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REVIEW ARTICLE



Targeting childhood obesity through primary schools: reviewing alignment amongst English policies for physical activity and healthy eating

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ABSTRACT

Introduction: Primary schools have been widely identified as a key site to tackle childhood obesity. While specific school-based interventions have been widely researched, there is an absence of collective analysis of national policies targeting childhood obesity and its determinants in primary schools. Therefore, this narrative review of English policy documentation from 2010 to 2017 examines the extent of alignment across governmental aspirations and implementation approaches towards childhood obesity, physical activity and healthy eating.

Methods and analytic framework: Using Arksey and O'Malley's scoping review methodology, 43 relevant policy documents were identified. From these documents, statements of policy aspirations were coded according to the different levels of the socio-ecological model (SEM). Information on policy implementation was coded according to Hood's "NATO" taxonomy of "Nodality", "Authority", "Treasure" and "Organisation" tools which governments can utilise to implement policy.

Findings: Common articulations of aspirations to address recognised problems of childhood obesity were identified across policy documents, with the need for multi-level action articulated more clearly for healthy eating than physical activity. The government's signature Childhood Obesity Plan published in 2016 was an isolated example of a policy document that encompassed aspirations across all SEM levels, but still replicated a wider trend in which only aspirations for individual-level behaviours were articulated with precision. Policy documents evidenced uses of information dissemination, funding, organisational direction and, less prominently, governmental authority to drive policy implementation in primary schools. However, the use of these policy tools was often vaguely specified and disjointed both across different tools and between physical activity and healthy eating policies.

Conclusion: High-level aspirations in national policy documents align across the dual approach of tackling childhood obesity by enhancing physical activity and healthy eating. However, the effectiveness of policies is likely constrained by limited alignment across different levels of the SEM and across different policy implementation tools.

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Introduction

Globally, 5.6% of girls and 7.8% of boys are classified as obese (NCD-RisC 2017), and the prevalence of obesity is socioeconomically patterned (Bambra et al. 2015). Childhood obesity is associated with premature mortality in adulthood (Reilly and Kelly 2011), but also has adverse effects on various physical and psychological health conditions during early life (Jeffery et al. 2005; Sahoo et al. 2015). At the time of writing, children living in England had greater excess weight than global counterparts with 30% of 2–15 year olds classed as overweight or obese (Conolly and Davies 2018). The last decade has, as a result, seen a proliferation of national policy initiatives which are either directly focused on childhood obesity or which indirectly aim to address obesity through seeking to improve wider conditions that affect children's lives (e.g. transport, welfare, housing). Regardless of these policy initiatives, national survey data demonstrates a levelling-off of obesity levels over the past decade (PHE 2017a). The persistence of these high rates of childhood obesity suggests that recent and current policy initiatives may have reached an effectiveness “ceiling” and thus require thorough investigation in terms of their collective potential for impact.

Primary schools often feature prominently in policies that seek to address childhood obesity. Their role in implementing policies is emphasised as schools are contexts in which all children may be engaged in learning about and enacting various positive health behaviours (Jaime and Lock 2009; Clarke et al. 2013). In England specifically, the government's 2016 Childhood Obesity Plan recognised the “vital part” that primary schools are expected to play in providing “opportunities to support healthier eating, physical activity and to shape healthy habits” (HM Government 2016, p. 8). Various other government policies and initiatives focused on primary schools have sought to enhance provision and education for healthy eating (Department for Education 2013a) and also improve opportunities, learning and participation in physical education, activity and sport (Department for Education 2013b). Thus, government policies related to childhood obesity have spanned provision within and beyond the primary school curriculum and included both physical activity and healthy eating as interrelated behavioural risk-factors (Rutkow et al. 2016).

The increasing governmental impetus across different streams of childhood obesity-related policy brings risks of “initiativitis”, whereby limited alignment across numerous policy initiatives results in ambiguity or duplication in responsibilities for implementation. Problems of “initiativitis” are

recognised across various policy sectors in England (Coalter 2007), including education (Ball et al. 2012) and public health (Hunter 2003). “Initiativitis” may be a particular risk in respect of childhood obesity in schools given that the issue is one that spans the government ministry that has responsibility for public health (the Department of Health and Social Care) and the Department for Education, as well as the ministry with responsibility for sport and physical activity (the Department of Digital, Culture, Media and Sport¹). Despite calls from a leading UK parliamentary committee for a more “joined-up” approach to childhood obesity policy (House of Commons Health Committee 2018, p. 34), the challenge this presents for policymakers has largely gone unconsidered in much of the childhood obesity literature.

To date, academic studies have substantively evaluated the effectiveness of individual government initiatives for physical education, activity and sport (Griggs 2016; Lindsey 2020) and healthy eating (Evans and Cade 2017) in primary schools. In addition, systematic reviews of public health interventions orientated towards childhood obesity have been undertaken (Wolfenden et al. 2016; Brown et al. 2019). However, extensive searching fails to identify previous research that specifically examines the extent to which various government policies for childhood obesity, physical activity and healthy eating may (or may not be) commonly aligned. Therefore, this study sought to generate new insights by reviewing national policies for childhood obesity, physical activity and healthy eating in English primary schools. With policy literature in other fields suggesting that alignment across policy goals (or aspirations) and their implementation are important but potentially distinct considerations (Sianes 2017), the study sought to answer the following two research questions:

- (1) To what extent are stated governmental aspirations for change commonly aligned across national childhood obesity, physical activity and healthy eating policies related to primary schools (5–11 years)?
- (2) To what extent do government-driven implementation approaches commonly align across childhood obesity, physical activity and healthy eating policies related to primary schools?

