Point by point response to editors’ and reviewers’ comments for manuscript originally titled ‘Adequate spending on obesity can only follow a reconsideration of our appraisal of interventions’ (BMJ-2023-077139.R1)

	Editors' comments	Authors’ response
1	1. Clarify the framing and argument The committee felt the manuscript is well written and engaging, and the reviews offer very helpful commentary for strengthening the piece. In particular, we agreed with reviewer comments related to the focus and specificity of the argument. The committee felt that the piece seems to be coming at two broad and complex problems (obesity and how policy is made in the UK) without sufficient specificity. By the end we felt it was unclear what the piece is really asking for other than calling out the problem and asking for a substantial rethink. The title points to this (we need a reconsideration) and the key messages are similar e.g. the current situation is not improving so we need more investment and a different approach. But it is unclear what the new way is or how we would find the new investment.	Thank you for the very useful comments and we are gratified to see the positive views on the article topic and quality of the writing. We have refined our key objectives for the manuscript to make clearer that the context is specifically UK obesity policy inadequacy, and that we are calling for three defined actions to address this (line 174 onwards), rather than just a generalised reconsideration of the situation. We have also reordered the introduction so that our key argument regarding the need for modelling of entire policy package is stated earlier in the content (line 97). We have altered the title to match with this clarification of the context and call for action: Revised title: ‘UK Government must be held accountable for reducing obesity prevalence; inadequate policy choices should be laid bare by modelling’
2	Furthermore, at times the paper appears to be advocating for prevention vs treatment in places, which the committee found confusing as it feels a little out of kilter with the argument (which is a bit more holistic). In some parts, the paper seems to call for more investment in long-term rather than short-term interventions. In other parts, it is calling for different, more holistic ways to evaluate complex interventions. Yet in other parts, you seem to want to shift spending away from individual interventions towards more population-level programs or packages of interventions. The paper seems to be assuming that	We do seek to highlight the overreliance on treatment-focused, short-term interventions in the UK policy approach and have altered the content of the manuscript to lay out the World Health Organisation framework for obesity policy which requires adequate attention on policy across the spectrum from prevention to treatment. Section ‘The gaps in policy are no mystery’ Line 106 to 119, including Box 1: Summary of WHO ten priority intervention areas for obesity.

	better, more holistic modelling/evaluation will mean that long-term and population-level interventions **will always win out** compared to individual and short-term solutions like drugs. This is far from certain and we think it muddles the argument.	We acknowledge that our original submission required amendment in line with your comment over our implied over-confidence that 'population-level interventions will always win out'. We now write to argue that these intervention types must be used in concert with treatment-focused approaches and that modelling improvements can quantify the current deficiency in both this balance, and in the overall resources applied to the policy approach as a whole. We have refined the presentation of our argument that current UK appraisal systems enable policy decision making based on inappropriately short-term, narrow appraisals (lines 149 to 172) and our assertion that a new modelling tool is needed to instead demonstrate the lifetime impact of the overall choice of policy package (Lines 183 to 188).
3	Ultimately, the question for the committee was why focus on obesity when the major issue seems to be around UK systems of policy development? We felt the issue is not really about obesity, although it can be used as a hook to get into the topic, nor is it about investment in certain types of interventions (prevention vs treatment when there will always be both), but its really about the way we tackle these difficult questions and how government makes policy on these complex issues. What is an actionable way forward? We 'think' this is what you might be interested in but you haven't made the point clearly and this could be your chance to do that. The committee felt that responding to these issues would make for a stronger argument.	We agree that the issues seen in obesity policy making are symptomatic of policy development issues across a number of public health topics, however we feel that obesity is the most significant, longstanding health concern in need of urgent meaningful change and therefore worthy of sole focus in this article. It also best represents the influence of nanny-statism political concerns which hamper political evidence-based decision making over public health matters. We agree with your comment that what we are interested in is presenting the actionable way forward for Government and feel that the improved article layout to set out three calls for change addresses this objective.
4	2. Related to the framing, clarify the context - It seems the piece is suggesting NICE to have an expanded role, but this isn't	We address the role of NICE and its public health remit in the response to comment 17 below.

