NIHR134419: An Evaluation of 'Healthy Weight Tayside', a whole system approach to child healthy weight in Dundee City. Protocol Version 2, January 2022

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Abstract: This protocol sets out our PHIRST team's methodological approach to the evaluation of Healthy Weight Tayside, a whole systems approach (WSA) to child healthy weight in Dundee City. We opted for a developmental evaluation that uses participatory approaches, in particular peer researchers and action learning sets, to learn from the experience of initiating a WSA to childhood obesity in Dundee in order to apply that learning when rolling out to the two other local authorities in the region. Therefore, various Knowledge Mobilisation approaches (KM) are built in throughout this protocol. The evaluation will be premised on outcomes and research questions identified through the Evaluability Assessment (EA). The findings of the evaluation will provide Dundee with an understanding of how different stakeholders perceive their roles, knowledge and engagement within the WSA approach, shaped by co-production activities with local communities, and what they can do in relation to actions at different levels within the system for children, young people and families. This will help inform decision making around future development of the WSA approach in Dundee. The evaluation will also contain recommendations for how to apply and adapt this approach to other local authorities in Tayside.

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1. Overview of the intervention to be evaluated and contextual information

In 2017 the Tayside Regional Improvement Collaborative (TRIC) published the Tayside Plan for Children Young People and Families (2017-2020) with a pledge to develop a child healthy weight strategy. In Tayside, one in five Primary 1 (school entry) children is classified as overweight or obese and the proportion increases as deprivation increases. Children and young people growing up in our most deprived communities are twice as likely to live with obesity compared to their peers in the most affluent areas and, are more likely to continue living with obesity into adulthood.

Obesity is a complex and multi-factorial disease with genetic, behavioural, socioeconomic, and environmental origins. Prevention requires sustained and systemic action and buy-in from a wide range of stakeholders to enable partners to work differently and test new approaches. Many positive actions are already being delivered by local authorities and partners to help children to eat well, drink well and be active - improving health and wellbeing. TRIC plan to build on, support and strengthen this work by applying a Whole Systems Approach (WSA) so that they can go further and faster to realise their vision - for every child in Tayside to grow up in a community and an environment that supports them to feel great and ready to learn so that they can achieve optimum health and flourish to the best of their abilities.

Instigating a whole systems approach across Dundee City will enable communities to take forward key local actions related to 'Healthy Weight Tayside'. TRIC want to learn from experiences in Dundee City and then progress to Angus and Perth & Kinross. Tayside's commitment by 2030 is to halve the proportion of Tayside's children affected by obesity and, to reduce the healthy weight inequality between the most and least disadvantaged communities.

The child healthy weight strategy was co-produced by engaging extensively with c.1,500 people in Tayside during 2019/20 and is informed by the local community-based assets approach 'Eat, Play, Learn Well'. It is also informed by learning from the Early Adopter work in Dundee City as they implement the Scottish Government's Diet & Healthy Weight Delivery Plan. This work benefits from support from Public Health Scotland, Obesity Action Scotland and Leeds Beckett University in applying the PHE Whole Systems Approach to Obesity Guide.

The child healthy weight strategy identifies five ambitions i.e. 1) child healthy weight is seen as a society wide issue; 2) children have the best start in life; 3) our environment supports healthier choices; 4) families get helpful weight management support; 5) families and communities that are most in need are our main concern. These ambitions include interconnected calls to action, which Tayside believe are needed in their journey to becoming a place that supports the health and wellbeing of children, young people and

families. Together, they have the potential to shift the whole system to help children and young people growing up in the three local authority areas to eat well, drink well, be active and have a healthy weight.

2. Review of existing evidence

We conducted a rapid scoping review of the literature on whole system approaches relating to healthy weight strategies and schemes (see Appendix 1). The primary aim was to identify and evidence theory and outcomes from such schemes alongside their impacts. The overarching question guiding the literature scoping was 'What can be learnt from previous/existing strategies/schemes which address healthy weight by taking a whole systems approach?'

A number of papers and reports purposively selected by the project group provided the initial focus of the literature scoping. These papers were reviewed, and data was extracted in response to the key thematic areas (Brief overview of paper/report; Overview of strategy/scheme; What did the systems approach consist of?; How and why was a systems approach used?; How have/have systems changed as a result?; Detail of any evaluation conducted on scheme/strategy; Impact of the scheme/strategy; How is impact shown – short/medium/long term critical success factors; Training and development).

Following the review of purposively selected papers, a developmental approach to literature searching was used based on key terms emerging from the initial papers and sourcing relevant reference lists of included papers, along with forward citation tracking.

The most significant paper which informed this developmental approach to literature searching was Bagnall et al. (2019) systematic review of whole systems approaches to obesity and other complex public health challenges. Key findings from this paper have been used to supplement individual scheme/strategy level data from four examples of system-based programmes identified through the literature scope (Change4Life; Be Active Eat Well intervention program; Healthy Living Cambridge Kids (HLCK); Whole of Systems Trial of Prevention Strategies for Childhood Obesity (WHOSTOPS).

As highlighted by Bagnall et al. (2019) and derived from the papers reviewed in this literature scoping, there generally appears to be a lack of detail with regards to the reporting of interventions and approaches relating to whole systems approaches.

2.1 Ten features of a WSA to tackle obesity

Bagnall et al (2019) describe ten features of a whole systems approach to tackle obesity and state that initiative which have these features are more likely to be successful than initiatives that do not adopt these principles. These features have been explored in the initiatives identified within this literature scope.

1. Identifying a system
2. Capacity building
3. Creativity and innovation
4. Relationships
5. Engagement
6. Communication
7. Embedded action and policies
8. Robust and sustainable

9. Facilitative leadership
10. Monitoring and evaluation

Through their systematic review, Bagnall et al (2019) identify the following facilitators to whole systems approaches:

- Strong leadership and full engagement of all partners
- Engaging the local community
- Time to build relationships, trust and community
- Capacity
- Good governance and shared values
- Appropriate partnerships to create sustainable multilevel environmental change
- Consistency in language used across organisations
- Embedding initiatives within a broader policy context
- Local evaluations
- Sufficient financial support and resources

Impacts reported from the approaches taken varied but generally point to a better understanding: of the context of the intervention, which can result in a better targeting; of interconnections (direct and feedback), which may shift the nature of the intervention; of deeper system insights highlighting the importance of social networks, the information that flows through them, and the characteristics of people within them (Hennessy, 2019).

2.2. Evaluation of existing programmes

Most of the initiatives reviewed detailed some kind of evaluation. Be Active Eat Well used a quasi-experimental, longitudinal design in order to detail change in behaviours of children as a result of the initiative (Sanigorski et al., 2008). The Central California regional obesity prevention program (CCROPP) included evaluation measures to understand progress on a variety of the indicators reflected in their local and regional logic models which were developed by the evaluation team (Schwarte et al., 2010). Due to its size, Change4Life used tracking studies to understand reach and impact of the campaign (Department for Health, 2010 & Copeland et al., 2011). Healthy Living Cambridge Kids (HLCK) used a baseline and follow-up (3 years later) evaluation design in order to assess change in children's weight and fitness status (Chomitz et al., 2010).

In addition, relevant methods were identified from an Australian and American study. Jenkins et al (2020) conducted a process evaluation of a whole-of-community systems approach to address childhood obesity in western Victoria, Australia, using semi-structured interviews with steering group members and community task team members. They collected data using open ended interview questions to gather in-depth information regarding programme implementation, and the individual attitudes, beliefs and experiences of key stakeholders.

They analysed their data under three key themes: collective impact, systems thinking and asset-based community development (ABCD). Participants offered perceptions of significant events; factors positively and negatively affecting the process; reasons for becoming involved in the process; perceived efficacy of task teams, principles of diversity and areas of

concern. Their results highlighted that collective impact was a crucial element in applying the systems thinking. Strong and equitable relationships between steering organisations and topic experts provided the initiative with a sustainable foundation, and ABCD promoted community ownership and future sustainability.

Jenkins et al. (2020) identify three implications for future practice which should influence systems thinking:

1. Ensure all steering group organisations have shared understanding over ownership of the process and an appropriate level of readiness and high willingness to communicate openly as part of a collaborative
2. Engage community members first through assets they provide for community action, not agencies or organisations they represent
3. Utilise existing relationships between organisations, employees and community members to enhance engagement

The second study involved the validation and refinement of the Stakeholder-driven Community Diffusion Survey for childhood obesity prevention (see Appendix 2), conducted by Korn et al (2021). Questions in the survey were framed by the COMPACT Stakeholder-driven Community Diffusion theory, which posits that stakeholders' knowledge of childhood obesity prevention efforts and engagement with the issue contribute to successful intervention implementation. The authors developed and tested a survey with 23 knowledge items across four domains (intervention factors, roles and resources, sustainability, and problem) and 23 engagement items across five domains (dialogue & mutual learning, flexibility, influence & power, leadership, and trust). Their findings demonstrate that all scales had adequate fit (the different items worked well together) and strong item factor loadings on the nine domains (most >0.7 and all >0.5; meaning that the included items measured the domains well), with subscales having high internal scale consistency (the survey actually measured what we want them to measure). Knowledge intraclass correlation coefficients (ICCs) for test-retest agreement of subscale scores ranged from 0.50 to 0.96, suggesting that scores remain consistent over brief periods of time). Components from both methods will be applied in the research design (WP) outlined below.

3. Evaluation Aim and Objectives

Building on the insights of the scoping review and distilled from the Evaluability Assessment Workshops (see section 5), we propose the following overarching aim and research questions for the evaluation.

Aim: to learn from the experience of initiating a WSA to childhood obesity in Dundee and apply that learning when rolling out to the two other local authorities in the region.

Research questions

1. Does the approach taken in Dundee support key stakeholders to recognise what they can do in relation to actions at different levels within the system?
2. How do/ can co-produced activities (e.g. with children, vulnerable communities) shape this approach?

3. What adaptations to the approach taken in Dundee would be required over time to connect this approach to other 'systems' (e.g. Mental Health) and implement this approach in other Local Authorities in Tayside?