Conceptual and analytic frameworks

There was a need for distinct conceptual frameworks to support analysis of governmental aspirations and approaches to implementation. Policy aspirations are particular to a policy sector, and so the social ecological model

¹“Digital” was added to the responsibilities of this department after the timescale of this research. Hence, the original title of this ministry, the Department of Culture, Media and Sport (DCMS), will be used throughout the article.

(SEM) (Stokols 1992) offered a health-specific framework for considering policy goals and aspirations across childhood obesity, physical activity and healthy eating. Potential approaches that governments can take to implementing policies share similarities across different policy sectors. Therefore, Hood's (1986) seminal taxonomy of governmental policy "tools" provided a conceptual framework for the analysis of government's stated approaches towards implementing childhood obesity-related policies. Broad explanation of each of these two frameworks follows in turn.

Socio-Ecological Model (SEM): emerging from ecological systems theory (Bronfenbrenner 1989), the SEM is a hierarchical theory-based framework highlighting that: (i) influencing factors for health behaviour occur within and across individual, interpersonal, organisational, community, and policy environment levels; and (ii) effective interventions for change are likely to span these multiple levels of influence. The SEM recognises that behavioural influences encompass attitudes and beliefs (individual-level), proximal others (e.g., friends, family, healthcare providers: interpersonal level), schools and places of worship (organisational), communities and their cultural communications, through to local, regional, and national policies. Despite widespread use of SEM-based models in health behaviour discourse, its application can be problematic, with policy and programmes criticised for targeting individual levels only (Elder et al. 2006).

Policy tools: Hood's taxonomy adopted the acronym "NATO" in identifying "Nodality", "Authority", "Treasure" and "Organisation" as different resources or instruments that governments may utilise, in concurrent and overlapping ways, to drive policy implementation (Hood 1986). Nodality refers to the scope for the government's central position in the acquisition and distribution of information to be utilised to influence policy implementation (Hood and Margetts 2007). Governments can gather information through various means, through their own departmental infrastructures and by commissioning external agencies, and thereby hold the power to monitor the implementation of policy. Authority refers to government tools relating to regulation and legislation, and also includes elements relating to enforcement of specific standards or approaches. Treasure refers to government finances including how monies are raised, for example, through taxation, what amounts are allocated and how the funds are distributed. In the case of health and education policies in the UK, significant funding is allocated to organisations, including schools, to be used in a specific way in order to achieve specific results. Organisation relates to government's capacity to instigate, structure and mobilise networks of organisations at national, regional and local levels that implement government policy. In the case of the UK government, this may include non-ministerial departments, non-departmental public bodies and executive agencies.

Research strategy and methods

The qualitative research strategy adopted for this narrative review followed a modified version of the stage-based methodology for scoping studies that has been collectively developed over time by Arksey and O'Malley (2005), Levac et al. (2010) and Daudt et al. (2013). While scoping studies have mainly been undertaken to review specific bodies of academic and research literature, Anderson et al. (2008) highlight the utility of applying similar methodologies to mapping policies associated with particular issues. Recognised scoping review methodologies were also particularly appropriate for this study due to their value in developing understanding across an area that “has not been reviewed comprehensively before” (Mays et al. 2001, p. 194), a condition that readily applies to the array of government policies associated with childhood obesity, physical activity and healthy eating in primary schools in England.

In addition to setting broad research questions (as identified above), Levac et al. (2010) specify the need to “clearly articulate [the] scope of inquiry” from the outset of a scoping review. Two specific decisions were crucial in this regard. First, the chronological scope of the review was bounded by the UK general elections of 2010 and 2017 and so encompassed a period in which the national government was led by a single party, the Conservatives, either in coalition or through their own majority in parliament. This period was, therefore, both sufficient in length to encompass announcement of a number of new policy initiatives whilst also encompassing a degree of stability in government that could potentially allow alignment across different policy initiatives to emerge.² Second, decisions on the potential range of policy documents to be sought for inclusion and analysis drew both on Arksey and O'Malley's (2005, p. 21) recommendation that scoping reviews prioritise the “need for comprehensive coverage” and also Jenkin's (1978, p. 15) broad, and widely cited, definition of policy as a “set of interrelated decisions ... concerning the selection of goals and the means of achieving them”. Therefore, expressions of government policy can be identified not only within particular documents that specifically state government aspirations or strategies for implementation but also within a range of other publications and online material that, for example, may be considered to guide implementation. Content from national public bodies mandated by government, as well as government ministries themselves, was also considered as relevant, given the desired breadth of review.

