Complex problems, local solutions: Understanding systems approaches to obesity prevention in the UK

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Complex problems, local solutions: Understanding systems approaches to obesity prevention in the UK

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A B S T R A C T

Background: Obesity prevention is a complex public health challenge requiring coordinated, multi-sectoral responses. Systems approaches offer a framework for addressing this complexity, but evidence on their operationalisation is limited. We aimed to examine how systems approaches to obesity prevention are designed, implemented, and evaluated at the local level in the UK, and to identify the factors associated with greater maturity.

Methods: We co-designed the 38-item Systems Approach Survey and invited all 178 UK local public health teams to participate. The survey captured the design, implementation, maturity, and evaluation of systems approaches. Data were gathered April to October 2024. Quantitative responses were analysed descriptively and qualitative responses using content analysis. Findings are presented by nation and maturity tertile.

Results: Seventy teams responded (39%), of which 59 indicated that they were implementing a systems approach (46 in England, five in Wales, six in Scotland, and three in Northern Ireland). On average, approaches engaged 12 sectors, aligned with five other complex social issues (e.g. food insecurity and cost-of-living), and were co-ordinated by four people, committing 49 h/month. Only 23 (39%) were being formally evaluated, mostly in Wales, Scotland, and Northern Ireland. Maturity scores ranged from 16 to 93%. Senior leadership support was consistently central to implementation.

Conclusions: Local systems approaches to obesity prevention are emerging across the UK, but implementation is largely in early stages. Whilst the complexity of obesity is widely recognised, more support is required to help local teams intervene within the obesogenic environment.

1. Introduction

Population-level obesity is driven by a complex web of interconnected factors. These are further shaped by wider social-, political-, and commercial-determinants of health; all of which disproportionately affect those living in deprivation, with inequities worsening over time (Swinburn et al., 2019; Marmot and Bell, 2019; NHS Digital, 2023). Traditional interventions which have attempted to equip the public with the knowledge and capability to make healthier decisions are insufficient (Nobles et al., 2019). Systems approaches have been widely advocated as a more effective response to the multifaceted nature of population-level obesity that can be applied at the local, regional, national, and international levels (Marmot and Bell, 2019; Baugh Littlejohns and Wilson, 2019; Bellew et al., 2020; Foster-Fishman et al., 2007).

Here, we position a systems approach as a framework for recognising, understanding, and engaging with a complex issue (Swinburn et al., 2019; Foster-Fishman et al., 2007; Whelan et al., 2022; Bagnall et al., 2019; Garside et al., 2010; Li et al., 2023; Stansfield et al., 2020; Waterlander et al., 2020) – for us, the population levels of overweight and obesity. In doing so, a systems approach requires diverse and multi-sectoral stakeholder input (e.g. community members, local organisations, government bodies) to redesign the places and conditions in which people live. They enable stakeholders to create a shared understanding as to the systemic nature of the issue and how it emerges within the local context. This recognises that contexts, and therefore what action is required, will differ substantially from place to place. A systems approach necessitates that stakeholders define the problem and the boundaries of interest and influence, from which stakeholders can identify places where they can intervene in the system, individually and collectively, to change how it functions, rather than merely reacting to symptomatic problems. Stakeholders self-organise to work within and

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across the dynamic system, meaning that their collective efforts will adapt and respond to the behaviour of the system, as opposed to taking a fixed and programmatic response.

Several systematic reviews have examined the use of systems approaches in public health (Baugh Littlejohns and Wilson, 2019; Bellew et al., 2020; Bagnall et al., 2019; Li et al., 2023; Jebb et al., 2021; Breslin et al., 2024; Astbury et al., 2023); most drawing similar conclusions. At present, systems science *methods* (e.g. agent-based modelling, systems dynamics modelling, group-model building) are often used to examine the complexity of public health issues. To a lesser extent, the same methods are used to identify modifiable parts of the complex system, and then simulate policy and other interventional approaches. A 2019 review, which focused more on identifying intervention efforts, found many examples of multi -component, -setting, and -stakeholder approaches, but seldom was systems science or a systems perspective embedded within (Bagnall et al., 2019). As such, the complex adaptive nature of public health issues was largely not recognised. This principal finding was mirrored by Li et al. (2023), whose review only identified three high-quality examples of systems approaches being used to prevent overweight and obesity. This included two initiatives from Australia, WHO STOPS (Allender et al., 2021) and RESPOND (Whelan et al., 2022), and one from the Netherlands, the LIKE programme (Waterlander et al., 2020). Thus, although there is widespread interest in the use of systems approaches, evidence of their value and application remains limited (Jebb et al., 2021).