4. Data

Available data for the evaluation, suggested by EAW participants, include strategic documents and reports on the WSA in Dundee, population demographic data, PHS data on infant feeding, weaning and developmental outcomes, the Child Health and Wellbeing Census, and Engage Dundee 2021 survey results, which we will consider as part of the scoping work for the research. The Directorate of Public Health in NHS Tayside can also provide data from their health intelligence team on supplementary analysis of locality profiles, if required.

5. Methods

5.1: Co-production activity

We have used evaluability assessment methods (Leviton, 2010; Craig and Campbell, 2015) to develop the evaluation design. Evaluability assessment is a rapid, systematic, and collaborative way of deciding whether and how a programme or policy can be evaluated, and at what potential cost. We conducted three evaluability assessment workshops with stakeholders in Dundee (see Appendix 3). In the first two evaluability assessment sessions we co-produced a draft logic model for the WSA in Dundee. In the third and final session, we simplified this logic model to focus on system-level issues. Based on this simplified model, we co-produced the key evaluation questions and inventoried data/evidence sources for an evaluation design.

Workshop participants (n=36) included representation from a wide range of disciplines within third sector organisations, Local Authorities and NHS departments between May and October 2021. We allowed the workshop format to evolve to take account of feedback from preceding workshops, and to enable stakeholders to shape the approach to evaluation. After the second workshop in June 2021, we agreed with stakeholders to delay a third workshop until October 2021, to enable the team in Dundee to run an additional action planning session with their network that is involved in implementing the WSA. Our approach to evaluability assessment is underpinned by the principle of understanding change from diverse perspectives. This provides opportunities for co-production and knowledge mobilisation, which emerged or were clarified in the evaluability assessment workshops. These opportunities relate to four of the six NIHR School for Public Health Research knowledge-sharing principles (School for Public Health Research, 2018).

<u>Principle 1: clarify purpose and knowledge-sharing goals</u>

During the evaluation, we aim to share knowledge by working towards *co-production* to provide evidence and insight for a range of stakeholders. The evaluation will support work by local commissioners to develop the WSA approach in Dundee and other local authorities. We are working to achieve our knowledge-sharing aim in a number of ways (see below and section 8).

Principle 2: identify knowledge users

The people who would shape/ connect services as part of the WSA approach in Dundee were among those identified by workshop participants as a key audience for the outputs from the evaluation. People who shape/ connect services will be a key informant group and active participants in the research process. Other key knowledge users identified in the workshops included community representatives, who will be included in work packages 2 and 3 (see section 5.3) to ensure their voice is heard in the development and implementation of the WSA, along with the Scottish Government, funders, and other local authorities. Local people from communities who have traditionally been underrepresented in research are those who would benefit most from knowledge exchange and impactful interventions. Particular effort will be made to include the views of children and young people in the research.

Principle 3: design the research to incorporate the expertise of knowledge users

The research design has been agreed with local stakeholders. During the EA process, local stakeholders pointed to the importance of involving key stakeholders in co-producing the research, by acting as peer researchers, working alongside the research team and conducting additional interviews. A participatory approach, involving key stakeholders and ordinary members of the community to generate in-depth and contextual data has potential to include 'hard-to-reach' participants. Young people's views will be collected by stakeholders in their peer researcher roles and young people from local communities will be invited to share their expertise through the online survey. The action learning sets provide further opportunity for stakeholders, including community representatives, to shape the recommendations and future development of WSA in Dundee and other Tayside Local Authorities.

In addition, we propose to bring together an advisory group of senior stakeholders (n=10) across Tayside with an interest in the WSA to child healthy weight, including a representative from the national WSA evaluation group and a representative from PHIRST Central, who are conducting a similar evaluation on WSA to obesity (commissioned separately for their own stakeholders). To avoid duplication of governance structures, we will utilise the core working group in Dundee as an initial sounding board and advisory group for the evaluation and invite additional members to join meetings where relevant and useful, in line with the dynamic nature of this group. Members of the core working group are already linked into the Tayside Regional Improvement Collaborative (TRIC) and will update this Collaborative in their regular meetings and reporting process on evaluation progress and share any feedback with the advisory group. These feedback meetings will help to sense check emerging findings between work packages.

Principle 4: agree expectations

We are in discussion with local and regional knowledge users about options for increasing the usefulness and accessibility of knowledge co-produced in the project, and to support implementation of findings in the development and implementation of the WSA. The outcome of these discussions will be reflected in a knowledge mobilisation plan, elements of which are outlined in the outputs section below. An important component of this plan

will be managing expectations of stakeholders to encourage their involvement as peer researchers, by clearly communicating the opportunities that the research presents for adding their expert voice to the evaluation, build their research skills and contribute to action plans in Dundee and other WSA in Tayside.

5.2 Participatory Evaluation

The evaluation of the WSA approach to childhood obesity developed in Dundee is most suited to a Participatory Ethnographic Evaluation and Research (PEER). PEER involves members of a community (stakeholders leading on the development of the approach) being trained to carry out in-depth conversational interviews with colleagues in their social networks. This approach can generate rich insights from a range of stakeholders on how they perceive their role and ability to engage at different levels of the system.

The method is based on the principle that in-depth interviews of a small sample of people can yield more information on experiences and perspectives than interviewing a larger sample of people once or twice only. Interviewees are encouraged to talk about "other people like themselves" and are not asked to name individuals or provide personal information. Without acknowledging that they are talking about themselves, interviewees will often refer to their own experiences and perspectives due to the conversational approach of the interview.

PEER has been used in a wide variety of settings and in countries across the world (Price & Hawkins, 2002), including the UK (Oguntoye et al, 2009). PEER researchers will need to be trained to do research.

5.3 Work packages

The evaluation research will consist of four work packages to facilitate the PEER activities, which build on each other to reflect on various stakeholders' perceptions of the their role within the developing WSA to childhood obesity in Dundee, in order to inform future adaptations of the model and application to other local authorities in Tayside.

WP1: semi-structured interviews with key stakeholders from the working group (n=5-8).

Semi-structured Interviews will be conducted with a sample of key stakeholders involved in the governance structure of the WSA in Dundee regarding WSA development, implementation, and their individual attitudes, beliefs and experiences. Building on Jenkins et al (2020), interviews will focus on perceptions of significant events; factors positively and negatively affecting the development and implementation process; reasons for becoming involved in the process; perceived efficacy of task teams, principles of diversity and areas of concern. Where possible, we will build on insights from the national evaluation, adding depth and a local perspective to their findings. The make-up of the core working group is not fixed and may evolve over time to reflect the actions identified as part of the WSA and therefore we will be flexible in our recruitment of stakeholders over time.

WP2: Participatory Ethnographic Evaluation and Research (PEER)
Key stakeholders (n=5) interviewed in WP1, and others who might be interested, will be offered the opportunity and receive training to become peer researchers in the project.

As peer researchers, they will observe and interview wider stakeholders in their social networks about role perceptions in the WSA/ developed system map and their understanding of what they can do in relation to actions at different levels within the system. For example, how do they define the capacity they (their team and/or organisation) have in effecting system change related to child healthy weight in Dundee?

Key stakeholder will be encouraged and trained to use creative methods for these interviews and observations, such as photo-elicitation and walking interviews. Training will consist of a one-day participatory workshop two months in advance, potentially aligned with a scheduled core working group meeting, whereby materials for data collection (such as interview topic guides and questions) will be developed. Keeping time commitments feasible and flexible will be a crucial part of the training for and scheduling of peer activities.

Each key stakeholder will engage on average with three other stakeholders in their network (n=15). Where possible, this will include relevant community representatives and children and young people to explore local strategies & key messages with stakeholders to support the system-level. We will explore opportunities for this with the core working group in Dundee, utilising existing links to schools. Community representatives (n=5) could be sampled from action planning groups on priority topics identified in the system mapping, e.g. green Streets/ Safe streets, Educational settings/ PA, Planning & Licensing, Diet and Cooking.

Peer researchers will be selected and recruited by Dundee WSA Governance Team in conjunction with the target population. Researchers do not need to have a high level of literacy.

WP3: Survey among wider group of stakeholders, including community members (n=100 approximately, TBC by sample calculations)
Based on insights from the key stakeholder interviews (WP1) and PEER activities (WP2), an online survey will be conducted, which is modelled on the Stakeholder-driven Community Diffusion Survey for childhood obesity prevention validated and refined by Korn et al (2021). The survey will be adapted and tailored to key themes emerging from WP1 and 2 to sense check and deepen findings, related to stakeholders' knowledge and engagement with the WSA approach in Dundee. We will also ensure that the language and content of the survey is relevant and accessible for community representatives. The survey will allow for an assessment of the current WSA approach on successful development and implementation in Dundee and could be used in future iterations to collect follow-up data on longer-term impact and change within the WSA to childhood obesity in Dundee and across Tayside by comparing data between Local Authorities. Dundee's WSA stakeholder list (which includes staff across different LA departments, NHS staff, policy makers and commissioners, and voluntary and community sector organisations) and data from their network analysis tool will be used to circulate the survey widely across the system.

WP4: Action learning sets with key stakeholders across the 3 Tayside LAs (n=15)
The survey data will identify opportunities for future development of the WSA approach in Dundee, including the identification of intervention sweet-spots, based on current knowledge and engagement gaps across stakeholders at various levels in the system. Findings from the stakeholder interviews will also identify learning and best practice across the system to inform recommendations for future development and adaptation. To sense check key lessons, identify what adaptations are required to reflect the system change over time and explore scalability of approach taken in Dundee to other Local Authorities in Tayside, one (or more) online action learning sets (ALS) will be organised with key stakeholders, including community representatives.

ALS bring together a group of approximately 15 stakeholders, including public health & social care commissioners, front-line practitioners, third-sector representatives, service users and local academics to reflect on the evaluation findings from the three Local Authorities in Tayside (5 representatives from each). Stakeholders will be identified from previous work packages and in conversation with relevant networks, such as the Tayside Regional Improvement Collaborative.