A multi-phased searching approach was utilised to ensure all potentially relevant documentation was identified. First, the search engine on the

²It is also relevant to note that the period encompassed by the study predates the deepest governmental and parliamentary problems with negotiating the UK's exit from the European Union which, in turn, affected and hindered development of policy in other areas such as childhood obesity.

umbrella website for the UK government (www.gov.uk) provided the capability to identify all relevant documents published by government ministries across the period covered by the study. In line with the research questions, searches were undertaken using the term “primary schools” in separate combinations with “diet”, “nutrition”, “healthy eating”, “obesity”, “sport”, “physical education” and “physical activity” in turn. All documents identified through these searches were examined to identify that they were published within the stated time period, pertained to England specifically and were relevant to the overarching topic and the research questions. In this last regard, specific inclusion criteria that were applied in this and subsequent searching phases were that documents needed to include specific content related to obesity, physical activity or healthy eating in English primary schools. In the case of health- and obesity-focused documents, inclusion or exclusion primarily depended on whether they made specific reference to primary schools. Conversely, decisions on documents published by the Department of Education commonly depended on whether they included passages on obesity, physical activity or healthy eating. A total of 29 documents were identified through this phase of the searching strategy.

Searching for relevant documentation continued through two further phases. A “snowballing” approach, using those documents and webpages identified through the initial website searches, was undertaken. Passages relating to childhood obesity in primary schools as well as reference lists within documents were examined to identify any further documents or webpages relevant to the scope of the study. This phase especially supported identification of documents or content that was published by non-departmental public bodies whose role in relation to childhood obesity in primary schools was mandated or approved by the government. Identified examples of such documents were those published by Public Health England (PHE), the Office for Standards in Education, Children’s Services and Skills (OFSTED), the National Institute for Clinical Excellence (NICE), and Sport England.³ Applying the same selection criteria as in the initial website searching led to further 11 documents being included through this process. Finally, all of the research team reviewed the entire list of identified documents, utilising their range of expertise to consider if the list was comprehensive or if they were aware of further documentation from any public agencies that could have been relevant to the study. This process identified 3 further documents that met the inclusion criteria. [Table 1](#) provides a complete list of documents included for analysis.

³PHE is an executive agency responsible for public health. OFSTED is the governmental, but non-ministerial, agency responsible for inspecting schools and reporting on the standards being met within schools. Sport England is a non-departmental public body responsible for providing opportunities for participation in sport and physical activity across England. National Institute for Clinical Excellence (NICE) is a non-departmental public body responsible for providing national guidance and advice to improve health and social care.

Table 1. Full list of policy documents identified and included for analysis (alphabetical by document title).

No.	Lead/author department or organisation	Year	Title	URL
1	DCMS/Dept Education	2015	2010–2015 government policy: sports participation	https://www.gov.uk/government/publications/2010-to-2015-government-policy-sports-participation
2	DCMS	2015	A New Strategy for Sport: Consultation Paper	https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/450712/1619-F_Sports_Strategy_ACCESSIBLE.pdf
3	Ofsted	2013	Beyond 2012: outstanding physical education for all	https://www.gov.uk/government/publications/beyond-2012-outstanding-physical-education-for-all
4	PHE	2015	Change 4 Life Evidence Review: rapid evidence review on the effect of physical activity participation among children aged 5–11 years	https://www.gov.uk/government/publications/changed4life-evidence-review-on-physical-activity-in-children
5	Dept Health	2017	Charlton Manor primary school	https://www.gov.uk/government/case-studies/charlton-manor-primary-school
6	PHE	2016	Childhood obesity plan: PHE's role in implementation	https://www.gov.uk/government/publications/childhood-obesity-plan-phes-role-in-implementation
7	HM Government	2016	Childhood obesity: a plan for action	https://www.gov.uk/government/publications/childhood-obesity-a-plan-for-action
8	Dept Health	2016	Childhood obesity: government response	https://www.gov.uk/government/publications/childhood-obesity-government-response
9	Dept Health	2017	Clapham Manor primary school	https://www.gov.uk/government/case-studies/clapham-manor-primary-school
10	DCMS	2012	Creating a sporting habit for life: a new youth sport strategy	https://www.sportengland.org/media/3487/dcms-creating-a-sporting-habit-for-life-1.pdf
11	Dept Education	2017	Statutory framework for the early years foundation stage	https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/596629/EYFS_STATUTORY_FRAMEWORK_2017.pdf
12	PHE	2014	Everybody Active Every Day	https://www.gov.uk/government/publications/everybody-active-every-day-a-framework-to-embed-physical-activity-into-daily-life
13	Dept Education	2013	Evidence on physical education and sport in schools	https://www.gov.uk/government/publications/evidence-on-physical-education-and-sport-in-schools

(Continued)



Table 1. (Continued).

