

# Blueprint for halving obesity: rapid review

Obesity screening interventions for  
children



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# Contents

<b>Summary table</b>	<b>2</b>
<b>Rapid umbrella review</b>	<b>3</b>
Background	3
Objective	3
Methods	3
Results	6
Conclusions	9
<b>Appendices</b>	<b>11</b>

## Summary table

<b>Title</b>	<a href="#">Screening for obesity in children of 7-11 and 0-5 years</a>	<a href="#">Screening for obesity and intervention for weight management in children and adolescents</a>	<a href="#">The benefits and harms of providing parents with weight feedback as part of the national child measurement programme: a prospective cohort study</a>
<b>Author and year</b>	UK National Screening Service (2018)	O'Connor et al. (2017)	Falconer et al. (2014)
<b>Type of study</b>	Non-systematic review	Systematic review	Pre-post quasi-experimental study
<b>Outcome variable</b>	Weight loss or changes to obesity status	Changes to BMI z-scores or obesity status	Proportion of children attaining a healthy diet based on parent-reported healthy eating score of $\geq 5$
<b>Treatment</b>	Screening	Screening	Receipt of weight status feedback
<b>Control</b>	No screening	No screening	n/a
<b>Magnitude of effect (Children)</b>	n/a (no evidence returned in searches)	n/a (no evidence returned in searches)	For children with overweight: Mean diff = 4.3 percentage points [-12.7-4.0] NS For children with obesity: Mean diff = 0
<b>Notes</b>	For modelling the impact of this policy, the review highlighted in the <b>green column</b> was used.		

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# Rapid umbrella review

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## Background

Screening refers to systematic or routine measurement of a particular group for weight or BMI for the purposes of identifying individuals at risk for obesity and offering an intervention. Screening is distinct from surveillance, the monitoring of BMI for population-level data on obesity and overweight. For example, the National Child Measurement Programme (NCMP) measures height and weight in all children in Reception and Year 6 in [England](#) and [Scotland](#), and [reception only in Wales](#). The [purpose of the NCMP is to serve the UK Government's obesity strategy](#) to inform local service planning and delivery, and to analyse trends in growth patterns and obesity. It also facilitates engagement with families regarding weight concerns by sending feedback letters to parents about their child's weight category and directing them to support services for maintaining a healthy weight.

## Objective

To summarise the best available evidence on the impact of weight screening programmes on outcomes relevant to calorie consumption, weight loss, obesity and general health, including any iatrogenic effects.

## Methods

We aimed to identify and synthesise reviews that include quantitative and/or qualitative research synthesis of the effectiveness of weight screening on dietary behaviours, clinically reliable obesity measures, or obesity status.

### Eligibility criteria

To be eligible for inclusion, articles were required to use systematic review methodology (ie, use of systematic search and inclusion strategy to identify all available studies) with randomised controlled trials and include quantitative data synthesis (ie, meta-analysis) of multiple studies that examined the effect of weight or

obesity screening on outcomes relevant to clinically appropriate body weight measures, weight loss, obesity status or the consumption of healthy versus unhealthy foods and beverages, calorie consumption, energy intake or other dietary behaviours.

If the search did not identify any studies where a meta-analysis had been conducted due to heterogeneity of outcomes of interest, we intended to include reviews with narrative synthesis or impact assessments from government departments. We did not set inclusion criteria on the number or type of databases searched in the reviews.

We selected a single review that best represented our research question. Where more than one review was identified, we assessed the quality and selected the one with the highest rating (taking into account year of publication). In case of the absence of a single review with a meta-analysis, we included an impact assessment where available.

*Participants.* To be eligible for inclusion, articles were required to examine the effect of weight screening on body weight or consumption behaviour in children aged 0-18 years. If multiple reviews were identified that split the effects of the intervention by adults and children we reported more than one review for the research question.

*Intervention.* We sought reviews that synthesised measurement or screening programmes/interventions that aim to identify children with overweight or obesity. We considered reviews that include both small scale feasibility studies and national mandatory child measurement programmes.

*Comparator.* We did not restrict inclusion by comparator group. For reviews of randomised controlled trials the comparator may be no intervention or a lower intensity intervention.

*Outcomes.* To be eligible for inclusion, reviews were required to include clinical (eg, weight, BMI, % fat change of individuals), behavioural (including, but not limited to: HFSS consumption, food diaries, HFSS sales or proportion of sales, HFSS content of shopping baskets, HFSS purchases), or population prevalence outcomes related to obesity (eg, obesity prevalence rates). Reviews that only included measures of

intentions/plans for future behaviour were excluded due to evidence of the gap between intended and actual behaviour.