Using deliberative dialogue (Escobar et al. 2013), including structured questioning and reflection, over a series (n=3-4) of online workshops, participants will explore the evaluation findings and agree recommendations. By applying this approach, the ALS aims to help mobilise the evaluation findings (and other forms of knowledge within the WSA) across the Local Authorities on effective development and implementation of the approach by collectively agreeing action plans in their context for future development. This could include exploring opportunities and strategies for further community engagement and co-production of activities within the WSA to childhood obesity. Where possible, we will try to align the format of the ALS to the WSA development approach taken in the three Local Authorities to ensure that action planning is relevant to the phase of the PHE guidance that these areas are in at the time of the ALS.

6. Data Management Plan

We are developing a framework to evaluate knowledge mobilisation activities, in line with the NIHR School for Public Health Research (SPHR) knowledge-sharing principle 5, 'monitor, reflect, be responsive' (School for Public Health Research 2018). This might involve a contribution analysis methodology. These initial ideas will be worked through with stakeholders, including the embedded practitioner in Dundee. The aim will be to assess how far knowledge mobilisation activities contribute to a legacy in Dundee and more widely in Tayside (SPHR knowledge-sharing principle 6). More details on our data management are available in our ethics application.

7. Ethics

Ethical approval will be sought from Teesside University School of Health and Life Sciences Ethics Committee.

8. Timeline

Timing of fieldwork will depend on when we obtain ethical approval. The timetable below is based on the assumption that this is no later than 31 December 2021. We will endeavour to these key milestones to Dundee's and other Tayside Local Authorities WSA timelines. Key milestones are:

Milestone	**Date**
Ethics approval	31 December 2021
WP1 completed	28 February 2022
WP2 completed	30 May 2022
WP3 completed	31 August 2022
Analysis completed	30 September 2022
WP4 completed	31 October 2022
Write up of findings/ draft final report	November 2022

NHS Tayside have 3 undergraduate students starting placements or honours projects with them in January 2022 and will try to align the work packages to these placements to provide additional capacity for the research and develop research skills of students on placements.

9. Outputs

Proposed outputs include a full report, a summary of recommendations and a one-page lay summary, although we will continue to work with local stakeholders to ensure outputs reflect their needs. In discussion with stakeholders, we are currently exploring possibilities for mobilising knowledge with different knowledge user groups, including Tayside Local Authorities, community representatives, and local communities. An initial knowledge mobilisation plan will be agreed with local stakeholders and will be adapted to reflect changes as the project develops.

We are developing a framework to evaluate knowledge mobilisation activities, which might involve a contribution analysis methodology. This will be developed during the project. It might involve a range of possible data collection and analysis methods, including interviews with local stakeholders and analysis of documents and plans. We may look to use some of this data in publications. If required, we will seek additional ethical clearance once our preferred approach is finalised.

The ALS will generate specific action plan outlines for each Local Authority to further develop the WSA in their area, as part of a coordinated approach across the region. Evaluation findings will also be made available in accessible briefs, blogs and potentially

podcasts, which will be posted on the NIHR PHIRST website. Intermediate outputs could include specific events, such as community or school-based events showcasing some of the outputs and discussions with different stakeholders, potentially including the proposed advisory board, to sense-check and to promote findings and recommendations. The aim is for these interactions to provide opportunities for different stakeholder groups to further influence the research and identify additional options for mobilising knowledge in and from the project.

We will also make good use of existing dissemination mechanisms in Tayside, such as quarterly newsletters to update stakeholders on progress, social media account (Twitter) and links with schools.

10. References

Allender, S, Brown, A, Bolton, K, Fraser, P, Lowe, J & Hovmand, P (2018) Translating systems thinking into practice for community action on childhood obesity. Obesity Reviews. 2019;20(S2):179–184. https://doi.org/10.1111/obr.12865

Bagnall, A, Radley, D, Jones, R, Gately, P, Nobles, J, Van Dijk, M, Blackshaw, J, Montel, S & Sahota, P (2019) Whole systems approaches to obesity and other complex public health challenges: a systematic review. BMC Public Health 19:8 https://doi.org/10.1186/s12889-018-6274-z

Chomitz VR, McGowan RJ, Wendel JM, Williams SA, Cabral HJ, King SE, Olcott DB, Cappello M, Breen S, Hacker KA. Healthy living Cambridge kids: a community-based participatory effort to promote healthy weight and fitness. Obesity. 2010;18(1):s45–53.

Copeland R, Moullin M, Reece L, Gibson D, Barrett D. Sheffield's Let's Change4Life: a whole systems approach to tackling overweight and obesity in children, young people and families. A local evaluation report. Sheffield: Sheffield Hallam University; 2011.

Craig P, Campbell M. Evaluability Assessment: a systematic approach to deciding whether and how to evaluate programmes and policies. 2015.

Department Of Health: Change4life: one year on; 2010 https://webarchive.nationalarchives.gov.uk/ukgwa/20130107105354/http:/www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/@dh/@en/documents/digitalasset/dh_115511.pdf

Escobar O. (2013) Upstream public engagement, downstream policy-making? The Brain Imaging Dialogue as a community of inquiry. Science and Public Policy.

Foster-Fishman, P, Nowell, B & Yang, H (2007) Putting the system back into systems change: a framework for understanding and changing organizational and community systems. American Journal of Psychology 39:197-215 DOI 10.1007/s10464-007-9109-0

Hennessy, E, Korn, A & Economos, C (2019) Using Systems Approaches to Catalyze Whole-of-Community Childhood Obesity Prevention Efforts. The Chicago Council on Global Affairs

Jenkins, E, Lowe, J, Allender, S & Bolton, K (2020) Process evaluation of a whole-of community systems approach to address childhood obesity in western Victoria, Australia. BMC Public Health 20:450 https://doi.org/10.1186/s12889-020-08576-x

Johnson BA, Kremer PJ, Swinburn BA, de Silva-Sanigorski AM. Multilevel analysis of the be active eat well intervention: environmental and behavioural influences on reductions in child obesity risk. International Journal of Obesity. 2012;36:901–7.

Korn AR, Appel J, Hammond RA, Hennessy E, Mâsse LC, Must A, Economos CD. Validation and refinement of the Stakeholder-driven Community Diffusion Survey for childhood obesity prevention. Implementation Science. 2021 Dec;16(1):1-3.

Leviton LC, Khan LK, Rog D, Dawkins N, Cotton D. Evaluability assessment to improve public health policies, programs, and practices. Annu Rev Public Health. 2010;31:213-33.7.

Oguntoye S, Otoo-Oyortey N, Hemmings J, Norman K, Hussein E. "FGM is with us Everyday" Women and Girls Speak out about Female Genital Mutilation in the UK. World Academy of Science, Engineering and Technology. 2009;54.

Price N, Hawkins K. Researching sexual and reproductive behaviour: a peer ethnographic approach. Soc Sci Med. 2002;55(8):1325-36.21.

Sanigorski AM, Bell AC, Kremer PJ, Cuttler R, Swinburn BA. Reducing unhealthy weight gain in children through community capacity-building: results of a quasi-experimental intervention program, Be Active Eat Well. Int J Obes. 2008;32:1060–7.

Schwarte L, Samuels SE, Capitman J, Ruwe M, Boyle M, Flores G. The Central California regional obesity prevention program: changing nutrition and physical activity environments in California's heartland. American Journal of Public Health. 2010;100:2124–8.

Thesis, D & White, M (2021) Is Obesity Policy in England Fit for Purpose? Analysis of Government Strategies and Policies, 1992–2020. The Milbank Quarterly, Vol. 99, No. 1, 2021 (pp. 126-170)

Wilkinson, H, Penn, A & Barbrook-Johnson, P (2021) Building a system-based Theory of Change using Participatory Systems Mapping. Evaluation 27(1) 80-101 DOI: 10.1177/1356389020980493

11. Appendices

Appendix 1. A rapid scoping review of the literature on whole system approaches relating to healthy weight strategies and schemes

Appendix 2. Stakeholder-driven Community Diffusion Survey for childhood obesity prevention (Korn et al, 2021)

Appendix 3. Final report of Evaluability Assessment Workshops with stakeholders in Dundee (May-October 2021)

Appendix 4. Dundee's, Angus's and P&K's Whole System Approach to Child Healthy Weight milestones (July 2021- March 2023)

Appendix 1. A rapid scoping review of the literature on whole system approaches relating to healthy weight strategies and schemes

Overview

The requirement for this literature scope was for a short but detailed overview on whole system approaches relating to healthy weight strategies and schemes. The primary aim was to identify and evidence theory and outcomes from such schemes alongside their impacts. The overarching question guiding the literature scope was *'What can be learnt from previous/existing strategies/schemes which address healthy weight by taking a whole systems approach?'*

Method

A number of papers and reports purposively selected by the project group provided the initial focus of the literature scope. These papers were reviewed, and data was extracted in response to the following key thematic areas:

- Brief overview of paper/report
- Overview of strategy/scheme
- What did the systems approach consist of?
- How and why was a systems approach used?
- How have/have systems changed as a result?
- Detail of any evaluation conducted on scheme/strategy
- Impact of the scheme/strategy
    - How is impact shown – short/medium/long term critical success factors
    - Training and development

Following the review of purposively selected papers, a developmental approach to literature searching was used based on key terms emerging from the initial papers and sourcing relevant reference lists of included papers, along with forward citation tracking.
The most significant paper which informed this developmental approach to literature searching was Bagnell et al. (2019) systematic review of whole systems approaches to obesity and other complex public health challenges. Key findings from this paper have been used to supplement individual scheme/strategy level data and are presented below.

Findings

Developing nature of systems-based approaches

Bagnell et al. (2019) highlight how *'In recent years, in response to the increasing awareness of the complexity of many public health problems, there has been growing interest in the role of systems based approaches in public health.'* (p2). This view was echoed by many of the papers, citing also the approaches suitability in the area of health weight *'…systems theory and systems-based approaches appear well suited to address the complexity inherent in public health problems such as obesity.'* (Hennessy et al., 2019). Also, *'Given that the development of obesity is complex, it is likely that effective approaches to preventing childhood obesity will require addressing multiple determinants across multiple settings'* (Johnson et al., 2012 p901).