No.	Lead/author department or organisation	Year	Title	URL
14	Dept Education	2012	Free school meals pilot: impact report	https://www.gov.uk/government/publications/evaluation-of-the-free-school-meals-pilot-impact-report
15	PM Office/Dept Education	2014	Funding for primary school sports	https://www.gov.uk/government/news/funding-for-primary-school-sports
16	Dept Education/DCMS	2014	Getting more pupils playing sport	https://www.gov.uk/government/case-studies/getting-more-pupils-playing-sport
17	Dept Health	2017	Government extends Change4Life sports club funding	https://www.gov.uk/government/news/government-extends-change4life-sports-club-funding
18	Dept Education	2012	Implementing the free school meals pilot	https://www.gov.uk/government/publications/implementing-the-free-school-meals-pilot
19	Dept Education/DCMS	2014	Improving school sport and measuring progress	https://www.gov.uk/government/case-studies/improving-school-sport-and-measuring-progress
20	PHE	2017	National Child Measurement Programme Operational Guidance	https://www.gov.uk/government/publications/national-child-measurement-programme-operational-guidance
21	Dept Education	2013	National curriculum in England: Key stages 1 and 2 framework document	https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/425601/PRIMARY_national_curriculum.pdf
22	Dept Education	2017	New funding to boost schools facilities and healthy lifestyles	https://www.gov.uk/government/news/new-funding-to-boost-schools-facilities-and-healthy-lifestyles
23	NICE	2012	NICE PH41 Physical activity: walking and cycling (includes recommendation for schools eg. promotion of active transport)	https://www.nice.org.uk/guidance/ph41
24	PM Office	2013	Olympic legacy boost: £150million for primary school sport in England	https://www.gov.uk/government/news/olympic-legacy-boost-150-million-for-primary-school-sport-in-england
25	Dept Education	2016	PE and sport premium conditions of grant 2016 to 2017: local authorities and maintained schools	https://www.gov.uk/government/publications/pe-and-sport-premium-funding-conditions-for-2016-to-2017/pe-and-sport-premium-conditions-of-grant-2016-to-2017-local-authorities-and-maintained-schools
26	Dept Education	2016	PE and sport premium for primary schools	https://www.gov.uk/guidance/pe-and-sport-premium-for-primary-schools
27	Dept Education	2015	PE and sport premium: an investigation in primary schools	https://www.gov.uk/government/publications/pe-and-sport-premium-an-investigation-in-primary-schools
28	NICE	2015	Physical activity for children and young people	https://www.nice.org.uk/guidance/ph17/evidence/evidence-update-pdf-65748637

(Continued)

Table 1. (Continued).

No.	Lead/author department or organisation	Year	Title	URL
29	Dept Education/DCMS	2014	Raising teaching standards in school sport	https://www.gov.uk/government/case-studies/raising-teaching-standards-in-school-sport
30	Dept Education	2014	Revised standards for food in schools	https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/320697/Government_Response_-_Revised_Standards_for_School_Food_Consultation_FINAL.pdf
31	Dept Education	2015	School food in England: Departmental advice for governing boards	https://www.gov.uk/government/publications/standards-for-school-food-in-england
32	Dept Education	2013	School food: headteachers' and school senior managers' perceptions survey	https://www.gov.uk/government/publications/school-food-head-teachers-and-school-senior-managers-perceptions-survey
33	DCMS	2016	School Games Indicator 2015/16	https://www.gov.uk/government/statistics/school-games-indicator-2015-16
34	Sport England	2016	School Games Review	https://www.sportengland.org/media/10902/school-games-review-exec-summary.pdf
35	Sport England	2016	Sport England: Towards an Active Nation	https://www.sportengland.org/media/10629/sport-england-towards-an-active-nation.pdf
36	DCMS	2017	Sporting Future – First Annual Report	https://www.gov.uk/government/publications/sporting-future-first-annual-report
37	HM Government	2015	Sporting Future: A New Strategy for an Active Nation	https://www.gov.uk/government/publications/sporting-future-a-new-strategy-for-an-active-nation
38	Dept Education/DCMS	2014	Sports partnerships with local schools and community	https://www.gov.uk/government/case-studies/sports-partnerships-with-local-schools-and-community
39	Dept Health	2011	Start Active Stay Active	https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/216370/dh_128210.pdf
40	PHE	2014	The link between pupil health and wellbeing and attainment: a briefing for head teachers, governors and staff in education settings	https://www.gov.uk/government/publications/the-link-between-pupil-health-and-wellbeing-and-attainment
41	Ofsted	2014	The PE and sport premium for primary schools – Good practice to maximise effective use of the funding	https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/379202/The_PE_and_sport_premium_20for_20primary_20schools.pdf
42	Dept Education	2013	The School Food Plan	https://www.gov.uk/government/publications/the-school-food-plan
43	PHE	2015	What works in schools and colleges to increase physical activity?	https://www.gov.uk/government/publications/what-works-in-schools-to-increase-physical-activity-briefing

All included documents were classified according to their date, type of publication, publishing organisation and orientation towards physical activity, healthy eating and/or obesity (Arksey and O'Malley 2005). Any content from each document that was relevant to the study's two research questions was then extracted and collated in a standardised analysis spreadsheet (Daudt et al. 2013). A deductive thematic analysis of all data was initially undertaken by the first author. Extracts that reflected policy aspirations were coded according to their association with different levels of the SEM. Codes representing the different elements of the NATO typology were applied to extracts that related to policy implementation approaches. Further specific, interpretive notes were also added for each of data extracts in the analysis file so as to extend the depth of analysis. On completion of the initial round of analysis, and following Daudt et al. (2013), three other members of the research team undertook a secondary review of the entire data set to consider the codes previously applied. As Smith and McGannon (2018) recommend, having researchers with different academic backgrounds each examine the data set allowed identification of different interpretations and enabled collective discussion of findings leading to their agreed presentation in the following sections.

Findings

The methods for data collection outlined in the previous section resulted in a total of 43 documents being identified and analysed (see Table 1). Findings relevant to aspects of both the SEM and NATO frameworks are summarised in Table 2, which also includes a list of documents from which associated data was extracted. As noted in the previous section, analysis and coding focused on relevant extracts identified within the policy documents and so multiple themes were found in most of these documents.

