Healthier Systems 4 Healthier Weight: Belfast Mapping the System

Authors:
Rabia Butt
Dr. Leandro Garcia
Dr. Gary McKeown
Dr. Gavin Breslin

School of Psychology and Centre for Public Health, Queen's University Belfast
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Introduction

This document reports the outputs associated with the systems mapping workshops conducted as part of the project "Co-developing a Systems Map to Promote Healthier Weight in Belfast". The workshops were led by researchers from Queen's University Belfast as part of a programme of research which aims to investigate the causes and consequences of healthier weight in Belfast.

Obesity represents one of Northern Ireland's most pressing public health challenges[1,2,3], with one in four adults (27%) and around one in sixteen children (6% of children aged two to fifteen years) living with obesity. The burden is not equally distributed across society, with obesity strongly linked to deprivation status[1]. The health and economic implications are substantial, with direct and indirect costs estimated to be £370 million annually in Northern Ireland[1].

The Public Health Agency (PHA) has been tasked by the Department of Health with implementing a Whole Systems Approach (WSA) to obesity prevention within Northern Ireland. The PHA has adopted the Public Health England six-phase methodology, comprising (1) Set-up, (2) Building the local picture, (3) Mapping the local system, (4) Action, (5) Managing the system network, and (6) Reflect and refresh[4]. This framework recognises the complexity demonstrated by the Foresight Obesities Report[5], which illustrated the intricate web of factors influencing obesity including societal influences, individual psychology, food environments, and activity environments, all interconnected through multiple feedback loops.

Problem of Interest

How can we promote healthy weight in Belfast, considering the interactions between environmental, social, cultural, economic and political factors that shape and sustain the problem?

Objectives

The systems mapping workshops aimed to achieve three core objectives:

1. **Co-develop a systems map** with stakeholder organisations visualising a shared understanding of the physical, social, cultural, economic and political environments that promote healthy weight in Belfast.
2. **Use the systems map** to identify and explore interventions and policies to prevent obesity, what is of value to stakeholders, and what is needed to implement the actions.
3. **Use the systems plan** to develop a Whole Systems Approach to Obesity Action Plan for Belfast City Council.

Methods Used

This project aimed to develop a qualitative baseline system map within Belfast. Drawing on established methodologies for psychology, and systems mapping in public health contexts, this work has enabled visualisation of complex relationships between obesity-related factors, identification of leverage points for intervention, understanding of system feedback loops, and the development of an evidence-based action plan. This represents a critical step in advancing collaborative approaches to obesity prevention, ensuring interventions are grounded in comprehensive understanding of local systems and designed to achieve sustainable, population-level impact on healthy weight outcomes across Northern Ireland communities.

The workshop planning process followed ‘co-design principles’ through multiple engagement streams. Participants were identified via network analysis and invited to pre-workshop sessions covering whole systems approaches, workshop objectives, and progress to date. Following these sessions, a poll assessed participants' suitability, availability, and understanding of the systematic and systemic causes and effects of obesity. The design incorporated diverse perspectives throughout, including people with lived experience contributing through pre-

workshop sessions, reviewing and shaping the workshop design, and providing feedback on the post-workshop report.

A series of participatory workshops were held across two full days in November 2025 involving 30 stakeholders from multiple sectors across Belfast. Two systems mapping workshops were conducted, with Workshop 1 engaging 23 participants and Workshop 2 involving 27 participants. There was considerable continuity between sessions, with 23 participants from Workshop 1 returning for Workshop 2, while 7 new stakeholders joined the second workshop. Combined workshops data reveals participant mean age was 44.85 and the range was 25 to 63 years. 55.55% of participants were female while 44.44% were male. Participants represented diverse multi-sectoral stakeholders including managers, practitioners and policy makers from PHA, FSA, BHSCT, GLL, BHDU, Department of Finance, EBCDA, BCC, Food Ethics Council, Sports NI and Belfast Healthy Cities.

The workshops employed a structured approach to systems mapping that emphasised active listening, mutual discussion, and collaborative refinement of system understanding, utilising factor identification activities examining environmental, social, cultural, economic, and political influences on healthier weight.

Participatory Approach

This systems mapping was conducted with commitment to participatory approaches, inclusivity, and health equity. The maps reflect perspectives from a specific stakeholder group at a particular point in time.