One of the advantages of using a systems-based approach was stated to be related to the ability in *'understanding and identifying the fundamental system parts and interdependencies that can help to explain system functioning and leverage systems change'* (Foster-Fishman et al., 2007). This notion of understanding system parts was seen to be a central in the majority of papers reviewed. There are different ways in understanding system 'parts'. For example, SEA Change Portland used systems maps which were co-created by the community in order to identify systemic causes of childhood obesity within their community (Jenkins et al., 2020). Similarly, Wilkinson et al., (2021) use Participatory Systems Mapping, where components of a system are mapped along with how they are causally interlinked. Foster-Fishman et al. (2007) describe four principal steps in identifying and interacting with the system; Bounding the system; Understanding fundamental system parts as potential root causes; Assessing system interactions; and Identifying levers for change.

Existing strategies

As highlighted by Bagnell et al. (2019) in their systematic review of whole systems approaches to obesity and other complex public health challenges and derived from the papers reviewed in this literature scope, there generally appears to be a lack of detail with regards to the reporting of interventions and approaches relating to whole systems approaches. Four examples of system-based programmes identified through the literature scope are highlighted below:

> ***Change4Life*** *is the social marketing component of the Government's much broader response to the rise in obesity…A theoretical model of how families' behaviours might change was developed, with all assumptions being documented in the Change4Life marketing strategy. The programme developed to support this model differed from traditional government marketing and communications campaigns. Rather than taking a top down approach, the campaign set out to use marketing as a catalyst for a broader societal movement in which everyone who had an interest in preventing obesity (be they teachers, healthcare professionals, community groups, businesses, charities or individual members of the public) could play a part. This involved working across government departments, recruiting local supporters and forming partnerships with non-governmental organisations and the commercial sector.* (Department for Health, 2010 p12-14)

> ***Be Active Eat Well*** *intervention program Be Active Eat Well was designed to build the community's capacity to create its own solutions to promoting healthy eating, physical activity and healthy weight in children aged 4–12 years and their families. The intervention program was designed, planned and implemented by the key organizations in Colac, particularly Colac Area Health (lead agency), Colac Otway Shire and Colac Neighbourhood Renewal, with Deakin University providing support, training and evaluation. The action plan was developed by the agencies and other stakeholders in 2002 and implemented from 2003 to 2006. It had 10 objectives, with the first three being capacity building, increasing awareness of the project messages and evaluation. The capacity-building objective included broad actions around governance, partnerships, coordination, training and resource allocation. Five objectives targeted evidence-based behaviour changes (reducing television viewing, reducing sugar drinks and increasing water consumption, reducing*

energy dense snacks and increasing fruit intake, increasing active play after school and weekends, increasing active transport to school), and each objective had a variety of strategies (such as social marketing, programs and policies). The two final objectives were intentionally more innovative: a small parent support and education program and a project to improve the deep-frying practices in food outlets (healthier frying oils, wider chips). (Sanigorski et al., 2008 p1061)

Annual increases of overweight and obesity from 2000 (37.0%) to 2004 (39.1%), triggered a multidisciplinary team of researchers, educators, health care, and public health professionals to mobilize environmental and policy interventions. Guided by the social-ecological model and community-based participatory research (CBPR) principles, the team developed and implemented ***Healthy Living Cambridge Kids*** *(HLCK), a multicomponent intervention targeting community, school, family, and individuals. The intervention included city policies and community awareness campaigns; physical education (PE) enhancements, food service reforms, farm-to-school-to-home programs; and family outreach and "BMI and fitness reports".* (Chomitz et al., 2010 pS45)

The ***Whole of Systems Trial of Prevention Strategies for Childhood Obesity (WHOSTOPS)*** *is a cluster-randomized trial of a systems approach to mobilizing community action for childhood obesity prevention in 10 communities from the Great South Coast region of Victoria, Australia… The intervention approach was to build and support capacity within intervention communities to apply methods inspired by community based system dynamics in the design, implementation, evaluation, and constant improvement of efforts to prevent childhood obesity. The design is adaptive and cocreated with communities.* (Allender et al., 2019 p180)

What is included in a systems approach?

Bagnell et al (2019) describe ten features of a whole systems approach (Table 1) to tackle obesity and state that initiative which have these features are more likely to be successful than initiatives that do not adopt these principles. These features have been explored in the initiatives identified within this literature scope.

Table 1: 10 features of a systems approach to tackle public health problems, adapted from NICE and Garside et al. (taken from Bagnell et al., 2019)

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.
Capacity building	An explicit goal to support communities and organisations within the system.
Creativity and innovation	Mechanisms to support and encourage local creativity and/ or innovation to address public health and social problems.
Relationships	Methods of working and specific activities to develop and maintain effective relationships within and between organisations.
Engagement	Clear methods to enhance the ability of people, organisations and sectors to engage community members in programme development and delivery.
Communication	Mechanisms to support communication between actors and organisations within the system.
Embedded action and policies	Practices explicitly set out for public health and social improvement within organisations within the system.
Robust and sustainable	Clear strategies to resource existing and new projects and staff.
Facilitative leadership	Strong strategic support and appropriate resourcing developed at all levels.
Monitoring and evaluation	Well-articulated methods to provide ongoing feedback into the system, to drive change to enhance effectiveness and acceptability.

Identifying a system

Systems identified in the papers included within this scope all focused on obesity/healthy weight. However, few of the papers explicitly stated who was within the system. Of those that did, little detail was provided as to the involvement and role of those within the system. WHOSTOPS (Allender et al., 2019) who stated that,

> *'Defining the boundary of the system began with a local catalyst organization defining an appropriate geographical boundary. Leaders from within each area were then identified using the key question "Who in the community has authority to change the places where children make decisions or have decisions made for them about physical activity and nutrition?" - create an open community invitation to join and contribute to the initiative'*

Change4Life (Department of Health, 2010) also alluded to a system spanning government departments, local supporters, non-governmental organisations and the commercial sector. In addition, CCROPP was described as *'…a collaborative venture of the public health department directors from eight Central California counties. CCROPP was implemented in each of the sites by a partnership between the local public health department, a community-based organization, and an obesity council.'* (Schwarte et al., 2010).

Capacity building

The role of capacity building was detailed in a couple of the papers. Capacity building was seen as central to the WHOSTOPS where the intervention approach was to *'…build and support capacity within intervention communities to apply methods inspired by community based system dynamics in the design, implementation, evaluation, and constant improvement of efforts to prevent childhood obesity.'* (Allender et al., 2019). This approach was also stated to influence other communities outside the scope of WHOSTOPS where it was reported that *'Communities are now applying the approach to identify alignment between prevention efforts in alcohol misuse, methamphetamine use, homelessness, suicide prevention, educational attainment, and local government planning.'* (Allender et al., 2019).

Sanigorski et al., (2008) state that, *'It is rare that communities have sufficient resources or capacity to promote health, and therefore a process of capacity building is required.'* As well as being required, capacity building can also be seen as adding value within a systems approach, it is *'the value added to a system so that it can sustain any particular health promotion or disease prevention program and [so it can] initiate additional health promotion programs.'* (Sanigorski et al., 2008). In this respect capacity building can include *'…enhancing skills, reorienting organizational priorities, creating partnerships and structures, building leadership and community ownership, and finding the resources to promote healthy eating and physical activity in a sustainable way.*' (Sanigorski et al., 2008).

Creativity and innovation

Change4Life as an initiative was particularly creative. It was described to differ from traditional government marketing and communications campaigns – *'Rather than taking a topdown approach, the campaign set out to use marketing as a catalyst for a broader societal movement in which everyone who had an interest in preventing obesity (be they teachers, healthcare professionals, community groups, businesses, charities or individual members of the public) could play a part.'* (Department of Health, 2010).

Relationships
Change4Life Sheffield discuss how the initiative '…*had helped to develop partnerships between individuals, organisations and communities who would not have come together had it not been for the systems approach adopted here. Examples include; community health champions interacting with town planners and members of particular communities coming together to reduce barriers to physical activity within their locality which they themselves observed through the street audits'* (Copeland et al., 2011 p119).
Relationships are also seen to extend beyond the end of the initiative. Chomitz et al. (2010) highlight how new partnerships have emerged postimplementation of HLCK and that it is expected that these will support previous work and also have the ability to expand services in a similar areas.

Engagement
Due to the complex nature of the topic, healthy weight Jenkins et al. (2020) state that *'The multifaceted nature of obesity requires a multi-strategy, community-led and participatory intervention that mobilises community assets across all levels of a system to illicit sustainable solutions'*. A number of the initiatives detail how engagement has been far reaching in order to ensure the relevant people are involved. For example Allender et al (2019) report how *'Leaders from within each area were then identified using the key question "Who in the community has authority to change the places where children make decisions or have decisions made for them about physical activity and nutrition?" - create an open community invitation to join and contribute to the initiative.'*

Communication
As detailed above in creativity, Change4Life was based around communication being the social marketing part of the Healthy Weight, Healthy Lives cross-governmental strategy for England (Department for Health, 2010). This initiative used a number of platforms to promote its key messages. There was little detail about other initiatives communications, although some level of communication was often found to be implicit in the fact that the initiative was promoted and received by a community.

Embedded action and policies
All of the initiatives detailed in the literature scope outlined some form of embedded action. Change4Life Sheffield was explicit in outlining strands of work for adopting a targeted and universal approach to tackling obesity (Copeland et al., 2011). HLCK (Chomitz et al., 2010) identified three levels of embedded action, they stated that;

- *At the community level, implementation strategies were designed to provide policy support for healthy living choices.*
- *At the school level, PE and food service policies, systems, and programs were implemented*
- *At the individual- and family level, strategies and policies were designed*

CCROPP detailed a model of change integrating ideas and principles from multiple but complementary theoretical frames.

Robust and sustainable

There was very little information in regard to this feature detailed within the papers reviewed. The exception however was Change4Life Sheffield which identified future tasks and programmes to build on existing work.

