That protracted period in our human evolution is stamped deep into our DNA as our Palaeolithic genome. Such active 'hunter-gatherer-style' cultures, robustly refined by the rigours of natural selection, are well adapted to our bi-pedal physiology, while our dentition, metabolism and digestive system are likewise well suited to a diet of fresh fruit, vegetables, roots, nuts, berries, meat and fish (Kelly 2013).

### 3.10 HEALTHY ACTIVITY REGIMES

The human race is therefore genetically adapted for a life of routine activity essential for hunting, and foraging: this demands regular walking, running, lifting, throwing, carrying, crawling, bending, stretching, climbing and so forth, rather than for long sedentary periods (O'Keefe et al 2011, 472-478). The actual tasks accomplished in a "normal" hunter-gatherer's day could vary, depending on hunger, seasonality, weather or terrain. Nevertheless, the typical daily distance covered by human locomotion would be in the range of three to ten miles. The necessary daily activities would require an average energy expenditure of between 3,000 and 5,000 kj, up to five times greater than many modern sedentary adults (Cordain et al 1998).

3.11 For today's city dwellers (and also for schoolchildren) regular walking or cycling at least part of the way to and from work/school each day would be a modest evolutionary-concordant compromise, given an encouraging townscape to move within (Marshall et al 2015; Wang & Chen 2017). A report by Lucy Saunders estimates that, in London alone, if more people could be persuaded to walk or cycle to work each day, then more than 4,000 premature deaths, nearly 800 more cases of breast cancer, up to 500 more cases of colorectal cancer, 1,500 extra cases of coronary heart disease and nearly 45,000 more cases of type 2 diabetes could be avoided simply by increasing activity levels (TfL 2014).

### 3.20 HEALTHY NUTRITIONAL REGIMES

The human digestive system, like our dentition, evolved and mutated over many generations in response to the food resources that were most successfully exploited. Clearly, different mammals are better equipped to consume different diets. Humans, although classified as omnivores, cannot sensibly or safely digest literally anything, however. They can, nevertheless, benefit from a wide variety of nutrients, basically the standard range of food types that must have been more or less available during the extended period of our hunter-gatherer evolution. The list includes fresh vegetables, fruits, berries, nuts, roots, bulbs, non-grass seeds, larvae, insects, sundry animals (muscle meat and all the innards), birds, eggs, fish and shellfish. These are the 'normal' foods that our bodies can readily convert into energy or into developing a strong, growing skeleton (Lindeberg 2010, 30–34).

3.31 A clear understanding is required of which fuels work for us (i.e. the foods that our evolving digestive systems can deal with efficiently), as opposed to the ones that provide little in the way of nutrients, have harmful side effects or that are no more than slow poisons. Nutritional science needs to appreciate of the evolutionary rationale that underpins our wellbeing, since ignoring it leads to today's seemingly unstoppable rise in "western lifestyle' diseases.

3.32 Fortunately, archaeological and anthropological evidence has clarified our knowledge of the dietary regimes adopted by our hunter-gatherer ancestors in the differing environments they successfully exploited (eg. Brothwell & Brothwell 1998; Stanford & Bunn 2001; Ungar 2006; Kiple & Kriemhild 2012). Foods (or additives) that have been part of the human staple diet for less than 10,000 years have not been as rigorously tested by natural selection. There have been many detailed studies of the benefits afforded by 'ancestral' diets, beginning with the pioneering approach taken by Weston Price (1938), the research by Melvin Konner and S. Boyd Eaton (2010) and the remarkable work by Staffan Lindeberg, for example, who argues that "Dietary advice to prevent and treat common Western diseases should be designed in accordance with our human biological heritage" (Lindeberg 2010, 29).

3.33 Modern medical research lends considerable support to this assertion. Nitrates help to reduce blood pressure and regulate the body's metabolism. Studies by the Universities of Southampton and Cambridge show that a diet including beetroot or green leafy vegetables such as spinach (rich sources of nitrates) is especially beneficial, since it can reduce the production of a hormone called erythropoietin. This is made by the liver and kidneys and determines the quantity of red blood cells we have, how thick our blood is and how much oxygen can be carried around the body. Too many red blood cells in the system can lead to thickening of the blood and to hypoxia, a common symptom in many cardiovascular diseases (Ashmore et al. 2014b).

3.34 Eating more green vegetables can not only help to alleviate those symptoms, but also those of many other heart and circulatory diseases. This is because such a diet also increases the production of compounds that allow the heart to pump more efficiently, by widening our blood vessels (Ashmore et al. 2014a). Further research has showed that nitrates also stimulate the conversion of 'bad' white fat cells into 'good' beige fat cells, a process that can reduce the risk of obesity and Type 2 diabetes (Lee et al. 2012).

3.35 Another study, this time by the University of Queensland, suggests that eating eight or more portions every day also dramatically improves mental wellbeing. Dr Redzo Mujcic collected data from 12,000 Australian adults to examine how their consumption of fruit and vegetables correlated with their mental health. It would seem that women experience a greater mental health benefit than men, and that fruit has a larger impact on mental health than vegetables (Mujcic 2014).

3.36 The many benefits of eating an evolutionary-concordant diet with plenty of fresh fruit and vegetables and avoiding foods with quickly digestible carbohydrates and a high glycaemic load is now widely accepted (but not as widely practiced). The advice appears in most health authority dietary guidelines: in 1990, for example, the World Health Organization published its recommendations for healthy living, suggesting that each person should consume 400g of fruit and vegetables every day (WHO 1990). In 2003, the UK government launched its own initiative, the 'five-a-day' advice, in common with France and Germany. Australia, however, suggested a more generous '2 & 5' rule that incorporated two (150g) portions of fruit in addition to five (75g) portions of vegetables.

3.37 Research conducted at University College London (UCL) by Dr Oyebode suggests that the Australian approach should be followed. The study examined the records of some 65,226 individuals recorded in the Health Surveys for England. A relationship was sought between the consumption of fruit and vegetables and mortality, whether by cancer, cardiovascular disease or other causes of death. Eating not five but at least seven portions of fresh fruit and vegetables a day was linked to a 42% lower risk of death from all causes, a 31% lower risk of heart disease or stroke and a 25% lower risk of cancer. Fresh vegetables that seemed to provide greater protection against disease with each daily portion reducing the overall risk of death by 16%, a portion of salad by 13% and each portion of fruit by 4% (Oyebode et al 2014).

3.38 Our physiology was adapted to collect, eat and digest a daily complement meat, or fish, and fresh vegetables and fruit, and our digestive systems have not, as yet, evolved beyond that of the hunter-gatherer. Taking this standpoint, Dr Oyebode's research shows not only that eating more vegetables increases the chance of a longer life, but that conversely, the more a diet diverges from an evolutionary concordant norm, the shorter that life is likely to be.

#### 3.40 HEALTHY IMMUNE SYSTEMS

3.41 The lives of hunter-gatherers were lived outdoors. Crucially, we are not born with a fully-functioning immune system, since this co-evolved with us over the long period of human evolution as Professor Graham Rook's ground breaking studies demonstrate (Rook 2012, 2013; Rook et al 2013, 2014). It is now clear that it is from direct contact with plants, animals and other humans that we obtain the macro-organisms, microorganisms and microbiota that live and thrive on our skin and in the gut, managing our immune system within our own personal ecosystem.

3.42 Initially, we derive such microbiota from our mother's birth canal (but not, alas, from a Caesarean section (Yuan et al 2016)). Subsequently we absorb these organisms from the external environment, from the soil, plants, trees and animals and the air. Without them, we are susceptible to allergies, autoimmunity and inflammatory bowel disease. Consequently, reduced contact with nature is bad for our physical health: we still need the microorganisms that only the natural environment can provide. Living in sterile urban areas, however, decreases our exposure to nature (and thus an effective immune system) while cities increase our exposure to crowd infections. The importance of parks, gardens, pets and fresh air, especially for urban children, cannot be stressed too highly, as Professor Rook has shown.

### 3.50 DISEASES OF URBANISATION

3.51 Culturally, the human race has seen rapid transformations, but our genetic evolution has been far slower: anatomically we remain much as we were before extensive agriculture and urbanisation were gradually developed in the Neolithic period, some 5,000 to 10,000 years ago. Although there are major benefits in city living, there are also major costs, such as the seemingly unstoppable rise in obesity, coronary-related problems, Type 2 diabetes and various types of cancer. According to the WHO, these are listed in the ten most common causes of death in modern, urbanised societies. Do these deaths represent that mismatch between human biology and urban culture, or are they just an inevitable result of the ageing process?

3.52 There is compelling research that challenges the inevitability of death by the 'Diseases of Urbanisation' and raises the possibility that living in such artificial built environments may well be exerting an unanticipated, negative impact on modern urban wellbeing. Dr Staffan Lindeberg has shown that ALL those fatal 'urban' conditions are rare or non-existent in un-urbanised communities still maintaining an 'ancestral' life-style. His detailed research included study of a large community in Kitava, Papua New Guinea, where people can live well into old age (Lindeberg 2010).

3.53 Archaeological research supports this assumption, graphically showing how the transformation from ancestral foraging practices to farming and urbanisation damaged our collective wellbeing. The introduction of intensive farming during the Neolithic period, for example, heralded major changes in the human diet and activity regimes. This was accompanied by a noted increase in dental caries, dental defects, tooth loss, trauma, metabolic and joint disease. Significantly, it is also associated with the first evidence for diffuse idiopathic skeletal hyperostosis (DISH), which is regarded as a proxy for obesity, not to mention tumours, anaemia, and osteoporosis, as well as infections such as osteitis and periostitis. Centuries later, the Romans not only introduced the civilising concept of urbanisation to these islands, but also scurvy, osteomalacia (rickets), Reiter's syndrome, gout, ankylosing spondylitis, rheumatoid arthritis, psoriatic arthritis, septic arthritis, tuberculosis, poliomyelitis and leprosy. None of these diseases or conditions were seen in the largely un-urbanised populations that lived here before the Roman invasion of AD 43. Arguably, urbanisation was -and often remained- a mixed blessing (see eg Roberts & Cox 2003; Hassett 2017).

3.54 Certainly un-urbanised or pre-urbanised populations suffered from their own problems, such as malaria, childbirth complications, predators, seasonal food or water shortages and serious accidents associated with robust active lives. But what they did NOT suffer from were many of the ailments straining our health services today: these were introduced by urbanisation through its culture and its townscapes. Consequently, there should not be termed 'Western Lifestyle Diseases' (they are now part of a global pandemic) but 'the Diseases of Urbanisation'.

### 3.60 ADDRESSING THE CHALLENGE

There is therefore a mismatch between modern city life and our basic biology that needs to be addressed. In the past, public health officials and town planners worked together in the drive to eradicate such urban evils as cholera and typhoid (Herbert 1999). One of the prime goals for the new generation of cities is an equally concerted drive to improve urban wellbeing. Despite significant achievements over the previous century, it is now evident that modern medicine on its own cannot solve all health problems: its resources are over-stretched and its limitations increasingly recognised. Progress is no longer solely a matter of eradicating particular diseases, but requires an improved understanding of the political, economic, cultural, social and genetic determinants of health. Improving a nation's health must now rely not just on reactive medical advances but also on positive proactive cultural change that translates directly into improved urban wellbeing.

3.52 The megacities of the future and modern urban lifestyles should be designed to contain or constrain the 'Diseases of Urbanisation' that currently beset us. These and a myriad of other issues have been considered at length by bodies such as the Healthy Cities Movement (Rydin et al 2012), and the World Health Organisation (WHO 2004). As a contribution to this complex and far-reaching debate, it is suggested that the urban lifestyles and townscapes of tomorrow should simulate, or at least approximate, the diet, activity regimes and environments that our hunter-gatherer biology is best adapted for (Milne 2017).

3.53 Our overburdened National Health Service is all too well aware of the complications that arise from an urban population that ignores the fundamental evolutionary determinants of health, as the prevalence of obesity, diabetes, cardiovascular problems and several forms of cancer prove. As Professor Marmot states, "Although our material and social environments have changed beyond recognition over the last 10,000 years ... our underlying biology is essentially the same as it was in ancient Babylon" (Marmot & Wilkinson 2006, 13). Archaeologists agree with his sentiment, but respectfully add many millennia to his chronology.

### 3.60 CITIES FIT FOR HUMANS

3.61 To contain the curse of obesity and the diseases it is so closely associated, we need to reconfigure our lifestyles to simulate the normal everyday needs of those ancestral hunter-gatherers, but in a modern urban context.

3.62 For our school children, this involves reconsideration of their daily curriculum, if it is too sedentary, for example. It may also involve in the fabric, design and layout of our schools as well as the surrounding streetscapes- as will be discussed in later chapters- if we are to make a real and lasting difference to our children's health today, and to urban wellbeing tomorrow.

3.63 Over many millennia, the human race has adapted to living in forests, valleys, deserts, jungles, mountains and open plains. But can it take the next step in its evolutionary progress, and adapt more successfully to an urbanised environment of its own making? Tomorrow's cities and urban societies would be 'healthier' if configured or reconfigured on evolutionary-concordant principles, working with our palaeolithic genome rather than against it. This would require co-ordinated approaches combining cultural change with changes in urban design, town planning and associated legislation: it is possible to configure an evolutionary-concordant urban future in which the prevalence of obesity was contained. Towns may not be our natural habitat, but we can make them our optimal one.