	explained - how would this be achieved? The reviewers also point to some notable omissions re. the role of NICE and public health policy and evaluations that have happened. - Please also clarify in the introduction why the focus is on the NHS (and then later NICE guidelines), and not a broader perspective. Bringing in other examples beyond NICE (to compare, contrast) could help to further build and illustrate your argument.	The introductory paragraphs are now clear that the context is UK obesity policy (lines 89 to 103), removing the previous implication that the NHS is our intended focus. Lines 265 to 283 now expand on the potential range of other organisations and responsible bodies which could/should influence UK obesity policymaking alongside the work of NICE.
5	Additional comments: - Introduction: To make the introduction more impactful for readers, we suggest you highlight the argument / stance you are taking at the end of the introduction rather than mid-way through (e.g. 98). It may be difficult for readers to understand why the piece is arguing for a different type of appraisal when the problem with the current approach hasn't been introduced for readers. Line 98 - 'health eco evidence through alterations in intervention appraisal' - this may also read as jargon and could be clarified for readers.	We have reworded the introduction and state our argument in the second of the two paragraphs (lines 97-103). As noted in the responses above, we have refined our objectives to argue that the issue to be addressed is adequacy of the overall policy package, and that we present modelling as a key tool for progress. The discussion of intervention appraisal forms a contextual point for the necessity of rigorous modelling and so has been presented in a more defined section of the article, later in the content (lines 149 to 172) to avoid confusion in what we are calling for at the stage of the introduction.
6	- Line 132: "To justify the higher investment in broader policies...." because the focus on short term interventions isn't well set up in the introduction, it is not clear what 'broader interventions' means or that they are supposedly more expensive.	‘Broader’ interventions are now described in the new section on the World Health Organisation framework, with lines 116-117 explaining that these represent ‘population-level, fiscal, regulatory and environmental areas’ of policy for the UK.
7	- Section "Modelling could support decisions..." – please give readers a sense of what this modeling means in practice, who does it, when and how, its benefits etc. How can it better inform the decision-making processes? Including some concrete examples of the modelling that has been used, such as for other complex chronic diseases, would also help convince readers of why modelling is a necessary response.	We have added an introductory description of economic modelling in lines 178 – 181, and discuss its specific benefits in working backwards from a target and in quantifying uncertainties in lines 231-236 and lines 252-253 respectively. We have reported the modelling finding that the Soft Drinks Industry Levy is estimated to reduce obesity prevalence in children and adolescents by less than 1 percentage point (lines 140-143). We have added the UK net zero strategy as another example of modelling used in the working backward from a target approach in lines 242-245

8	- Please be more specific when describing research, guidance or reports for example: Line 128 recent eco analysis (please specify where and when, by who); Line 148 "latest govt briefing. (please specify when, which govt, briefing on what?) Line 209 "Guidance was published last year...." (from who, when, on what, for who?)	'recent eco analysis' and 'Guidance published last year' have been removed. 'latest government briefing' has been amended to 'The 2023 Government research briefing 'Obesity policy in England' (line 156) We have checked the rest of the citations for this description requirement.
9	- Line 212 "Despite this, the use of models that fall short of these recommendations continues, leaving decision-making on health service design difficult " – please clarify the use of models by who? When? Are you able to provide any examples/evidence to back up the statements being made?	We have revised the text to be more specific on the inconsistencies and needs for improvements in current obesity models, along with additional citations of examples of modelling used in policy evaluations (references 16 – 20). These issues are addressed in the section 'Priority areas for obesity modelling improvement' at line 191-232 and in Box 2.
10	- Please remove the use of 'our' 'us' etc throughout and instead make the language more direct and specific. The rhetorical questions also could be made as statements or removed.	We have changed the rhetorical questions to statements and removed the use of 'our' and 'us' throughout.
11	- We suggest using sub-headings to help break up the different sections and ideas for readers e.g. for the section on current systems perpetuate the focus on short terms intervention	We have added subheadings to break up the sections, including hierarchical sub-headings to signpost the specific ideas being presented within the sections, and numbered subheadings for the three calls for change.
12	- The committee wasn't sure if comparing government responses to COVID in the conclusion is reasonable or valid considering the very different nature of the contexts.	We have removed the comparison with COVID.
13	- Please reconsider the title to make it a little more straightforward for readers	We have revised the title, please see response to comment 1.
14	**Reviewer: 1 Lennert Veerman** Adequate spending on obesity This paper makes the case for methodological improvement in the assessment of obesity interventions, notably to include longer term impacts and to broaden the scope and rigour of health economic analyses to inform policy. The problem is well described in this paper: to tackle obesity, we need a systems	