In an attempt to increase the adoption of systems approaches in England, Public Health England (now the Office for Health Improvement and Disparities; a government unit in the Department for Health and Social Care) published guidance to support local government authorities (LAs) to design and implement a systems approach for the prevention of overweight and obesity (Public Health England, 2019a). Since 2019, this guidance has been downloaded >60 000 times and has been adapted and adopted in Wales, Scotland, and Northern Ireland (Breslin et al., 2024; Public Health Wales and Improvement, 2024). The guidance provides LAs with a detailed methodology, across six phases, to: 1) build a coalition of multi-sectoral partners, 2) garner support from senior leaders (both within- and outside-the LA), 3) visualise the complex system driving obesity in the local area, 4) identify places to intervene in the system, 5) design and implement a cohesive action plan, and 6) evaluate progress and dynamically adapt the approach. Despite several small-scale process and mixed-methods evaluations (van der Graaf et al., 2025; Breslin et al., 2023; Public Health England, 2019b), little is known about the broader uptake of these approaches. As such, the aims of this study were to:

1) explore how systems approaches have been adopted to support the local healthy weight agenda across the UK,
2) understand how systems approaches have been designed and implemented in practice,
3) determine the maturity of implemented systems approaches and assess whether specific characteristics are associated with greater maturity,
4) identify the main barriers and facilitators influencing the implementation of systems approaches, and
5) establish how these approaches have been evaluated.

2. Methods

2.1. Design

We gathered cross-sectional data about local systems approaches from public health teams across the UK (England, Wales, Scotland, and Northern Ireland) via the Systems Approach Survey. This study received ethical approval from Leeds Beckett University's Research Ethics Committee (*Ref*: 129115).

2.2. Systems approach survey

The Systems Approach Survey was co-designed with local public health practitioners and academics between January and April 2024. The co-design process involved several online workshops with stakeholders, online follow up conversations, and survey piloting and refinement. Stakeholders emphasised the time pressures facing local public health teams, and so the number of questions was kept to a minimum with a mixture of open and closed response options. The final survey (see Appendix I) comprised 38 questions (27 mandatory) across five sections: 1) description of the systems approach (10 questions), 2) design and development (8 questions), 3) core components (10 questions), 4) barriers and facilitators to implementation (3 questions), and 5) evaluation (7 questions).

To understand the maturity of the systems approaches, we simplified the Systems Maturity Matrix (Shearn and Armour, 2024) – a tool designed to examine the maturity of *physical activity* systems approaches – through collaboration with the lead developer (KS). The original matrix included 33 questions, across 10 core conditions, for three different focal points of systems approaches ([1] integrating physical activity into sectors, [2] strengthening community and individual capacities, and [3] tackling structural inequalities). Based on our co-design, the first focal point, integration, was particularly relevant for obesity prevention systems approaches in the UK, reducing total questions to 10, one per condition. Questions were re-oriented towards obesity prevention rather than physical activity. Questions provided Likert scale response options (1 [not embedded in practice] to 7 [embedded in practice]) and detailed descriptions were provided for what constitutes a higher or lower score (see Appendix I). The 10 core conditions align with those identified consistently within the wider literature (Baugh Littlejohns and Wilson, 2019; Foster-Fishman et al., 2007; Bagnall et al., 2019; Garside et al., 2010; Stansfield et al., 2020).

2.3. Survey dissemination

We worked with public health organisations to disseminate the survey, including: the Office for Health Improvement and Disparities (OHID; England), Public Health Wales, Public Health Scotland, the Public Health Agency Northern Ireland, the Association for Directors of Public Health (England), and the Royal Society for Public Health. Additional survey dissemination routes included the National Institute for Health and Care Research (NIHR) Health Determinants Research Collaborations, the NIHR Applied Research Collaborations, the Food Active network, and personal and institutional social media accounts (LinkedIn and *X*). We supported these organisations and networks to create tailored emails, which included information about the study and a survey link, and ensure that emails were sent to the likely local systems approach lead (for example, to Principal Public Health Specialists responsible for the healthy weight agenda). At least two emails per organisation or network were shared throughout the recruitment window. As a result, we are confident that all public health leads in the UK received an invitation to complete the survey. For context, England has 152 upper tier LAs, Wales has seven Local Health Boards, Scotland has 14 NHS Health Boards, and Northern Ireland has five Health and Social Care Trusts, each of which provide the local public health function.