## 4 national emergency

**“If current trends were to continue, 72% of the UK adult population would be overweight or obese by 2035”**

Bhimjani, Knuchel-Takano & Hunt (2015)

*Tipping the Scales: why preventing obesity makes economic sense*, p. 16

**4.1 COSTING THE FUTURE** In the UK, it has been estimated that over 70% of the adult population would become overweight in the next twenty years. The scale of this challenge is daunting, since suggested increase in obesity in this period could lead to an additional 4.62m cases of Type 2 diabetes, 1.63m cases of coronary heart disease and 670,000 new cases of cancer. The cost of treating these new obesity-related diseases and the associated social care involved has been estimated at an additional £2.51bn to the NHS (Bhimjani, Knuchel-Takano & Hunt 2015).

**4.2 QUANTIFYING THE PROBLEM** As for children, primary care electronic health records have been used to evaluate the prevalence of overweight and obesity in 2 to 15-year-olds in England over the last two decades. Some 375 general practices in England contribute to the UK Clinical Practice Research Datalink, from which individual participants who were of the appropriate age between 1994-2013 were sampled provided that they had one or more Body Mass Index (BMI) records. Data were analysed for 370,544 children with 507,483 BMI records. From 1994 to 2003, the odds of overweight and obesity increased by 8.1% per year. Trends were similar for boys and girls, but differed by age groups, with prevalence stabilising (but not falling) in 2004 to 2013 in the younger age group (2–10 year) but not in the older (11–15 year) age group, where rates continued to increase (Jaarsveld & Guildford 2015).

**4.3 PRE-SCHOOL OBESITY** There are now some 1.6m obese children aged between 2 and 15 in England (HSCIC 2014): indeed 9.6% of English children are dangerously overweight or obese before they even start primary school, according to a report compiled by the NHS (*Statistics on Obesity, Physical Activity and Diet England: 2017*).

**4.4 PRIMARY SCHOOL OBESITY** For all those concerned with primary education, however, there is an even more worrying figure listed in that report: by the time children reach the age of ten or eleven, 20% are overweight or obese. This is in spite of enjoying the benefits of six years of compulsory state education, with all its under-used potential for delivering vigorous physical activities on a daily basis.

4.5 PLANS FOR ACTION The government is aware of the seriousness of the situation. In England, it set a target of a sustained downward trend in level of excess weight in children by 2020, with responsibility shared between local and national government, businesses and individuals (2011: *Healthy Lives, Healthy Places*). In Scotland, the devolved government published a strategy (2010 *Route Map Towards Healthy Weight*): this included a £200m investment in the sport and health budget, one of the aims of which is to increase the proportion of children of a healthy weight. In Wales, the government introduced regulations on *Healthy Eating in Schools* (2013) and in Northern Ireland the Assembly published *A Fitter Future For All* (2012), setting targets of reducing obesity in children by 3% by 2022 (Bhimjani, Knuchel-Takano & Hunt 2015).

4.6 In its 2015 manifesto, the UK government pledged to ‘take action to reduce childhood obesity’, described by the Secretary of State for Health, as ‘a national emergency’. The legislation to introduce the *Soft Drinks Industry Levy* (the ‘Sugar Tax’), will come into force in April 2018, which will prompt some soft-drinks manufacturers to reduce the amount of sugar their products contain. There has also been discussion with the food industry concerning the amounts of sugar in other products, with the issues regarding TV advertising at peak viewing time for children and with more informative food labeling, based on WHO recommendations.

4.7 The UK Government then updated its ***Childhood Obesity: A Plan for Action*** in 2017. The 14-point plan is summarized in the Appendix A, p.47-51. It demonstrates a robust commitment to dealing with this major challenge, and there is also welcome discussion of resources, support and evaluation. But how might the goal of actually producing a significant decrease in the prevalence of child obesity be achieved? Certainly the ‘Sugar Tax’ and related issues have an important role to play, but are there any other major interventions ready to be implemented?

4.8 PROPOSED NEW PROGRAMME The proposed programme builds on the positive momentum created thus far to address child obesity in England, with the implementation of the guidance from UK Government and the WHO through three related projects.

4.9 The first of these is described in next section, while the second and third would be embedded and delivered through the National Curriculum. These will work with the Government’s plan of action (see Appendix A), particularly targeted on the following sections:-

- #7. Helping all children to enjoy an hour of physical activity every day**
- #8. Improving the co-ordination of quality sport and physical activity programmes**
- #9. Creating a new healthy rating scheme for primary schools**
- #10. Making school food healthier**

Those themes will be expanded upon below in Sections 6 to 10 of this report.

## 5 pre-school protocol

**“The first years of life are critical in establishing good nutrition and physical activity behaviours that reduce the risk of developing obesity”**

WHO (2016) *Report of the commission on ending childhood obesity*

### 5.1 PRE-SCHOOL PROTOCOL

Although the prime focus of this report involves working with children while attending state schools (ie between the ages of five and sixteen), the first of the proposed sub-programmes deals with early childhood, before children start their compulsory education. It is concerned with educating parents to be better informed on a wide range of prenatal issues, and be better prepared to provide for the health and wellbeing of their growing infants at these most crucial stages of their development. Good nutrition, for example, is as essential for the mother as for the child in utero as well as in its most formative years subsequently.

5.2 For the purposes of the proposed pilot project, a comprehensive educational guidance package would be delivered to those parents living in the catchment areas of the primary schools participating in the pilot Primary Protocol scheme (see Chapter 8). Working with current initiatives, such as the *Early Years Foundation Stage Framework*, the proposed education programme would be delivered by professionals through the health and social care services. It would support parents from pre-pregnancy, through pregnancy and childbirth, and through the child’s first five years of life.

5.3 This work could be effective in increasing the number of healthy five-year old children arriving at primary school, by instilling patterns of healthy behavior in them and by decreasing the number of overweight or obese individuals in that cohort. From then onwards, the schools can provide pro-active support to the children as well as to the parents.

5.4 Although outside the scope of this particular project, it could be possible in future years to conduct more research on pre-school children. Since they spend most of their time within the home, a study in Australia sought to measure the physical and nutritional characteristics of those varied environments and the associated obesogenicity. It worked through the administration of two newly devised inventories, the Physical Activity and Nutrition Inventories, exploring the relationships between these characteristics and children’s body mass index (BMI) z-score (Croser 2012).

5.5 For the proposed Pre-school Protocol in the UK, however, our focus would be on the provision of guidance and advice, based firmly of the recommendations of the WHO and the government’s own Childhood Obesity action plan (see 5.6 to 5.8 below).

## **5.6 GOV.UK (2017) *Childhood obesity: a plan for action***

### **#12 Supporting early years settings**

*The early years are a crucial time for children's development. One in five children are already overweight or obese before they start school and only one in ten children aged two to four meets the UK chief medical officers' physical activity guidelines for this age group. Public Health England have commissioned the Children's Food Trust to develop revised menus for early years settings. These will be incorporated into voluntary guidelines to help them meet current Government dietary recommendations. We will launch a campaign to raise awareness of these guidelines among both early years practitioners and parents and we will update the Early Years Foundation Stage Framework to make specific reference to the UK chief medical officers' guidelines for physical activity in the early years*

## **5.7 WHO (2016) *Report of the commission on ending childhood obesity***

The care that women receive before, during and after pregnancy has profound implications for the later health and development of their children. Timely and good-quality care throughout these periods provides important opportunities to prevent the intergenerational transmission of risk and has a high impact on the health of the child throughout the lifecourse. Evidence shows that maternal undernutrition, maternal overweight or obesity, excess pregnancy weight gain, maternal hyperglycaemia, smoking or exposure to toxins can increase the likelihood of obesity during infancy and childhood. Maternal overweight and obesity increase the risk of complications during pregnancy, labour and delivery, and maternal undernutrition increases the risk of low birth weight. These factors can put the child at greater risk of infant mortality, childhood obesity and of adult non-communicable diseases

The health of fathers at the time of conception may also influence the risk of obesity in their children. Healthy lifestyle guidance thus needs to include advice to would-be fathers. Current guidance for preconception and antenatal care focuses on the prevention of fetal undernutrition. Given changing obesogenic exposures, guidelines are needed that address malnutrition in all its forms (including caloric excess) and later obesity risk in the offspring. Interventions to address childhood obesity risk factors also prevent other adverse pregnancy outcomes and so contribute to improving maternal and newborn health.

## 5.8 WHO (2016) *Report of the commission on ending childhood obesity*

### **RECOMMENDATIONS: GUIDANCE FOR HEALTHY DIET, SLEEP AND PHYSICAL ACTIVITY IN EARLY CHILDHOOD TO ENSURE CHILDREN GROW APPROPRIATELY AND DEVELOP HEALTHY HABITS**

*The first years of life are critical in establishing good nutrition and physical activity behaviours that reduce the risk of developing obesity. Exclusive breastfeeding for the first six months of life, followed by the introduction of appropriate complementary foods, is a significant factor in reducing the risk of obesity. Appropriate complementary feeding with continued breastfeeding can reduce the risk of undernutrition and excess body fat deposition in infants, both risk factors for childhood obesity. Encouraging the intake of a variety of healthy foods, rather than unhealthy, energy-dense, nutrient-poor foods and sugar-sweetened beverages, during this critical period supports optimal growth and development. Health-care providers can use routine growth monitoring opportunities to track children's BMI-for-age and give appropriate advice to caregivers to help prevent children developing overweight and obesity.*

- **Ensure maternity facilities practice the Ten Steps to Successful Breastfeeding**
- **Promote the benefits of breastfeeding for both mother and child through broad-based education to parents and the community at large.**
- **Support mothers to breastfeed, through regulatory measures such as maternity leave, facilities and time for breastfeeding in the work place**
- **Develop regulations on marketing of complementary foods and beverages, in line with WHO recommendations, to limit the consumption of foods and drink high in fat, sugar and salt by infants.**
- **Provide clear guidance and support to caregivers to avoid specific categories of foods (eg sugar sweetened milks and juices or energy-dense, nutrient-poor foods) for the prevention of excess weight gain.**
- **Provide clear guidance and support to caregivers to encourage the consumption of a wide variety of healthy foods.**
- **Provide guidance to caregivers on appropriate nutrition, diet and portion size.**
- **Ensure only healthy foods, beverages and snacks are served in formal child care settings or institutions, and that education and understanding are incorporated into the curriculum in formal child-care settings or institutions.**
- **Ensure physical activity is incorporated into the daily routine and curriculum in formal child care settings or institutions.**
- **Provide guidance on appropriate sleep time, sedentary or screen-time, and physical activity or active play for the 2–5 years of age group.**
- **Engage whole-of-community support for caregivers and child care settings to promote healthy lifestyles for young children.**

## 6 child obesity and the classroom

**“The compulsory school years provide an easy entry point to engage these age groups and embed healthy eating and physical activity habits for lifetime obesity prevention “**

*WHO (2016) Report of the commission on ending childhood obesity*

6.01 It is troubling to read that 10% of pupils arriving at English primary school for the first time are already overweight at 5 years old. For all those concerned with primary education, however, there is an even more worrying figure listed in NHS report (2017): by the time children reach the age of ten or eleven, 20% are overweight or obese. This is in spite of enjoying the benefits of six years of compulsory state education, with all its potential for delivering vigorous physical activities on a daily basis.

6.02 The children from the most deprived communities are particularly affected: there is more than double the proportion of obese children in these areas compared to more affluent ones (Kelly, Goisis & Sackler 2015). Significantly, the most disadvantaged children include those eligible for free schools meals and, once again, the school has an obvious role to play, this time in the dietary education of and nutritional provision for these children.

6.03 **WHO (2016) Report of the commission on ending childhood obesity**

- ***Given that the government controls the education sector, effective collaboration between health and education can ensure that school environments are healthy environments, where both nutrition literacy and physical activity are promoted.***
- ***To be successful, programmes to improve the nutrition and physical activity of children and adolescents need to engage with a number of stakeholders. Obesity prevention and health promotion has traditionally been the remit of ministries of health. Key to success will be the integration of activities into a health-promoting school initiative, with active engagement of the education sector. Interventions that are incorporated into the school day or curriculum will then be seen as part of their own remit.***
- ***The most frequently mentioned challenge to implementation is competition with the schools' primary mission. By appropriate engagement with teachers, such education can be integrated effectively into mainstream topics, rather than requiring separate time allocation. Collaboration and exchange of information, the use evidence-based approaches appropriately adapted to context, and resource-sharing between education and health ministries will help to move this agenda forward.***

## 6.10 A STRONGER HEALTH FOCUS IN SCHOOLS?

**“Ensure that nutrition and health education are included and delivered in the school’s core curriculum”**

*WHO (2016) Report of the commission on ending childhood obesity*

6.11 NATIONAL STANDARDS The National Curriculum was introduced in all state schools in England, Wales and Northern Ireland in 1988, exactly 30 years ago. It prescribes what children should be taught to ensure each pupil is given the same standard of education wherever they live. There have been changes, however, the majority of which relate to academic attainment. *Standard Assessment Tests* (SATs), for example, were introduced for 7 year-olds in 1990, for 11 year-olds in 1994, and for 14 year-olds in 1997. Other changes include the requirement to offer courses on religious education (introduced in the 1996 *Education Act*) as well as a sex education programme. From these examples it can be seen that change to the National Curriculum is clearly possible.