Application of the SEM in examining policy aspirations

Aspirations for change spanned all levels of the SEM. With regards to the highest level, *policy environments*, this included developing cross-departmental approaches to policy development – “there are important links to be made across national government – most closely with DCMS [Department of Culture, Media Sport] and DH [Department of Health] – as well as local government” (Doc no.⁴ 1 – DCMS/DfE 2015, p. 20). There were also changes to education policy specifically, with the statutory National Curriculum addressing health-related knowledge and behaviours within the different subject areas of science, physical education, and design and

⁴Hereafter, documents referred to within the analysis will include a document number (noted as “Doc no.”) which will correspond to the list in Table 1.

technology (e.g., “pupils should be taught how to cook and apply the principles of nutrition and healthy eating”) (Doc no. 42 – DfE 2013a, p.183). There remains, however, an absence of an overarching curriculum for health which leads to resulting concerns that implementation would not be well aligned across the different subject areas in which health is a subsidiary component.

Moving down through the SEM levels, Table 2 indicates that only occasional references to desired change within *communities* were made in the documents. Such references were also relatively brief, but included recognition that playing sport “is good for communities” (Doc no. 1 – DCMS /DfE, 2015), that experiences transcend school environments, and that cultural change can only come about if “all sectors in the places we live and work act together” (Doc no. 12 – PHE 2014, p. 13). Clear aspirations for community-level change or how this might be achieved were missing; it is unclear how schools are desired to develop or utilise cross-community partnerships to impact on obesity-related outcomes.

Aspirations for change at the *organisational level* of the SEM were more clearly and substantially articulated. Government policy documents include aspirations that a range of national public bodies, such as Public Health England (PHE), OFSTED and Sport England, as well as charities, such as the Youth Sport Trust⁵ and the national governing bodies for particular sports (Doc no. 7 –HM Government 2016), should influence the work of schools with regard to obesity, physical activity and healthy eating. The principal organisation targeted for change, however, was clearly schools themselves and aspirations encompassed changes in both curriculum-based education and extra-curricular provision. For example, the government’s overall “Childhood obesity: a plan for action” document (hereafter “Childhood Obesity Plan”) (Doc no. 7 –HM Government 2016, p. 7) specifically indicated that all primary schools should enable children to undertake at least 30 minutes of moderate to vigorous physical activity a day through a combination of “active break times, PE, extra-curricular clubs, active lessons, or other sport and physical activity events”.

Addressing obesity-related outcomes through enhancing the *interpersonal* influence that teachers and others may have on children within primary schools was a minor feature within only three of the policy documents (see Table 2). For example, Sport England’s strategy document “Towards an Active Nation” offered one of the few references to interpersonal factors in seeking to enable the “provision of high-quality, insight-based training to coaches and teachers who work with children” (Doc no. 35 –Sport England 2016a, p. 21).

⁵The Youth Sport Trust is a national charity that seeks to promote and develop ways in which sport can be used to improve children’s wellbeing.

Table 2. Summary of analysis, key themes and associated policy documents.

Key themes from policy documents		Associated policy documents (numbered in Table 1)
Policy Aspirations – Classified according to levels of the Socio-Economic Model (SEM)		
Policy	<ul style="list-style-type: none"> Overarching dual approach of increasing PA levels and improving healthy eating habits Cross-departmental approach to policy development 	1, 2, 4, 7, 10, 12, 14, 24, 25, 27, 32, 34, 35, 36, 37, 41, 43
Community	<ul style="list-style-type: none"> Little articulation of policy aspirations for communities Some, brief recognition of the value of different settings with society for shaping behaviours 	6, 7, 8, 12, 39
Organisational	<ul style="list-style-type: none"> Potential influence of a number of national public and voluntary sector bodies recognised Key focus on the school as an organisation where change can occur 	1, 2, 3, 4, 5, 7, 8, 9, 11, 13, 14, 15, 16, 17, 19, 20, 21, 22, 23, 25, 26, 27, 28, 29, 30, 31, 33, 34, 37, 38, 39, 40, 41, 42, 43
Inter-personal	<ul style="list-style-type: none"> Children's interactions with teachers and teachers' training highlighted in some documents 	7, 12, 35
Individual	<ul style="list-style-type: none"> Strong focus on and targets for short-term gains in children's behaviours, knowledge and attitudes for living more healthily Encouragement for consequential development of lifelong knowledge and habits 	1, 2, 7, 14, 18, 20, 21, 34, 37, 39, 43
Policy Implementation Tools – Classified according to Hood's Nodality, Authority, Treasure and Organisation (NATO) framework		
Nodality	<ul style="list-style-type: none"> Various information disseminated to guide implementation within schools More limited collation of information on schools' provision or progress towards policy aspirations 	2, 3, 4, 5, 6, 7, 9, 12, 13, 14, 16, 18, 19, 20, 23, 25, 27, 28, 29, 30, 32, 33, 34, 35, 37, 38, 39, 40, 41, 42, 43
Authority	<ul style="list-style-type: none"> National Curriculum represented primary governmental setting standards of requirements that schools' provision must meet in curricular and extra-curricular time Statutory role of OFSTED in quality assurance of schools' provision, but limitations of potential influence in areas associated with childhood obesity 	11, 20, 21, 25, 26, 30, 31, 34, 35, 37, 41, 43
Treasure	<ul style="list-style-type: none"> Ring-fenced funding for specific initiatives for physical activity or healthy eating, respectively Varying extent of clarity and specificity in funding distribution approaches and mechanisms 	2, 7, 8, 15, 17, 22, 24, 25, 26, 27, 31, 35, 36, 41, 43
Organisation	<ul style="list-style-type: none"> Network of organisations to support implementation but the roles and responsibilities of organisations were not always clear 	1, 2, 7, 8, 10, 12, 18, 34, 43

