

Protocol: Systematic Review of Whole System Approaches to Obesity

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Background

The nature of the obesogenic environment means that comprehensive and sustained success in tackling obesity can only come through the implementation of a Whole Systems Approach (WSA): bringing together all the elements and levers identified in Foresight (2007): planning and built environment; transport; education; adult and children's services; business; culture; sport and leisure; advertising and media, as well as nutrition, physical activity and expertise in social marketing and interventions for all ages and settings, throughout the life course.

Although there are good examples of effective individual actions, there is little evidence or practical demonstration of how to join these up to create a Whole Systems Approach.

A series of systematic reviews undertaken for NICE in 2010 (Garside et al. 2010, Hunt et al. 2011, Pearson et al. 2011), with the aim of providing a working definition of a WSA to obesity prevention, identified ten features of a systems approach to tackle health problems (Garside et al. 2010):

1. *Identifying a system.* Explicit recognition of the public health system with the interacting, self-regulating and evolving elements of a complex adaptive system. Recognition given that a wide range of bodies with no overt interest or objectives referring to public health may have a role in the system and therefore that the boundaries of the system may be broad.
2. *Capacity building.* An explicit goal to support communities and organisations within the system.
3. *Creativity and innovation.* Mechanisms to support and encourage local creativity and/ or innovation to address obesity.
4. *Relationships.* Methods of working and specific activities to develop and maintain effective relationships within and between organisations.
5. *Engagement.* Clear methods to enhance the ability of people, organisations and sectors to engage community members in programme development and delivery.
6. *Communication.* Mechanisms to support communication between actors and organisations within the system.
7. *Embedded action and policies.* Practices explicitly set out for obesity prevention within organisations within the system.
8. *Robust and sustainable.* Clear strategies to resource existing and new projects and staff.
9. *Facilitative leadership.* Strong strategic support and appropriate resourcing developed at all levels.
10. *Monitoring and evaluation.* Well articulated methods to provide ongoing feedback into the system, to drive change to enhance effectiveness and acceptability.

The NICE reviews found a paucity of evidence on the effectiveness of community wide programmes displaying features of a WSA to prevent obesity, with only eight included articles, none of which were undertaken in the UK and all of which targeted children below 14 years of age (Hunt et al. 2011). Most findings favoured the interventions but improvements were found to be small and not always statistically significant.

The authors of the NICE reviews found a clear division in the way in which the language of a “whole system approach” was used in the literature (Garside et al. 2010). On the one hand it was found to represent approaches informed by theory about complex systems which propose radical new ways of organising, managing and evaluating local activities. On the other hand, it had been used as terminology within a long list of approaches which referred to cross-disciplinary, multi-agency, multi-level community activities aimed at addressing health concerns affected by complex socio-economic condition. *The NICE reviews did not find any papers in the first category.*

A recent interim report of a scoping review on the new public health infrastructure in England in relation to obesity (Gadsby et al. 2015) reported that the structural changes to the health and care system in England have had a profound effect in that leadership for public health appears to be dispersed amongst a range of organisations and people within the local authorities (LAs). At a national level, the leadership role is complex and not yet developed (from a local perspective). This could obviously present further challenges to any forthcoming WSAs.

This systematic review is being carried out as part of a wider project, which aims to understand the whole systems approach to obesity at local level and to inform the development of a framework and tools to support Local Authorities to address obesity. It is commissioned by Public Health England with its partners the Local Government Association and the Association of Directors of Public Health. This project is strongly focused on co-production of solutions with national and local partners. It is recognised that this programme comes at a period of significant pressure and change in the health and local government sectors particularly budgetary pressures and the drive to provide better value, more integrated approaches.

Aims and Objectives

The aim is to undertake a systematic appraisal of national and international published evidence, reports and policy documents on obesity, other public health areas and areas outside public health, including understanding what is known about WSAs and how they can be implemented in practice.

This systematic review will follow standard guidelines for carrying out systematic reviews (CRD 2009; Higgins & Green 2008).

Review Questions

1. What has been done in terms of a whole system approach to obesity, and other complex public health problems, and how effective was it?
2. What elements of a WSA are effective in (a) obesity (b) other areas of public health (c) areas other than public health?
3. What elements of a WSA are not effective in (a) obesity (b) other areas of public health (c) areas other than public health?
4. What are the barriers to implementing a WSA in (a) obesity (b) other areas of public health (c) areas other than public health?
5. What are the facilitators to implementing a WSA in (a) obesity (b) other areas of public health (c) areas other than public health?