6.12 FLEXIBILITY WITHIN THE CURRICULUM But it should be stressed that there is also a measure of flexibility in the delivery of the curriculum. For our purposes, regarding the provision of physical activities for example, the Department of Education states that it is up to the individual school to determine precisely which specific sports programmes it offers, although it suggests possible options that could be selected (eg badminton, basketball, cricket, football, hockey, netball, rounders, rugby or tennis). Flexibility will be important, not least because schools in urban areas often have a mix of cultures, faiths and languages to contend with: a one-size-fits-all approach on nutritional and physical activity regimes may not be appropriate in all situations.

6.13 It is also up to each individual school to determine exactly how much time should be spent in physical education. Although guidance from the Department of Education recommends that schools should provide pupils with a minimum of just **two hours** curricular PE per week, it should be stressed that this is well below the WHO guidance of **one hour per day**, a figure with which the government’s own Chief Medical Officer agrees, and is now enshrined in the UK Government’s own Obesity Plan (2017).

6.14 ENHANCED HEALTH FOCUS If the curriculum were to take on a more specific health focus alongside its prime academic one, then the information below sets out the WHO recommendations of nutrition and activity regimes that schools could work with.

**6.15 DIET AND NUTRITION-**  
**WHO (2016) *Report of the commission on ending childhood obesity***

**IMPLEMENT COMPREHENSIVE PROGRAMMES THAT PROMOTE HEALTHY SCHOOL ENVIRONMENTS, HEALTH AND NUTRITION LITERACY AND PHYSICAL ACTIVITY**

- Establish standards for meals provided in schools, or foods and drinks sold in schools that meet healthy nutrition guidelines.
- Eliminate the provision or sale of unhealthy foods, such as sugar-sweetened beverages and energy-dense, nutrient-poor foods, in the school environment.
- Require inclusion of nutrition and health education within the core curriculum of schools.
- Improve the nutrition literacy and skills of parents and caregivers.
- Make food preparation classes available to children, their parents and caregivers.

**6.16 EXERCISE AND ACTIVITY REGIMES-**  
**WHO (2016) *Report of the commission on ending childhood obesity***

**IMPLEMENT COMPREHENSIVE PROGRAMMES THAT PROMOTE PHYSICAL ACTIVITY AND REDUCE SEDENTARY BEHAVIOURS**

- Provide guidance to children, their parents, caregivers, teachers and health professionals on healthy body size, physical activity, sleep behaviours and appropriate use of screenbased entertainment.
- Ensure that adequate facilities are available on school premises and in public spaces for physical activity during recreational time for all children (including those with disabilities), with the provision of gender-friendly spaces where appropriate
- Include Quality Physical Education in the school curriculum and provide adequate and appropriate staffing and facilities to support this. It is recommended that each pupil should undertake at least 60 minutes of moderate to vigorous physical activity every day.

### 6.17 WHO (2016) *Report of the commission on ending childhood obesity*

- *Low physical activity is rapidly becoming the social norm in most countries, and is an important factor in the obesity epidemic. Physical activity can reduce the risk of diabetes, cardiovascular disease and cancers), and improve children's ability to learn, their mental health and well-being. Recent evidence suggests that obesity, in turn, reduces physical activity, creating a vicious cycle of increasing body fat levels and declining physical activity.*
- *Physical activity behaviours across the life-course can be heavily influenced by childhood experience. Creating safe, physical activity-friendly communities, which enable, and encourage the use of active transport (walking, cycling etc.) and participation in an active lifestyle and physical activities, will benefit all children already affected by overweight and obesity, disadvantaged children, girls and children with disabilities.*

### 6.20 BODY MASS INDEX

A standard method of measuring (and thus quantifying) obesity and changes in its prevalence over time, is through Body Mass Index (BMI) data. This is a value derived from the mass (weight) and height of an individual, with the body mass divided by the square of the body height, expressed in units of kg/m<sup>2</sup>.

6.21 Some twenty years ago, internationally acceptable definitions of child overweight and obesity were published. The study worked with six large nationally representative cross sectional growth studies in Brazil, Great Britain, Hong Kong, the Netherlands, Singapore, and the USA, a reference population comprising 97, 876 males and 94, 851 females from birth to 25 years of age, for which Body Mass Index was calculated. For each of the surveys, centile curves were drawn that at age 18 years passed through the widely used cut-off points of 25 and 30 kg/m<sup>2</sup> for adult overweight and obesity. The resulting curves were averaged to provide age and sex specific cut-off points from 2-18 years. The proposed cut-off points, which are less arbitrary and more internationally based than previous alternatives, would arguably help to provide internationally comparable prevalence rates of overweight and obesity in children (Cole et al 2000).

6.22 Commonly accepted BMI ranges for adults are:

<b>Below 18.5 kg/m<sup>2</sup></b>	<b>=underweight:</b>
<b>18.5-25</b>	<b>=normal weight;</b>
<b>25-30</b>	<b>=overweight;</b>
<b>Over 30</b>	<b>=obese.</b>

6.23 For children, the basic calculation is the same, but care must be taken with the measurements since slight inaccuracies can produce major deviations. Consequently, instead of comparison against fixed thresholds for underweight and overweight, as with adult BMI readings, the child BMI is compared against the percentile for children of the same sex and age. BMI reading for a child that is less than the 5th percentile is considered *underweight*, one that is between the 85th and 95th percentile is considered *overweight*, while one above the 95th percentile is considered *obese*.

6.24 There are some reservations concerning BMI measurements, however. After research in schools in Addis Ababs (Ethiopia), it proved difficult to develop a meaningful record for adolescents, since they naturally exhibit rapid changes in growth over a relatively short time span. This was compounded by a lack of consensus over which definition to use, and therefore which measurements would be most helpful in providing data for obesity prevention, intervention and rehabilitation programmes (Gebreohanne 2015).

6.25 There are also other means of calculating obesity, such as *Triceps Skin Fold Thickness* (TSFT). Obesity in children leads to decrease in muscle mass which affects children growth, and can mark the early occurrence of metabolic syndrome. There are two types of fat storage which represents about 80% of all body fat: *visceral* which is more pathogenic, and *subcutaneous*. Distribution of fat differs according to sex and ethnicity. Female lower body fat is less metabolically active. Exercise seems to result in more subcutaneous fat loss, while just changing to a more healthy diet results in more visceral fat loss. Moreover, body fat% appears to be lower in black African children, and higher among Asian races and Hispanics compared with Caucasians. BMI does not give any indication of body fat distribution. Since it could be argued that it is more important to assess abdominal fat rather than the total body fat, the use of other anthropometric methods to assess body fatness may therefore be more informative. These alternative measures include skinfold thickness, waist circumference and body composition (El-Masry et al 2016).

6.26 This viewpoint is lent some support from the results of a study of 1,100 adolescents in public and private secondary schools in Lagos, Nigeria, which collected a range of anthropometric indices of central obesity. Since waist circumference was had a strong positive correlation with BMI that measure was advocated as a more practical screening tool in the monitoring of obesity (Akinola et al 2017).

6.27 **IN CONCLUSION** All that said, for the purposes of standardising comparisons over time, BMI data will be used to identify overweight and obese children in the UK project. Its aim would be to significantly reduce the number of pupils recorded as being overweight or obese year-on-year, ie demonstrate a clear quantifiable reversal in the current alarming upward trend of child obesity.

### 6.30 PHYSICAL ACTIVITY IN SCHOOLS

This following section has benefitted from a detailed literature review of recent research that considered not just the range of physical activities that are being (or could be) offered in schools, but also a teaching curriculum that demands long periods of sedentary behaviour as well as the fabric, layout and facilities of school buildings (Ucci et al 2015).

6.31 Illuminating results were obtained from a cross-sectional survey of 137,593 ten- to sixteen-year old children from 34 countries that participated in the 2001–2002 *Health Behaviour in School-Aged Children Study*. Data on the prevalence of overweight and obesity were collected and related to height, weight and child body mass index, from which associations between overweight status and selected dietary and physical activity patterns were made. Some twenty years ago, the two countries with the highest prevalence of overweight and obese youth were Malta (25.4% and 7.9%) and the United States (25.1% and 6.8%) while the two countries with the lowest prevalence were Lithuania (5.1% and 0.4%) and Latvia (5.9% and 0.5%). Overweight and obesity prevalence was particularly high in North America, Great Britain, and south-western Europe. Within most countries physical activity levels were lower and television viewing times were higher for overweight youths, compared to those of normal weight. Overweight status was inversely associated with the consumption of fruit, vegetables and soft drinks. The adolescent obesity epidemic was seen as a global issue, while increasing participation in physical activity and decreasing television viewing were advocated as the prime focii for strategies containing and treating overweight and obese school children (Janssen, Katzmarzyk & Boyce et al 2005). But can schools do more to address the challenge?

6.32 School children's activity levels are currently less than official guidance recommends in many countries including the UK (Griffiths et al. 2013) and in the United States (CDC 2014). The majority of school children do not reach the suggested level of physical activity even during supervised Physical Education sessions (Nettlefold et al. 2011), with one study in England showed that the activity levels of some children was lower when they were in primary school than when they were out (Smith et al 2012). First and foremost, the World Health Organisation's recommendation of 60 minutes of supervised physical activity each day every day need to be met or exceeded- Finland continues to lead the field in this regard with its recent adoption of not just one, but three hours per day for its pupils. Increased physical activity levels and decreased sitting behaviour will not only increase the health of the children but, it has been suggested, their academic performance and cognitive skills as well (Rasberry et al 2011).

6.33 Consideration has also been given to how the proposed increase in activities delivered in English schools from just two hours per week to a minimum of five hours per week might be incorporated into the National Curriculum, and then into the daily syllabus. The current two-hours of skills-based quality physical education would be retained, but would be supplemented by other approaches, incorporating supervised health-based physical education sessions. It is suggested here that gyms, sports fields and specialised equipment are not the only items needed by a school wishing to increase the activity levels of its pupils. **Classroom-based activities** (rather than gym-based) have been discussed in Lengel and Kuczala's *Kinesthetic Classroom* (2010) and can be very effective in delivering results economically, as several studies have shown (Goffedra, 2011; Schetzina et al., 2009; Whitt-Glover et al., 2011). A series of short, five- to ten-minute sessions of, for example, bending and stretching, spread out over the school day, can be very beneficial.

6.34 Should most classes in each year group be conducted in the same classroom, regardless of subject, or should greater movement between rooms be encouraged throughout the day, to break up prolonged sitting behaviours? Should standing desks be introduced? A study in the US showed that pupils using them increase their calorific expenditure (Blake, Benden & Wendel 2012) while another in New Zealand successfully integrated these work stations into classrooms, decreasing sedentariness (Hickson et al 2013). Should there be regular stretch breaks in the classroom together with the promotion of learning games, with more robust activities during each recess?

6.35 In other words, the focus of 'Physical Activity' need not be solely dedicated to 'sport' but to a wider range of supervised daily activity sessions. In addition, a culture of moderate but continuous movement could be developed throughout the academic day, one that simultaneously reduces sitting behaviour and increases activity levels. The Finnish concept of an activity break after each and every 'taught' lesson has much to commend it.

**6.40 WHO (2016) *Report of the commission on ending childhood obesity*  
Urban planning and design has the potential to both contribute to the problem and offer the opportunity to form part of the solution. Increased recreational space and safe walking and cycling-paths for active transport, help make physical activity functions of daily life.**

6.41 WALK-TO-SCHOOL INITIATIVES As the WHO guidelines remind us, facilitating a healthy environment reaches beyond the classroom. School children should learn the habit of walking (not being driven) to school each morning: our bi-pedal physiology, like the family dog, demands a daily workout. But this spills over to town-planning issues, since such active commuting can only be encouraged through increased pedestrianisation, greened streets, traffic calming measures, safe crossings, designated cycle lane schemes and, where necessary, CCTV provision.

6.42 Support for walk-to-school initiatives in large urban centres also requires the banning of diesel particulates and other noxious emissions to protect out lungs and those of our infants and young children in sensitive zones around and in the approaches to school buildings (Marshall et al 2015; Milne 2017, 107-109; Poole 2012).

6.43 The UK Government is committed to producing a *Cycling and Walking Investment Strategy*, with £300m support. The target is to increase the number of children walking to school as well as continued support for *Bikeability* cycle training for children.

6.50 BUILDING DESIGN In addition, consideration is required of the school building itself, its age, its layout and its associated facilities, grounds and sports fields. Case studies of primary schools in Ireland, for example, have considered aspects of the size and use of space in classrooms. Modern schools are more positively reviewed in relation to features such as classroom size and lighting (Darmody, Smith, and Doherty 2010): such factors have also been discussed by other researchers (Barrett, Zhang, Moffat, and Kobbacy (2013); Wall, Dockrell, & Peacey 2008). A major publication from Scotland looked at a series of key themes concerning the architecture of schools (Children in Scotland 2011) while the pupil's perspective on their schools has also been discussed (Barrett & Zhang, 2012; Barrett, Zhang, & Barrett, 2011).