Variable Elicitation

Thirty-four factors were identified through collaborative mapping with participants using a voting process to prioritise factors. The top-voted factors included:

- Affordability/levels of deprivation (8 votes)
- Lack of access to affordable healthy food (7 votes)
- Education about nutrition and physical activity (7 votes)
- Advertising/Media/Marketing (e.g. of junk food) (7 votes)
- Social-cultural and behavioural norms (6 votes)
- Policy making (6 votes)
- Legislation (6 votes)
- Generational inactivity and poor diet passes onto next generation (6 votes)

Findings from Integrated Systems Map

The integrated systems map synthesises the individual mental models developed by the five groups, demonstrating how healthier weight has multiple determinants and effects, with complex interrelationships represented through causal arrows between factors. The integrated systems map has twenty-three factors including the central theme/factor ‘Healthy Weight in Belfast'. These factors are grouped into ten color-coded themes represented by the legend . The analysis of the map revealed one central hub, six critical factors, one primary critical pathway operating through four sub pathways within the system. The map also revealed fifteen feedback loops.

The online interactive version of the integrated systems map is available at:
https://embed.kumu.io/882ebbe0a02e5cea9a40167a1531e92e

Key insights

1. High system complexity with multiple feedback loops that can either accelerate problems or solutions.
2. Policy and legislation are critical upstream levers affecting infrastructure (including the built environment), funding and regulation.

3. Socio-economic factors including affordability/levels of deprivation and poverty act as fundamental constraints across multiple domains.
4. Cultural and behavioural factors such as social-cultural and behavioural norms and family habits and supports create intergenerational change/ feedback loops.
5. Multiple pathways to healthy weight suggest that no single intervention will be sufficient and therefore systems level change is needed.

Key determinants of the integrated systems map

1. Central Hub

A central hub in a systems map is a factor with significantly more connections to other factors than average, serving as a key node through which many causal pathways flow. Hubs can have high in-degree (receiving influence from many factors), high out-degree (influencing many factors), or both, making them structurally critical points where interventions may produce widespread system effects.

