containing child obesity through the national curriculum:

a project blueprint

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Evolutionary Determinants of Health: discussion paper

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contents

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)

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*

2 global challenge

2.1 GLOBAL CHALLENEGE The World Health Organisation (WHO) records that obesity

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 from1991-3, from c.12% to

2.6 CAUSES OF OBESITY A country like India is facing a double burden of poor

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

3.20 HEALTHY NUTRITIONAL REGIMES

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

3.50 **DISEASES OF URBANISATION**

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 to15-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.

5 pre-school protocol

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

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

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

RECOMMENDATIONS: GUIDANCE FOR HEALTHY DIET, SLEEP AND PHYSICAL ACTIVITY IN EARLY CHILDHOODTO ENSURE CHILDREN GROW APPROPRIATELY AND DEVELOP HEALTHY HABITS

6 child obesity and the classroom

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,

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/m2.

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

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

6.30 PHYSICAL ACTIVITY IN SCHOOLS

6.51 More schools should invesigate the concept of ‘Active Buildings’, designs that positively

7 activating the National Curriculum

7.01 The responsibility for the current decrease in the health of primary school-age children in

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

7.10 DAILY ACTIVITIES A central concept would see delivery of 60 minutes of daily activities through

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,

7.42 **Primary PE & Sport Premium**:
Five key indicators that participating schools are expected to see improve are:

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

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.

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

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

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

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

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. **(01**01) and school Year Group no: 0101 - 01**11**); 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*	

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 maemold .3270 0 1

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

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

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-

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[5] 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

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

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.

Appendix B

SUMMARY of National Health Service (UK) guidelines:

Physical activity guidelines for children and young people

Appendix C

2. European case studies of school-based projects

Summary of Mura,G.et al, 2015 'Physical Activity Interventions in Schools for Improving Lifestyle in European Countries' *Clin Pract Epidemiol Ment Health*. 11 (Suppl 1 M5): 77–101. doi: 10.2174/1745017901511010077

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Appendix D

with Oliver Hutchinson

physical activity and education in US schools

How united are the United States?

The political system in the US is complex: several states already have legislation that includes

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