6.51 More schools should investigate the concept of 'Active Buildings', designs that positively promote less sedentary regimes (Smith et al 2013). Studies of schools and their immediate environment are required to identify best practice in this field. Plans should consider the size and format of classrooms, the relationship of the indoor to the outdoor space, the length of lessons as well as facilities for physical activities. It has been shown, for example, that classroom design on its own can have a very significant impact on the learning rates of primary school pupils, based on a study of 751 children working in 34 different classrooms in seven different UK schools (Barrett et al. 2013).

6.52 Building design can also support the wellbeing of its inhabitants by simulating elements of the natural environment our DNA is more familiar with. Schools that capture more natural daylight have recorded improvements in attendance records and exam results. In a similar vein, hospitals with wards in which windows overlook greenspace saw recovery times much improve, when compared to the wards that overlooked blank walls (Milne 2017, 197-8).

6.53 GREENING SCHOOLS Indoor greenery also score positively. Plants can absorb carbon dioxide, moderate humidity, help remove pollutants from electrical equipment, reduce sound and stress levels. According to a study by Exeter University, installing appropriate plants in suitable places in the office not only enhanced staff wellbeing, but improved productivity by 38%. Similar results can be achieved in schools as recent work has shown (Han 2009).

6.54 GREENING CITIES To encourage walkability for adults as well as school children, a city should promote "greening", not just with large central parks, but with smaller 'pocket parks', tree-lined streets, roof gardens, green walls, and the greater provision of pitches, sports fields and allotments. These elements are essential for bio-diversity and for fostering our immune systems, absolutely crucial in young children. In this regard, gardening is a much under-valued physical activity, but one which schools that have the space should encourage (Milne 2017, 166-172).

## 7 activating the National Curriculum

AIM 1: The school curriculum should aim to provide opportunities for all pupils to learn and to achieve...

**“...It should also develop their physical skills and encourage them to recognise the importance of pursuing a healthy life..”**

*The National Curriculum: Principal Aims and Purposes*

7.01 The responsibility for the current decrease in the health of primary school-age children in England (NHS 2017) must lie, at least in part, with the curriculum itself or, more accurately, in the way it is interpreted and delivered. Clearly as sharp a focus should be placed on physical activities and on nutrition, as on the academic attainments: apart from the obvious health benefits for the pupils, a healthy child is more likely to achieve better results across the board than an unhealthy one (PHE 2014).

7.02 Since attendance at school is compulsory for all children in England, and since all schools share a common curriculum, it is suggested that the National Curriculum provides an appropriate, comprehensive, flexible and accountable means of achieving significant and sustainable results in the battle to overcome child obesity in England. To address the current child obesity emergency, a major upstream intervention is proposed, delivered to school children through a reworked National Curriculum at Primary and Secondary School levels, ie from Key Stage 1 to Key Stage 4.

7.03 Although this is directly in line with WHO Guidance (summarised in the boxed sections above) it has not, as yet, been formally adopted by or fully applied to schools in England. The development and implementation of the PRIMARY PROTOCOL and the SECONDARY PROTOCOL would make good this oversight.

## 7.04 IN-SCHOOL DELIVERY

7.05 **HEAD of HEALTH** It is suggested here each school should appoint a Head of Health (with appropriate Deputies, depending on the size of the school), with a detailed support and guidance pack. Their responsibility would be to establish and maintain a healthy school, a healthy environment and a healthy curriculum. Their remit would include the following

### **HEALTHY SCHOOLS: NUTRITION & ACTIVITY GUIDANCE:**

- Ensure that the school has adequate, appropriate and well-maintained toilet and washing facilities as well as clean drinking water
- Ensure that nutrition and health education are included and delivered in the school's core curriculum
- Ensure that the standards for meals, food and drink provided or sold in schools meet healthy nutrition guidelines, working with the updated *Schools Food Standards* being prepared by Public Health England, and in line with the updated Nutrient Profile currently under discussion.
- Eliminate the provision or sale of unhealthy foods, such as sugar-sweetened drinks and energy-dense, nutrient-poor foods, in the school environment to pupils or staff
- Provide training and support to improve and develop the nutrition literacy and skills of staff, parents and caregivers
- Make food preparation classes available to children, their parents and caregivers
- Include Physical Exercise in the curriculum, ensuring all pupils undertake a minimum of 60 minutes of at least moderate physical activity every day
- Ensure the provision of adequate and appropriate staffing and facilities to support the delivery of daily quality physical exercise for all pupils
- Robustly encourage 'walk-to-school' (or cycle-to-school) initiatives for pupils and staff, working with, for example, the government's updated *Cycling and Walking Strategy* report.
- Where possible, promote gardening and the provision and maintenance of house plants within the school precinct as appropriate
- Ensure all pupils keep a *Nutrition & Activity Diary*
- Ensure all pupils have regular health checks and that their BMI is recorded annually
- Maintain records of the number of pupils classified as overweight/obese according to their BMI data, and take supportive action as appropriate
- Consider how the architecture and layout of the school buildings might be adapted or better used to improve the wellbeing of staff and pupils.

7.10 DAILY ACTIVITIES A central concept would see delivery of 60 minutes of daily activities through **Physical Education** courses, one of six compulsory subjects taught from KS1 to the end of KS4. Discussion on dietary advice and the provision of nutritious meals could be included in an associated **Personal, Social, Health & Economic** (PHSE) module.

7.11 In the US, physical education teachers attempt to keep track of children's fitness levels while measuring their *Health-Related Physical Fitness* (HRPF) as well as their *Skills-Related Physical Fitness* (SRPF) (Miller 2010; Kulkarni 2016). In addition to encouraging non-sitting behaviours, the system proposed for the UK would recognise not two, but three broad types of physical exercise that would be involved within the school curriculum, of which just the first two (supervised) elements would be included in the 60-minutes a day remit.

**a) Supervised Health-based Physical Education SHPE**

At least three hours per week:-

The menu would vary according to the age of the pupils, staff available and facilities on offer, as well as the weather.

*For example, short but regular "keep fit" sessions in the classroom;  
walks to local park, city farm or other external focus;  
rigorous exercise in a gym setting;  
organized dancing sessions;  
games involving running, climbing, skipping, crawling, jumping etc;*

**b) Supervised Skill-based Physical Education SSPE**

At least two hours per week:-

*individual sports: skill training and competitions  
team sports: skill training and matches*

**c) Unsupervised Physical Activities**

Five hours per week:-

*Eg Break time in playground etc: opportunities to encourage children to develop their own non-sedentary behaviours*

7.12 SCHOOL CATCHMENT AREA STUDIES In addition to these in-house sessions, as many pupils (and staff) as possible should be encouraged to join 'Walk-to-School' (or cycle) initiatives. To assist in the planning of their work, the Head of Health would need a School Catchment Area study, within which the most appropriate routes to school (from North, South, East and West) would be marked. This is an essential aspect of Walk-to-School initiatives. Such an assessment could lead to the establishment of traffic calming measures, better road crossings points, street lighting, CCTV, street greening, as well as pedestrianisation schemes. The quality of the urban air on each of the main suggested walking routes should be monitored, since schools are classified as 'sensitive locations' in air pollution studies.

7.13 Also shown on the catchment study plan would be the location of parks, City Farms, river/canal walks and heritage sites or other features which could serve as a focus for a short field trip. There may well be other locations just outside the actual catchment area. Such walks should be regular weekly features for all pupils, while school visits to the larger museums and galleries in the greater London area would also be encouraged: such activities involve walking as well a significant cultural benefit, and would be included in the 60-minute daily rule.

7.20 NUTRITIONAL EDUCATION The provision and consumption of food and drink on school need to be controlled, but can have significant results. For example, a targeted, school based education programme in south-west England showed that a modest reduction in the number of carbonated drinks consumed was associated with a reduction in the number of overweight and obese children. The randomised controlled trial was set up in six primary schools with 644 children aged 7-11 years participating over one school year. After 12 months the percentage of overweight and obese children increased in the control group (with continuing carbonated drinks) by 7.5%, compared with a decrease in the intervention group (reduced carbonated drinks) ( James et al 2004).

7.21 NUTRITION & ACTIVITY DIARY In 2018, the *Healthy Active Schools System* (HASS) was launched. This includes the compilation by each participating school of a daily report on pupil's physical activities. Building directly on this initiative, it is proposed that a Nutrition & Activity diary would be kept by or for each pupil. This would enable their health progress to be longitudinal tracked while within the formal State Education system from Y1 to Y11. BMI measurements will be recorded alongside nutritional, activity and academic attainment data, related to attributes such as social status (eg disadvantaged/ non-disadvantaged using the provision of free school meals as the proxy). Information to be collated could include:

- Journey home previous day;
- Main meal previous night;
- Journey to school today:
- Breakfast; Lunch;
- Supervised Activity sessions (60 minutes or more)

7.30 DATA COLLECTION At least once per annum each pupil's BMI must be recorded, and set against academic attainments at each Key Stage, their Activity Profile (eg excellent/ very good/ good/ poor/ very poor) and whether considered Non-disadvantaged or Disadvantaged (defined by eligibility for Free School Dinners). This data will prove essential for the longitudinal tracking of the pupil's progress over the course of the pilot project (and indeed for any subsequent associated project).

7.40 RESOURCES At present, the Primary School Protocol and Secondary School Protocol are models that can be adopted by schools on a voluntary basis. Once the pilot programmes have been completed, and if they prove successful in containing child obesity, then they could be formally integrated into the National Curriculum. At that point, they would be directly resourced and be fully sustainable. Arguably, the Department of Education could suggest that some funding to implement the work might justifiably be sought from the Department of Health. That said, some schools can already apply for funding for various health-related matters regarding:

7.41 **Breakfast Clubs:** to ensure pupils have a (hopefully) healthy meal before lessons begin, some £23m is being made available in 2018. The programme is targeted at schools in areas of high social deprivation, ie with more than 35% of pupils eligible for free school meals. Some 183 schools completed the initial programme and most of those schools have continued with the club subsequently. Initially, a registered charity delivered free food such as low salt and sugar bagels, porridge, cereals and juice to each school for twelve months. Schools provided supplementary food, and staff or volunteers to organise the club. A £300 equipment grant was also available for each school.

#### 7.42 Primary PE & Sport Premium:

Five key indicators that participating schools are expected to see improve are:

- engagement of all pupils in regular physical activity – the Chief Medical Officer recommends that all children and young people **aged** 5 to 18 engage in at least 60 minutes of physical activity a day, of which 30 minutes should be in school; profile of PE and sport raised across the school as a tool for whole-school improvement;
- increased confidence, knowledge and skills of staff teaching PE and sport;
- broader experience of a range of sports and activities offered to all pupils;
- increased participation in competitive sport.

#### 7.43 Healthy Pupils Capital Fund

Smaller schools may bid for a grant from this £100m fund, with revenue obtained from the *Soft Drinks Industry Levy*. The fund is intended to facilitate improvements in pupil's health by increasing and improving access to and use of facilities for physical activity, healthy eating and wellbeing, for example. The funding can therefore be used for improving a range of facilities such as kitchens, dining facilities, changing rooms, playgrounds and sports facilities.

### 7.50 guidance and recommendations

**National Institute for Health & Care Excellence:** London

- NICE 2006 *Public Health Guidance: Obesity Prevention NICE Guidelines CG43*
- NICE 2007 *Public Health Guideline 6: Behaviour Change: General Approaches*
- NICE 2008a *Public Health Guidance 8: Physical Activity and the Environment*
- NICE 2008b *Public Health Guidance 13: Promoting Physical Activity in the Work Place*
- NICE 2009 *Public Health Guidance 17: Promoting Physical Activity for Children*
- NICE 2010 *Public Health Guidance 25: Prevention of Cardiovascular Disease*
- NICE 2012 *Public Health Guidance 41: Walking & Cycling*
- NICE 2015 *National Guidelines 7: Preventing Excess Weight Gain*
- NICE 2016 *NICE Guidelines 34: Sunlight Exposure: Risks and Benefits*

**WORLD HEALTH ORGANISATION:** Geneva

- WHO 2004 *The Global Burden of Disease: 2004 Update*
- WHO 2008a *Early Child Development*
- WHO 2008b *Closing the gap in a generation: Health equity through action on the social determinants of health,*  
Commission on the Social Determinants of Health
- WHO 2011 Global recommendations on physical activity for health: 5–17 years old.
- WHO 2015 *Guideline: Sugars Intake for Adults and Children*
- WHP 2016a *Report of the commission on ending childhood obesity*
- WHO 2016b *Global Report on Diabetes.*

# 8 primary protocol

## 8.01 PRIMARY PROTOCOL

**Age 5-7    Years 1-2 = Key Stage 1**

**Age 7-11    Years 3-6 = Key Stage 2**

8.02 An outline is presented of how the National Curriculum in Physical Education for Key Stages 1 and 2 (School Years 1-6) might be reconfigured to better address the challenge of childhood obesity after consideration of the WHO guidance: see, for example, the additional comments in *ITALICS*

### 8.03 The NATIONAL CURRICULUM/ Physical Education:

**Purpose of study** A high-quality physical education curriculum inspires all pupils to succeed and excel in competitive sport and other physically-demanding activities. It should provide opportunities for pupils to become physically confident in a way which supports **and improves** their health and fitness. Opportunities to compete in sport and other activities build character and help to embed values such as fairness and respect.