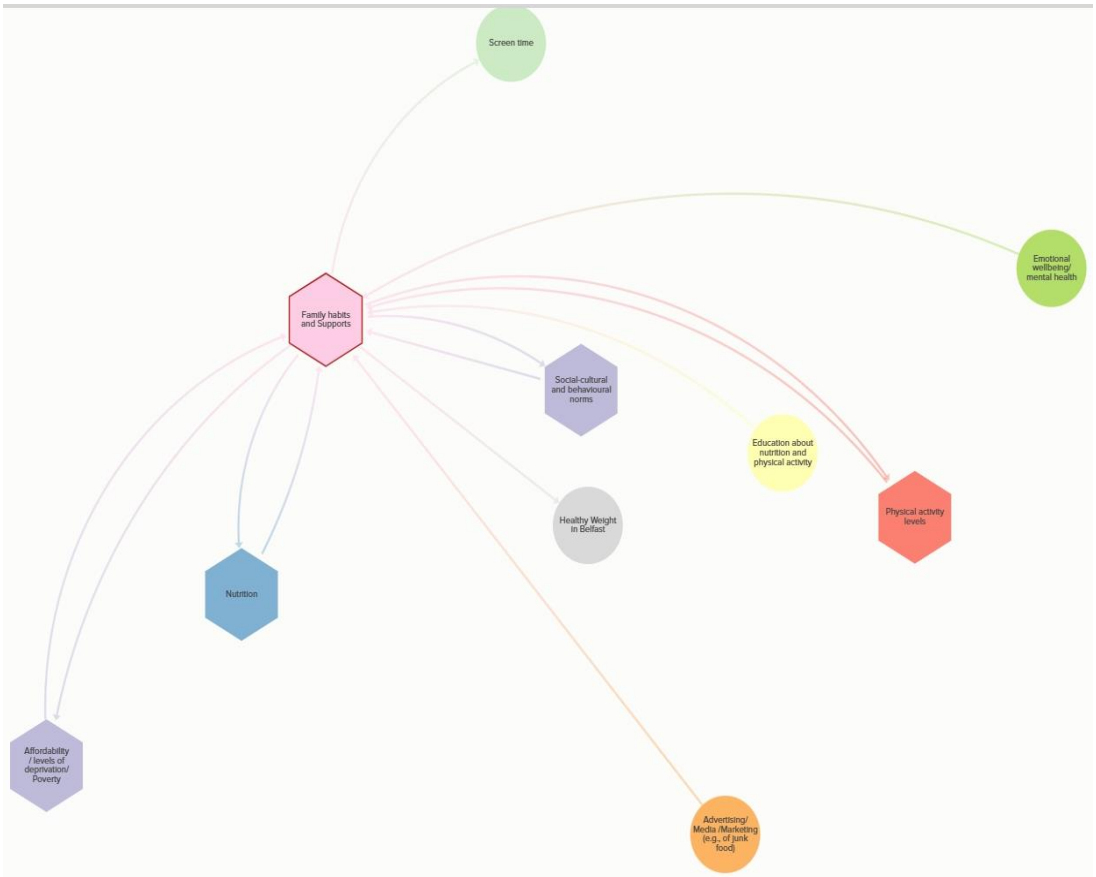

Figure 1: Family habits and supports as a central hub

Description:

'Family habits and supports' has emerged both as a central hub and a critical factor. This factor has 13 connections and four feedback loops. 'Family habits and supports' function as a powerful intergenerational transmitter within the healthy weight system. The factor, 'Family habits and supports' has a bidirectional relationship with four other factors including: affordability/levels of deprivation/poverty, nutrition, social-cultural and behavioural norms, physical activity levels. Furthermore, family habits and supports are shaped by, advertising/media marketing (e.g., junk food), education about nutrition and physical activity, emotional well-being and mental health. 'Family habits

and supports' influence other elements including online video screen time and healthy weight in Belfast. The positioning of this factor in the integrated systems map reveals family habits and supports as a critical juncture where socioeconomic realities crystallise into daily practices that shape social, cultural, and behavioural norms around health. The patterns families establish around food, activity, and screen time are constrained by affordability and resources, yet become self-reinforcing, thus shaping children's behaviours in ways that carry into adulthood and the next generation. Transforming family habits and supports requires addressing the economic pressures that limit healthier choices while recognizing that habits are deeply embedded in family culture and daily life, necessitating co-created solutions rather than prescribed behaviours.

2. Critical Factors

A critical factor is a key determinant or variable within a system that has significant influence over system outcomes and represents a high-leverage intervention point. Six critical determinants emerged from the analysis, the Central Hub is also considered as a critical factor (to view these determinants, you can hover over the factors in the interactive systems map):

