Authors' line by line responses to editors' comments – June 2024

No.	Line in tracked changes version supplied by BMJ 10.5.24	comment	Line number in June 24 revised manuscript	Response / comment
1	4	Please revise this title to one statement which covers the main message of the paper which seems to be about more holistic/system-wide modeling for obesity.	4	We have changed the title to: *'Holistic modelling can be a catalyst for the policy innovation required to reduce obesity prevalence'*
2	Key messages	We felt this claim is a bit of an over-reach. Please revise these messages to be short, one sentences (max of 5) reflecting the main points of the paper. We have proposed a start to the first two but please note the first key message is not currently captured in the paper	Key messages	We have amended the key messages so that they are line with the revised content of the article: ● *The adequacy and coherence of UK obesity policy strategy does not match the political rhetoric of a commitment to reducing obesity prevalence* ● *Appraisals of obesity interventions are siloed and fragmented, hindering policy decision-making* ● *Holistic, systems-wide modelling of policy strategy would highlight the policy innovation required for governments to meet targets for obesity reduction* ● *Modelling would support scrutiny of the cost-effectiveness and health inequality impacts of policy choices*
3	Key messages	This point is not captured in the paper.	n/a	This point has been replaced
4	85	Please revise/tone this down as per the committee's comments. E.g. modelling can inform the policy expansion..	84	The standfirst has been amended to be more measured: '*modelling is needed to inform the policy expansion required to achieve equitable progress towards reducing obesity prevalence in the UK'*

5	100	Authors: please include a short sentence on the prevalence and trends of obesity in the UK. For example this was from the IfG report. We aren't suggesting to include this but something along these lines to show the context and the increase. "The UK has the third highest obesity rate in Europe, behind only Malta and Turkey. Almost one in three adults are now classified as obese – an increase from one in 10 adults in 1970, which is a much bigger increase than seen in Germany, France and Italy."	96	We have added: *'Obesity is one of the biggest health challenges of our age; prevalence in England continues to rise and reached 26% in 2021 (32% of those aged 55-74), one of the highest rates worldwide, and shows stark inequalities by deprivation [3].'*
6	101	Authors: these points are in quotation marks. Can you please be specific on the source otherwise please reword. And please provide refs	98	These concepts that we cannot 'treat our way out of obesity' and that 'eat less move more' is an inappropriate fallback are now so widespread in expert commentary and published evidence that it is difficult to identify an original source. We feel the IfG report summarises the evidence to this effect and so have removed the relevant quotation marks, reworded the sentence and cited the report. The succeeding sentence on the Foresight report provides follow-on a further evidenced citation.
7	107	Authors: we did not think Box 1 was necessary for your argument and suggest it could be summarised here.	104	Thank you for the suggestions. We have removed Box 1 and instead summarised in the text as follows: *'The World Health Organisation's 2022 'Acceleration plan to stop obesity' further highlights the range of settings and approaches where action must be taken, including via fiscal, regulatory and lived environment interventions [5]. However, UK obesity policy is deficient in these population-level interventions, instead relying on short-term, individual-level, treatment-focused approaches [1,2], which only a low percentage of the eligible population can access [6].'*
8	113 & 119	here we are suggesting to set up the argument in a clear and a concise way - would something like this para work?	114	Thank you for the suggested wording. We are happy to amend the paragraph to begin in this way: *'Current siloed and fragmented approaches to appraising policy interventions means policymakers may have a limited understanding of the gap between the potential impact of current policy choices and stated government aims.'*