2.4. Data collection

The Systems Approach Survey, hosted in Online Surveys and open from April to October 2024, could be completed individually (e.g. by the lead) or collectively (e.g. by the implementation team) and required 20-60 min to undertake. Participants provided informed consent prior to accessing the survey questions.

2.5. Analysis

Quantitative data were descriptively analysed, and content analysis was used for the qualitative data. Alongside analysing data pertaining to individual core conditions, we created a composite "maturity" score for each systems approach by summing individual condition scores (maximum score of 70), expressed out of 100, with higher scores denoting greater maturity. Independent t-Tests and one-way ANOVAs identified any differences in system maturity by design characteristics (e.g. leadership support, training provision, guidance used). No further analyses were undertaken due to the sample size. Based on the composite maturity score, systems approaches were categorised into maturity tertiles (high-, moderate-, and low-maturity) to allow comparison of qualitative findings (e.g. barriers to implementation) between the three groups. Content analysis allowed us to provide numerical overviews for how often patterns were identified in the qualitative data. These data were coded initially by JN, and double coded by AP, LL or SB, with coding discrepancies discussed and agreed. Similar codes were grouped where possible. Quotations are not provided due to the type and depth of qualitative survey data noting that most responses were one sentence long. We triangulated findings to corroborate or refute the results emerging from single sources (e.g. quantitative or qualitative questions). The triangulation therefore strengthens the confidence of our conclusions.

3. Results

Seventy local public health teams completed the survey. Of these, 59 (39·3%) indicated that they were implementing a systems approach to support the healthy weight agenda; 45 (76·3%) in England, five (8·3%) in Wales, six (10·2%) in Scotland, and three (5·0%) in Northern Ireland. Data were combined for Wales, Scotland, and Northern Ireland (WSNI) given the lower number of responses. Almost two thirds ($n = 38$, 64·4%) of responses were completed by a single team member, the remainder collaboratively between team members.

3.1. Systems approaches in practice

3.1.1. Designing the approach

Table 1 provides a descriptive overview of the 59 systems approaches. Approximately 50% of approaches commenced after 2022, with most spending less than one year designing their approach before moving to implementation. Nearly all used guidance to shape their approach; the Public Health England Whole Systems Approach Guidance most often (74·6%), with academic research (13·6%) and the Healthy Weight Declaration (11·9%) thereafter. Thirty approaches provided training for stakeholders to upskill in their methodology; all but one from WSNI (92·9%) offered training in contrast to 37·8% in England. Similarly, the approaches in WSNI (78·6%) obtained more external support when compared to those in England (48·9%), predominantly from academics, external agencies, other local public health teams, or OHID regional networks.

3.1.2. Implementing the approach

There was substantial variation in the amount of resource used to implement the approach. Co-ordinating teams ranged from one to 29 people and the collective time commitment per month ranged from 1·5 h to 875 h. On average (median), teams comprised four people and spent 49 h per month facilitating the implementation. Dedicated funding was obtained by 30·5% of approaches, however further data were limited here regarding the degree/length/conditions of funding. Those from Scotland and Wales frequently noted that national government provided financial support. Nearly 90% of approaches stated that they had moderate-to strong-senior leadership support.

Most approaches targeted the whole local authority or health services footprint (88·1%). Many also placed concerted efforts on areas of greatest need, particular community groups, or specific geographic locations. The systems approaches were often and intentionally used to address other aligned priorities. For example, 78·0% aimed to benefit the physical activity agenda, 72·9% the food insecurity agenda, and 59·3% and 55·9% the poverty and cost-of-living agendas respectively. On average, the healthy weight systems approaches aligned with five other agendas (further detail in Appendix II).

As for stakeholder involvement, an average of 12 other sectors were engaged per approach (range 0-22 sectors). Most frequently involved were leisure and parks services (86·4%), the voluntary and community sector (86·4%), children's services (83·1%), health care services (78·0%), planning departments (76·3%), and schools (76·3%). Appendix II provides further detail. The public were seldom involved meaningfully, predominantly being *consulted with* (42·4%) rather than *collaborated with* (18·6%). Qualitative data suggest that many thought it was too early to include the public in their approach, and that they did not have the time or funds for thorough public involvement. Instead, many relied on the voluntary and community sector to provide the public voice.

3.1.3. Evaluating the approach

Only 23 approaches (39·0%) had a formal evaluation in place, with 10 being in WSNI. These included process and impact evaluations using

Table 1
Descriptive overview of 59 systems approaches.