2.1.Policy making

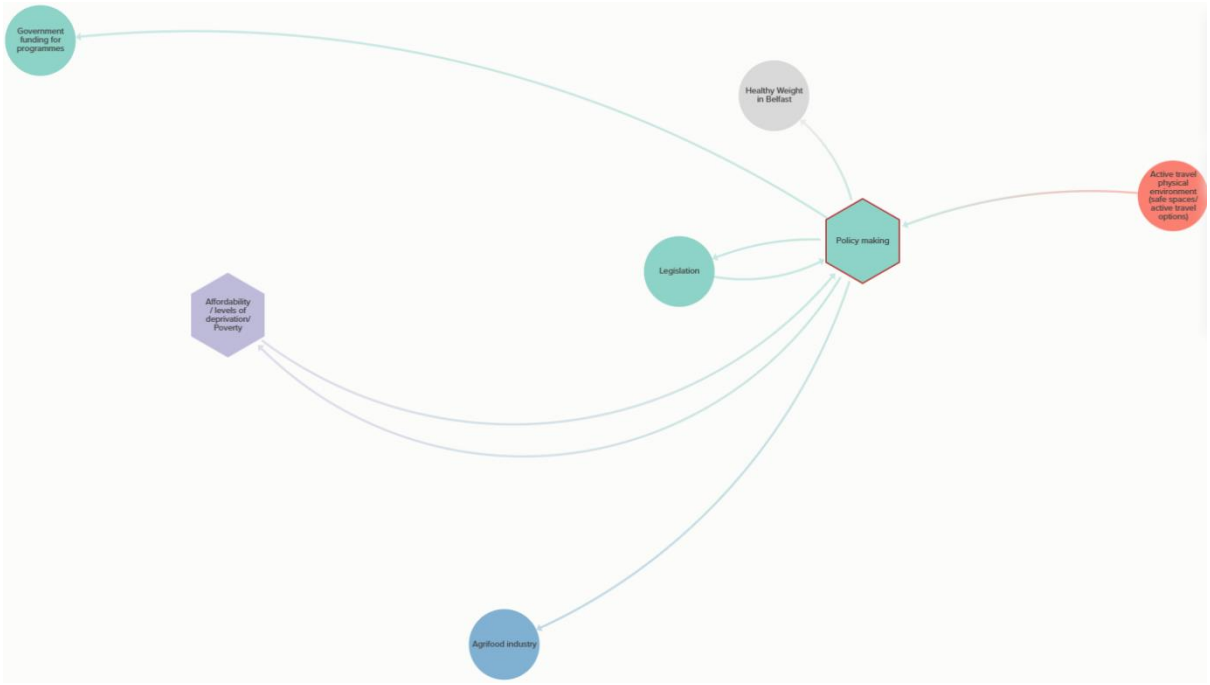

Figure 2.1: Policy making as a critical factor

Description:

'Policy making' has eight connections and two feedback loops and functions as a strategic lever within the healthy weight system, linking upstream factors like government funding, legislation, and affordability to downstream elements including agrifood industry and healthy weight in Belfast. This positioning reveals policy making as a powerful leverage point that shapes the conditions enabling healthier choices. Policy decisions fundamentally alter the landscape of opportunity and access that communities navigate daily, from what food is available in schools to how communities support physical activity. However, the map also shows that policy operates within a web of mutual influence, both shaping and being shaped by economic realities (affordability/levels of deprivation/poverty) and regulatory frameworks (legislation). Effective intervention requires leveraging policy's broad reach while

ensuring coherence across multiple pathways, creating aligned actions that reinforce rather than undermine each other.