**Aims** The curriculum for physical education aims to ensure that all pupils:

**8.04 Aim 1:** DEVELOP COMPETENCE TO EXCEL IN A BROAD RANGE OF PHYSICAL ACTIVITIES *including team and individual sports and dancing.*

**8.05 Aim 2:** ARE PHYSICALLY ACTIVE FOR SUSTAINED PERIODS OF TIME  
*The duration of these period should be up to 60 minutes, and should be DAILY. Outside school, all pupils encouraged to partake in Walk-to-School initiatives. In school, supervised physical activity sessions could/ should by delivered daily, not always team sports: could be dancing, games or simply “keep fit” sessions.*

**8.06 Aim 3:** ENGAGE IN COMPETITIVE SPORTS AND ACTIVITIES *as well as uncompetitive sports and activities including eg walking and gardening.*

**8.07 Aim 4:** LEAD HEALTHY, ACTIVE LIVES *The level of success should be measured each year through BMI data as a comparative proxy for healthy, active bodies. Measurements collected by the National Childhood Measurement Programme (NCMP) could be linked to other data sets such as the pupil’s involvement with Aims 1-3, especially with Walk-to-School projects as well as to academic attainments at KS1 and KS2.*

**8.08 Attainment targets** By the end of each key stage, pupils are expected to know, apply and understand the matters, skills and processes specified in the relevant programme of study. *They will have retained or attained a healthy BMI index appropriate for their age and stature.*

810 PILOT PROJECT . Before such a scheme is rolled out across the nation, a pilot programme needs to be tested and evaluated. In a major conurbation like London, for example, there are 1,453 Local Authority-run primary schools, with some 608,000 pupils. It is important that those schools wishing to participate should cover the full social and academic spectrum. This is wide-ranging, as the discrepancies of between 8 and 13% in attainment levels shown in this table of **Pupil Performance in London Primary Schools in 2016** implies.

	<b>All</b>	<b>Non-Disadvantaged</b>	<b>Disadvantaged</b> <i>(ie eligible for free school meals)</i>
KS1 Reading	77%	79%	68%
KS1 Writing	70%	68%	60%
KS1 Maths	77%	79%	66%

*Annual London Education Report 2017, Fig A1.1*

[https://www.london.gov.uk/sites/default/files/final\\_epi\\_edits\\_design\\_final\\_gla\\_annual\\_report\\_2017\\_0.pdf](https://www.london.gov.uk/sites/default/files/final_epi_edits_design_final_gla_annual_report_2017_0.pdf)

8.11 Given that a healthy child is more likely to achieve better academic results across the board than an unhealthy one, the government would welcome a programme that not only improves the health of all children, including those from disadvantaged backgrounds, but would also see a reduction in the scale of the discrepancies in columns two and three.

8.12 In an ideal world the pilot should run for a minimum of 11 years to track at least one cohort of pupils over the full course of their compulsory state education. However, to enable procedures and logistics to be tested and modified while solid data is captured and evaluated relatively fast, a shorter window is suggested. Initially, schools would be asked to volunteer their institution for a focused trial period of six years, so that complete cohorts could be tracked from Year 1 to Year 6, ie before the pupils start secondary School.

8.13 It will run simultaneously with the Secondary Protocol Pilot at secondary schools in the same boroughs as the participating primary schools, so that at least some of the pupils involved in the Primary Protocol could be tracked forwards into School Years 7 to 11.

8.14 Participating schools, with their new Head of Health, would be encouraged to collaborate with the government's proposed new *Healthy Ratings Scheme*, which will hopefully include a forum at which common issues could be discussed, methodologies shared and achievements celebrated.

# 9 secondary protocol

## 9.01 SECONDARY PROTOCOL

Age 11-14 Years 7-9 =Key Stage 3;  
Age 14-16 Years 10-11 =Key Stage 4.

9.02 With regard to their wellbeing, pupils in secondary schools face additional challenges when compared to those in primary schools. Recent evidence shows that, without direct encouragement, the level of physical activity starts to decline at this time. Globally, in 2010, 81% of adolescents aged 11–17 years were insufficiently physically active. Adolescent girls were even less active than adolescent boys, with 84% of girls and 78% of boys not attaining the 60 minutes of moderate to vigorous daily physical activity recommended by WHO.

9.03 Indeed, lower levels of physical activity is becoming the social norm in many countries, an important factor in the obesity epidemic. As the WHO (2016) reports, physical activity is known to reduce the risk of diabetes, cardiovascular disease and cancers, and can also improve children's mental health, as well as their ability to learn. In stark contrast, recent evidence suggests that obese pupils are less inclined to participate in physical activities, creating a vicious cycle of increasing body fat levels and ever declining exercise.

9.04 As for dietary issues, adolescents have more freedom with regard to the food and drink they consume outside the home, when compared with primary school pupils. In addition, adolescents are highly susceptible to the marketing of unhealthy foods and sugar-sweetened drinks and also have to contend with peer pressure and perceptions of ideal body image.

**9.05 PILOT PROJECT** Initially, secondary schools volunteering to participate in the pilot project would be asked to volunteer their institution for a focused trial period of six years, so that complete cohorts could be tracked from Year 7 to Year 11. The later years of this pilot would see increased numbers of pupils arriving in secondary schools having already benefited from the Primary Protocol.

**9.06 WHO (2016) Report on the commission on ending childhood obesity**  
*Ensure that adequate facilities are available on school premises and in public spaces for physical activity during recreational time for all children (including those with disabilities), with the provision of gender-friendly spaces where appropriate. Provide guidance to adolescents, their parents, caregivers, teachers and health professionals on healthy body size, physical activity, sleep behaviours and appropriate use of screenbased entertainment.*

### 9.07 WHO (2016) *Report on the commission on ending childhood obesity*

#### **IMPLEMENT COMPREHENSIVE PROGRAMMES THAT PROMOTE HEALTHY SCHOOL ENVIRONMENTS, HEALTH AND NUTRITION LITERACY AND PHYSICAL ACTIVITY, AND REDUCE SEDENTARY BEHAVIOURS IN ADOLESCENTS**

- Establish standards for meals provided in schools, or foods and drinks sold in schools, that meet healthy nutrition guidelines.
- Eliminate the provision or sale of unhealthy foods, such as sugar-sweetened beverages and energy-dense, nutrient-poor foods, in the school environment.
- Require inclusion of nutrition and health education within the core curriculum of schools.
- Improve the nutrition literacy and skills of parents and caregivers
- Make food preparation classes available to children, their parents and caregivers
- Include Quality Physical Education in the curriculum and provide adequate and appropriate staffing and facilities to support this

### 9.10 National curriculum in England Physical Education programmes of study: Key Stages 3 and 4

This is the current wording of the national programme, but with additional comments in *ITALICS* added, to accommodate the WHO recommendations.

**9.11 Purpose of study** A high-quality physical education curriculum inspires all pupils to succeed and excel in competitive sport and other physically-demanding activities. It should provide opportunities for pupils to become physically confident in a way which supports their health and fitness. Opportunities to compete in sport and other activities build character and help to embed values such as fairness and respect.

**9.12 Aims** The curriculum for physical education aims to ensure that all pupils:

**9.13 *Regularly participate in and*** DEVELOP COMPETENCE TO EXCEL IN A BROAD RANGE OF PHYSICAL ACTIVITIES

**9.14.1** ARE PHYSICALLY ACTIVE FOR SUSTAINED PERIODS OF TIME  
*of at least 60 minutes each day*

9.15 ENGAGE IN COMPETITIVE SPORTS *as well as other non-competitive activities*

9.16 LEAD HEALTHY, ACTIVE LIVES.

### 9.17 Attainment targets

By the end of each key stage, pupils are expected to know, apply and understand the matters, skills and processes specified in the relevant programme of study.

*Attain or retain a healthy body weight.*

### 9.18 Subject content Key stages 3 and 4

Pupils should build on and embed the physical development and skills learned in previous key stages, become more competent, confident and expert in their techniques, and apply them across different sports and physical activities. They should understand what makes a performance effective and how to apply these principles to their own and others' work. They should develop the confidence and interest to get involved in exercise, sports, **dance** and activities out of school and in later life, and understand and apply the long-term health benefits of physical activity.

9.19 Pupils should be taught to:

- use a range of tactics and strategies to overcome opponents in direct competition through team and individual games (for example, badminton, basketball, cricket, football, hockey, netball, rounders, rugby and tennis]
- develop their technique and improve their performance in other competitive sports [for example, athletics and gymnastics]
- perform dances using advanced dance techniques within a range of dance styles and forms
- *Participate regularly in uncompetitive physical activities such as walking, swimming or gardening*
- take part in outdoor and adventurous activities which present intellectual and physical challenges and be encouraged to work in a team, building on trust and developing skills to solve problems, either individually or as a group
- analyse their performances compared to previous ones and demonstrate improvement to achieve their personal best
- take part in competitive sports and activities outside school through community links or sports clubs: *take part in non-competitive sports and activities outside school through community links or other clubs.*

## 10 delivery

10.1 To develop and deliver the Active National Curriculum project throughout England will require a clear plan and a careful co-ordination of teams of specialists responsible for preparing guidance, advising and supporting the teaching professionals across the country. First, a development team must prepare a pilot project: three separate schemes are proposed here: a three-year, a six-year and an eleven-year scheme. Provisional schedules are suggested below. All three programmes would be trialed simultaneously in Primary and in Secondary Schools.

10.2 The short-form three-year programme would provide (relatively) a clear indication of the logistics and feasibility of the scheme, together with an indication of how effective the programme might be in containing child obesity. However, there would only be a modest overlap between those children who moved to Secondary Schools with the benefit of the Primary Protocol.

10.3 The six-year programme would provide a much clearer idea of the logistics and feasibility, and would also have tracked a cohort through all six years of the Activated National Curriculum at Primary Level, a complete cohort through all five years at Secondary Level, and a cohort of six years groups that spent three years at Primary Level and three at Secondary level.

10.4 The eleven-year programme, the preferred option but the longest in terms of deliverables, would track one complete cohort from Y1 in primary school to Y11 at secondary school, as well as five more cohorts that spent at least two years in both systems, to demonstrate the comparative benefits.

### 10.5 **3-6-11 Option**

It is suggested here that the short-form three-year programme should be initiated as soon as is practical, and then directly extended into the six year scheme while full evaluation and reporting is being undertaken of the initial three-year study. Given that the results justify further work, then the remaining five-year could be added on directly to the end of the six-year programme, while evaluation and full reporting takes place. In this way, a full 11-year cycle would be recorded, but detailed evaluative results would be made available at earlier stages.

## **10.20 provisional project schedule: development phase/ Six Months**

- Bring initial *Development Team* together
- Develop *Partnership Network*
- Develop *Pilot Pre-school programme*:  
current guidelines and approaches  
evaluation and assessment  
discuss delivery methodology
- Develop *Pilot Schools programmes*:  
Activity and Nutrition guidelines  
Project Database/ BMI index  
Select schools for pilot project
- Develop outline *Three-; Six- ; or Eleven-Year Programme*
- Develop Project Costings Model

## **10.21 provisional project schedule: delivery phase – pilot project/ 3-6-11 years**

- Advertise & Appoint Delivery co-ordination team and new Heads of Health in participating schools
- Launch PRE-SCHOOL PROTOCOL
- Launch PRIMARY PROTOCOL in \*\*\* schools KS1 & KS2 (voluntary basis)
- Launch SECONDARY PROTOCOL in \*\*\* schools KS3 & KS4 (voluntary basis)
- Evaluation & assessment  
BMI data/ Pupil Attainment data/ school data  
Reporting: academic & financial

### **10.30                   ACTIVATING THE NATIONAL CURRICULUM**

#### **10.31   PROVISIONAL 3-6-11-YEAR PILOT PROJECT SCHEDULE**

Having selected a number of primary and secondary schools initially volunteering to participate in the scheme, having compiled the Project Guidelines and Support Packs, developed appropriate partnerships and, crucially, appointed a *Head of Health* in each school to co-ordinate the agreed programme, the pilot project can be launched.

10.32 The Tables on the next pages lists the annual groups involved by Project Year no. (0101) and school Year Group no: 0101 - 0111); the asterix simply notes the change from Primary to Secondary school.

10.33 The numbers in italics identify the Year Groups that have benefitted from the previous year's ANC programme: this shows that, in Year Three, for example, that the 0101 to 0103 cohorts will have had three-years in-school activity regime, whereas the oldest pupils in 0111 and the youngest in 0301 will have had least opportunity to benefit.