Facilitative leadership
Although implicit in many of the initiatives, this factor had very little evidence within the papers reviewed. CCROPP for example, highlighted that it included *'a collaborative venture of the public health department directors from eight Central California counties.'* (Schwarte et al., 2010) Suggesting some level of leadership.

Monitoring and evaluation
Most of the initiatives reviewed detailed some kind of evaluation. Be Active Eat Well used quasi-experimental, longitudinal design in order to detail change in behaviours as a result of the initiative (Sanigorski et al., 2008). The CCROPP included evaluation measures to understand progress on a variety of the indicators reflected in their local and regional logic models which were developed by the evaluation team (Schwarte et al., 2010). Due to its size, Change4Life used tracking studies to understand reach and impact of the campaign (Department for Health, 2010 & Copeland et al., 2011). HLCK used a baseline and follow-up (3 years later) evaluation design in order to assess change in children's weight and fitness status (Chomitz et al., 2010).

Facilitating a whole systems approach
Through their systematic review, Bagnell et al (2019) identify the following facilitators to whole systems approaches:

- Strong leadership and full engagement of all partners is key for success
- Engaging the local community is an important component of a successful approach
- Creating successful outcomes requires time to build relationships, trust and community
- capacity
- Good governance and shared values
- Appropriate partnerships are important to create sustainable multilevel environmental change
- Consistency in language used across organisations
- Embedding initiatives within a broader policy context
- Local evaluations
- Sufficient financial support and resources

Echoing the points above the Change 4 Life Sheffield evaluation also identified critical factors which influenced the interventions success (p124-5):

- Utilising the model of Foresight as an underpinning for a whole systems approach to tackling obesity
- Strong strategic leadership with a desire to overcome differences in organizational culture
- Bringing professionals and practitioners together through a shared Vision
- One brand, one message
- Rewarding/kite marking success and good practice

- The provision of high-quality information and signposting to appropriate support.
- The provision of high-quality training that focuses on building self worth and life skills
- Public showcase events and displays
- Community audits and local funding opportunities
- Using schools as platforms for engaging children and their families in healthy lifestyle activities
- Inclusion of children & parental consultation in intervention design and implementation
- The integration of the Public Sector Scorecard (PSS)and Theory of Planned behaviour (TPB)

Jenkins et al. (2020) identify three implications for future practice which should influence systems thinking:

- Ensure all steering group organisations have shared understanding over ownership of the process and an appropriate level of readiness and high willingness to communicate openly as part of a collaborative
- Engage community members first through assets they provide for community action, not agencies or organisations they represent
- Utilise existing relationships between organisations, employees and community members to enhance engagement

Impact of a systems approach

Impacts from the approaches taken varied but are summarised below;

Initiative	**Key impacts**
WHOSTOPS (Allender et al., 2019)	• Universal approaches adopted with emphasis on the inclusion of underserved subgroups of population in the design and implementation of systems actions. • Creation of stronger relationships between the local primary care partnership, council, and health services along with new and stronger relationships across key community members and agencies. • Shift towards systems thinking for other connected plans around obesity and broader social problems (drug and alcohol use, intimate partner violence, etc) in local communities • Creation of significant engagement and momentum across the intervention communities • Reorientation of practice towards a community-empowered and -led approach
No intervention – summary of papers identified impacts from systems approaches (Hennessy, 2019)	• System approaches for whole community interventions allows for better understanding of the context of the intervention and can therefore result in a more targeted intervention • By applying systems approaches, the interconnections (direct and feedback) can become clearer, which may shift the nature of the intervention • Systems approaches can uncover deeper system insights and the importance of social networks, the information that flows through them, and the characteristics of people within them. This

	is akin to relational change.
SEA Change Portland (Jenkins et al., 2020)	• Collective input is a crucial element of this initiative and the application of systems thinking. • Factors increasing efficiency of task teams include: Networking and connecting the 'right' community members for task teams, Engaging those with personal interest, Engaging those with passion for broader community development, not just health, Engaging those with a high level of readiness to act
BAEW (Schwarte et al., 2010)	• A capacity-building approach to reducing childhood obesity is flexible, cost effective, sustainable, equitable and safe.
HLCK (Chomitz et al., 2010)	• The approach facilitated sustaining policies and program elements post intervention in a diverse community
Change4Life (Department of Health, 2010 & Copeland et al., 2011)	• The interaction between programmes of activity through a whole systems approach strengthens the message of the importance of obesity prevention and there is clear evidence that such an approach has fostered an intention to adopt healthy behaviours amongst those who participated in the programme. • Despite some concerns, partnerships and in particular organisations working together emerged as a strength of the whole systems approach.

References

Allender, S, Brown, A, Bolton, K, Fraser, P, Lowe, J & Hovmand, P (2018) *Translating systems thinking into practice for community action on childhood obesity.* Obesity Reviews. 2019;20(S2):179–184. https://doi.org/10.1111/obr.12865

Bagnall, A, Radley, D, Jones, R, Gately, P, Nobles, J, Van Dijk, M, Blackshaw, J, Montel, S & Sahota, P (2019) *Whole systems approaches to obesity and other complex public health challenges: a systematic review.* BMC Public Health 19:8 https://doi.org/10.1186/s12889-018-6274-z

Chomitz VR, McGowan RJ, Wendel JM, Williams SA, Cabral HJ, King SE, Olcott DB, Cappello M, Breen S, Hacker KA. *Healthy living Cambridge kids: a community-based participatory effort to promote healthy weight and fitness*. Obesity. 2010;18(1):s45–53.

Copeland R, Moullin M, Reece L, Gibson D, Barrett D. *Sheffield's Let's Change4Life: a whole systems approach to tackling overweight and obesity in children, young people and families. A local evaluation report.* Sheffield: Sheffield Hallam University; 2011.

Department Of Health: Change4life: one year on; 2010 https://webarchive.nationalarchives.gov.uk/ukgwa/20130107105354/http:/www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/@dh/@en/documents/digitalasset/dh_115511.pdf

Foster-Fishman, P, Nowell, B & Yang, H (2007) *Putting the system back into systems change: a framework for understanding and changing organizational and community systems.* American Journal of Psychology 39:197-215 DOI 10.1007/s10464-007-9109-0

Hennessy, E, Korn, A & Economos, C (2019) *Using Systems Approaches to Catalyze Whole-of-Community Childhood Obesity Prevention Efforts.* The Chicago Council on Global Affairs

Jenkins, E, Lowe, J, Allender, S & Bolton, K (2020) *Process evaluation of a whole-of community systems approach to address childhood obesity in western Victoria, Australia.* BMC Public Health 20:450 https://doi.org/10.1186/s12889-020-08576-x

Johnson BA, Kremer PJ, Swinburn BA, de Silva-Sanigorski AM. *Multilevel analysis of the be active eat well intervention: environmental and behavioural influences on reductions in child obesity risk.* International Journal of Obesity. 2012;36:901–7.

Sanigorski AM, Bell AC, Kremer PJ, Cuttler R, Swinburn BA. *Reducing unhealthy weight gain in children through community capacity-building: results of a quasi-experimental intervention program, Be Active Eat Well*. Int J Obes. 2008;32:1060–7.

Schwarte L, Samuels SE, Capitman J, Ruwe M, Boyle M, Flores G. *The Central California regional obesity prevention program: changing nutrition and physical activity environments in California's heartland*. American Journal of Public Health. 2010;100:2124–8.

Thesis, D & White, M (2021) *Is Obesity Policy in England Fit for Purpose? Analysis of Government Strategies and Policies, 1992–2020*. The Milbank Quarterly, Vol. 99, No. 1, 2021 (pp. 126-170)

Wilkinson, H, Penn, A & Barbrook-Johnson, P (2021) *Building a system-based Theory of Change using Participatory Systems Mapping*. Evaluation 27(1) 80-101 DOI: 10.1177/1356389020980493

Appendix 2. Stakeholder-driven Community Diffusion Survey for childhood obesity prevention (Korn et al, 2021)

Knowledge and engagement survey item characteristics from the field test (n=164 stakeholders in three communities), 2019-2020

Note: track changes on survey items indicate modifications used in Tucson, Arizona in response to community partners' feedback to improve readability. These changes are recommended for survey applications moving forward.

Knowledge

Knowledge domain	**Knowledge item** *I am knowledgeable about…*	**Mean (SD)**	**Median (range)**	**Standardized factor loading of modified 23-item scale**[a]
1. *Intervention factors*	…risk factors related to childhood obesity[b]	4.5 (0.6)	5 (2, 5)	-
	…evidence-based strategies that target risk factors related to childhood obesity	4.0 (0.9)	4 (1, 5)	0.67
	…possible policy changes to prevent childhood obesity in [community]	3.4 (1.0)	4 (1, 5)	0.71
	…possible changes in childhood settings (like schools, medical settings, play areas) to prevent childhood obesity in [community]	3.8 (0.9)	4 (1, 5)	0.74
	…how to use systems approaches to prevent childhood obesity in [community]	3.5 (1.0)	4 (1, 5)	0.86
	…how to innovate new strategies to prevent childhood obesity in [community]	3.4 (1.0)	4 (1, 5)	0.84
2. *Roles & resources*	…my role in preventing childhood obesity in [community]	4.0 (0.9)	4 (2, 5)	0.70
*domains merged in modified 23-	…what is being done by others in [community] to prevent childhood obesity	3.4 (0.9)	4 (1, 5)	0.65