2.2.Nutrition

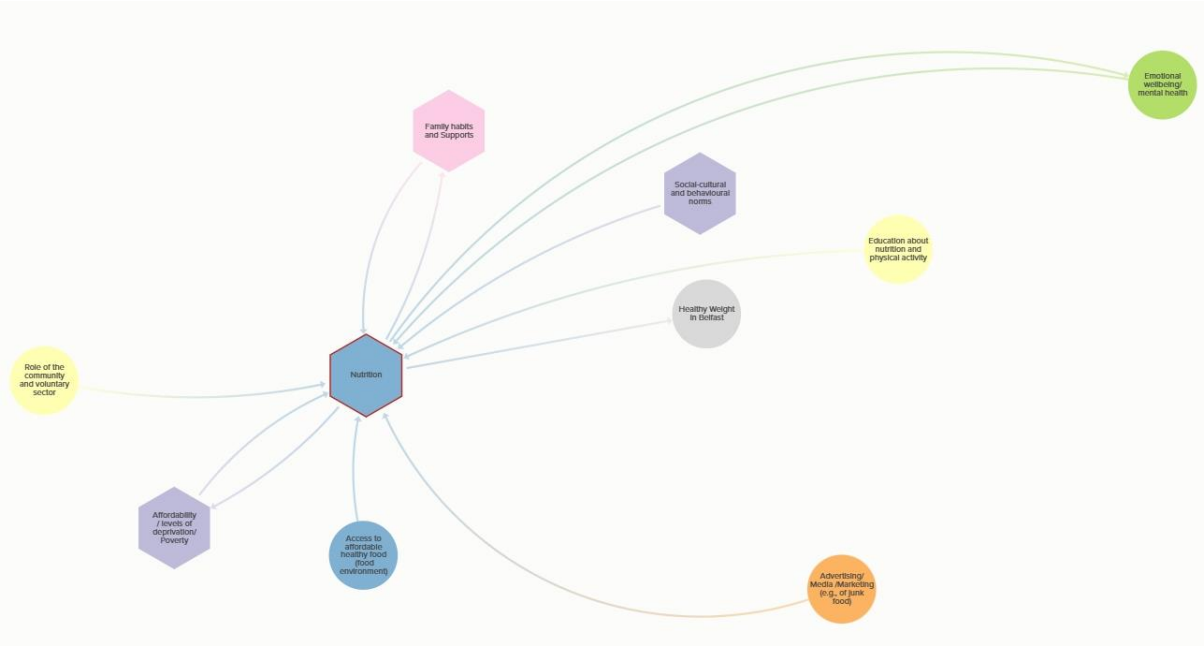

Figure 2.2: Nutrition as a critical factor

Description:
'Nutrition' has twelve connections and three feedback loops and operates as a critical mediator within the healthy weight system, bridging structural conditions with individual and community-level outcomes. This factor has bidirectional relations with three other factors in the system including affordability/levels of deprivation/poverty, family habits and supports, emotional wellbeing and mental health. 'Nutrition' is also influenced by other factors such as role of the community and voluntary sector, advertising/media/marketing (e.g. of junk food), education about nutrition and physical activity, social cultural and behavioural norms. In turn, nutrition directly influences healthy weight in Belfast. This positioning reveals 'nutrition' as a vital translation point where systemic conditions meet lived experience. Nutrition doesn't exist in isolation but is shaped by what families can afford, what's available in their communities, and what cultural norms prevail, while simultaneously influencing habits that ripple across generations and affect emotional wellbeing and mental health. The map shows how nutrition sits at the intersection of economic constraints, educational opportunities, and social influences, making it both a product of systemic inequities and a pathway through which those inequities perpetuate. Improving nutrition requires addressing the affordability and accessibility barriers that constrain healthy eating, while also attending to the knowledge, habits, and environments that shape food choices across the life course.