#### **10.34   PRE-SCHOOL PROTOCOL**

In addition, the 0200, 0300, 0400, 0500 etc numbers indicate that a *Pre-School Protocol* had been established in the Primary school's catchment area before the appropriate year intake was accepted into the school: the 0601, 0701, 0801, 0901, 1001 and 1101 intake would see the greatest benefit from that programme, while the 0101 intake would miss out.

#### **10.35   PRIMARY PROTOCOL**

Primary Cohort 0101 will benefit from up to 11years of the increased activity regime

#### **10.36   SECONDARY PROTOCOL**

Secondary Cohort 0107 would not see any benefit from previous regimes, in marked contrast to Secondary Cohorts 0207 to 1107 if the guidance and recommendations are correct and the delivery appropriate. All these factors need to be taken into consideration in the statistical evaluation of the results.

**PILOT PROJECT: 2019 - 2020**

0101 0102 0103 0104 0105 0106 \*0107 0108 0109 0110 0111

**PILOT PROJECT: 2020 - 2021**

0200 0201 0202 0203 0204 0205 0206 \*0207 0208 0209 0200 0211  
0100 0101 0102 0103 0104 0105 0106 0107 0108 0109 0110

**PILOT PROJECT: 2021 - 22**

0300 0301 0302 0303 0304 0305 0306 \*0307 0308 0309 0310 0311  
0200 0201 0202 0203 0204 0205 0206 0207 0208 0209 0210  
0101 0102 0103 0104 0105 0106 0107 0108 0109

**PILOT PROJECT: 2022 - 23**

0400 0401 0402 0403 0404 0405 0406 \*0407 0408 0409 0410 0411  
0200-0300 0301 0302 0303 0304 0305 0306 0307 0308 0309 0310  
0200 0201 0202 0203 0204 0205 0206 0207 0208 0209  
0101 0102 0103 0104 0105 0106 0107 0108

**PILOT PROJECT: 2023 - 24**

0500 0501 0502 0503 0504 0505 0506 \*0507 0508 0509 0510 0511  
0200-0400 0401 0402 0403 0404 0405 0406 0407 0408 0409 0410  
0200-0300 0301 0302 0303 0304 0305 0306 0307 0308 0309  
0200- 0201 0202 0203 0204 0205 0206 0207 0208  
0101 0102 0103 0104 0105 0106 0107

**PILOT PROJECT: 2024 - 25**

0600 0601 0602 0603 0604 0605 0606 \*0607 0608 0609 0610 0611  
0200-0500 0501 0502 0503 0504 0505 0506 0507 0508 0509 0510  
0200-0400 0401 0402 0403 0404 0405 0406 0407 0408 0409  
0200-0300 0301 0302 0303 0304 0305 0306 0307 0308  
0200 0201 0202 0203 0204 0205 0206 0207  
0101 0102 0103 0104 0105 0106

**PILOT PROJECT: 2025 - 26**

0700 0701 0702 0703 0704 0705 0706 \*0707 0708 0709 0710 0711  
0200-0600 0601 0602 0603 0604 0605 0606 0607 0608 0609 0610  
0200-0500 0501 0502 0503 0504 0505 0506 0507 0508 0509  
0200-0400 0401 0402 0403 0404 0405 0406 0407 0408  
0200-0300 0301 0302 0303 0304 0305 0306 0307  
0200 0201 0202 0203 0204 0205 0206  
0101 0102 0103 0104 0105

**PILOT PROJECT: 2026 - 2027**

**0800 0801 0802 0803 0804 0805 0806 \*0807 0808 0809 0810 0811**  
0300-0700 0701 0702 0703 0704 0705 0706 0707 0708 0709 0710  
    0200-0600 0601 0602 0603 0604 0605 0606 0607 0608 0609  
        0200-0500 0501 0502 0503 0504 0505 0506 0507 0508  
            0200-0400 0401 0402 0403 0404 0405 0406 0407  
                0200-0300 0301 0302 0303 0304 0305 0306  
                    0200 0201 0202 0203 0204 0205  
                        0101 0102 0103 0104

**PILOT PROJECT: 2027 – 28**

**0900 0901 0902 0903 0904 0905 0906 \*0907 0908 0909 0910 0911**  
0400-0800 0801 0802 0803 0804 0805 0806 \*0807 0808 0809 0810  
    0300-0700 0701 0702 0703 0704 0705 0706 0707 0708 0709  
        0200-0600 0601 0602 0603 0604 0605 0606 0607 0608  
            0200-0500 0501 0502 0503 0504 0505 0506 0507  
                0200-0400 0401 0402 0403 0404 0405 0406  
                    0200-0300 0301 0302 0303 0304 0305  
                        0200 0201 0202 0203 0204  
                            0101 0102 0103

**PILOT PROJECT: 2028 – 29**

**1000 1001 1002 1003 1004 1005 1006 \*1007 1008 1009 1010 1011**  
0400- 0900 0901 0902 0903 0904 0905 0906 0907 0908 0909 0910  
    0500-0800 0801 0802 0803 0804 0805 0806 0807 0808 0809  
        0300-0700 0701 0702 0703 0704 0705 0706 0707 0708  
            0200-0600 0601 0602 0603 0604 0605 0606 0607  
                0200-0500 0501 0502 0503 0504 0505 0506  
                    0200-0400 0401 0402 0403 0404  
                        0200-0300 0301 0302 0303  
                            0200 0201 0202  
                                0101 0102

**PILOT PROJECT: 2029 – 30**

**1100 1101 1102 1103 1104 1105 1106 \*1107 1108 1109 1110 1111**  
0500-1000 1001 1002 1003 1004 1005 1006 1007 1008 1009 1010  
    0400-0900 0901 0902 0903 0904 0905 0906 0907 0908 0909  
        0500-0800 0801 0802 0803 0804 0805 0806 0807 0808  
            0300-0700 0701 0702 0703 0704 0705 0706 0707  
                0200-0600 0601 0602 0603 0604 0605 0606  
                    0200-0500 0501 0502 0503 0504 0505  
                        0200-0400 0401 0402 0403 0404  
                            0200-0300 0301 0302 0303  
                                0200 0201 0202  
                                    0101

# 11 conclusions

11.1 This study has outlined a programme that could tackle the real challenge of childhood obesity in England by fully implementing UK Government and WHO guidance, working through the National Curriculum. Given that much of the organizational framework is already in place, it could prove a practical and effective solution which could much improve the children's present and future wellbeing. Once the future savings to the NHS are fully considered, it could also be seen as a sound economic investment.

11.2 The current programme clearly needs to be piloted and evaluated, but if it really can eradicate, or at least contain, the prevalence of child obesity, then it would make sense to implement it nationally, and also to extend the programme to colleges for those pupils aged 17-18, working with Key Stage 5.

## 11.3 DISCUSSING WELLBEING IN OTHER NATIONAL CURRICULUM COURSES

In addition to the National Curriculum on **Physical Education**, there are other units into which lessons on obesity prevention, diet and activity can be formally introduced. One example would be on a **Personal, Social, Health and Economic** course (PSHE in England) where topics such as alcohol, drugs and smoking are already considered. Comparable course in Wales are termed *Personal and Social Education* (PSE) and *Social, Personal and Health education* (SPHE) in Ireland.

Dr Emma Karoune has shown that it is also possible to introduce lessons on the issue of obesity, through other subjects such as the Science Key Stage 4 Curriculum: *How Science Works* and in *Biology* for example. She produced lesson plans and work sheets dealing with the differences (and consequences) of three contrasting dietary regimes: hunter-gatherers, early farmers and modern city dwellers. These lessons were piloted and linked to OCR GCSE assessment (Karoune forthcoming in Stougaard-Nielsen & Renon *Achieving Wellbeing*, UCL Press)

11.5 The activation of the National Curriculum will not only benefit the children. Teachers serve as role models for their students, and thus their physical activity profile and engagement with the programme sets an important example of its benefits and of health awareness, as a recent study reminds us (Verma 2015).

11.6 Other countries also have both an increasing child obesity issue and a national curriculum, and so might also benefit from this discussion. India, for example, began developing its own National Curriculum before the UK. The task here was considerable: not only is the population of just under 1.3 billion enormous, but education had to consider major religious and cultural differences, addressing illiteracy in some more remote areas, as well as trying to operate with regional languages as well as Hindi and English. Nevertheless, in the summary of recommendations on the thorough paper published in 2016 on *the Evolution of the National Policy on Education*, mid-day meals (9.27) as well as health and physical education (9.28) are both considered.

11.7 In the United States of America, with its own alarming rise in the prevalence of obesity, there are some 70m children attending primary and secondary schools. Although there is no uniform National Curriculum, they do operate within a system termed the Common Core State Standards, initially focused on subjects such as maths, languages and arts, but now is expanding its remit to other areas such as Physical Education. They also run the *Coordinated School Health Program*, intended to reduce childhood obesity in the US. This has been evaluated using state level data collected by the *Centers for Disease Control and Prevention* (CDC) through the *School Health Policies and Programs Study* (SHPPS) for the years 1994, 2000, and 2006. The effectiveness of school health policies were measured, including routine BMI screening, joint activities between health education and food service staff, staff training on nutrition, staff training on exercise, certifying health educators, prohibiting sale of junk food, limiting access to vending machines, whether schools teach about nutrition in class, and whether schools teach about exercise in class. Demographic differences including race, education, income, health coverage, and adults' smoking habits were also taken into consideration. It seems that the regular BMI screening and the provision of nutrition training for school staff yielded the more statistically significant positive results (Himathonmoka 2011).

## **POTENTIAL HEALTH & ECONOMIC BENEFITS**

11.10 To return to the UK, if the Activated National Curriculum project were to be implemented, and if it were to be successful, it would represent a major exercise in beneficial cultural behavior change.

11.11 For most of the pupils involved the project should produce the first generation in the 21<sup>st</sup> century in which the general levels of childhood obesity were significantly reduced,

11.11 Given that the lessons learned while young might become embedded in future lifestyles, then the project would produce the first generation in the 21<sup>st</sup> century in which the general levels of adult obesity were significantly reduced, together with the attendant debilitating diseases and conditions

11.13 The project would therefore see an equivalent rise in the wellbeing of a significant proportion of the population, especially those from disadvantaged families.

11.14 Even if the long term result achieved just a 50% success rate, then there would be a significant reduction in the demands on the National Health Service, with considerable cost benefits.

## **Postscript: improving the health of the nation**

*Activating the National Curriculum is just one element in a government initiative to improve the health of the nation. There is clear evidence that such major interventions can deliver major health benefits comprehensively and at speed: an extreme example is discussed here.*

In the horrors of the Blitz over 70 years ago, the word 'non-combatant' lost its meaning. Lessons were learned the hard way as civilian communities were forced to confront the actuality and impact of a modern war in logistical, societal and human terms. And one of those lessons has an urgent resonance in these more peaceful, prosperous times: it is the story of rationing, its rationale and the remarkable results it had on the health of the whole country.

The Second World War inflicted unprecedented levels of destruction and death on whole nations: more civilians were killed or injured than those serving in the military. Mass starvation was deliberately used as a weapon against civilian populations whether in concentration camps or in besieged or occupied towns. Although the British mainland was not invaded, it was repeatedly bombed and the convoys importing supplies from overseas were mercilessly hunted by German U-boats. Food was in increasingly short supply and had to be rationed.

In 1940, the British Ministry of Food set out the basic nutritional requirements for adults to stay 'fighting fit' during the course of the war. The weekly ration decreed by the government was a practical compromise of nutrition and cultural requirement, tempered by the need to spread the pain more or less evenly across the population. Home-produced fruit and vegetables in season were exempt, and thus provided the bulk of the diet, while meat was strictly limited, with only 4 oz (100 g) of bacon and ham per week, for example. This was not a dissimilar proportion of meat/vegetables to some ancestral diets. Indeed, the allocation is described by Dr Zweiniger-Bargielowska in her comprehensive study of the (2000, 37) as a "virtual peasant diet".

Milk (three pints or 1,800 ml), butter and cheese (both two ounces or 50 g) were also rationed. Even tea, without which no English family could be expected to live, was restricted to two ounces (50 g) per person per week. But in addition, all children had daily doses of orange juice and cod-liver oil, while those from the poorer families were provided with a free school meal. Rationing of sweets and sugar continued until 1953 and on meat until July 1954.

Thus for over ten years the population enjoyed a rather monotonous but balanced diet comprising many vegetables and locally produced fruits, but with far less meat, fat or sugar than would be deemed 'normal' today. In terms of basic nutrition, while much of the world starved, the British population as a whole was arguably healthier than it had been in the 1930s. The nationally-imposed diet and the simultaneous development of the new National Health Service saw levels of maternal and infant mortality decline significantly, while adults were living longer too: the average age at which people died from natural causes actually increased (the Luftwaffe excepted). Sugar had been restricted to a weekly allowance of eight ounces (225 g) and this was a major factor in a pronounced fall in the recorded cases of dental caries and obesity.

Anthropometric data also shows notable improvements in child health and physique: in addition to the improved 'peasant' diet, a vigorous activity regime was also in place. Severe petrol shortages meant that walking to and from work or school became the norm, while many gardens, parks and bombsites were vigorously turned over to allotments where vegetables were regularly planted, tended and harvested.