Finally, policy aspirations for changes associated with the *individual level* were found in relatively few policy documents. However, where stated, the focused orientation of individual-level aspirations contrasted with the “high level” and broad aspirations at other levels of the SEM. Commonly stated aims were to influence the knowledge, attitudes, and motivation of children, and subsequently their lifestyle-related behavioural choices. Policies predominantly focused on short-term individual outcomes, for example: [to] “engender a sense of competence” and “promote enjoyment” (Doc no. 34 – Sport England 2016b, p. 2) in physical activity and to ensure that “a high-quality physical education curriculum inspires all pupils to succeed and excel in competitive sport [and] to become physically confident in a way which supports their health and fitness” (Doc no. 21 – DfE 2013c, p. 198). In places, this was linked to broad aspirations of lifelong beneficial health outcomes, “becoming healthy, happy active adults . . . establish healthy habits and a love of being active that will benefit them throughout their lives” (Doc no. 2 – DCMS 2015, p. 21). Targets aspired to within identified documents reflected this individual focus, specifically for physical activity. For example, increasing the percentage of children “with a positive attitude towards sport”, “achieving swimming proficiency and bikeability levels 1-3”, and “achieving physical literacy standards” (Doc no. 37 – HM Government 2015, p. 78).

Across the levels of the SEM, the analysis suggests a number of problematic issues in the extent of alignment between stated aspirations. While the documents analysed could be regarded as collectively covering all levels of the SEM, individual documents tended to specialise in terms of their focus on influencing particular levels. Across the documents analysed a lack of clarity was apparent, in the sense that the desired mechanisms required to reach intended outcomes related to physical activity and healthy eating were not clearly indicated. Physical activity guidelines (Doc no.3 9– DoH, 2011) provided highly specific targets for children aged 5–18 years old, for example, “1. All children and young people should engage in moderate to vigorous intensity physical activity for at least 60 minutes and up to several hours every day”, yet only superficially acknowledged mechanisms and settings “Physical activity for children and young people naturally occurs throughout most days and in numerous settings”. There were issues concerning specific roles and responsibilities of organisations with respect to promoting change – as analysis in the following subsection indicates, it is not always apparent who policy messages are targeting and how this links to desired changes at the individual level.

There was also a lack of alignment between aspirations for physical activity and healthy eating and their representation at different levels of the SEM. Within the policy documents analysed, promoting physical activity was seemingly presented as being more straightforward than promoting aspects of healthy eating. Interpretation of policy texts indicated an

underlying assumption that provision of opportunities would be sufficient to change children's activity behaviours, whilst there was acknowledgement that eating habits are subject to a broader range of contextual influences. This was apparent in the Childhood Obesity Plan itself (Doc no. 7 –HM Government 2016, p. 7), in which aspirations for physical activity specifically were centred on enhancing extra-curricular provision within schools. For healthy eating, on the other hand, aspects for development included awareness campaigns in early years settings, provision of advice by school nurses and other professionals, updating and expanding food standards for schools and providing funding for healthy eating in breakfast clubs, in addition to a range of other measures beyond schools.

Organisational level aspirations for change were the principal and most commonly cited policy approach for increasing physical activity (see Table 2) – the assumption being that providing opportunities within primary schools would deliver aspirations for individual-level outcomes. In addition, stated opportunities for physical activity were again less detailed than those for healthy eating and understanding of the complex nature and the structural determinants of physical activity engagement was again lacking. For example, the Department of Education's (2017, p. 8) statutory framework for learning, development and care for children under 5 stated that "physical development involves providing opportunities for young children to be active and interactive; and to develop their co-ordination, control, and movement." (Doc no. 11 – DfE, 2017). Conversely, healthy eating was addressed in a more direct manner, with mandated and direct aspirations for change regarding in-school food provision (e.g. revised standards for food in schools), whilst recognising the more nuanced multi-level influences on food intake behaviours (e.g. subsidies, levies and manufacturing technology and food labelling, food environment, roles of different organisations and care providers) through the Childhood Obesity Plan (Doc no. 7 –HM Government 2016). Therefore, it was largely in respect of healthy eating alone that aspirations for individual-level behaviour change were accompanied by recognition that schools are one component within a broader landscape – thus giving a degree of consideration to action across different levels of the SEM.

Application of the NATO typology in examining the approaches to policy implementation

Policy implementation approaches relating to all four tools of the NATO (Nodality, Authority, Treasure and Organisations) framework were identifiable in the documents analysed and are discussed in this section.