2.3.Affordability/levels of deprivation/poverty

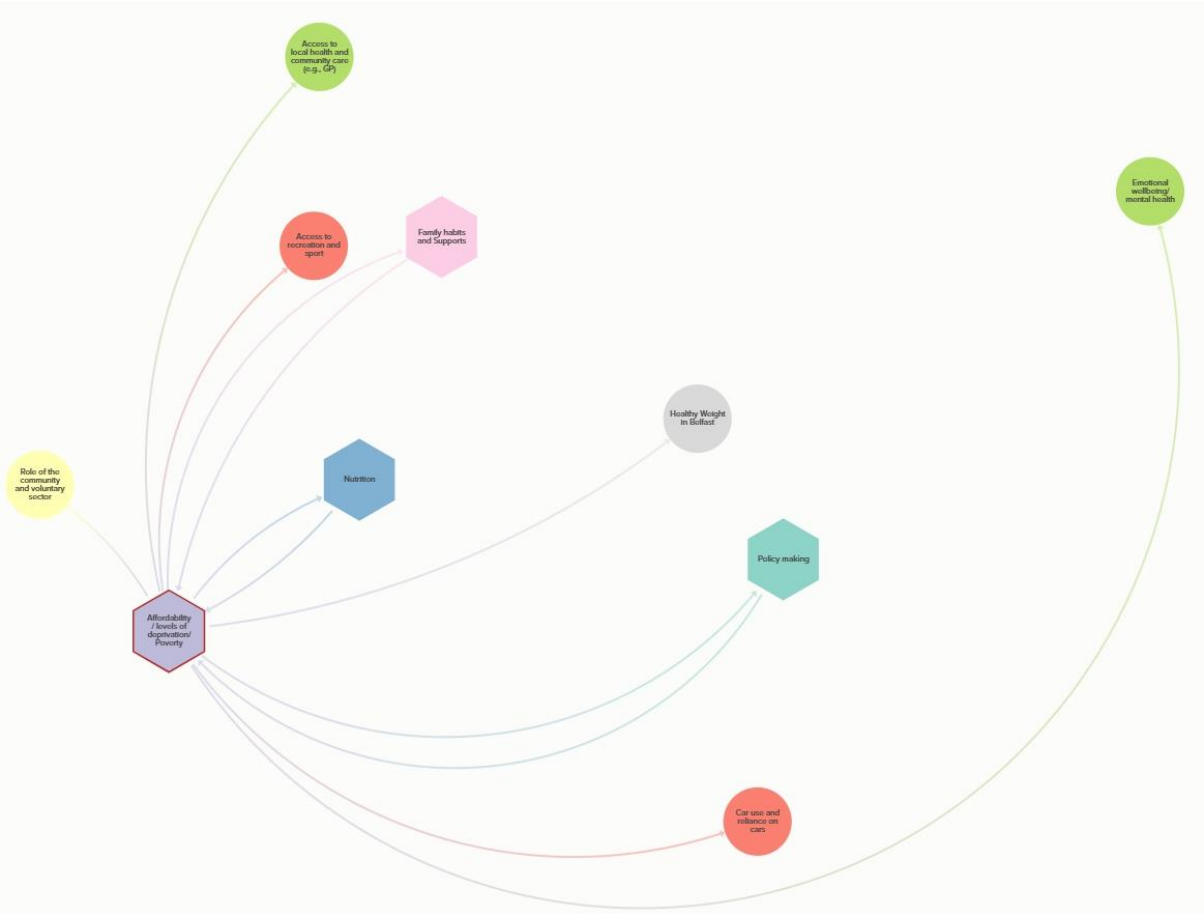

Figure 2.3: Affordability/levels of deprivation/poverty as a critical factor

Description:

'Affordability/levels of deprivation/poverty' has emerged as a critical upstream factor in the system with twelve connections (3 incoming and 9 outgoing) and three intertwined feedback loops. These loops reveal how affordability/levels of deprivation and poverty are intimately tied to policy making, family habits and supports and nutrition.

Three factors shape affordability/levels of deprivation/poverty in the system including: policy making, family habits and supports and nutrition. At the same time, 'affordability/levels of deprivation/poverty' ripples outward to affect nine aspects of the system, these are: policy making, family habits and supports, nutrition, role of the community and voluntary sector, access to recreation and sport, access to health and community care (e.g. General Practitioner), emotional well-being/mental health, car use and reliance on cars, and 'healthy weight in Belfast'.

This web of connections shows that affordability isn't just another factor in the system, it is a critical factor that shapes nearly every aspect of achieving and maintaining healthy weight. When people have the financial resources, they can maintain healthy weight, positive changes can ripple across multiple areas of their lives simultaneously. Furthermore, the feedback loops tell an important story: affordability is shaped by the same factors it influences. Tackling affordability alone, without addressing the policies, family habits and supports, nutrition and community resources that determine it, risks creating temporary relief. Therefore, a real, lasting change requires working on multiple fronts, strengthening the factors that

support affordability/levels of deprivation/poverty while simultaneously leveraging affordability/levels of deprivation/poverty to improve access, choices, and emotional well-being/mental health across the system.