## Information sources and article selection

The search strategy was designed to identify syntheses of research evidence such as systematic reviews between the year 2010 and the date of search. Initial keywords were identified via a scoping review of relevant papers and reports as well as via MEDLINE using the MeSH function. A search was performed in PubMed and the Cochrane Database of Systematic Reviews. We searched grey literature using Google Scholar and Google to identify relevant reports.

## Screening

Due to the rapid nature of the reviews, a single reviewer screened titles and abstracts and discussed any uncertainty with a second reviewer. For relevant titles/abstracts, the full text was retrieved for full text review. We aimed to identify one single review to provide the highest quality overview of evidence relating to our research question.

## Assessment of methodological quality

Where more than one suitable review was identified we aimed to use the JBI Critical Appraisal Checklist for Systematic Reviews and Research Syntheses to make a choice on which single review to select. We also considered the year of publication in our selection.

## Data extraction

The JBI Data Extraction Form for Review for Systematic Reviews and Research Syntheses was used for data extraction for the final included review. Extracted characteristics included:

- Review characteristics: author/year, objectives, participants (characteristics, total number), setting/context, interventions of interest, date range of included studies, detailed description of the included studies (number/ type/ country of origin), appraisal instrument and rating, type of review/method of analyses and outcomes.

- Results: findings of the review and comments.

## Results

There was only one relevant post-2010 systematic review of the studies examining impacts of BMI or obesity screening in children. [O'Connor et al. \(2017\)](#) conducted a systematic review on the benefits and harms of both screening and treatment for obesity and overweight in children and adolescents. This was an evidence review for the US Preventive Services Task Force (USPSTF), a panel of experts in prevention and evidence-based medicine tasked with advising on clinical preventive interventions such as screening, psychological services, and medication.

What were the systematic review methods?

The review included articles if they reported studies that were of fair to good quality and conducted in economically developed countries, as determined by [OECD](#) categorisation. Studies included were:

- randomised and non-randomised controlled trials conducted in a clinical setting in children aged 2-18
- screening or weight management programmes (counselling, metformin, orlistat, and healthcare system-level approaches)
- and included weight-related measures at 12 month follow-up as the primary outcome, with a body mass index (BMI) z-score or standard deviation selected if available. A minimum of six months follow-up was required. Other included health outcomes were reduced orthopaedic pain, sleep apnea, or asthma; improved quality of life, functioning, or depression; avoidance of adult obesity), intermediate cardiometabolic outcomes (blood pressure, lipid, insulin/glucose measures), and adverse effects of screening or treatment (eg, labelling, stigma or increased body image concerns, eating disorder, exercise-induced injury).

Study methods were rated as having a very low risk of bias.

Whilst O'Connor et al. (2017) was interested in the impact of both obesity screening and treatment programmes on weight and obesity outcomes, for the purposes of the current Blueprint report, we report findings for screening only.

What did the review find?

O'Connor et al. (2017) did not identify any studies of screening which met the inclusion criteria. The authors acknowledged that some bodies of literature not included in this review, those conducted outside healthcare settings, may provide relevant information. However, they suggested that interventions in other settings that would have been excluded from the O'Connor et al. review were likely very similar to those in the included studies.

### Grey literature findings

Two relevant grey literature reviews with broader inclusion criteria were identified. However these reports also found no studies examining benefits of screening or tested impacts of treatment programmes on screened versus non-screened children. These [2018 reports](#) were two rapid evidence reviews for the UK Screening Service to assess the appropriateness of universal child BMI screening in the UK. Separate reviews were conducted for 0-5 and 7-11 year olds. These were comprehensive reviews examining evidence on whether screening children using BMI measures and commencing early intervention impacted health in adolescence and adulthood and, if so, whether the previous [UK NSC recommendation against a screening programme](#) should be revised.

The review assessed evidence against the three NSC criteria for screening, and was not limited to reviewing impact of screening programmes on weight or health outcomes. These criteria were as follows:

- Are weight related outcomes in treatment programmes different for screened versus unscreened children? There needs to be evidence that early intervention is more effective than later/none.
- If the rationale for screening is preventing obesity or ill health in the future, then does childhood obesity significantly predict obesity in adulthood or morbidity in adolescence or adulthood?



- Are BMI or other clinical obesity measures reliable detectors of obesity in children aged 0-11?

#### What were the review methods?

These were non-systematic rapid reviews. Searches to address these questions were conducted in MEDLINE, Embase, Cochrane and PsycInfo. No other searches were done.

Studies were included if they were prospective cohort studies or systematic reviews, randomised controlled or comparative trials of screening, and systematic reviews thereof. Other study types including natural history were considered, as relatively few studies met RCT or comparative trial criteria. Studies include populations in the UK and Ireland, Europe, USA, Australia, and New Zealand. Non-systematic reviews were excluded. PICOS criteria were applied to search, where outcomes of interest were BMI, z-scores or obesity status. In contrast to O'Connor et al., UK Screening Service reviews included studies from a range of settings that varied widely from primary and secondary care to community and academic settings. Efforts were made to assess the quality of the identified evidence, including study design and methodology, risk of bias, directness and applicability of the evidence.