	approach that focuses on the determinants of population weight gain but in practice, we end up with short-acting 'medicines'.	
15	The solution, however, could perhaps be described more clearly, or more specifically. While I find it difficult to criticise this opinion piece, I did have the following thoughts while considering it, in the hope that some of this may help strengthening the paper.	Please see the response to comment 1.
16	Why limit the focus to obesity – isn't that too narrow? Or is it more an example of a broader issue in how population-wide preventive health interventions are assessed? The examples given are good: taxation on obesogenic foods, legislation on advertising, and structural and behavioural prompts such as better walking and cycling infrastructure. All have large non-obesity effects, on health and in other domains. Taxation and advertising restrictions are cheap (depending on whose perspectives you include in the analysis) but better walking and cycling infrastructure is not. I agree that modelling is part of the solution, but that extends beyond obesity and health. Yet the terms 'cost benefit analysis' or 'return on investment' are absent from this article. Should such models or analyses integrate the health impacts with impacts in other domains, to come to a holistic assessment, including, quantifying and valuing all costs and consequences?	Please see the response to comment 3 regarding limiting the scope to that of obesity. Lines 242-245 now state explicitly that modelling's role includes the examination of cost effectiveness and that this should extend to societal impact beyond health alone. Lines 207-220 discuss the deficiencies in scope of appraising obesity interventions. Line 215 notes that productivity is a neglected, but important, domain extra to health effects. Box 2 directly states the need for lifetime, wider impacts to be better represented in modelling.
17	Who should be doing this health economic modelling of the impacts of system-wide obesity interventions? We need modelling to estimate the long-term impact of obesity prevention, especially for interventions outside the health field. NICE's focus is narrowly on health interventions (or even 'medicines'), and the Green Book attributes higher values to QALYs. So why then argue for NICE to pick this up? The broader societal focus of the Green Book would seem better suited, also because obesity prevention often has beneficial effects in other areas (often termed "co-benefits" from a – somewhat narrow – health perspective). The use of the Green Book could also remove the responsibility from the Health Department, which could strengthen its intersectoral health policy capabilities but is still at the mercy of other departments for concrete action. And is NICE well-positioned to assess the impact of, say, the impact of changes in walking and cycling infrastructure on travel patterns, which are on the causal pathway to health outcomes? Should it be strengthened and equipped for this task, and if so, what other agencies might it collaborate with? Or is there (/can there be) a better agency to take up this task?	While we felt that it was still important to include the criticism of the role of the short-term appraisals used in the UK, and the mandate of NICE including the results on the NHS where newly recommended drugs must be provided (lines 156-172), we agree that advocating for NICE to pick up the additional modelling called for lacks nuance. As such, we have revised our coverage of the role of NICE and how NICE's remit may expand and have extended our discussion of which other organisations or responsible bodies should manage, report on and hold government to account for modelling outputs, including the possibility that this may require the creation of a new body, in line with the 2023 Institute for Government 'Tackling Obesity' report (lines 265 -283).

18	The example interventions also all have strong logic underpinning their causal pathways, but little direct evidence of effectiveness. "… economic modelling evidence will have to provide policymakers with robust assurance about value for money in upstream interventions" (Key messages). True, but it may struggle to do so by the standards of evidence-based medicine. These are policy level interventions and much of the evidence rests on observation evidence, often time series, or even… modelling, which pieces together various bits of evidence along lengthy causal pathways. That will be 'robust' by the standard in economics, where decisions are very often undertaken on little direct evidence of likely impact. But not by health standards. The authors could consider commenting on this question of what evidence should be considered strong enough for what decisions.	We have now included discussion of the problematic disparity in available levels of 'gold standard' evidence from randomised controlled trials between treatment-focused interventions and population-level interventions (line 254-256) and the fact that this may result in 'highlighting those policy options for which more evidence of effectiveness and cost-effectiveness is required' where this is the only route to creating a policy package with a chance of being adequate (lines 256-259).
19	Specific comments Line 111-112: 'this decision' refers back to something several sentences ago; not very clear to this reader.	We have reworded the sentences regarding the NICE decision on GLP-1 agonists and removed the orphaned phrase 'this decision'. (lines 165-172)
20	Line 154: "Counter-views will attest to …" Counter-views to what, exactly? Was the argument to stop using NICE methods? Or to apply them better? Or to broaden the remit to include systemic preventive interventions outside the health care sector?	We have removed this line and moved the discussion of additions and alternatives to appraisal approaches to the sections 'Priority areas for obesity modelling improvement' (line 190) and the section covering other/new organisations or responsible bodies – please see response to comment 17.
21	Line 163: "Early interventions and prevention measures cannot compete well in direct comparison with individual-level therapy over the short-term". Perhaps, but whereas the benefits of semaglutide are modelling only over the short term (and rightly so, given the lack of evidence for, and low likelihood of, longer term impacts), the guidelines do not mandate that all interventions are only modelled for short-term impacts?	We have revised the text (lines 167-172) to clarify that there are challenges associated with both no assessment of post-treatment weight gain or treatment over a longer duration. Within these limitations, the economic modelling took a lifetime perspective when estimating impacts on health.
22	Line 167-177: This paragraph asks "Who then should act on NICE's findings?" but this question is not really answered.	We have removed the rhetorical statements (see response to comment 10) and our response to comment 17 covers our expansion in discussion on NICE and other organisations and their potential remits.
23	Line 172: If NICE's valuation of health benefits is lower than that in the broader 'Green Book', would that not lead to more investment in upstream interventions, rather than less? Should NICE adopt the Treasury's higher value for a QALY?	In lines 222-227 we now outline that the higher monetary value attached to QALYs in the Green Book compared to NICE's threshold approach means that there is no level playing field when assessing the value for money of interventions which impact on health-related quality of life outcomes. For example,