But then it all went wrong. The post-war period in the West witnessed major expansion in food production and processing, coupled with a general consensus that more food – from whatever source, however produced – was the key to good living. This was an understandable cultural reaction to the deprivations suffered by that generation, but did more food automatically equate with better health for the consumers? The alarming prevalence of obesity and its associated consequences suggests that urbanization is not necessarily a recipe for global wellbeing.

A major underlying cause of child obesity, for example, lies in the discarding of nutritional and activity regimes that better fit our biology: the active lives and 'healthy' diets our ancestors were best adapted for, or to return to the Blitz, the proxy "peasant" regimes introduced during the last war. The British food rationing exercise- with its attendant very robust activity regimes- could be regarded as a major intervention that successfully tested the value of a co-ordinated state-sponsored public health drive.

One positive lesson that can be drawn from the nightmare of the Blitz is that where there is real political will, real positive health benefits can ensue with remarkable speed. Indeed, it shows that the dietary health of an entire urbanised nation can be bettered within a generation: this was a public health intervention on a truly national scale, and it worked.

**We have a new world war on our hands today- the battle against child obesity, which must be won for the sake of the children, for the quality of their adult lives and to lower the potentially unbearable demands on tomorrow's Health Services.**

**Our schools must be allowed play a more active role in this new war. They should have the resources to provide more vigorous daily activities (at least one hour a day) to counteract the sedentary delights of TVs and computer games. Comprehensive walk-to-school initiatives and, of course, improved school dinners and better nutritional information are also required before this battle can be won.**

**Much of this can and should be delivered, not this time through Rationing, but through our National Curriculum. If we bettered the health of a nation in the middle of a war, then why can't we do it in the middle of a peace?**



# Appendix A

## *Summary of Childhood Obesity: a plan for action (2017) GOV.UK*

**INTRODUCTION** Today nearly a third of children aged 2 to 15 are overweight or obese and younger generations are becoming obese at earlier ages and staying obese for longer. Reducing obesity levels will save lives as obesity doubles the risk of dying prematurely. Obese adults are seven times more likely to become a type 2 diabetic than adults of a healthy weight<sup>5</sup> which may cause blindness or limb amputation. And not only are obese people more likely to get physical health conditions like heart disease, they are also more likely to be living with conditions like depression. The economic costs are great, too. It was estimated that the NHS in England spent £5.1 billion on overweight and obesity-related ill-health in 2014/15.

The burden is falling hardest on those children from low-income backgrounds. Obesity rates are highest for children from the most deprived areas and this is getting worse. Children aged 5 and from the poorest income groups are twice as likely to be obese compared to their most well off counterparts and by age 11 they are three times as likely. At its root obesity is caused by an energy imbalance: taking in more energy through food than we use through activity. Physical activity is associated with numerous health benefits for children, such as muscle and bone strength, health and fitness, improved quality of sleep and maintenance of a healthy weight. Long-term, sustainable change will only be achieved through the active engagement of schools, communities, families and individuals. balanced

### **1 Introducing a soft drinks industry levy**

Our children are consuming too many calories - and, in particular, too much sugar. Teenagers in England are the biggest consumers of sugar-sweetened drinks in Europe. As a first major step towards tackling childhood obesity, we will be introducing a soft drinks industry levy across the UK. In England, the revenue from the levy will be invested in programmes to reduce obesity and encourage physical activity and diets for school age children. This includes doubling the Primary PE and Sport Premium and putting a further £10 million a year into school healthy breakfast clubs to give more children a healthier start to their day.

### **2 Taking out 20% of sugar in products**

Evidence shows that slowly changing the balance of ingredients in everyday products, or making changes to product size, is a successful way of improving diets. This is because the changes are universal and do not rely on individual behaviour change. We will therefore launch a broad, structured sugar reduction programme to remove sugar from the products children eat most. All sectors of the food and drinks industry will be challenged to reduce overall sugar across a range of products that contribute to children's sugar intakes by at least 20% by 2020, including a 5% reduction in year one. This can be achieved through reduction of sugar levels in products, reducing portion size or shifting purchasing towards lower sugar alternatives.

### **3 Supporting innovation to help businesses to make their products healthier**

We want to encourage the next generation of innovation in science and technology to allow industry to create healthier, more sustainable products. To support this, Innovate UK ran a collaborative research and development (R&D) competition worth £10 million for research to stimulate new processes and products to increase the availability of healthier food choices for consumers and open up new markets.

The recently formed Agri-Food Technology Council provides leadership in areas such as health and nutrition and consumer acceptability, and the Food Innovation Network is bringing together food businesses, researchers, and innovation support to enable greater take up of world-leading R&D.

#### **4 Developing a new framework by updating the nutrient profile model**

To help families to recognise healthier choices, we need a new way to determine which food and drink products are healthier and which are less healthy. The restrictions on food and drink advertising that are already in place to protect children are based on a tool called a 'nutrient profile'. Each food and drink is assigned a score based on working out how much sugar, fat, salt, fruit, vegetables and nuts, fibre and protein it contains. Having a strong, effective model will be crucial for underpinning all areas of this plan: giving clear guidance on how products will be treated will encourage companies to make their products healthier so they can avoid potential sanctions. Therefore, PHE is working with academics, industry, health non-governmental organisations and other stakeholders, to review the nutrient profile model to ensure it reflects the latest government dietary guidelines.

#### **5 Making healthy options available in the public sector**

We need to harness the true potential of the public sector to reduce childhood obesity. The public sector in England spends over £2 billion on food and catering services annually, with just under half, £1 billion, being the cost of food and ingredients. These buildings, services and spaces should set an example to children and families. Every public sector setting, from leisure centres to hospitals, should have a food environment designed so the easy choices are also the healthy ones. We will also ensure that there is full uptake of the *Government Buying Standards for Food and Catering Services* (GBSF) in central government departments

#### **6 Provide support with the cost of healthy food for those who need it most**

We are re-committing to the Healthy Start scheme, which provided an estimated £60 million worth of vouchers to families on low income across England in 2015 to 2016. These can be exchanged for fresh or frozen fruit or vegetables and milk. The scheme also provides free vitamins to support intake during pregnancy and early years. Last year over 1.7m vouchers were issued every four weeks and an average of 480,000 children in low income families were benefiting from the scheme in each month of the year.

#### **7 Helping all children to enjoy an hour of physical activity every day.**

There is strong evidence that regular physical activity is associated with numerous health benefits for children. The UK chief medical officers recommend that all children and young people should engage in moderate to vigorous intensity physical activity for at least 60 minutes every day. Many schools already offer an average of two hours of PE or other physical activities per week. However, we need to do more to encourage children to be active every day. Every primary school child should get at least 60 minutes of moderate to vigorous physical activity a day. At least 30 minutes should be delivered in school every day through active break times, PE, extra-curricular clubs, active lessons, or other sport and physical activity events, with the remaining 30 minutes supported by parents and carers outside of school time.

During inspections, Ofsted assess how effectively leaders use the Primary PE and Sport Premium and measure its impact on outcomes for pupils, and how effectively governors hold them to account for this. Physical activity will be a key part of the new healthy schools rating scheme, and so schools will have an opportunity to demonstrate what they are doing to make their pupils more physically active.

Schools will continue to have the freedom to consider spending the Primary PE and Sport Premium on specific interventions but to help schools understand what help is available, PHE will be developing advice to schools for the academic year 2017/18. This will set out how schools can work with the school nurses, health centres, healthy weight teams in local authorities and other resources, to help children develop a healthier lifestyle. Furthermore, we will make available a new interactive online tool which will help schools plan at least 30 minutes of physical activity every day. This will help schools identify gaps in the existing opportunities for children to be active and will recommend a number of solutions they can choose, for example after school clubs, initiatives such as the daily mile, creating an active playground or having an active lesson.

## **8 Improving co-ordination of quality sport and physical activity programmes**

We have asked the County Sports Partnerships to work with National Governing Bodies of sport, the Youth Sport Trust and other national and local providers to ensure that from September 2017, every primary school in England has access to a co-ordinated offer of high quality sport and physical activity programmes, both local and national. As part of this, national governing bodies will offer high quality sport programmes to every primary school.

We will continue investing in walking and cycling to school. Walking or cycling to school provides a healthy way to start the day. The government has committed to producing a Cycling and Walking Investment Strategy. The first strategy will set out plans for investing £300m to support cycling and walking. It will set a clear target to increase the number of children walking to school as well as continued support for Bikeability cycle training for children.

## **9 Creating a new healthy rating scheme for primary schools**

Schools are a vital part of our plan, and have opportunities to support healthier eating, physical activity and to shape healthy habits. Schools also have unique contact with parents and can signpost them to information and advice on keeping their children healthy. From September 2017, we will introduce a new voluntary healthy rating scheme for primary schools to recognise and encourage their contribution to preventing obesity by helping children to eat better and move more. This scheme will be taken into account during Ofsted inspections. The scheme will help schools to demonstrate to parents that they are taking evidence-based actions to improve their pupils' health.

Building on existing schemes where appropriate, the criteria for the rating scheme will be developed in consultation with schools and experts but will cover the school's approach as a whole. We will seek to actively involve parents in the rating process so they can be confident their children are attending schools which provide healthy food and opportunities for physical activity. We are also keen to celebrate schools that can demonstrate healthy approaches towards tackling obesity amongst their pupils, and therefore we will run an annual competition to recognise schools with the most innovative and impactful projects. Ofsted already evaluate a school's success in promoting and supporting pupils' knowledge of how to keep themselves healthy, including through exercising and healthy eating. Inspectors expect to see pupils making informed choices about eating and physical activity and the school's culture promoting this aspect of pupils' welfare. This evaluation informs inspectors' judgement on pupils' personal development, behaviour and welfare.

Once the new rating scheme is operational it will be referred to in the school inspection handbook, and Ofsted inspectors will be able to take account of the scheme as an important source of evidence about the steps taken by the school to promote healthy eating and physical activity. In addition, in 2017, Ofsted will undertake a thematic review on obesity, healthy eating and physical activity in schools. The review will provide examples of good practice and recommendations on what more schools can do in this area.

## **10 Making school food healthier**

The School Food Plan (July 2013) has helped bring about whole school improvements in food. The new School Food Standards came in to force from January 2015 and have been widely welcomed. Since then new advice on sugar and nutrition has been published. Therefore the Department for Education (DfE), supported by PHE, will update the Standards (**see below**) in light of refreshed government dietary recommendations.

Breakfast clubs can contribute to improved attainment, attendance and overall health. This is why the government recently announced that £10 million a year of revenue from the soft drinks levy will fund the expansion of healthy breakfast clubs. This programme will ensure that more children benefit from a healthy start to their school day.

## **11 Clearer food labelling**

In order to make healthier choices, families need to be presented with clear information about the food they are buying. The UK has led the way, working with industry to implement a voluntary front of pack traffic light labelling scheme, which now covers two thirds of products sold in the UK. However, an issue of increasing concern to families is understanding which sugars they should be cutting out of their diet. Current sugar labelling shows the total sugar content of foods but the new maximum intake recommendations are based on the specific sugars that are easily over-consumed. The UK's decision to leave the European Union will give us greater flexibility to determine what information should be presented on packaged food, and how it should be displayed. We want to build on the success of our current labelling scheme, and review additional opportunities to go further and ensure we are using the most effective ways to communicate information to families.

## **12 Supporting early years settings**

The early years are a crucial time for children's development. One in five children are already overweight or obese before they start school and only one in ten children aged two to four meets the UK chief medical officers' physical activity guidelines for this age group. PHE have commissioned the Children's Food Trust to develop revised menus for early years settings by December 2016. These will be incorporated into voluntary guidelines for early years settings to help them meet current Government dietary recommendations. This will include practical ideas and suggestions, alongside the sample menus. In early 2017, we will launch a campaign to raise awareness of these guidelines among both early years practitioners and parents and we will update the Early Years Foundation Stage Framework to make specific reference to the UK chief medical officers' guidelines for physical activity in the early years.

## **13 Harnessing the best new technology**

Consumer power and choices are important drivers of the food environment and, potentially, in ending the childhood obesity crisis. We need accessible, simple information on how much sugar, fat and salt your weekly shop contains. We need to capitalise on the power of technology to support healthier choices. The uptake of Change4Life's Sugar Smart app shows the potential of digital applications in this regard. We will therefore work with PHE, Innovate UK, the third sector and commercial players to investigate opportunities to bring forward a suite of applications that enable consumers to make the best use of technology and data to inform eating decisions. We will also ask PHE to build on work which is underway around digital based weight management support for adults and explore similar approaches for children and families.

## **14 Enabling health professionals to support families**

We are asking health care professionals to build on the good work they already do by always talking to parents about their family's diet, working towards making it the default to weigh everyone, referring people to local weight management services, clubs and websites if they ask for more advice.

**CONCLUSION** With nearly a third of children aged 2-15 overweight or obese, tackling childhood obesity requires us all to take action. Government, industry, schools and the public sector all have a part to play in making food and drink healthier and supporting healthier choices for our children. The benefits for reducing obesity are clear – it will save lives and reduce inequalities. The actions in this plan will significantly reduce England's rate of childhood obesity within the next 10 years. Achieving this will mean fewer obese children in 2026 than if obesity rates stay as they are.