9	115	Authors: we aren't sure this is clear. The paper clearly outlines policy shortcomings and we probably don't need modeling to learn more about gaps. Rather, don't we need modeling to learn about the best strategies moving forward? We thought the main argument seems to be the statement on p7, line 40: "To inform essential obesity policy innovation, we need economic modeling capable of comparing combinations of policies against and in concert with each other." As you summarise, modeling already takes place by organisations like NICE. What they seem to be calling for is more holistic/system-wide modeling. We felt this point should come upfront in the introduction and picked up throughout the paper. We have proposed to revise this - please review and revise as needed.	116	Thank you for the suggested wording – we agree that this brings our main argument to the forefront in this introduction section and the following sentences now conclude the introduction: *'We argue that economic modelling capable of comparing combinations of policies against and in concert with each other is needed to inform essential obesity policy innovation. More holistic, systems-wide modelling would support the demonstration of policy strategy with sufficient breadth and depth to make a difference.'* Regarding learning more about gaps in policy – we agree that the gaps are well characterised in the underlying evidence and in recommendations such as the WHO publication. We intended to communicate that the holistic modelling would quantify the missing aspects of the policy approach and support policy-makers to recognise that only policy packages with a breadth of approaches such that these gaps would be addressed are sufficient. We feel this is now reflected in the amended sentences to this section.
10	119	Authors: Here we suggest you end with a sentence that reflects your focus on obesity but acknowledges that this is the case for many other issues	109	We have added the following sentence to justify our decision to focus on obesity: *'The issues seen in obesity policymaking are symptomatic of inadequacies across many public health policy areas [7,8]; we focus here on obesity due to the scale of the health impact, and because it illustrates the problematic influence of 'nanny-statism' political concerns [1].'*

		too (e.g. something along these lines from your response letter): The issues seen in obesity policy are symptomatic of policy development issues across a number of public health areas. However we focus on obesity in this Analysis as ….		
11	127	Authors: We felt this sub-heading did not add value to your argument and we suggested removing. In addition, to strengthen the flow of the narrative, we propose moving this section to follow the first para in the introduction to lay out the UK policy situation and then end with the last para in introduction which presents the argument. Please review this proposed change	Introduction	We have reviewed these changes and have included them in the changes to the introduction section – please see above.
12	147	Authors: Here you are introducing the problem with current approaches to modelling. Please indicate what this is. You said it was 'inconsistent' but compared with what? Please be more specific.	n/a	The introduction to the problems with current modelling has been changed as suggested, and this sentence is no longer included.
13	150	Authors: We appreciate the word count may increase in response to editorial comments (e.g. more consideration of the	221	We agree that the word count assigned to these points could be reduced but we would really like to retain the overall point that we acknowledge that unless they are addressed, limitations in obesity modelling could threaten the validity of the proposed holistic modelling.

		counterargument) and If you are looking for words to cut, we felt these three paragraphs are not necessarily about your main argument. These points are relevant to any model (even those siloed, fragmented ones). If you remove there will be no need to add a sub-heading and you could integrate the first para at the start of the section 'Current appraisals...		We have re-ordered the article in the way that was suggested, moving the sentences explaining what modelling is to the current appraisals section and removing the previous subheading. The content related to obesity model limitations has been cut to two paragraphs, each shorter than before, and now read: *'Models must avoid unwarranted assumptions, including heroic assumptions translating short-term drops in calorie intake into substantial or sustained reductions in body mass index (BMI), as appetite regulation responses can undermine dietary changes in the longer term [24]. For example, 2019 modelling reported that a successful 5% sugar reduction programme would reduce calorie intake by 19kcal per day and UK adult obesity by 5.5%, but included a caution that unanticipated changes in eating habits could negate these effects [25].* *Additionally, current models tend to rely on four major obesity-associated health outcomes: cardiovascular disease, cerebrovascular disease, some cancers and type 2 diabetes [26]. This limited assessment of the impact of obesity on health may considerably underestimate the cost-effectiveness of interventions to reduce BMI [27]. The impact of BMI on mental health, musculoskeletal health and productivity are three factors often missing from current models [26], yet the evaluation of Transport for London's ban on fast food advertising [17] suggested that the largest cost savings (29% of the total) resulted from prevention of osteoarthritis, and UK productivity losses due to obesity in 2021 were estimated to be £8.9 billion [28].'* We have drawn on the specific challenges of modelling for obesity in the new content we have added in response to the request to write more about modelling limitations – please see our response to comments 23 and 24. The article word count is now at 2185 words and we hope that this <10% discrepancy fits with your directions to remain close to the 2000 word wordcount.
14	177	Authors: agree to add this siloed to link with argument above?	122	Agreed. Subtitle has been changed to '*Current appraisals of interventions are siloed and fragmented'*
15	178	Authors: Please clarify. Current approaches to what? And please link back to the modelling gaps.	130	We have amended this line to: *'Current approaches to the modelling of obesity policies persist […]'.* The modelling gaps are now discussed in a different order in the narrative so follow later.