	Total ($n = 59$)		England ($n = 45$)		WSNI ($n = 14$)	
Commencement *(n, %)*						
2016-2018	7	12·3%	6	14·0%	1	7·1%
2019-2021	22	38·6%	17	39·5%	5	35·7%
2022-2024	28	49·1%	20	46·5%	8	57·1%
Time spent designing approach (*n*, %)						
Less than 1 year	31	52·5%	21	46·7%	10	71·4%
More than 1 year	20	33·9%	17	37·8%	3	21·4%
Not applicable	8	13·6%	7	15·6%	1	7·1%
Support when designing the approach (*n*, %)						
Guidance used	55	93·2%	41	91·1%	14	100%
Training provided	30	50·8%	17	37·8%	13	92·9%**
External support	33	55·9%	22	48·9%	11	78·6%
Size of co-ordinating team (median, IQR)	4	3 – 6	4	3 – 6	5·5	2·8 – 7·5
Hours per month co-ordinating (median, IQR)	49	15 – 218	35	10 – 268	60	27·5 – 205
Ring-fenced funding (*n*, %)						
Yes	18	30·5%	11	24·4%	7	50·0%
No	41	69·5%	34	75·6%	7	50·0%
Boundaries of the approach (*n*, %)						
Local authority/service footprint	52	88·1%	41	91·1%	11	78·6%
Areas of greatest need	13	22·0%	10	22·2%	3	21·4%
Specific communities	4	6·8%	3	6·7%	1	7·1%
Specific geographic area	10	16·9%	5	11·1%	5	35·7%
Senior leadership commitment (*n*, %)						
Very strong	13	22·0%	8	17·8%	5	35·7%
Moderately strong	39	66·1%	31	68·9%	8	57·1%
Limited	6	10·2%	5	11·1%	1	7·1%
Not applicable	1	1·7%	1	2·2%	0	-
Number of aligned priorities (median, IQR)	5	3 – 7	5	3 – 6	6·5	4·5 – 8·3
Number of sectors involved (median, IQR)	12	9 – 15	12	9 – 15·5	12	9 – 14·3
Public involvement in the approach (*n*, %)						
Leading	0	-	0	-	0	-
Collaborating	11	18·6%	8	17·8%	3	21·4%
Consulting	25	42·4%	22	48·9%	3	21·4%
Not involved	23	39·0%	15	33·3%	8	57·1%
Evaluating the approach (*n*, %)						
Yes	23	39·0%	13	28·9%	10	71·4%*
No	32	54·2%	30	66·7%	2	14·3%
Not applicable	4	6·8%	2	4·4%	2	14·3%

*$p < 0·05$, **$p < 0·01$, difference between England and WSNI.

a range of methods, from interviews ($n = 7$), to ripple effects mapping ($n = 4$), to surveys, focus groups, and maturity matrices ($n = 3$ each). Primary reasons for no evaluation included a lack of capacity ($n = 8$), being too early in the approach ($n = 6$), and the complexity of their systems approach ($n = 3$).

3.2. Maturity of the systems approaches

3.2.1. Maturity across core conditions

Fig. 1 displays the distribution of maturity across the 59 systems approaches, with a mean composite maturity score of 48·7% (±18·3). Maturity scores were higher in England (50·7 ± 16·2%) in contrast to WSNI (42·4 ± 23·2%). Maturity scores ranged from 15·7% to 92·9%, with both approaches located in Scotland.

When assessing maturity across the 10 conditions (maximum score of 7, higher scores represent greater maturity), mean scores ranged from 3·0 ± 1·5 (condition 5; governance) to 4·2 ± 1·9 (condition 1; recognising complexity). Scores between 3 and 4 suggest that the condition was emerging- or becoming established-in practice (see Table 2 for further information).

Maturity scores by condition were consistently, but not significantly, higher for systems approaches in England in contrast to those in WSNI. We did observe a significant difference for condition 9 (addressing the obesogenic environments) which was lower in WSNI (2·5 ± 1·6) compared to England (3·6 ± 1·4).

3.2.2. Factors associated with greater composite maturity

We examined the association between design characteristics of the systems approaches and the composite maturity score (Table 3), for which we hypothesised that a relationship exists (e.g. those who spent more time planning the approach = greater maturity). Continuous variables (size of co-ordinating team, hours per month co-ordinating, number of aligned agendas, and number of sectors involved) were collapsed into binary outcomes to facilitate analyses. The degree of senior leadership commitment was the only factor significantly associated with systems maturity, with univariate analyses determining that this difference was predominantly between "Limited" (mean composite maturity = 40·0 ± 17·2%) and "Very strong" (mean composite maturity = 60·7 ± 20·9%) commitment.