		NICE's assessment of Semaglutide [11] uses £20,000 and Cobiac et al's (2023) (doi.org/10.1101/2023.10.05.23296619) analysis of the Soft Drinks Industry Levy (SDIL) used £60,000 when reporting household-level findings, but gave no monetary value for QALY gains for children and adolescents [8]. It would not be appropriate for NICE to adopt the Treasury's higher value for a QALY as it would represent too high an opportunity cost compared to existing NHS resource use. In contrast, the debate is more whether the QALY value should be lower when assessing value for money in light of the available empirical evidence (https://link.springer.com/article/10.1007/s40273-014-0158-6).
24	**Reviewer: 2 Vicki Brown** Comments: Thank you for the opportunity to review the manuscript. This is a well-written manuscript which raises some interesting points.	
25	My over-arching concern re some of the arguments in the paper (and the title itself) is that decisions on resource allocation are not borne solely on evidence of effectiveness and cost-effectiveness. Statements such as "The required policy innovation will entail substantial new investment, for strategies far more diverse than short-term individual-level treatments, such that economic modelling evidence will have to provide policymakers with robust assurance about value for money in upstream interventions" suggests that no action can be taken until such time as evidence of cost-effectiveness supports it. In reality, resource allocation decisions and policy-making are far more complex – and many other factors (other than evidence of cost-effectiveness) influence spending decisions. Indeed, policies are enacted all the time without little or limited evidence of either effectiveness or cost-effectiveness.	Please see our responses to comment 18 above regarding this point.
26	In addition, the article does not mention any of the evidence that has been generated in terms of population level approaches to obesity prevention and/or	The new section on the World Health Organisation framework serves to highlight that these population-level approaches are