16	180	Authors: we suggest really being clear about what the individual approach means. Might something like this work?	130	Thank you for the suggested text regarding clarity that the current issue is appraisal of a single policy at a time. The paragraph has been amended to add clarity: *'Current approaches to the modelling of obesity policies persist with fragmentary assessment of individual interventions (typically making comparisons with 'usual care'), rather than a more holistic assessment of a comprehensive strategy. This results in a siloed approach which gives policymakers only limited evidence of the opportunity costs of their decisions.'*
17	185	Authors: The committee was concerned that some of the statements about NICE's work are misleading. It is suggested that NICE models adopt a short-term horizon, which is not accurate. NICE recommends adopting a life-time horizon, similar to what the authors advocate. If this hasn't happened in some isolated cases, this reflects limitations in the evidence base (like those for semaglutide), not NICE's overall approach.	140	Thank you for your feedback here. We have revised the text to clarify, and avoid implying that NICE does not use life-time horizons: *"This appraisal system can drive scarce resources towards short-term use of well-defined treatment options deemed cost-effective …".*
18	185	We felt the paper was also conflating NICE's cost-effectiveness threshold with the consumption value of health, as defined by the Treasury. This reference may help clarify these concepts: https://pubmed.ncbi.nlm.nih.gov/34467474/ Portraying these as conflicting thresholds is not appropriate. Please make small edits as needed to address these points.	159	We are confident that it is appropriate to draw attention to this issue as the different monetary values ascribed to QALYs is undermining value for money comparisons between different interventions. We have added clarification and additional references to the text: *'While in theory, these values represent different measures [16], in practice they are used for the same purpose and there is no level playing field when assessing the value for money of interventions which impact quality-of-life outcomes [17].'* We suggest that there is not space in this article to further explain our justification for our statement, but hope that the following explanation is satisfactory: The NICE willingness-to-pay (WTP) threshold and the consumption value of health are different concepts, which are set out very clearly by Wouterse et al (2023). The empirical basis for both NICE's threshold and the Treasury's estimate of the consumption value of health are both weak (https://academic.oup.com/jrssig/article/17/2/38/7029415 p39, https://assets.publishing.service.gov.uk/media/5a7b951740f0b645ba3c53f5/dh_120107.pdf p23),

				but that is not the concern here. The key issue is that both values are advocated as QALY WTP estimates for commissioners to use when determining whether an intervention represents good value for money. A clear example of this is the different values used in the 'return on investment' tools published by NICE and PHE. NICE used £20,000 (https://docslib.org/doc/13845393/estimating-return-on-investment-of-tobacco-control-nice-tobacco-roi-tool p27). PHE used £60,000 and noted that "This cost-effectiveness threshold [£60,000] is higher than the value typically applied by NICE for the technology appraisals programme (£20,000 to £30,000) but is relevant for public health interventions such as those considered here" (https://assets.publishing.service.gov.uk/media/5a7aedafe5274a319e77bb5d/A_return_on_investment_tool_for_falls_prevention_programmes.pdf p36). No justification is provided for the relevancy of the £60,000 value for the purpose of determining value for money. However, its historical adoption by the Treasury is not surprising given the Department of Health's reticence to state a value (https://data.parliament.uk/DepositedPapers/Files/DEP2014-1019/PQ203081_072_073_074_079_-_Lib_Doc_-_Report.pdf) and its need for a "pragmatic approach" which "focuses on benefits that it is easy to put a monetary value on" (https://assets.publishing.service.gov.uk/media/5fbce9cce90e077ee32ea0c3/Green_Book_Review_final_report_241120v2.pdf p4). In this context, the Green Book's adoption of the Department for Transport study to estimate the value of a prevented fatality (VPF) in a road traffic accident using a stated preference technique (https://assets.publishing.service.gov.uk/media/5a7b951740f0b645ba3c53f5/dh_120107.pdf p23) is certainly pragmatic, but lacks justification given the very wide range of values generated by such studies (Wouterse et al, 2023, p611). Moreover, the Green Book makes no attempt to distinguish the role of this consumption value of health estimate and a WTP threshold for assessing value for money of interventions. One could argue that the Green book is at risk of being disingenuous when stating "The current monetary WTP value for a QALY is £70,000 in 20/21 prices. Further information on the basis for the value of a QALY can be obtained by contacting the Department of Health and Social Care." (https://www.gov.uk/government/publications/the-green-book-appraisal-and-evaluation-in-central-government/the-green-book-2020#a1-non-market-valuation-and-unmonetisable-values). The invitation to contact DHSC hints at uncertainty about the validity of the position taken based as it is on historical pragmaticism. This issue means that obesity studies are using a range of values for QALY gains, which will inhibit understanding and comparative analysis by decision makers. For example, Thomas et al's (2022) [16] analysis of the transport for London advertisement ban used £20,000 per QALY gained, Cobiac et al's (2023) [doi: https://doi.org/10.1101/2023.10.05.23296619] analysis of the Soft Drinks Industry Levy