The collection and dissemination of information (*Nodality*) as a mechanism for implementing policy was identified in almost three-quarters of the documents that were analysed (see Table 2). Some of the information disseminated

through the government's website includes recommendations drawn from research, such as information that was intended to inform and guide implementation of the PE and Sport Premium (the government's flagship funding initiative for physical activity in primary schools) (Doc no. 4 1– OFSTED 2014). Other examples of information available online include case studies outlining how specific schools are implementing new initiatives to encourage healthier lifestyles amongst their pupils. For example, approaches to encouraging more children to participate in sport (Doc no. 16 – DfE 2014a), improving school meals and introducing cooking classes (Doc no. 5 – DoHSC 2017a) and encouraging families to learn about healthy lifestyles (Doc no. 9 – DoHSC 2017b) were published on the government's website. There was evidence of innovation in information dissemination, with one of the initiatives in the Childhood Obesity Plan (Doc no. 7 –HM Government 2016) seeking to enhance the accessibility of information relating to school-based healthy behaviours and physical activity through the development of new online tools and apps. What was not clear through the analysis was the extent to which these forms of information were specifically promoted to schools and how they are expected to act upon the information, which raises questions about the extent to which they may specifically influence implementation.

As indicated in the previous section, the National Curriculum represents the principal mechanism by which the government exercises *authority* over the content and delivery of primary school teaching, including that which specifically relates to health and obesity. As the government-authorised and statutory institution with responsibility for inspections and regulation of schools and the National Curriculum, OFSTED were specifically required to evaluate “the extent to which schools proactively support students with the knowledge of how to keep themselves emotionally and physically healthy” (Doc no. 20 – PHE 2017b, p. 11). OFSTED was also allocated considerable responsibility in terms of inspecting specific aspects of primary schools' wider provision that are relevant to obesity, including the implementation of food standards and the use of funding from the PE and Sport Premium. However, it was acknowledged within the Department of Education's “Revised standards on food in schools” (Doc no. 30 – DfE 2014b) document that OFSTED may not have appropriate knowledge to monitor healthy eating within schools, which could impact upon their capacity to guide and regulate obesity-related policy implementation. While the National Curriculum and the work of OFSTED are important and well-established tools for ensuring standardised approaches to both curricular and extra-curricular activities within schools, the documents analysed did not indicate or provide for any sanctions to be applied where schools' provision in relation to physical activity, healthy eating or obesity may be identified as inadequate. This represents a limitation in the use of authority as a policy tool. If education and other school-based activities relating to healthy eating

and physical activity remain at the margins of schools' work with no real authority exercised by government, the implementation of policies relating to addressing childhood obesity may not be successful.

In terms of *treasure*, funding for addressing obesity in primary schools came from a variety of different sources across different government ministries and was routed through a range of different initiatives, most of which were specifically concerned with either physical activity or healthy eating. The precise mechanisms for how funding is distributed and what the money can be spent on were clear for some initiatives but not others. For example, the specific amount of funding and the mechanism for distribution of funding for the PE and Sport Premium, with roles identified for local authorities, OFSTED and schools themselves, were outlined explicitly (Doc no. 26 – DfE 2016a, Doc no. 25 –, DfE 2016b). By comparison, the government stated in the Childhood Obesity Plan (Doc no. 7 –HM Government 2016) that £300million will be invested to support increased walking and cycling to school but no details were provided about the initiatives it will fund and how this money will be distributed.

Overall, the ring-fencing of funding for specific initiatives is an indicator of the government's commitment to the dual policy approach of using physical activity and healthy eating to tackle childhood obesity. A particularly high profile and unusual example of this commitment was the government's introduction of a new Soft Drinks Industry Levy on the producers of high sugar drinks (colloquially known as the Sugar Tax), announced in the 2016 budget and expanded upon in the subsequently published Childhood Obesity Plan (Doc no. 7 –HM Government 2016). The levy specifically represented integration across aspects of childhood obesity policy through, on the one hand, being intended as an incentive for producers to reduce the amount of sugar in their products and, on the other, generating income that was solely earmarked for spending on "programmes to reduce obesity and encourage physical activity and balanced diets for school age children" (Doc no. 7 –HM Government 2016, p. 4). In a number of ways, however, the announcement and implementation of the levy represented an anomalous policy initiative (Lindsey 2020), especially as the majority of other funding programmes are specifically concerned with either physical activity or healthy eating. This common separation of government funding for the two areas of work remains significant and problematic for alignment of policy implementation approaches for preventing childhood obesity.

Finally, networks of *organisations* with roles supporting implementation were identified in a small proportion of the documents analysed. Such organisations either have an overarching health focus (such as Department of Health and Social Care, and Public Health England), an education focus (Department of Education, OFSTED) or a sport and physical activity focus (Department for Culture, Media and Sport, Sport England). However, there was often an overlap between the organisations' roles and responsibilities in leading implementation of policy. For

example, it was stated within the Childhood Obesity Plan document that Public Health England will advise schools on the use of their PE and Sport Premium, even though the organisation itself does not identify physical education as one of its areas of expertise. As noted in the previous section, schools are the central organisations within the documents analysed and they have a “vital” role to play in policy implementation (Doc no. 7 –HM Government 2016, p. 8), but in order to implement policy, they must navigate the complex and at times unclear network of organisations that also have roles in respect of policy implementation.