6. What is the evidence on cost-effectiveness of WSAs in (a) obesity (b) other areas of public health (c) areas other than public health?
7. We will assess what material if any we find on this point and then if necessary seek support: we have identified an Economist in the Built Environment team with an appropriate Health background

Inclusion criteria

Population: Any population where a WSA has been used, at local, regional or national and international level

Intervention: Whole system approaches in public health (and specifically, but not limited to, obesity). Includes Complex Adaptive Systems. The brief from PHE defines a WSA to tackle obesity within this programme as using approaches that:

- Consider, in concert, the multifactorial drivers of overweight and obesity, as outlined by Foresight, and the wider determinants of health;
- Involve transformative co-ordinated action (including policies, strategies, practices) across a broad range of disciplines and stakeholders, including partners outside traditional health sectors;
- Operate across all levels of governance, including the local level so that such approaches are reinforced and sustained, and
- Identify and target opportunities throughout the life course.

Comparisons: Any or none.

Outcomes: For review questions 1, 2 and 3: improvements in obesity-related or other health outcomes, such as weight and BMI, prevalence of Type 2 diabetes, measures of diet and nutrition, levels of physical activity, psychological well-being e.g. quality of life; ill-health e.g. back pain, co-morbidities related to obesity, reductions in health inequalities, reductions in premature morbidity and mortality, cardiovascular disease and fat-related cancers, or organisational outcomes such as cross-sector collaboration. In addition, we will look at what each individual project aimed to achieve and assess its effectiveness in terms of whether it achieved those aims and barriers and facilitating factors associated with achieving or not achieving those aims. Outcomes may be at individual, local, regional or national level.

For review questions 4 and 5: process outcomes such as training, recruitment, sustainability, as well as people's views on barriers and facilitators to implementation of WSAs.

For review question 6: cost, cost-effectiveness, cost-benefit or cost-utility.

Study designs: For review questions 1, 2 and 3: evaluations. These may be randomised or non-randomised controlled trials, natural experiments, before and after studies, or mixed methods evaluations (including case study approaches). For review questions 4 and 5: process evaluations (qualitative studies). For review question 6: cost-effectiveness, cost-benefit or cost-utility studies.

Search strategy

As the search strategy for the NICE reviews went up to April 2010, we will search the following databases from 1995 (to cover any time-lag between article publication and indexing in electronic databases): MEDLINE, CINAHL, Social Science Citation Index, The Cochrane Library (includes CENTRAL, DARE, NHSEED, HTA and INAHTA databases), PsycLIT/ PsycINFO, DoPHER, TRoPHI and IDOX.

Key search terms will include

1. “whole system approach” and synonyms such as: holistic; cross-sector; joined up; collaborative; culture; multi-disciplinary; inter-disciplinary; integrated; local authority approach; local authority wide approach; community wide; health and social care approach; inter organisational networks; full system; coordinated; aligned; systematic approach; networked; systems approach; obesity strategies; healthy weight strategies; city wide; regional; vanguard; Manchester Experiment; complex adaptive systems; obesogenic environment; leptogenic environment; systems-based approach; multi-strategy approaches
2. Terms related to relevant initiatives such as: Healthy Cities; Healthy Towns; EPODE; Change4Life; Healthy Weight Healthy Lives; National Support Team Childhood Obesity; Healthy Schools; Healthy Places, Health Promoting Hospitals, Health Promoting Schools, Health Promoting Workplaces ; Shape-up Australia
3. As we are looking for examples of whole systems approaches in issues other than obesity and also areas other than public health, we propose to look at other major cross-cutting issues or “wicked problems”: these are issues where we either know of work or think there may have been work to create joined up approaches across several sectors and that therefore we could learn from those.

We will also search the websites of relevant organisations such as: Department of Health; Public Health England; Local Government Association; SOLACE; Association of Directors of Public Health; Association of Public Health; Obesity Learning Centre; WHO; NICE; ASO; British Heart Foundation National Centre for Physical Activity and Health; National Obesity Forum; Health Foundation; Heart Foundation; The King’s Fund; Diabetes UK; Faculty of Public Health Medicine; Town and Country Planning Association; Royal Town Planning Institute; Core Cities; NIHR; NHS Health Scotland; Parliamentary Commission on Physical Activity; Nutrition Society; British Nutrition Foundation; MRC; ESRC; Wellcome Foundation; Sorrell Foundation; YHEC; Big Lottery Fund; CDP (USA); Leeds Beckett University; More Life; “This city’s going on a diet”; Heart of Mersey; Nuffield Trust; Imperial College London; National Obesity Observatory.