				used £60,000 when reporting household-level findings, and the same research team gave no monetary value for QALY gains for children and adolescents.
19	210	Authors: we wondered if it might be possible to give readers a sense of how policymakers are understanding the consequences of their obesity-related decisions over time. Are policies currently being improved or adapted if needed?	173	We are of the opinion that the existing evidence we present supports the significant deficit in policymakers' responses to their decisions and unfortunately we are unable to provide further commentary on internal processes for improvements to policy. We do address this point to some extent in the example of the advertising restrictions which were acknowledged to require further action based on the results of the first regulations, though it is the case that the delays to these additions further strengthen our view. The introduction section highlights the published analyses of the repeated failure of decades of government strategies to meet targets for obesity.
20	211	Authors: Please review the edits to this para to ensure the meaning has not be inadvertently changed.	165	Thank you for the suggested changes. We have made some included these along with some further minor edits: *'A fragmented and siloed policy appraisal approach allows UK governments to repeatedly present a commitment to tackling obesity, while advocating an ineffectual range of policies. Lobbying pressures and short-term election cycles result in the recurring advocacy of politically palatable, yet inadequate, treatment-focused measures, which avoid the perception of an overreaching 'nanny-state' [1,2].'*
21	240	Authors: Please clarify. Do you mean fiscal or regulatory measures?	187	We have amended the second half of this sentence to clarify the types of policies we are referring to: *'Moreover, political timidity continues with postponements to the commitment to placing restrictions on multibuy deals and further advertising restrictions for HFSS foods, with the ideology of 'choice' used to justify overly cautious timeframes in proceeding with impactful fiscal and regulatory policies requiring low individual agency to reduce obesity prevalence [19].'*
22	268	Authors: please add a sub-heading here the gives readers an indication of the main takeaway of this way forward section e.g. improving eco modelling for xxx	197	We have added a subheading which reflects the call to use holistic modelling, while acknowledging the challenges and counter-arguments for this: *'Embracing the challenge of holistic, systems-wide modelling'*
23	270	Authors: The paper acknowledges the limitations in current modelling practices but we felt you could strengthen the counter	289	We have added new text at various points in the article to elaborate on the limitations within modelling. We address issues with long-term outcome data availability, concerns models are over-simplifications, the need for model validation, the role of qualitative data and stakeholder insight. We also include a briefer discussion of some of the specific limitations in the modelling of