Table 2
Maturity of the systems approach by condition.

	Total ($n = 59$)	England ($n = 45$)	WSNI ($n = 14$)
1. There is a collective recognition across the approach that overweight and obesity are the product of a complex adaptive system	4·22 ± 1·86	4·47 ± 1·79	3·43 ± 1·91
2. The approach has distributed and collective leadership	3·50 ± 1·56	3·56 ± 1·50	3·29 ± 1·77
3. The approach promotes collaboration within and across organisations	3·68 ± 1·66	3·80 ± 1·62	3·29 ± 1·77
4. The approach seeks to build capacity and capability amongst stakeholders involved in the approach	3·27 ± 1·60	3·38 ± 1·57	2·93 ± 1·69
5. The approach has facilitative processes for agile, collaborative working and proportionate, representative governance	3·03 ± 1·54	3·09 ± 1·44	2·86 ± 1·88
6. The approach empowers local people to co-produce and lead initiatives	3·10 ± 1·53	3·29 ± 1·50	2·50 ± 1·51
7. The approach seeks to address inequality and intersectionality	3·56 ± 1·62	3·71 ± 1·47	3·07 ± 2·02
8. The approach promotes a culture and practice which creates a healthier [weight] environment	3·20 ± 1·61	3·36 ± 1·51	2·71 ± 1·86
9. The approach focuses on addressing the environments which influence population health outcomes	3·36 ± 1·54	3·62 ± 1·43	2·50 ± 1·61*
10. The approach emphasises the need for cycles of learning and action	3·20 ± 1·57	3·24 ± 1·42	3·07 ± 2·06

*$p < 0·05$, difference between England and WSNI.

3.3. Facilitators of implementation

Forty-nine areas (83·1%) provided insight as to the facilitators of implementation, with some variation dependent on tertile of maturity

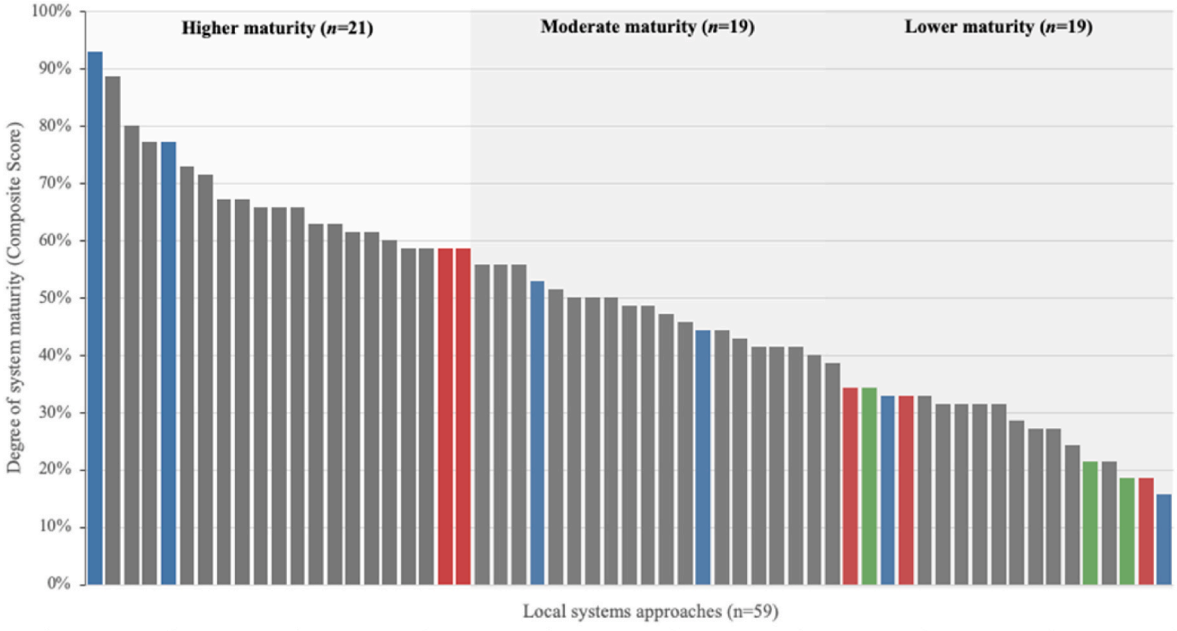

Fig. 1. Maturity across 59 systems approaches (Grey: England, Blue: Scotland, Red: Wales, Green: Northern Ireland).

Table 3
Association between design characteristics of systems approaches and composite maturity score.