Some of the specific policy implementation tools outlined in this section are well-embedded features of government policies relating to primary schools, for example, the National Curriculum and the role of OFSTED, and others, such as funding from the new Soft Drinks Industry Levy and the use of apps for disseminating information, show some degree of innovation. However, there is a lack of connectivity between the policy tools, especially across the two key policy considerations of increasing physical activity and improving eating behaviours. Overall, the extent of alignment amongst policy implementation approaches may be considered limited due to the high degree of ambiguity that remains across the policy documents.

Discussion and conclusion

The purpose of this study was to review the extent of alignment across policies orientated towards addressing childhood obesity in primary schools in England. This was achieved through undertaking a comprehensive search for all relevant policy documentation across the period 2010 to 2017. The use of SEM and NATO frameworks supported analysis of governmental aspirations and approaches to implementation, respectively, which allows the following conclusions to be drawn regarding the extent of policy alignment across childhood obesity, physical activity and healthy eating.

Overall, across the entirety of the policy documentation that was analysed, there was consistent application of a dual approach of tackling childhood obesity by increasing physical activity levels and enhancing healthy eating. There were cross-references between documents and a shared language within them, even if they were published by different government departments or agencies. Long-term aspirations appeared aligned across policies for physical activity and healthy eating, centering broadly on seeking improvements in child health that could sustain into adulthood. More immediate aspirations for both curriculum and extra-curricular activities within primary schools were also commonly articulated.

However, there were some ambiguities in respect of governmental aspirations and implementation strategies that limited the extent of alignment across policies, and these ambiguities lead to questions as to whether overarching aims for reducing childhood obesity can be fully achieved. Three particular problems are

particularly notable in this respect. First, a degree of alignment across policies orientated towards childhood obesity only becomes apparent when analysing a range of policy documents collectively. The UK government's signature Childhood Obesity Plan (Doc no. 7 –HM Government 2016), was the only document analysed which singly encompassed aspirations across all levels of the SEM. Even then, implementation proposals within this Plan consisted of a limited set of distinct initiatives rather than a comprehensive policy approach in itself. Moreover, the subsequent Childhood Obesity Plan Chapter 2 (HM Government 2018) also failed to resolve this issue given its continued reliance on voluntary guidelines for schools and, especially, the food and drink industry (Knai et al. 2018). The development of the Childhood Obesity Plan, therefore, represents a missed opportunity for government to set out comprehensive, overarching aspirations and approaches to implementation which could then serve to guide stakeholders contributing to more specific policies related to particular aspects of childhood obesity, physical activity and healthy eating.

Second, approaches to address obesity through healthy eating and physical activity were imbalanced and, hence, lacked alignment. Aspirations for healthy eating practices were more specifically stated than those for physical activity in the 2016 Childhood Obesity Plan. The study also found that healthy eating received greater depth of consideration across the policy documents collectively. In comparison, implementation approaches for physical activity were less well defined. Multilevel influences and complex organisation systems associated with children's physical activity behaviours need to be more fully recognised within national policies.

Third, and more broadly, physical activity and healthy eating are largely considered separately with distinct policy documents and initiatives largely focusing on either one or the other. Most funding for childhood obesity, physical activity and healthy eating that is earmarked for primary schools is distributed through distinct initiatives, each with their own agendas and desired outcomes. Implementation in this way is resonant of the ongoing problems of "initiativitis" identified at the outset of the article. Addressing this problem would require greater cross-governmental co-ordination of policies and initiatives associated with childhood obesity. This is a long-standing concern that is not only recognised in some of the childhood obesity policy documents themselves but is also problematic across central government more generally. Any progress towards improved central co-ordination is likely to be slow, at best. Ultimately, primary schools will likely have to give continued consideration as to how to implement the range of distinct policies and initiatives directed towards them, despite some questions as to their capacity to fulfil this role effectively (Griggs 2016). Nevertheless, further research on primary schools' approaches to enacting policies across childhood obesity, physical activity and healthy eating could

both provide further understanding of this issue and also potentially help advocate for the development of more joined-up policies in the future.

Overall, these problems lead to an overarching conclusion that the government's political prioritisation of high-level aspirations for childhood obesity has yet to be followed by development of policies that are well aligned across physical activity and healthy eating, across all levels of the SEM or across different tools guiding policy implementation in primary schools. The scope of this study precludes comment as to whether similar concerns may be applicable to secondary schools or wider contexts. However, given the importance that the government has placed on addressing childhood obesity in primary schools and the identified shortcomings in the breadth and depth of alignment of policies applicable in this context, there must be limited confidence that progress will be made nationally to improve rates of obesity amongst young children in England. Policy development for childhood obesity is intrinsically complex, spanning multiple determinants that, in the English case, span multiple government ministries. The study does not extend to examining policymaking processes, but other research (e.g. Müller-Schoell 2018) does indicate that the broader ideological orientation and institutional organisation of government in the UK does give rise to short-termism in policymaking that may continue to be detrimental to co-ordinating approaches to childhood obesity. While there is value in examining a single country case such as England, further research that compares the extent of alignment in policies for childhood obesity across countries with different characteristics would be valuable in understanding whether the policy problems identified in this article are specific to England or are resonant of those that may exist internationally.

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No potential conflict of interest was reported by the authors.

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