		arguments by elaborating on these limitations (e.g., data availability, uncertainty in long-term outcomes). Also in this section we suggest you could raise other potential counterarguments to using modelling, such as concerns about over-reliance on data or the difficulty in capturing complex social determinants of health. Models may be inaccurate. They may simplify reality or lack data. How do we mitigate against this? Depending heavily on models can lead to a neglect of qualitative factors that are not captured in models. How do we mitigate against this? These are some examples, but please integrate some of these considerations with evidence in this section and briefly explain how these concerns can be mitigated.		obesity which should be addressed before holistic modelling can be of sufficient validity. Please see the response to comment 13. In the final section before the conclusion we focus on a counterargument to the concerns over a neglect of qualitative data/stakeholder input: *'This article advocates for a fundamental role for holistic modelling in obesity policy innovation, but modelling is by no means the only tool required. For example, qualitative analysis of stakeholder insight including the experience of people living with obesity is key, and can inform modelling parameters, validate model output, and contribute to holistic decision-making.'* Please also see our response to comment 26
24	270	To bring more balance we would also like to see more acknowledgement of the potential challenges in implementing the proposed modeling approach, such as political resistance to certain interventions or difficulty in obtaining accurate data. What happens if the model outputs	239, 264	We have significantly shortened the conclusion section as suggested. Thank you for the suggested text in this section. Please see our response to comment 23 regarding the challenges in data availability, and we include the following text: *'Potential solutions to existing issues with the availability and quality of data on a breadth of long-term health and societal outcomes include attention on frameworks for minimum data requirements in trials, designed to support modelling of more comparable lifetime appraisals between interventions. Increased use of natural experimental studies – whereby real-world data are collected from settings which happen to have introduced policies at different times or levels of*

		conflict with political views/ideologies of policymakers? What happens then? Highlighting potential solutions or ongoing efforts to address these challenges would be valuable. These additions will also make this section much more compelling for readers. We also touch on this again below. We recommend removing / significantly shortening the conclusion to make space for more consideration of the limitations/counter argument.		*intensity – can also address the data limitations which present challenges in modelling combinations of population-level measures [29].'* Please see our response to comment 26 – we feel that in increasing our discussion on how modelling could address political timidity we have offered discussion on the role of scrutiny in driving progress when model outputs direct policymaking to interventions in conflict with political ideologies. We also give the net zero strategy as an example, and have added a line following this: *'This approach would address the bias towards individual-level policies shaped by political ideology and support the acceleration in the use of fiscal and regulatory measures; modelling may demonstrate that these are essential elements for sufficient impact [2].'*
25	347	Authors: the committee felt this was an important point about including health inequalities in models and suggested it was again highlighted in this section and elaborated in a sentence to make it more concrete for readers. Please clarify/simplify in plain language: "be an important opportunity to systematise the value of policies on this crucial metric" How could modeling be used to assess the differential	207	We agree that we would like to emphasise this point. The sentence has been reworded to the following: *'Including health inequalities in modelling would allow policymakers to decide on the role of targeted interventions for obesity which address wider determinants of health even if these may not be highly valued in cost-effectiveness terms.'*

		impact of policies on various population subgroups?		
26	351	Authors: Because public health strategies are complex and multifaceted we felt the framing of the role of modelling as a solution could be improved. First, the committee didn't feel it was convincingly discussed how better modeling can address the political timidity and gaps in policy that is identified. It is assumed that these barriers would be overcome with better modeling but with no evidence. We suggest you be a little more modest about the role of modeling in galvanising political support and leadership. And as you touch on above, implementing these policies is resisted by powerful lobbying interests that benefit from the status quo. As per our comment above on this last section, we would like to see a little more nuance and consideration of the counter argument/challenges to modelling with a few sentences added on these points.	248	Please see our response to comment 23 on a related point. We have toned down our statements on the role of modelling, and with the re-ordering of the article in response to your suggestions we feel that the arguments we make regarding political timidity are now clearer; importantly that modelling -based demonstrations of inadequate policy packages can support more effective scrutiny. We have also added the following text to directly address opposition to the role of modelling: *'Modelling inevitably represents a simplification of reality. Nevertheless, it represents a valuable tool for informing policy development and evaluation [13], and countering lobbying interests resisting changes to the policy status quo [15]. A key benefit of modelling is that it can identify and explore uncertainty through transparent statistical methods to inform risk management by decision-makers. Developments in microsimulation modelling techniques, and adherence to existing expert recommendations on obesity modelling, including model validation requirements, already provide a functional framework [10].*