Design characteristic	Maturity score (Mean %)	SD
Commencement		
2016-2018 ($n = 7$)	52·86	21·27
2019-2021 ($n = 22$)	53·77	18·65
2022-2024 ($n = 28$)	44·08	16·90
Time spent designing the approach		
Less than 1 year ($n = 31$)	49·45	19·81
More than 1 year ($n = 20$)	48·36	18·25
Not applicable ($n = 8$)	46·96	12·90
Size of co-ordinating team		
<4 people ($n = 28$)	44·85	15·02
≥4 people ($n = 27$)	53·92	20·91
Hours per month co-ordinating		
<32 h ($n = 20$)	45·29	19·17
≥32 h ($n = 28$)	49·90	18·07
Ring-fenced funding		
Yes ($n = 18$)	51·75	17·72
No ($n = 41$)	47·42	18·53
Senior leadership commitment*		
Very strong ($n = 13$)	60·77	20·94
Moderate ($n = 39$)	46·70	15·79
Limited ($n = 6$)	40·00	17·19
Not applicable ($n = 1$)	24·29	
Number of aligned agendas		
<6 agendas ($n = 28$)	49·80	16·83
≥6 agendas ($n = 23$)	53·73	18·36
Number of sectors involved		
<13 sectors ($n = 32$)	48·17	19·43
≥13 sectors ($n = 27$)	49·42	17·08
Public involvement in the approach		
Collaborating ($n = 11$)	50·39	19·01
Consulting ($n = 25$)	48·86	15·41
Not involved ($n = 23$)	47·83	21·27
Evaluating the approach		
Yes ($n = 23$)	48·07	19·59
No ($n = 32$)	52·32	15·98
Not applicable ($n = 4$)	23·93	4·72

*$p < 0·05$, association between senior leadership commitment and maturity score.

being observed. Appendix III presents the full analyses. Codes are italicised within the text. Having *senior leadership* support (e.g. from Chief Executive Officers, Directors, LA Health and Wellbeing Boards, local politicians) was suggested by 20 respondents as imperative, often providing local teams with *dedicated time and resource* to co-ordinate the systems approach (11 references). This was noted amongst respondents from the four UK home nations. Senior leadership support also helped to endorse the approach and thus encouraged other sectors and organisations to engage.

Aligning the systems approach with other initiatives and priorities (e.g. physical activity promotion) supported implementation (10 references). Strategically designing the healthy weight approach to complement the ongoing efforts of others allowed wider organisations and sectors to readily see their place in the system. Three other facilitators were highly interconnected here: *collaboration* (8 references), *cross-sectoral enthusiasm* (7 references) and *careful and tailored communications* (6 references). Notably, collaboration and enthusiasm were more prominent amongst approaches of greater maturity (Appendix III), whilst communication was only cited by those of moderate or low maturity. For some, collaboration was essential to build strong strategic alignment, whilst for others, collaborations evolved from strong and pre-existing networks. Similarly, having support and enthusiasm from stakeholders across sectors both benefitted from, and bolstered, the strategic alignment of the systems approach with wider local priorities. Communication included the framing of the approach (e.g. health improvement rather than obesity prevention) and publicising the approach through a mission and brand.

Other facilitators included having *passionate stakeholders* involved in, and championing, the approach (5 references). Having *guidance* available, such as the Public Health England Whole Systems Approach resource, provided a framework for designing and implementing the approach (5 references). Having *dedicated* funding for personnel or implementation activities, *training* in systems methodologies (e.g. Human Learning Systems) and communication (e.g. Building Blocks of Health), and on-hand *expertise* within the LA each supported a systems approach.

3.4. Barriers to implementation

Fifty respondents (84·7%) provided insight as to the barriers experienced when designing or implementing a systems approach, with some notable differences between maturity tertiles. The three main barriers – 1) *capacity to implement*, 2) funding *to* support *implementation*, and 3) *competing priorities* – are highly entwined, and were experienced more so amongst approaches of high- and moderate-maturity (Appendix III). The main challenge was having the *capacity* to set up, govern, manage, and monitor the systems approach in a meaningful manner (24 references). Whilst public health teams often led the systems approach, the healthy weight agenda was one of many *competing priorities* (17 references), meaning that staff members were also responsible for other public health issues (e.g. substance misuse, smoking cessation, physical activity). As aforementioned, 55·9% had designated funding to support implementation, and thus, a lack of funding was raised as a barrier by 17 areas. The absence of funding – for many – had a direct impact upon the capacity of stakeholders to engage meaningfully in the approach.