**SCHOOL FOOD STANDARDS** <http://www.schoolfoodplan.com/wp-content/uploads/2014/09/School-Food-Standards-Guidance-FINAL-140911-V2C.pdf>

- **Fruit and Vegetables** *One or more portions of vegetables/salad and of fruit every day.*  
Each Week: dessert containing at least 50% fruit two or more times;  
at least three different fruits and three different vegetables.

- **Meat, fish, eggs, beans & other non-dairy sources of protein** *A portion every day.*  
Each Week: portion of meat/ poultry on three or more days each week.  
A meat or poultry product (manufactured or homemade, and meeting legal requirements) no more than once each week in primary schools and twice each week in secondary schools.  
Oily fish once or more every three weeks.  
For vegetarians, a portion of non-dairy protein on three or more days each week

- **Milk and dairy** *A portion of food from this group every day*  
Lower fat milk must be available for drinking at least once a day during school hours

- **Starchy foods** *One or more portions of food from this group every day.*  
Bread - with no added fat or oil - must be available every day.  
Each Week: three or more different starchy foods; one or more wholegrain varieties of starchy food.  
Starchy food cooked in fat or oil no more than two days per week

- **Foods high in fat, sugar and salt**  
*NO confectionery, chocolate or chocolatecoated products*  
Each Week: No more than two portions of food that is deep-fried, batter-coated, or breadcrumb-coated: No more than two portions of food which include pastry.  
NO snacks, except nuts, seeds, vegetables and fruit with no added salt, sugar or fat.  
Savoury crackers/breadsticks can be served at lunch with fruit, vegetables or dairy food.  
Desserts, cakes and biscuits allowed at lunchtime but must NOT contain confectionery.  
Salt must NOT be available to add to food after cooking.  
Condiments limited to sachets or portions of no more than 10 grams or one teaspoonful.

- **Healthier drinks** Free, fresh drinking water at all times  
Permitted drinks: Plain water (still/ carbonated); Lower fat milk/lactose reduced milk;  
Fruit or vegetable juice (max 150mls); Plain soya, rice or oat drinks enriched with calcium; plain fermented milk (eg yoghurt) drinks.  
Combinations of fruit/vegetable juice with water (still/carbonated, NO added sugars or honey).  
Combinations of fruit juice/lower fat milk or plain yoghurt, plain soya, rice or oat drinks enriched with calcium; cocoa and lower fat milk; flavoured lower fat milk, all with less than 5% added sugars or honey.  
Combination drinks limited to 330mls portion size, and may contain added vitamins/ minerals, and no more than 150mls of fruit or vegetable juice.  
Fruit or vegetable juice combination drinks must be at least 45% fruit/ vegetable juice.

# Appendix B

## SUMMARY of National Health Service (UK) guidelines:

### Physical activity guidelines for children and young people

[www.nhs.uk/Livewell/fitness/Pages/physical-activity-guidelines-for-young-people.aspx](http://www.nhs.uk/Livewell/fitness/Pages/physical-activity-guidelines-for-young-people.aspx)

1 For school children aged 5 to 16 to stay healthy or to improve health, three types of regular physical activity are required: **aerobic exercise** to stimulate and strengthen the heart and lungs and improve the body's utilization of oxygen, together with exercises to **strengthen bones** and exercises to **strengthen muscles**.

2 Children and young people should reduce the time they spend sitting watching TV, playing computer games and travelling by car when they could walk or cycle instead.

3 To maintain a basic level of health, children and young people need to do at least 60 minutes of physical activity **every day** – ranging from moderate activity to vigorous activity

**4 MODERATE ACTIVITY** raises your heart rate and makes you sweat. One way to tell if you're working at a moderate level is if you can still talk, but you can't sing the words to a song. Examples include:- *walking the dog; walking to school; playing in the playground; riding a scooter; skateboarding; rollerblading; cycling over ground with few hills*

**5 VIGOROUS ACTIVITY** Vigorous activity makes you breathe hard and fast. If you're working at this level, you won't be able to say more than a few words without pausing for a breath. One minute of vigorous activity seems to provide the same health benefits as two minutes of moderate activity. Examples include:- *playing chase; energetic dancing; swimming; running; gymnastics; most team sports, eg football; netball; rugby; hockey; martial arts, such as karate; cycling fast or on hilly terrain*

### 6 MUSCLE and BONE EXERCISES

On three days each week, the supervised activity sessions should involve exercises for strong muscles and for strong bones. Bone-strengthening activities produce an impact on the bones that promotes bone growth and strength. Muscle strength is necessary for daily activities, and to build and maintain strong bones, regulate blood sugar and blood pressure, and help maintain a healthy weight. For young people, muscle-strengthening activities are those that require them to lift their own body weight or work against a resistance, such as lifting a weight.

- **Muscle-strengthening activities** suitable for the **Primary Protocol** include:

*Games such as tug of war; swinging on playground equipment bars; rope or tree climbing; gymnastics; sit-ups, press-ups etc sports such as football or netball*

- **Muscle-strengthening activities** suitable for the **Secondary Protocol** include:

*Sit-ups, press-ups etc; gymnastics; resistance exercises with exercise bands, weight machines or hand-held weights; rock climbing; sports eg football; rugby, basketball; tennis.*

- **Bone-strengthening activities** suitable for the **Primary Protocol** include:

*Jumping and climbing activities, combined with the use of playground equipment and toys; games such as hopscotch; skipping with a rope; walking; running; dancing; gymnastics; sports eg football, netball*

- **Bone-strengthening activities** suitable for the **Secondary Protocol** include:

*Dance; aerobics; weight training; running; skipping with a rope; gymnastics; sports eg football rugby netball hockey badminton tennis; martial arts*

# Appendix C

## Physical Activity in European Schools

with Oliver Hutchinson

### 1. Physical Education and Sport at Schools in Europe

SOURCE: [http://eacea.ec.europa.eu/education/eurydice/thematic\\_studies\\_en.php](http://eacea.ec.europa.eu/education/eurydice/thematic_studies_en.php)

For almost all European Union countries, the main aim of physical education lies in fostering children's physical, personal and social development. Promoting a healthy lifestyle is also often emphasised and health education has become its own mandatory subject in Ireland, Cyprus and Finland. Learning outcomes of physical education are closely related to its main aims. **Countries such as Germany, Portugal, the United Kingdom and Nordic countries take a cross-curricular approach to the subject at school: aspects of, for example, social and natural sciences are explored during physical education and vice versa, showing how subjects are interrelated.**

Central authorities of many countries include basic motor activities such as walking, running, jumping and throwing in their curricula in the first years of primary education. Gradually, curricula build on these basic skills and enlarge their scope to cover more complex sports disciplines. Some countries allow their schools to decide whether or not a particular activity is optional or mandatory. Among the mandatory physical education activities in schools, games – typically ball games – are the most common.

Prescribed taught time of physical education varies significantly from one country to another as well as between education levels. For example, for the 2011/12 school year, the recommended minimum average taught time at primary level varied between 37 hours in Ireland and 108 hours in France. At secondary level, time spent ranged from 24 to 35 hours in Spain, Malta and Turkey to 102 to 108 hours in France and Austria. In general, the share of taught time recommended for physical education is rather low compared to that of other subjects – a fact that reveals that the subject is commonly perceived as less important. This difference is especially striking during primary education. Here, the proportion of taught time devoted to physical education is only around half of that dedicated to mathematics. Overall, there have been no major changes in the taught time for physical education since the 2006/07 school year.

Extracurricular physical activities offered outside of school time, such as competitions or health-related activities, are designed to make physical activities even more accessible and attractive to young people. Their main purpose is to broaden or complement activities undertaken during school time. Extracurricular physical activities are organised at national, regional, local and very often at school level. While extracurricular activities are available for all pupils, they also target children with disabilities or special educational needs. Some extracurricular activities even take place during the school day. Indeed, in some countries physical education is not limited to physical education classes, but is integrated into the daily school routine. In many Danish schools, for example, students practice 'morning running' before school starts. Other countries use extended school breaks to include physical activities on the playground or in the gym.

Around one-third of countries are currently planning reforms relevant to physical education. Portugal, for example, is intending to raise the profile of physical activities by increasing the minimum taught time: Finland, pioneer in this field, has already done so. Greece and Hungary intend to diversify the provision of organised physical activity at school. National reforms are also seeking to improve the associated teaching conditions, and to promote the training of those who teach it.

## 2. European case studies of school-based projects

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# Appendix D

with Oliver Hutchinson

## physical activity and education in US schools

In the United States, obesity has tripled among children and youth ages 6-19 years old over the last 30 years. The *Physical Activity Guidelines for Americans* recommend that all pupils aged 6 to 17 years should have 60 minutes or more of physical activity each day. Unfortunately only 22% of those attending school are actually recorded as undertaking 60 or more minutes of moderate-to-vigorous physical activity on at least 5 days per week. Only 27% of high school students participate in at least 1 hour per day of physical activity on all days of the week. In 2015, 53% of high school students participated in muscle strengthening exercises on 3 or more days during the week. Although 52% of high school students attended physical education classes weekly, only 30% of them attended PE classes daily. This is in spite of the following recommendations and guidelines:

- [2008 Physical Activity Guidelines for Americans\[PDF-8.35MB\]](#)
- [Physical Activity Guidelines for Americans Midcourse Report: Strategies to Increase Physical Activity Among Youth\[PDF-2.2MB\]](#)
- [Youth Physical Activity Guidelines Toolkit](#)
- [Educating the Student Body: Taking Physical Activity and Physical Education to School](#)
- [CDC School Health Guidelines to Promote Healthy Eating and Physical Activity\[PDF-973KB\]](#)
- [CDC Comprehensive School Physical Activity Program: A Guide for Schools\[PDF-6.44MB\]](#)

There are real challenges to be faced when trying to convert such “recommendations” into mandatory practice in a country without a formal nationally-applied curriculum and a need to raise educational standards generally. The situation has been incisively described in a major review by Elizabeth Whitehouse and Matthew Shafer (2017) summarized here. They report that state leaders are increasingly addressing obesity and promoting physical activity in schools through policies such as “mandatory recess”: this is defined as “regularly scheduled period in the school day for physical activity and play that is monitored by trained staff or volunteers”.

*The American Academy of Pediatrics* argues that recess not only offers physical benefits but also cognitive, social and emotional benefits, since it provides students with time to imagine, think and socialize in ways not attainable in a classroom. However, of the 39 states that have formal laws requiring physical education in elementary schools, only 19 specify the actual time limits that students must participate in physical education: more than half allow exemptions or substitutions that release students from the requirement.

In response to many schools cutting recess time, debate is focusing on the importance of recess as a formal, scheduled part of the school day. By way of an illuminating example, some schools in the Dallas-Fort Worth area of Texas are piloting the LiiNK project—*Let’s Inspire Innovation ‘N Kids*, developed by Professor Debbie Rhea. She is working from a Finnish model (the country that arguably leads the world in such matters), where schools provide 15 minutes of recess for every hour of instruction. In addition to their wellbeing, initial outcomes of the impact on students of multiple recesses during the day include fewer discipline and bullying problems, less anxiousness, as well as improved self-concept, attendance and academic achievement (Whitehouse & Schafer 2017).

## How united are the United States?

The political system in the US is complex: several states already have legislation that includes recommendations, rather than mandates, for recess and other types of physical activities, while others choose to let local school districts develop their own policies. Legislators in some states have recently debated whether to mandate recess in their elementary schools. For example, the New Jersey Legislature passed a bill requiring recess in elementary schools, but it was vetoed by the Governor, and the Florida House of Representatives passed HB 833, which required local school districts to provide recess daily, but the bill did not pass in a Senate committee. However, Rhode Island passed SB 2669 in 2016 that requires elementary schools to provide at least 20 minutes of recess each day, a bill which also prevents teachers and administrators from taking recess away as punishment for students. The Arizona Legislature will consider a bill that would require at least 50 minutes of daily mandatory recess. The bill unanimously passed the House Education Committee on Jan. 30 2017.

### States with formal recess requirements include:

- **Connecticut:** 20 mins a day of supervised recess, preferably outdoors.
- **Indiana:** Daily physical activity for students in elementary school.
- **Missouri:** Minimum of 20-minute recess period daily
- **Rhode Island:** Minimum of 20 consecutive minutes of free play
- **Virginia:** daily recess during the regular school year.

### States with general activity requirements include:

- **North Carolina:** 30 mins of daily physical activity on days when PE is not scheduled.
- **Louisiana:** 30 mins of vigorous physical activity each day
- **Texas:** Minimum of 30 mins physical activity each day
- **Iowa:** 30 mins physical activity each day
- **Arkansas:** 90 mins of physical activity each week
- **Tennessee:** 90 mins of physical activity each week
- **South Carolina:** Minimum of 150 mins per week (60 of which coming from PE)
- **Colorado:** 600 mins of physical activity monthly, including exercise programs, fitness breaks, recess, field trips, classroom activities including physical activity and physical education classes.

**Source:** Whitehouse, E. & Schafer, M. 2017 *State Policies on Physical Activity in Schools*  
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