27	270	Second, with its focus on modelling we felt there is an underplaying/lack of acknowledgment of other tools that are important in decision-making i.e. real-world experimentation, qualitative data, stakeholder engagement etc. these tools can maximise the benefits of modelling in policy-making. We suggest a sentence or two could be added on this point.	289	Thank you for raising this important point – we have included new text to address these other tools, some of which is already covered in our response to comment 23. Specifically we highlight the importance of natural experiment, real-world data in informing modelling, and the importance of qualitative data and stakeholder insight in shaping model parameters, validity and in holistic policy decision-making. We now conclude the body of the article with the new paragraph: *'This article advocates for a fundamental role for holistic modelling in obesity policy innovation, but modelling is by no means the only tool required. For example, qualitative analysis of stakeholder insight including the experience of people living with obesity is key, and can inform modelling parameters, validate model output, and contribute to holistic decision-making. Challenging decisions lie ahead once modelling output is available, e.g., the judgements to be made between policies which seek to achieve universal impact versus those targeted on health inequalities in narrower population groups.'*
28	358	Authors: We felt this reads as opinion and could be made more concise. We have proposed a revision for your review. While the paper criticizes the current approach, we felt it could benefit from including more specific examples of population-level interventions that could be modelled to help make this section more concrete and actionable. Here you could perhaps include specific examples of how modelling could be used e.g. discuss how modelling could compare the cost-effectiveness of a sugar	171, 178, 192, 224	Thank you for the proposed revision to make this section more concise. We have included references to modelling use in the specific examples of the sugary drinks industry levy, the appraisal of the advertising bans on Transport for London and the sugar reduction programme, and we have now added the following text to raise the potential for an even broader scope of modelling: *"Modelling the estimated impact of banning all HFSS-related advertising would, for example, provide impetus to addressing all the 'factors beyond empirical evidence, such as vested interests and political impediments, [which] are influencing policy decisions' [22].'*

		tax vs. restrictions on junk food advertising. We also wondered if you able to touch on other areas in which success or progress has been made? There are, for example, improvements in nutritional labelling. How were the consequences assessed before implementation?		
29	380	Authors: The committee was not clear what is being suggested here about who you think should be the organization assigned with the remit to oversee this. More specific actions or recommendations related to establishing such an organization or enhancing the roles of existing bodies like NICE or OHID would be useful.	275	We feel that the outcome of NICE's transformation process will be important in determining future direction in obesity policymaking, but we have amended the text to provide our view that an expanded role for NICE, reflecting that existing expertise and resource form a natural home for the modelling itself, would need to function in partnership with OHID as the lead body for the public health leadership needed to drive holistic policymaking. We have also increased the emphasis on the role of scrutiny in supporting this policymaking sphere as another essential function in driving progress. The second half of the relevant paragraph now reads: '*NICE plays a key role in UK intervention appraisal and its established expertise in using modelling to inform cost-effectiveness assessment means it should form the natural home for the development of holistic modelling tools. It is encouraging to see the increased prominence of public health in the scope within the current consultation over NICE's transformation [32], but a fully holistic policy appraisal and advisory remit would be a substantial step away from its current function. An effective partnership with OHID, therefore, will be required to achieve a prioritisation of holistic obesity policymaking, drawing on public health leadership to incorporate policy development and implementation expertise [2]. This will also require cross government collaboration and political leadership for which there is existing precedent [33]. Scrutiny of Government decision-making in the knowledge of the modelled verdicts on policy choice is a role that should be fulfilled by the Health Select Committee.*'
30	390	Please conclude the paper in one / two sentences max. by bringing the reader back to your main argument. We recommend the most of the	299	The conclusion is now shortened to two sentences: '*UK policymaking to reduce obesity prevalence is hindered by fragmented intervention appraisals. A move to holistic, systems-wide modelling of obesity policies would inform scrutiny of Government targets, and support leaders in committing to policy innovation of sufficient breadth and scope,*

		current word count in the conclusion be used to further strengthen the way forward section including to bring in the counter-argument a little more and add nuance to the impact of modelling.		*including use of politically sensitive fiscal and regulatory measures, responsive to both cost-effectiveness and health inequalities.*