Knowledge domain	**Knowledge item** *I am knowledgeable about…*	**Mean (SD)**	**Median (range)**	**Standardized factor loading of modified 23-item scale**[a]
item scale	…how to create ~~nontraditional~~ partnerships outside of my sector (for example, with food businesses or the private sector) to prevent childhood obesity in [community]	3.5 (1.0)	4 (1, 5)	0.67
	…where to find resources (like programs, tools, materials) related to childhood obesity prevention in [community]	3.6 (1.0)	4 (2, 5)	0.67
	…professional development, ~~staff~~ education, or training opportunities related to childhood obesity prevention in [community]	3.3 (1.0)	3 (2, 5)	0.74
	…evaluation and monitoring efforts in [community] that address childhood obesity	3.1 (1.0)	3 (1, 5)	0.78
	…how to build on [community]'s ~~assets and~~ strengths to prevent childhood obesity	3.4 (0.9)	3 (1, 5)	0.74
3. *Implementation & sustainability*	…strategies (like practices, programs, policies) to prevent childhood obesity that will be appropriate for [community]	3.6 (0.9)	4 (1, 5)	0.76
	…strategies (like practices, programs, policies) to prevent childhood obesity that will have the greatest impact in promoting healthy weight in our children[c]	3.5 (1.0)	4 (1, 5)	-
	…strategies (like practices, programs, policies) to prevent childhood obesity that can last ~~be sustained~~ over time (for many years in the future)	3.4 (1.0)	4 (1, 5)	0.77
	…how to ~~align~~ line up childhood obesity prevention efforts with other ~~community~~ priorities in [community]	3.3 (0.9)	3.5 (1, 5)	0.67

Knowledge domain	Knowledge item *I am knowledgeable about…*	Mean (SD)	Median (range)	Standardized factor loading of modified 23-item scale[a]
	…how to ~~translate~~ turn ideas about preventing childhood obesity into action	3.7 (0.8)	4 (2, 5)	0.67
	…factors that make it harder ~~the barriers~~ to ~~implementing~~ carry out childhood obesity prevention strategies in [community] (“barriers”)	3.8 (0.9)	4 (1, 5)	0.68
	…~~the facilitators of~~factors that make it easier to ~~implementing~~ carry out childhood obesity prevention strategies in [community] (“facilitators”)	3.4 (0.9)	4 (1, 5)	0.72
4. *Problem*	…~~the~~ economic costs (like healthcare spending, disability, work absences~~teeism~~) related to obesity throughout the life course	3.9 (1.0)	4 (1, 5)	0.73
	…~~the~~ health concerns (like cardiovascular disease, some cancers, depression) ~~associated~~ related to ~~with~~ obesity throughout the life course	4.4 (0.7)	4 (2, 5)	0.75
	…~~the~~ social costs (like weight stigma, decreased quality of life) related to obesity throughout the life course	4.2 (0.7)	4 (2, 5)	0.71
	…~~the existing~~ racial, ethnic, and/or socioeconomic health inequities related to childhood obesity in [community]	4.2 (0.7)	4 (2, 5)	0.79
	…~~the~~ social determinants of health (like education, healthcare, housing) related to childhood obesity in [community]	4.2 (0.8)	4 (2, 5)	0.86

[a] All standardized factor loadings are statistically significant with $p < 0.001$.
[b] Item eliminated due to high baseline value, limited response variability, and lower factor loading.
[c] Item eliminated due to high correlation with subsequent item (Spearman correlation = 0.82) and conceptually poorer fit relating to “impact” rather than implementation processes.

Engagement

Engagement domain	Engagement item	Mean (SD)	Median (range)	Standardized factor loading of modified 23-item scale[a]
1. *Dialogue & mutual learning*	I ~~make an effort~~try to participate in discussions about childhood obesity prevention in [community]	3.6 (1.0)	4 (1, 5)	0.80
	I ~~am~~ pay attenti~~on~~ve to what colleagues say ~~when they speak~~ about childhood obesity prevention in [community][b]	4.1 (0.7)	4 (2, 5)	-
	I share my ideas ~~and suggestions~~ about childhood obesity prevention whether or not colleagues agree with me ~~my input~~	3.8 (1.0)	4 (1, 5)	0.74
	I can openly discuss problems ~~and issues~~ related to childhood obesity prevention in [community][c]	4.0 (0.8)	4 (2, 5)	-
	I work with colleagues to develop the best ~~possible~~ approach to our work related to childhood obesity prevention in [community]	3.6 (1.1)	4 (1, 5)	0.86
	I ~~facilitate~~ promote a sense of ~~inclusivity~~ belonging ~~that~~ to engage~~s~~ diverse individuals and groups working to prevent childhood obesity in [community]	3.8 (0.9)	4 (1, 5)	0.81
2. *Flexibility*	I am willing to make compromises related to my work in childhood obesity prevention	3.9 (0.7)	4 (2,5)	0.56
	I work to come up with solutions related to childhood obesity prevention that satisfy all colleagues	3.5 (0.9)	4 (1, 5)	0.74
	I encourage mutual respect for different perspectives related to childhood obesity prevention	4.2 (0.7)	4 (3, 5)	0.64
	I ~~am able to~~can adapt to changing conditions (like fewer funds than expected, change in political climate or ~~in~~ leadership) to prevent childhood obesity in [community]	4.1 (0.7)	4 (2, 5)	0.65

Engagement domain	Engagement item	Mean (SD)	Median (range)	Standardized factor loading of
3. *Influence & power*	I influence decisions that affect childhood obesity prevention efforts in [community]	3.1 (1.1)	3 (1, 5)	0.91
	I influence policies ~~and actions~~ related to childhood obesity prevention in [community]	2.9 (1.1)	3 (1, 5)	0.88
	I promote shared decision-making ~~power~~ related to childhood obesity prevention efforts in [community]	3.6 (1.0)	4 (1, 5)	0.70
	I build strategic relationships with ~~key~~ influen<u>tial</u>~~cers~~ <u>people</u> (like elected officials, funders) that can impact childhood obesity prevention efforts in [community]	3.4 (1.1)	4 (1, 5)	0.65
4. *Leadership & stewardship*	I am motivated to prevent childhood obesity in [community][d]	4.4 (0.7)	5 (2, 5)	-
	I motivate others with my ~~passion and~~ enthusiasm to prevent childhood obesity in [community]	3.7 (1.0)	4 (1, 5)	0.85
	I ~~establish~~ <u>form</u> positive relationships with community members with whom my colleagues want to engage and mobilize to prevent childhood obesity in [community]	4.0 (0.8)	4 (1, 5)	0.76
	I have good skills for working with other people and organizations that are preventing childhood obesity in [community][e]	4.1 (0.7)	4 (1, 5)	-
	I emphasize the importance of having a collective sense of mission to prevent childhood obesity in [community]	4.0 (0.9)	4 (1, 5)	0.79
	I provide leadership and guidance in maintaining relationships among colleagues working to prevent childhood obesity in [community]	3.5 (1.0)	4 (1, 5)	0.76
	I advocate ~~strongly~~ for my own opinions and agendas related to childhood obesity prevention efforts in [community]	3.2 (0.9)	3 (1, 5)	0.60

Engagement domain	Engagement item	Mean (SD)	Median (range)	Standardized factor loading of
	I do not give up when faced with challenges related to childhood obesity prevention in [community]	3.7 (0.8)	4 (2, 5)	0.67
	I encourage community ownership of efforts to prevent childhood obesity in [community]	3.8 (0.8)	4 (1, 5)	0.65
	I am ~~have long-term~~ committed~~ment~~ to preventing childhood obesity in [community] in the long-term	4.2 (0.9)	4 (1, 5)	0.73
5. *Trust & trustworthiness*	I trust others involved in childhood obesity prevention efforts in [community][f]	4.1 (0.6)	4 (3, 5)	-
	I think that people involved in childhood obesity prevention efforts in [community] trust me	3.9 (0.7)	4 (2, 5)	0.67
	I ~~am effective in~~ promote~~ing~~ ~~a climate of~~ trust among colleagues working to prevent childhood obesity in [community]	3.9 (0.7)	4 (2, 5)	0.80
	I can be counted on when working to prevent childhood obesity in [community]	4.1 (0.7)	4 (2, 5)	0.81

[a] All standardized factor loadings are statistically significant with $p < 0.001$.
[b] Item eliminated due to high baseline value and limited response variability.
[c] Item eliminated due to high baseline value, limited response variability, and lower factor loading.
[d] Item eliminated due to high baseline value, limited response variability, and high correlation with "long-term commitment" item (Spearman correlation = 0.72).
[e] Item eliminated due to high baseline value, limited response variability, and lower factor loading.
[f] Item eliminated due to lower factor loading and low correlation with total scale (0.35).

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Appendix 3. Draft report of Evaluability Assessment Workshops with stakeholders in Dundee (May-October 2021)

Contents

Summary

TBC

Chapter 1. Background

Introduction

In Tayside, one in five Primary 1 (school entry) children is classified as overweight or obese and the proportion increases as deprivation increases. Children and young people growing up in the most deprived communities are twice as likely to live with obesity compared to their peers in the most affluent areas and, are more likely to continue living with obesity into adulthood. Obesity is a complex and multi-factorial disease with genetic, behavioural, socioeconomic, and environmental origins. Prevention requires sustained and systemic action and buy-in from systems' leaders to enable partners to work differently and test new approaches. Many positive actions are being delivered by local authorities and partners to help children to eat well, drink well and be active - improving health and wellbeing.

In 2017 the Tayside Regional Improvement Collaborative (TRIC) published the Tayside Plan for Children Young People and Families with a pledge to develop a child healthy weight strategy. TRIC plan to build on, support and strengthen this work by applying a Whole Systems Approach (WSA) so that they can go further and faster to realise their vision - for every child in Tayside to grow up in a community and an environment that supports them to feel great and ready to learn so that they can flourish to the best of their abilities. Instigating a WSA across Dundee City will enable communities to take forward key local actions related to 'Healthy Weight Tayside'. TRIC want to learn from experiences in Dundee City and then progress to Angus and Perth & Kinross. Tayside's commitment by 2030 is to halve the proportion of Tayside's children affected by obesity and, to reduce the healthy weight inequality between the most and least disadvantaged communities.

The child healthy weight strategy was co-produced by engaging extensively with c.1,500 people in Tayside during 2019/20 and was informed by the local community-based approach 'Eat, Play, Learn Well'. It was also informed by learning from the Early Adopter work in Dundee City as they implement the Scottish Government's Diet & Healthy Weight Delivery Plan. This work benefits from support from Public Health Scotland, Obesity Action Scotland and Leeds Beckett University in applying the PHE Whole Systems Approach to Obesity Guide.