Study selection

Titles and abstracts of records retrieved from electronic database searches will be transferred to reference management software (Endnote) or directly to EPPI-Reviewer 4, screened for relevance to the inclusion criteria using a piloted electronic form. A random 10% of titles and abstracts will be allocated for triple screening across all the reviewers, and once good agreement (80% or more) is reached, the remaining 90% will be allocated between the three reviewers. Any queries will be

discussed within the review team and if agreement cannot be reached, will be referred to the local steering group for decisions.

We propose to use a hierarchical screening process, with records being assessed against each of the following criteria in turn and excluded as soon as one criterion is not met:

EX1 Published before 1995

EX2 Not about outcomes relevant to public health, social care, safety or wellbeing

EX3 Not about a WSA (by definition given above)

Records which potentially meet the inclusion criteria will be retrieved in full and assessed again for inclusion using a more detailed electronic form, with inclusion criteria relating to each separate review question. Again, a random 10% will first be screened by all the review team and once good agreement is reached, the remaining 90% will be allocated between the review team. Any queries will be resolved as for the titles and abstracts.

Data extraction

Data will be extracted from included articles by one reviewer onto a piloted electronic form. Queries will be resolved as above. We anticipate extracting data into the following fields: Study details; study design; setting; population (including PROGRESS-Plus indicators (Kavanagh et al.)); intervention; comparator (if appropriate); outcomes; findings; reviewer comments.

Validity assessment

We will carry out validity assessment of included research studies using the appropriate checklists for the study design. For example, RCTs will be assessed using the Cochrane Risk of Bias tool (Higgins & Green 2008), whereas observational studies will be assessed using the STROBE checklist (von Elm et al. 2008), and qualitative studies will be assessed using a tool developed by the EPPI-centre (Rees et al. 2009).

Synthesis

Evidence for review questions 1, 2 and 3 is expected to be mostly quantitative and will be synthesised within each question, using meta-analysis if articles are similar enough in terms of populations, outcomes and intervention approaches, or using narrative synthesis if not. Evidence will be grouped according to whether it relates to obesity or to other public health issues, or to other issues not directly about public health. If meta-analysis is undertaken, we will take advice from a statistician on which summary statistic to use, whether to use fixed effect or random effects models, and we will be vigilant for unit of analysis issues, such as cluster randomisation. We will include and report assessment of statistical heterogeneity using the I^2 statistic, and where there is judged to be a high level of statistical heterogeneity we will explore potential reasons for this.

Evidence for review questions 4 and 5 is expected to be mostly qualitative and will be synthesised using qualitative synthesis methods and thematic or framework analysis (Dixon-Woods 2011), if time allows and if there is judged to be enough similarity between studies, or narrative synthesis if not.

Evidence for review question 6 will be cost-effectiveness studies and will be synthesised using narrative synthesis.

If time allows, there may be some scope for using the findings from the synthesis for review questions 4 and 5 (barriers and facilitators to WSA) as potential moderators in subgroup analyses for review questions 1, 2 and 3.

References

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Rees R, Oliver K, Woodman J, Thomas J (2009) *Children's views about obesity, body size, shape and weight: a systematic review*. London: EPPI-Centre, Social Science Research Unit, Institute of Education, University of London.

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APPENDIX A: DRAFT SEARCH STRATEGY

1. Obes* or overweight or fat* or "body weight" or "weight loss" or leptogenic or (health* adj/2 (weight* or eat* or choice* or adiposity) or (weight adj/2 (gain* or change* or retention* or loss*)) or poverty or "social exclusion" or depriv* or diabetes or "wicked problem*" or "wicked issue*" or "troubled famil*" or (drug* adj/2 (use* or abuse*))
2. "whole system" or "system* approach*" or (system adj/2 work*) or collaborative or "joined up" or holistic or "cross sector" or "multi disciplinary" or "inter disciplinary" or integrated or (local* adj/2 wide) or (local* adj/2 cross) or "multi faceted" or "multi agency" or "community wide" or "inter organisation* or network*" or "full system" or coordinated or aligned or systematic or "city wide" or (region* adj/2 wide) or (region* adj/2 cross) or regional or combined or united or "health system" or "public health" or "state wide" or (complex adj/2 system*)
3. Approach* or strateg* or policy or policies or initiative* or scheme* or program* or intervention* or prevention or control
4. "Healthy Cities" or "Healthy Town*" or EPODE or Change4Life or "Healthy Weight Healthy Lives" or "National Support Team Childhood Obesity" or "Healthy School*" or "Healthy Place*" or "Manchester Experiment"

Medline Subject Headings:

1. (MH "Obesity") OR (MH "Pediatric Obesity") OR (MH "Obesity, Morbid") OR (MH "Overweight") OR (MH "Body Weight") OR (MH "Weight Loss")