2.4.Social-cultural and behavioural norms

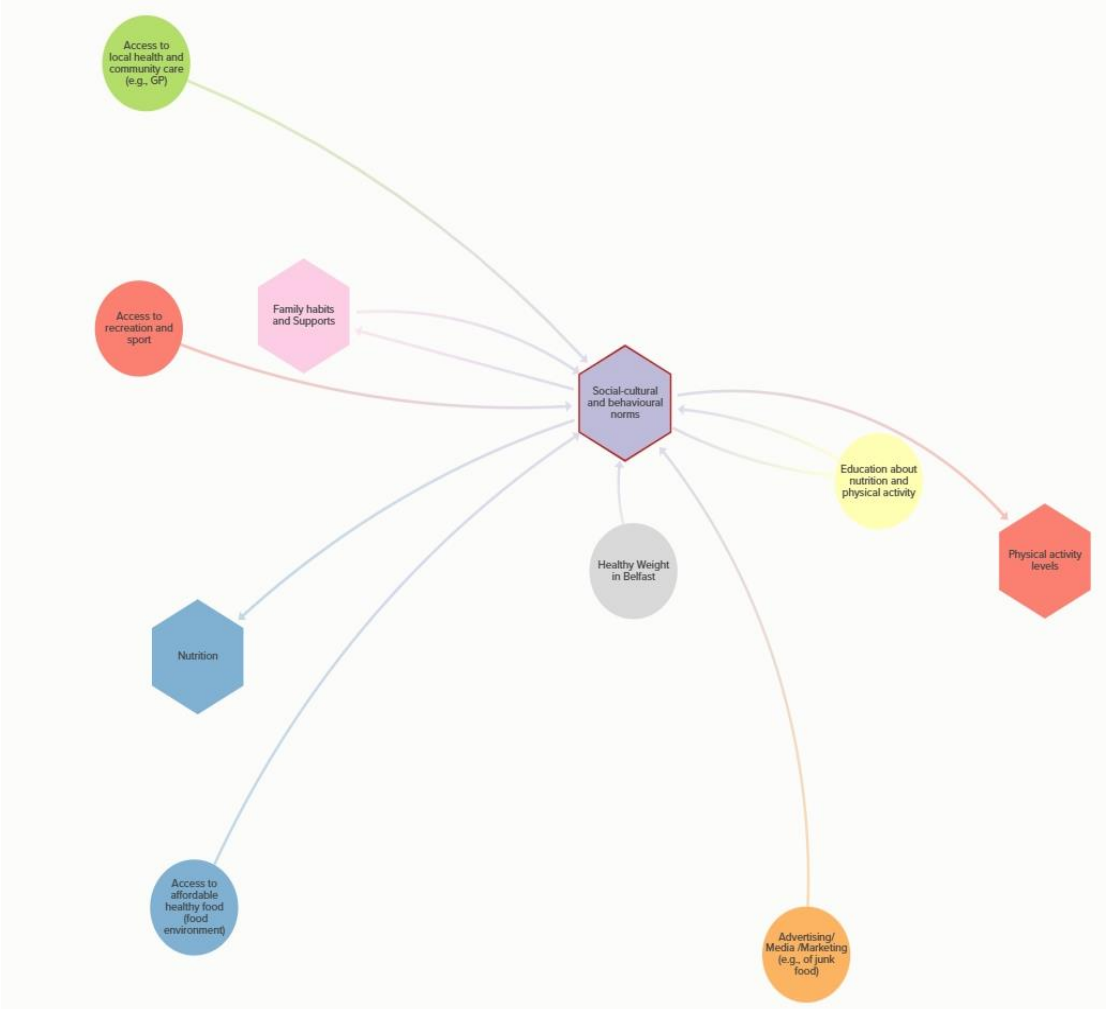

Figure 2.4: Social-cultural and behavioural norms as a critical factor.

Description:

This factor has eleven connections and two feedback loops. Social-cultural and behavioural norms operate as a central shaping force within the healthy weight system, revealing a bidirectional relation with 'family habits and supports', and 'education about nutrition and physical activity'. They are influenced by factors including access to health and community care (e.g. General Practitioner), access to recreation and sport, access to affordable healthy food (food environment), advertising/media/marketing (e.g. of junk food) and healthy weight in Belfast. This critical factor is shaping downstream factors, including nutrition and physical activity. This positioning reveals social-cultural norms as the collective lens through which individuals interpret and respond to health opportunities. These norms inform what's considered normal, acceptable, or desirable around food, body size, and physical activity, and are shaped by the resources available in communities and the practices families establish, yet they powerfully influence what knowledge is valued, what behaviors persist across generations, and even how commercial marketing and food environment resonate within the system of healthy weight in Belfast. The process of shifting norms requires more than individual education; it

requires transforming the social context through improved access to health and community services, access to recreation and sport, while working within communities to co-create new shared understandings of health and wellbeing.