#### Findings

The findings of both reviews for younger and older children is consistent with O'Connor et al. (2017). There were no studies specific to the treatment of children identified through screening programmes and there was no evidence assessing the difference in obesity-related outcomes for screened versus non-screened children in either age group. Other findings related to the broader criteria.

#### Evidence from a single study not included in reviews

[Falconer et al. \(2014\)](#) evaluated the dietary changes following feedback letters<sup>1</sup> to parents on their children's weight status (underweight, healthy weight, overweight or

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<sup>1</sup> \*Written feedback on children in overweight categories was supplemented in certain PCTs with school nurse-led telephone calls, in which parents could discuss the written feedback and seek advice. Parents in one PCT were also offered a face-to-face appointment with a school nurse.

very overweight) after measurements in the UK National Child Measurement Programme (NCMP). Sample participants were from five primary healthcare trusts in SE England. Participating parents completed questionnaires at baseline and follow up (before and after feedback on their children's weight status), which assessed children's diet and physical activity, plus other outcomes including parental understanding of the health risk associated with excess weight in children and ability to recognise overweight in their own children. Differences in the pre-post proportions of parents reporting each outcome were assessed using McNemar's test.

Assessment of diet was with a healthy eating score rating of 0-7 where  $\geq 5$  was considered healthy. The score was derived from a questionnaire assessing parent-reported frequency of fruits, vegetables, sugary drinks, sweet and savoury snacks consumption. Categories ranged from less than once a week to  $\geq 3$  times a day). A higher score indicated more frequent consumption of fruits and vegetables, and lower consumption of sugary drinks and snacks.

Results: No more than half the children in any weight category were reported to be eating a healthy diet at any time point. The proportion of overweight children with a parent-reported dietary health score of  $\geq 5$  did not change significantly between baseline (50.6%, 95% CI: 42.8 - 58.4) and post (46.3% 95% CI: 38.5 - 54.1) receipt of feedback letters. Similarly, for children identified as obese, there was no significant change in proportion reporting a healthy diet following the receipt of feedback; baseline and follow up both 41.3% (95% CI: 31.1 - 51.6).

These findings are consistent with findings from a US review of [peer-reviewed evidence of quantitative estimates](#) of the impact of BMI report cards on childhood obesity which concluded that they would have no impact on obesity prevention.

## **Conclusions**

There is currently no evidence to allow assessment of whether or not screening children for obesity or BMI would lead to a reduction in obesity prevalence in individuals or in the population more generally. Absence of evidence is not evidence of absence and comparative trials would need to be undertaken to answer this question.

The only study to assess an outcome related to dietary behaviour found that provision of feedback/advice following identification of children with overweight and obesity in the UK's NCMP did not result in an increase in proportion of those children adhering to a healthy diet.

## Appendices

### Appendix 1: PubMed search strategy

Effect of child weight screening or measurement programmes on overweight/obesity and other health outcomes: a rapid review protocol.

No.	Concept	PubMed search terms
1	Screening programme	"Mass screening"[tiab] OR "weight screening"[tiab] OR "BMI screening"[tiab] OR "mass screening"[Mesh] and ("BMI"[tiab] OR "obesity" [tiab] OR "overweight"[tiab])
2	Measurement programme	"child measurement programme"[tiab] OR "measurement programme"[tiab] OR "Measurement program"[tiab] OR "Weight monitoring"[tiab] AND ("BMI"[tiab] OR "obesity" [tiab] OR "overweight"[tiab])
3	Obesity	"obesity"[tiab] OR "overweight"[tiab] OR "over-weight"[tiab] OR "BMI"[tiab] OR "body weight"[tiab] OR "bodyweight"[tiab] OR "Body mass index"[tiab] OR "Body Mass Index" [Mesh] OR "Obesity"[Mesh] OR "Overweight" [Mesh]
4	Eating behaviour	"Food consumed" [tiab] OR "Feeding Behavior"[Mesh] OR "Feeding Behavio*"[tiab] OR "Eating rate"[tiab] OR "Dietary intake" [tiab] OR "Diet"[Mesh] OR "Food preferences"[Mesh] OR "Consumer Behavior"[Mesh]
5	Systematic review*	"systematic review"[tiab] OR "systematic*"[tiab] OR "meta-analys*"[tiab] OR "narrative synthes*"[tiab]
6	Full search	(#1 OR #2) AND (#3 OR #4) AND #5

\*If inclusion of 'systematic review' results in too few articles to screen, we will remove this term from the search strategy