	treatment. Some of this evidence has been generated for the UK – there are also other examples in countries like Australia and the US.	priority recommendations/considered to be sufficiently evidence-based (lines 106-111 and Box 2).
27	Could the author's also elaborate more on why sustained impact of injectable pharmacological treatments is unlikely? Certainly there is limited evidence of the impact of sustained use of these products on effectiveness – due largely to their recency of use. We don't have good evidence – yet – of effectiveness over time. I was unaware that there was evidence suggesting the unlikely impact of these sorts of products over time, and would like to see this point elaborated a little more in the manuscript. Is the "unlikeliness" due to the decision-makers timelimits on subsidisation (rather than a lack of effectiveness, which is yet to be definitively ruled in or out)? If so, please be more explicit on this point.	Please see our response to comment 21. We have amended the sentence regarding the uncertainty around these treatments to be explicit that the limitation to two years of treatment is what is highly problematic if these treatments are to be considered sustainable solutions to obesity (lines 167-172).
28	The article does not elaborate enough on the policy level initiatives of the UK Government, and seems to skip over some of the nuance in these. For instance, it should be mentioned that the UK policy of restricting marketing of unhealthy foods to children was announced – and seemed to be a very positive step in the right direction. Of course, the implementation of this policy has been pushed back and pushed back. None of this nuance comes through in the manuscript, but has important bearing on the overall message of the manuscript. Another example would be the introduction of a ban on junk food advertising across the London transport network – also not mentioned. While I wholeheartedly agree that there are political drivers to cling to narratives of individual responsibility, there are some clear and distinct examples (like those given) where there is also some recognition of the need for upstream, population level approaches. Obviously much more needs to be done, but to miss this nuance doesn't tell the full picture of the story.	Thank you for highlighting this omission. Lines 127-147 now provide examples of the UK Government's actions on regulatory and population-level policy initiatives, and include the nuance of political timidity in committing to, but then repeatedly postponing implementation of policies.
29	The authors state that "To justify the higher investment required for broader policies, decision-makers need assurance about their value for money and direct improvements to productivity and growth". Can the assertion that broader policies require higher investment (than what?) be referenced? Some population level approaches may in fact be more affordable than individual-level responses (like some programs for instance) delivered to large numbers of people, and this point should be stressed.	Please see the response to comment 2 regarding the amendments to the article to correct over-assertions that broader policies will 'win out' over treatment-focused policies. Please see our response to comment 6 regarding better defining what we meant by 'broader' policies. Overall, we feel we have reshaped the article to emphasise the need for modelling to examine policy benefits and costs and opportunity costs in the round, rather than broad calls for investment.

30	Finally, modelling a “package of interventions” would be the gold standard, however there are considerable challenges in doing so. The manuscript touches on this point, but I feel it needs a little more detail on exactly what some of these challenges are – and importantly, how could they be overcome (or likely, what are the steps in the right direction of being able to overcome some of these large challenges).	We agree, and have expanded on the discussion of the priority areas for obesity modelling improvement which we see as necessary for the ability to combine and compare policies in an overall model (section ‘Priority areas for obesity modelling improvement’ from line 190). The third point in the ‘3 calls for change’ (lines 256-283) tackles the uncertainties in identifying an organisational owner for the model which is the other element to the challenge.
31	**Reviewer: 3 Martin White** Comments: Thank you for asking me to review this analysis piece. It offers a helpful analysis of current economic and policy assessments in relation to the intractable problem of obesity in the UK. It is largely well-written and researched, and I have only minor comments.	
32	1. Page 5, lines 121-4, gives examples of the lack of boldness of UK policymaking. However, firstly, it is incorrect to say that government has not legislated on food advertising. It has done so twice - the 2007 Ofcom regulation of TV advertising of HFSS foods to children, and the 2022 regulation of online advertising and TV advertising of HFSS foods before 9pm (although, it is notable that implementation of this legislation, together with that on price promotions in supermarkets, has been delayed due to the 'cost-of-living' crisis'). Secondly, as far as I know, there is very little evidence to suggest that walking and cycling infrastructure can reduce obesity.	Please see the response to comment 28 regarding including these policy examples, and the response to comments 18 and 26 regarding levels of evidence for population-level policies.
33	2. Page 7, lines 148-85 - the discussion of the role of NICE here ought to acknowledge that public health was taken out of NICE's remit by government in 2010 and, since the disappearance of PHE and recent downscaling of OHID, there is now no equivalent organisation or mechanisms to conduct the appraisal that the authors propose. These were political decisions, meaning that since 2010 there have been no rigorous, systematic and transparent appraisals of public health policy interventions in the way they used to be done by NICE.	Please see the response to comment 17 regarding the discussion of NICE and other bodies. We have expanded the scope of this section to include the important point your comment raises about PHE and OHID and the public health appraisal and advocacy role (lines 267-271).
34	3. Page 8, lines 205-6 - the correct title of the 'sugar tax' is the Soft Drinks Industry Levy. Modelling of the health impacts of the SDIL, including on obesity, has been undertaken, although this is currently under review (although accessible in	Thank you for providing this reference. We have amended the mention of the sugar tax and provided additional text regarding the evaluation of its impact (lines 132 -141)

	preprint here: https://www.medrxiv.org/content/10.1101/2023.10.05.23296619v1)	
35	4. Page 9, line 242 - do you mean 'ensure' rather than 'allow'?	The revised article now calls for mechanisms to hold UK Government to account to produce a sufficient policy package for obesity, and this reflects your comment on changing the message from allowing to ensuring.
36	5. Page 10 - Reference 2 is not accessible at the link given	This reference has been replaced with the World Health Organisation framework component and its associated references.