Many other barriers, although less frequently noted, influenced people's capacity to implement a systems approach. Ten areas noted that *organisational and staff restructures* meant that key personnel, their knowledge, and their networks were lost throughout the implementation period (observed more so in moderate- and low-maturity approaches). This often included – and was particularly pertinent regarding – changes to leadership. Similarly, the gap between the current and desired *governance* structures (9 references) within local areas meant that it was challenging for organisations to engage in, or be accountable for, aspects of the systems approach. For example, several respondents alluded to the rigidity of, and being held accountable to, Health and Wellbeing Boards (or Health Boards). For approaches of moderate-to high-maturity, a key challenge related to *working systemically* (8 references). Respondents highlighted the historic and deeply ingrained reliance on individual-level behaviour change interventions, and that a systems approach, required a different way of thinking and acting. Encouraging stakeholders and leadership to adopt this mindset was arduous. On the contrary, low- and moderate-maturity approaches often mentioned that wider stakeholders were *unable to see their role* (8 references) in how they could contribute towards the healthy weight agenda. For many of these challenges, stakeholders stated that significant *time is required to build new, strong, and cross-sectoral relationships* (6 references), and that this was not easy to achieve within the current local government and public health landscape.

3.5. Future support requirements

Forty-five respondents (76·3%) identified the types of support needed to strengthen their systems approach (Appendix III). Regardless of maturity, 13 requested assistance with how to *meaningfully monitor and evaluate* their work, preferably through an accessible evaluation framework. A *Community of Practice* (13 references) was called for predominantly by moderate-to low-maturity approaches to provide a forum for discussion and learning, whereas *case study exemplars* (11 references) were often requested by approaches of higher maturity to identify additional actions for strengthening the local healthy weight agenda. *National leadership* and support was often referenced (n = 12) to ensure coherence between local and national efforts. This would/should also influence how *resources and* funding *are allocated* at the local level (11

references), subsequently helping to create capacity within local teams to implement the approach.

Other requirements included having *external* support (7 references), particularly with more academic elements such as systems mapping and evaluation, having *evidence around [cost] effectiveness* and impact of local systems approaches (5 references), and help with *engaging – and maintaining engagement of – senior leaders* (5 references). All three requests were largely made by those delivering high- or moderate-maturity approaches. Conversely, three approaches of low maturity asked for support in *systems leadership;* either for the core implementation team or for those in leadership positions in wider sectors.

4. Discussion

The Academy of Medical Sciences and the Canadian Academy of Health Sciences called for more evidence on systems-based approaches in public health (Jebb et al., 2021). This study responds directly to that call by providing an overview of the design, implementation, and evaluation of systems approaches for obesity prevention in the UK. We found clear evidence of the adoption of these approaches, which were used to galvanise multi-sectoral support and grapple with the complexity of population-level overweight and obesity at the local level. We also noted substantial variation, within and across nations, in how their systems approaches were operationalisation and in their associated maturity. There are clear challenges facing, and opportunities for, the future advancement of systems approaches.

The most prominent finding was the importance of senior leadership support (not involvement per se) in a systems approach. Although others have highlighted the need for such leadership (Baugh Littlejohns and Wilson, 2019; Bagnall et al., 2019; Bigland et al., 2020; Luna Pinzon et al., 2025), our study provides much needed detail on its function within a systems approach. The qualitative data identified that senior leadership could unlock dedicated time and resource for their teams to engage meaningfully in the systems approach. Conversely, insufficient time and resource, along with competing priorities, were noted as key barriers to implementation – all of which fall within the scope of senior leaders to manage. When momentum in a systems approach was lost, several areas stated that this was due to changing leadership within their organisation. Whilst this study focused on the local setting, there were strong calls amongst respondents for greater national leadership to ensure that local efforts are bolstered by a coherent, equitable, and cross-government approach. To achieve this, previous work suggests that robust evidence on the holistic effectiveness of systems approaches is required to build – and maintain – the buy-in of senior leadership (Jebb et al., 2021; Bird et al., 2022; Brown et al., 2022). Further support is also required to create and adopt an evaluation framework, thereby increasing the volume of local systems approaches being evaluated given that less than 40% are currently doing so (Jebb et al., 2021; Rutter et al., 2017).