The child healthy weight strategy identifies five ambitions i.e. 1) child healthy weight is seen as a society wide issue; 2) children have the best start in life; 3) our environment supports healthier choices; 4) families get helpful weight management support; 5) families and communities in most needs are our main concern. These ambitions include interconnected calls to action, which Tayside believe are needed in their journey to becoming a place that supports the health and wellbeing of children, young people and families. Together, they have the potential to shift the whole system to help children and young people growing up in the three local authority areas to eat well, drink well, be active and have a healthy weight.

In this report we describe the Whole Systems Approach (WSA) to child healthy weight and diet adopted by Dundee as an early adopter. We explain how the Evaluability Assessment process was conducted and how it was contextualised to meet the requirements of Dundee WSA. Finally, this report presents a number of

evaluation options and recommendations that can be considered and developed as part of NOLB's' overall monitoring and evaluation plan.

Rapid literature scoping

We conducted a rapid scoping review of the literature on whole system approaches relating to healthy weight strategies and schemes (see Appendix 1). The primary aim was to identify and evidence theory and outcomes from such schemes alongside their impacts. The overarching question guiding the literature scope was 'What can be learnt from previous/existing strategies/schemes which address healthy weight by taking a whole systems approach?'

A number of papers and reports purposively selected by the project group provided the initial focus of the literature scope. These papers were reviewed, and data was extracted in response to the key thematic areas (Brief overview of paper/report; Overview of strategy/scheme; What did the systems approach consist of?; How and why was a systems approach used?; How have/have systems changed as a result?; Detail of any evaluation conducted on scheme/strategy; Impact of the scheme/strategy; How is impact shown – short/medium/long term critical success factors; Training and development).

Following the review of purposively selected papers, a developmental approach to literature searching was used based on key terms emerging from the initial papers and sourcing relevant reference lists of included papers, along with forward citation tracking.

The most significant paper which informed this developmental approach to literature searching was Bagnall et al. (2019) systematic review of whole systems approaches to obesity and other complex public health challenges. Key findings from this paper have been used to supplement individual scheme/strategy level data from four examples of system-based programmes identified through the literature scope (Change4Life; Be Active Eat Well intervention program; Healthy Living Cambridge Kids (HLCK); Whole of Systems Trial of Prevention Strategies for Childhood Obesity (WHOSTOPS).

As highlighted by Bagnall et al. (2019) and derived from the papers reviewed in this literature scope, there generally appears to be a lack of detail with regards to the reporting of interventions and approaches relating to whole systems approaches.

Ten features of a WSA to tackle obesity

Bagnall et al (2019) describe ten features of a whole systems approach to tackle obesity and state that initiative which have these features are more likely to be successful than initiatives that do not adopt these principles. These features have been explored in the initiatives identified within this literature scope.

11. Identifying a system
12. Capacity building
13. Creativity and innovation
14. Relationships
15. Engagement
16. Communication
17. Embedded action and policies

18. Robust and sustainable
19. Facilitative leadership
20. Monitoring and evaluation

Through their systematic review, Bagnall et al (2019) identify the following facilitators to whole systems approaches:

- Strong leadership and full engagement of all partners
- Engaging the local community
- Time to build relationships, trust and community
- Capacity
- Good governance and shared values
- Appropriate partnerships to create sustainable multilevel environmental change
- Consistency in language used across organisations
- Embedding initiatives within a broader policy context
- Local evaluations
- Sufficient financial support and resources

Impacts reported from the approaches taken varied but generally point to a better understanding of the context of the intervention, which can result in a more targeted intervention; interconnections (direct and feedback) becoming clearer, which may shift the nature of the intervention, and uncovering deeper system insights and the importance of social networks, the information that flows through them, and the characteristics of people within them (Hennessy, 2019).

Evaluation of existing programmes

Most of the initiatives reviewed detailed some kind of evaluation. Be Active Eat Well used quasi-experimental, longitudinal design in order to detail change in behaviours as a result of the initiative (Sanigorski et al., 2008). The CCROPP included evaluation measures to understand progress on a variety of the indicators reflected in their local and regional logic models which were developed by the evaluation team (Schwarte et al., 2010). Due to its size, Change4Life used tracking studies to understand reach and impact of the campaign (Department for Health, 2010 & Copeland et al., 2011). HLCK used a baseline and follow-up (3 years later) evaluation design in order to assess change in children's weight and fitness status (Chomitz et al., 2010).

In addition, relevant methods were identified from an Australian and American study. Jenkins et al (2020) conducted a process evaluation of a whole-of-community systems approach to address childhood obesity in western Victoria, Australia, using semi-structured interviews with steering group members and community task team members. They collected data using open ended interview questions to gather in-depth information regarding programme implementation, and the individual attitudes, beliefs and experiences of key stakeholders.

They analysed their data under three key themes: collective impact, systems thinking and asset-based community development (ABCD). Participants gave perceptions of significant events; factors positively and negatively affecting the process; reasons for

becoming involved in the process; perceived efficacy of task teams, principles of diversity and areas of concern. Their results highlighted that collective impact was a crucial element in applying the systems thinking. Strong and equitable relationships between steering organisations and topic experts provided the initiative with a sustainable foundation, and ABCD promoted community ownership and future sustainability.

Jenkins et al. (2020) identify three implications for future practice which should influence systems thinking:

4. Ensure all steering group organisations have shared understanding over ownership of the process and an appropriate level of readiness and high willingness to communicate openly as part of a collaborative
5. Engage community members first through assets they provide for community action, not agencies or organisations they represent
6. Utilise existing relationships between organisations, employees and community members to enhance engagement

The second study involved the validation and refinement of the Stakeholder-driven Community Diffusion Survey for childhood obesity prevention (see Appendix 2), conducted by Korn et al (2021). Questions in the survey were framed by the COMPACT Stakeholder-driven Community Diffusion theory, which posits that stakeholders' knowledge of childhood obesity prevention efforts and engagement with the issue contribute to successful intervention implementation. They authors developed and tested a survey with 23 knowledge items across four domains (roles and resources merged) and 23 engagement items across five domains. Their findings demonstrate that all scales had adequate fit and strong item factor loadings (most >0.7 and all >0.5) with subscales having high internal scale consistency. Knowledge intraclass correlation coefficients (ICCs) for test-retest agreement of subscale scores ranged from 0.50 to 0.96. Components from both methods will be applied in the research design (WP) outlined below.

Chapter 2. Evaluability Assessment

The recently updated UK Medical Research Council (MRC) and National Institute for Health Research (NIHR) complex intervention research framework (Skivington et al 2021), and the new Complexity Evaluation Toolkit from the Centre for the Evaluation of Complexity Across the Nexus (CECAN 2021) both recommend the use of Evaluability Assessment (EA) as a key part of the intervention and evaluation design process in the context of complexity. We used EA methods (Leviton, 2010; Craig and Campbell, 2015) to co-develop the evaluation design with stakeholders.

EA is a rapid, systematic, and collaborative way of deciding whether and how a programme or policy can be evaluated, and at what potential cost. EA clarifies thinking and manages expectations of stakeholders about an intervention's objectives. The EA process can positively influence decisions about the nature, scope and design of any future evaluations and the associated monitoring and evaluation framework. Done collaboratively, EA can help stakeholders understand the constraints on evaluation design, whether and what kind of evaluation can usefully be undertaken given the stage of development and scale of their intervention, and what kinds of evidence the different approaches to evaluate will generate. EA can also improve intervention design and improve stakeholder buy-in to evaluation.

Our approach to evaluability assessment is underpinned by the principle of understanding change from diverse perspectives. This provides opportunities for co-production and knowledge mobilisation, which emerged or were clarified in the evaluability assessment workshops. They relate to four of the six NIHR School for Public Health Research knowledge-sharing principles (School for Public Health Research, 2018). We conducted three evaluability assessment workshops with stakeholders in Dundee. Workshop participants (n=36) included representation from a wide range of disciplines within third sector organisations, Local Authorities and NHS departments between May and October 2021. We allowed the workshop format to evolve to take account of feedback from preceding workshops, and to enable stakeholders to shape the approach to evaluation.

Workshop 1

In the first two evaluability assessment sessions we co-produced a draft logic model for the WSA in Dundee. In the third and final session, we simplified this logic model to focus on system-level issues. Based on this simplified model, we co-produced the key evaluation questions and inventoried data/evidence sources for an evaluation design.

Workshop 2

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After the second workshop in June 2021, we agreed with stakeholders to delay a third workshop until October 2021, to enable the team in Dundee to run an additional action planning session with their network that is involved in implementing the WSA.

Workshop 3

Ref both versions of ToC (Appendix 1)

Data

Available data for the evaluation, suggested by EAW participants, include strategic documents and reports on the WSA in Dundee, population demographic data, PHS data on infant feeding, weaning and developmental outcomes, the Child Health and Wellbeing Census, and Engage Dundee 2021 survey results, which we will consider as part of the scoping work for the research.

Chapter 3. Evaluation Design Considerations

The EA workshops were useful for better understanding the evidence needs of decision makers of stakeholders, as well as capacity and resources available for evaluation. This is needed to make decisions about systems-informed evaluation. Complex systems present unique challenges to evaluation. The objectives, design and data requirements of any interventions may change over time. Data from multiple sources are needed even as evaluation plans themselves may need to change as unexpected features emerge.

Complex systems present evaluation challenges

Complex system challenges	Evaluation challenges
Multiple interactions and influences	• Long, **indirect causal chains** linking inputs to impacts
Systems may be in continual change, or may resist change	• Objectives, design and data requirements may **change over time** • The programme may not reach a 'final state' when the evaluation comes to an end
Openness Context (and history) matters	• Hard to establish a clear boundary • **Difficult to standardise** the intervention • Outcomes may vary from one context to another
Multiple perspectives	• Need data from **multiple sources/informants**
The nature of the change is unpredictable Multiple causality	• Evaluation plans **may need to change** to address emergence of unexpected features • **New methods** may be needed for causality and attribution
Complexity is difficult to communicate	• Difficulties in communicating methodology and findings

Figure 1 Evaluation challenges of complex systems

Links between intervention inputs and impacts may be long and indirect, possibly involving multiple causality which need new methods for establishing causality and attribution. More on the challenges complex systems present to evaluation are described in the Magenta Book 2020 Supplementary Guide.