The local systems approaches were, by and large, intentionally designed to address other associated complex societal issues simultaneously (e.g. physical inactivity, food insecurity, cost-of-living crises). The qualitative data revealed that this alignment enabled other organisations and sectors to see their place in the system, and moreover, how the systems approach would benefit their own priorities. Across the 59 approaches, 12 other sectors – on average – were involved. This speaks to both the syndemic nature of complex societal issues (Swinburn et al., 2019), driven and exacerbated by underlying social and economic factors, and the potential for single actions to address several issues concurrently, often referred to as double- and triple-duty actions (Swinburn et al., 2019). Whilst data were not collected on specific actions, the engagement of multiple sectors and the intentional design to address several societal issues concurrently demonstrates a clear shift away from historically siloed working. Future research should examine how actions within a systems approach are implemented, and how they work in tandem with other actions to create health promoting places for people to live.

Whilst very few design characteristics were associated with higher maturity scores (aside leadership), the variation across the 10 maturity conditions paints a nuanced picture. The approaches in England consistently had higher scores than those from WSNI, although our data do not indicate why this may be the case. Going deeper into the conditions, most recognised the complex adaptive nature of obesity (condition 1, mean score 4·22) yet scored lower on their ability to address the environments that people live in (condition 9, mean score 3·36). Thus, although stakeholders may understand the complexity of the issue, intervening in this complexity is difficult – again, corroborated by others (Nobles et al., 2019; Blackman et al., 2012). The lowest mean score was observed for condition 5, having facilitative processes for collaboration and proportionate governance. This is unsurprising given that organisations and sectors have traditionally operated independently. Our qualitative data provide further depth by highlighting a gap between the current governance and that which is perceived as required for a systems approach. As a result, several areas called for additional training in systems leadership; leadership found to be essential when addressing other complex public health issues (Bigland et al., 2020). Transferring and refining the Systems Maturity Matrix has proven useful in ascertaining how and where systems approaches can be strengthened. As a next step, it would be helpful to examine the practices of areas who provide evidence for, and score highly in, systems maturity. Moreover, research is needed to determine whether systems maturity contributes to longer-term changes in the obesogenic environment.

4.1. Strengths and limitations

This work has several caveats. Thirty-eight of the 59 responses (64·4%) were completed by an individual rather than a group. Although likely that these individuals were central to implementation, we do not have data to corroborate this. Notwithstanding this, the responses may have differed at the local level if completed by a team rather than an individual, and so there is the potential for positive response bias in this study. Adding to the previous limitation, 70/178 (39·3%) of local public health teams completed the survey, which again has the potential to compound bias in our results. Despite this, engaging public health teams in the current public sector context is difficult, and achieving a ~40% response rate without a freedom of information request reflects the extensive dissemination efforts. Moreover, the survey also captured a commensurate response from the four nations, and only due to the lower number of public health teams in WSNI were their data combined. With regards to system maturity, both at the condition and composite levels, we do not know whether that is associated with more favourable outcomes, however effectiveness be defined, but further work is underway by the lead developer (KS). We also developed the Systems Approach Survey – with extensive input and piloting from local public health teams – which is now available for other areas and countries to test, modify and use. Collectively, this would build the evidence base and facilitate a more comprehensive understanding of the value of systems approaches.

5. Conclusion

The historic literature on systems approaches has largely been limited to calls to action, position papers, modelling studies, and process evaluations. This study provides unique insight to the realities of designing, implementing, and evaluating a systems approach within a local public health context, capturing the perspectives of 59 areas in the UK. Whilst many of these approaches are still in the early phases of implementation – particularly in WSNI – our results demonstrate their ability to engage multiple sectors, to address numerous complex social issues simultaneously, and to do so within the current public sector climate. The importance of senior leadership to facilitate a systems approach cannot be overstated. Sufficient time to implement and mature

a systems approach is needed, given that they represent a fundamental departure from previous ways of working, not across one, but many sectors and organisations.

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CRediT authorship contribution statement

J. Nobles: Conceptualization, Formal analysis, Methodology, Project administration, Writing – original draft, Writing – review & editing. **L. Livsey:** Formal analysis, Methodology, Writing – original draft, Writing – review & editing. **S. Beecroft:** Formal analysis, Methodology, Writing – original draft, Writing – review & editing. **D. Radley:** Conceptualization, Methodology, Writing – review & editing. **C. Griffiths:** Conceptualization, Methodology, Writing – review & editing. **L. Ells:** Conceptualization, Methodology, Writing – review & editing. **K. Shearn:** Conceptualization, Methodology, Writing – review & editing. **M. Hobbs:** Formal analysis, Methodology, Writing – original draft, Writing – review & editing. **A. Potts:** Formal analysis, Methodology, Writing – original draft, Writing – review & editing.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.healthplace.2026.103661.

Data availability

The authors do not have permission to share data.

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