The choice of evaluation approach will depend on the purpose of the evaluation. From the EA workshops, it was established that the Dundee WSA team and stakeholders were keen to learn about how the WSA was adopted in efforts to address child healthy weight and diet, and how early learning can inform how other areas in Tayside can also adopt WSA. 'Listening and building' was also identified as an important objective - ensuring diverse voices are heard and building trust and legitimacy across stakeholders, especially from children and young people.

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Purpose

The choice of approach will depend on the purpose of the evaluation. This is often articulated as a set of questions to pose to the evaluators, but these must relate to how the evaluation findings will be used. This will enable the evaluation team, in discussion with the client, to focus resources on the most useful activities and outputs, responding flexibly to the changing needs of the evaluation.

Table 4: Answering evaluation questions

Evaluation question	Approach / method	Benefits
What is important to different groups, who can champion change?	Emancipatory approaches	Most significant change is an iterative participatory process that aims to clarify the values held by different stakeholders
	Participatory system mapping	Participatory system mapping brings stakeholders together to build a system map and develop trust and mutual understanding
What levers are generating change, what may be inhibiting change?		Structures conversations about whether and how the policy is delivering change, can be used to develop the theory of change
How well was the policy implemented? How can this be improved?		If begun at the option appraisal stage, forms a consistent framework for design, monitoring and evaluation through piloting and full implementation
	Participatory, adaptive approaches	Generates trust and shared understanding, champions and agents for change
Is the policy making a difference, by how much? Is it delivering value for money?	Experimental approaches	Provides robust evidence of whether a policy has made a difference, and to what extent, in a specific context
	Statistical association approaches	Weaker than experimental designs, but can provide a quantitative measure of the extent of impact, where it is not possible to define a counterfactual
	Predictive modelling approaches	Using computational system modelling to predict a counterfactual has the advantage of being able to account for contextual factors and deal with the emergent properties of complex systems
Is the policy making a difference, how? What conditions are needed?	Generative causation approaches	Explores the causal mechanisms (decision making and behaviours) or processes leading to change and the impact of contextual factors
	Configurational approaches	Recognises that different combinations of factors can lead to change and that these may include factors external to the policy
How sustainable is change likely to be? How can we adapt the policy to work elsewhere? How can the policy be improved?	Generative causation approaches	Provides learning that is transferable to other contexts, and provides a basis for discussing sustainability, by uncovering the underpinning processes or mechanisms that lead to change and exploring the influence of context
	Computational system modelling	Using information available on system behaviour to date, modelling can confirm whether the policy is contributing to change and how, and project forward to explore whether change is likely to be sustained in different scenarios

Figure 2 Types of evaluation questions

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- Overview of participatory, emancipatory & adaptive approaches
- Data sources
- Questions
    - To discuss evaluation question prioritisation and what we chose to do with it – eg combine 6 & 2
    - Question 6 is key
    - Question 10 is important but maybe can blend with question 1(2)?

Chapter 4. Evaluation Options

Building on the insights of the scoping review and information distilled from the Evaluability Assessment Workshops, we propose the following overarching aim and research questions for the evaluation.

Aim: to learn from the experience of initiating a WSA to childhood obesity in Dundee and apply that learning when rolling out to the two other local authorities in the region.

Research questions

4. Does the approach taken in Dundee support key stakeholders to recognise what they can do in relation to actions at different levels within the system?
5. How do/ can co-produced activities (e.g. with children, vulnerable communities) shape this approach?
6. What adaptations to the approach taken in Dundee would be required over time to connect this approach to other 'systems' (e.g. Mental Health) and implement this approach in other Local Authorities in Tayside?

Options overview

Five options are presented in this chapter starting with the cheapest and most basic, and building on additional evaluation activity. See Table 1 for an overview:

- Option 0 involves no change or additional evaluation approach and relies on relevant and existing employability Monitoring & Evaluation (M&E) systems. We include Option 0 as a reference option. As discussed in the workshops, existing M&E systems do not address NOLB principles or evaluation requirements.
- Option 1 supplements Option 0 with a summative process evaluation. Primary qualitative data gathering and analysis will determine if NOLB has been delivered as intended in terms of service user and provider outcomes described in the ToC.
- Option 2 may involve the process evaluation from Option 1 and further includes more formative evaluation approaches that build on NOLB's service design (SAtSD) and human rights (PANEL) principles.
- Option 3 should include Option 1, and can include Option 2, resources and time permitting, but goes furthest in embedding NOLB's principles by incorporating a participatory evaluation approach that involves peer researchers. This option requires the most additional involvement and resources compared to the other options.

Table 1 Overview of evaluation options

Evaluation Questions (as prioritised by workshop 3 participants)	Evaluation Design	Elaboration	Data collection tools	Pros	Cons
1. How do co-produced activities (eg, with children, vulnerable communities) shape this approach? 2. How can Dundee's Whole System Approach to Child Healthy Weight connect to other 'systems' (eg, Mental Health)? 3. Does the approach taken in Dundee support key stakeholders to recognise what they can do in relation to actions at different levels within the system? 4. What are the vision and values that will guide the WSA? How was it co-created? 5. How will governance structures / reporting mechanisms be managed? 6. What adaptations to the approach taken in Dundee would be required to implement this approach in the other Local Authorities	**Option 0** • Existing M&E	•Relies on existing evaluation (NHS Early Adopters). No additional evaluation specifically on the Dundee WSA	Existing process evaluation	• No additional cost • Consistency with funder requirements and accountability	• Will not be able to specifically assess Dundee WSA learning in detail
	Option 1 • Option 0 + Action Research	•Plan, Act, Reflect, Observe	Existing Process Evaluation + participant observation + documentation review + interviews + focus groups	• Can be undertaken with minimal external evaluation support	• Can be time-consuming especially if done without external evaluation support
	Option 2 • Option 1 + Appreciative Inquiry	•A method of understanding the structures, processes, culture and the factors underpinning success in each organisation. AI is a strengths-based approach to promote positive change in people, groups and organisations by focusing on what is done well in or by an organisation			

in Tayside? 7. How well understood are the initial conditions and the nature of the environment within which action will occur? 8. What is the messaging of the approach? What issues are emphasised and what are left-out? How is it communicated? 9. What changes emerge in Dundee (eg, membership of the core working group/network) that may be more evaluable than others? 10. What adaptations are required to reflect the system change over time?	**Option 3** • Options 1/2 + Participatory Evaluation	Multiple approaches. For example, PEER is a participatory and qualitative research approach, based on the ethnographic method of involving ordinary members of the community to generate in-depth and contextual data		• Can involve specific groups like young people & families; and other 'hard-to-reach/easy-to-ignore' groups	• May require additional recruitment, training & supervision of peer researchers
	Option 4 • Option 1/2/3 + Developmental Evaluation	Developmental Evaluation (DE) for ongoing adaptive development may include some/all/none of design from previous options depending on how the DE adapts		• Can clarify nature of adaptive innovation, what is carried forward/changed; how these interact; and the consequences of ongoing innovation adaptation as a way of engaging in change through trial-and-error. • Evaluators may play a more involved role in the intervention	• Requires high commitment and openness from funder, evaluation and delivery staff • Unfamiliarity with process Uncertainty of outcomes • Requires a lot of time • Involvement of evaluators may "muddy the waters"

Options in detail

Option 0: No additional evaluation

This option relies on the process evaluation commissioned by NHS Health Scotland on all 3 of the early adopter whole systems approach sites. This will involve at least a few qualitative interviews. Without additional data gathering and analysis however, evaluation would be limited in terms of local contextual information, especially in relation to learning. There would also be less opportunities for stakeholders to be involved in the evaluation.

Option 1: Action Research

- https://www.sagepub.com/sites/default/files/upm-binaries/38974_2.pdf
- https://health-policy-systems.biomedcentral.com/track/pdf/10.1186/s12961-021-00792-0.pdf

Option 2: Appreciative Inquiry

- https://onlinelibrary.wiley.com/toc/1534875x/2003/2003/100
- https://us.sagepub.com/en-us/nam/reframing-evaluation-through-appreciative-inquiry/book227039
- Case: PHE (2019) Whole systems approach to obesity programme: Learning from co-producing and testing the guide and resources.

Option 3: Participatory Evaluation

- Participatory Ethnographic Evaluation and Research (PEER) involves members of a community (users of NOLB Fife commissioned services) being trained to carry out in-depth conversational interviews with friends in their social networks. This approach can generate rich insights into how users and potential users perceive and experience employability services. PEER has been used in a wide variety of settings and in countries across the world (20), including the UK (21).
- Peer researchers are selected and recruited by Dundee WSA Governance Team in conjunction with the target population. Researchers do not need to have a high level of literacy. The method is based on the principle that in-depth interviews of a small sample of people can yield more information on experiences and perspectives than interviewing a larger sample of people once or twice only. Interviewees are encouraged to talk about “other people like themselves” and are not asked to name individuals or provide personal information. Without acknowledging that they are talking about themselves, interviewees will often refer to their own experiences and perspectives due to the conversational approach of the interview. Recognising that Peer researchers may belong to vulnerable groups, a set of ethical guidelines have been

specifically developed for the PEER approach.[1] PEER researchers will need to be trained to do research.

Option 4: Developmental Evaluation

Developmental evaluation supports organisations who are innovating to adapt in complex environments. It "provides *evaluative* information and feedback to social innovators, and their funders and supporters, to inform adaptive *development* of change initiatives in complex dynamic environments" (4). Developmental evaluation is an emerging and maturing approach to evaluation. Developmental evaluation is prominent in North America (4), and emerging in the UK especially in healthcare quality improvement (5).

Chapter 5. Recommendations

Appendices

Appendix 1. Agreed Theory of Change

[1] https://options.co.uk/sites/default/files/peer_ethics_guidelines.pdf