2.5.Physical activity levels

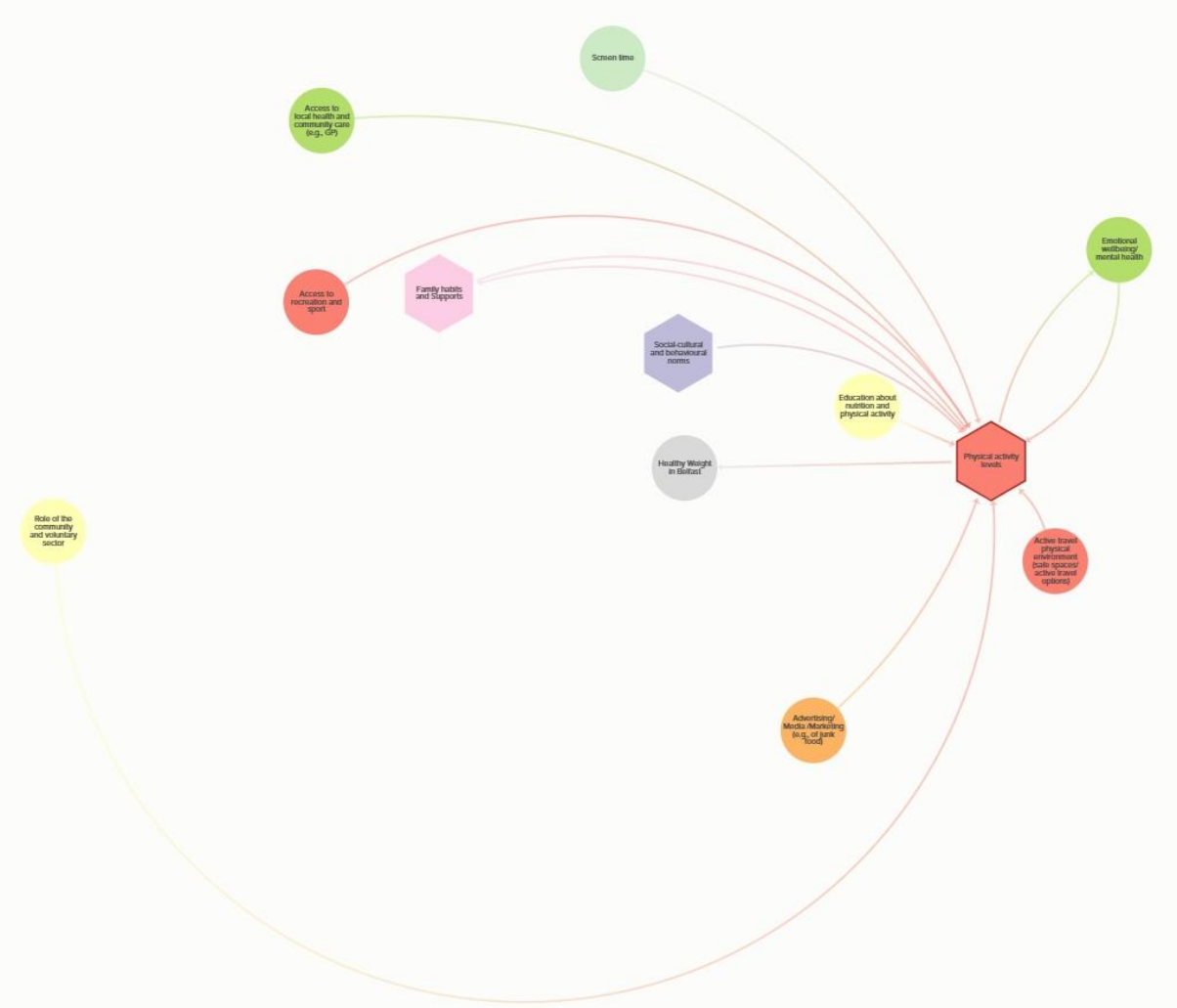

Figure 2.5: Physical activity levels as a critical factor

Description:
This factor has thirteen connections and two feedback loops with family habits and supports and emotional wellbeing/mental health. 'Physical activity levels' function as a key system outcome within the healthy weight system. It is shaped by factors including screen time, access to health and community care (e.g. General Practitioners), access to recreation and sport, social-cultural and behavioural norms, education about nutrition and physical activity, healthy weight in Belfast, role of the community and voluntary sector, advertising/media marketing (e.g. of junk food), and active travel physical environment. This positioning reveals 'physical activity levels' as both a product of environmental and social conditions and a driver of wider health outcomes. Physical activity levels don't simply reflect individual motivation but are also fundamentally shaped by whether communities have accessible facilities, whether families model active lifestyles, and whether people receive supportive education. Yet physical activity also generates its own momentum, influencing emotional wellbeing/mental health, creating cultures of movement that pass across generations through family habits and supports, and shaping how people

navigate their environments. Increasing physical activity requires creating the infrastructure, time, and social support that make movement possible and appealing, while recognising that active communities generate positive ripple effects across emotional wellbeing/mental health and intergenerational health patterns.

3. Critical Pathways

A critical pathway in a systems map represents a sequence of causal connections and feedback loops that traces how influence flows through a system from inputs to outcomes, revealing the mechanisms by which change propagates. One critical pathway (with four sub-pathways) emerged in the integrated systems map (to view hover over the text Pathway 1A, Pathway 1B, Pathway 1C, Pathway 1D on the interactive map).

Pathway 1: Policy and Legislation as System-Wide Leverage Points (From Governance to Healthy Weight: Five Pathways of Influence)

3.1.Pathway 1A: Creating Enabling Physical Infrastructure

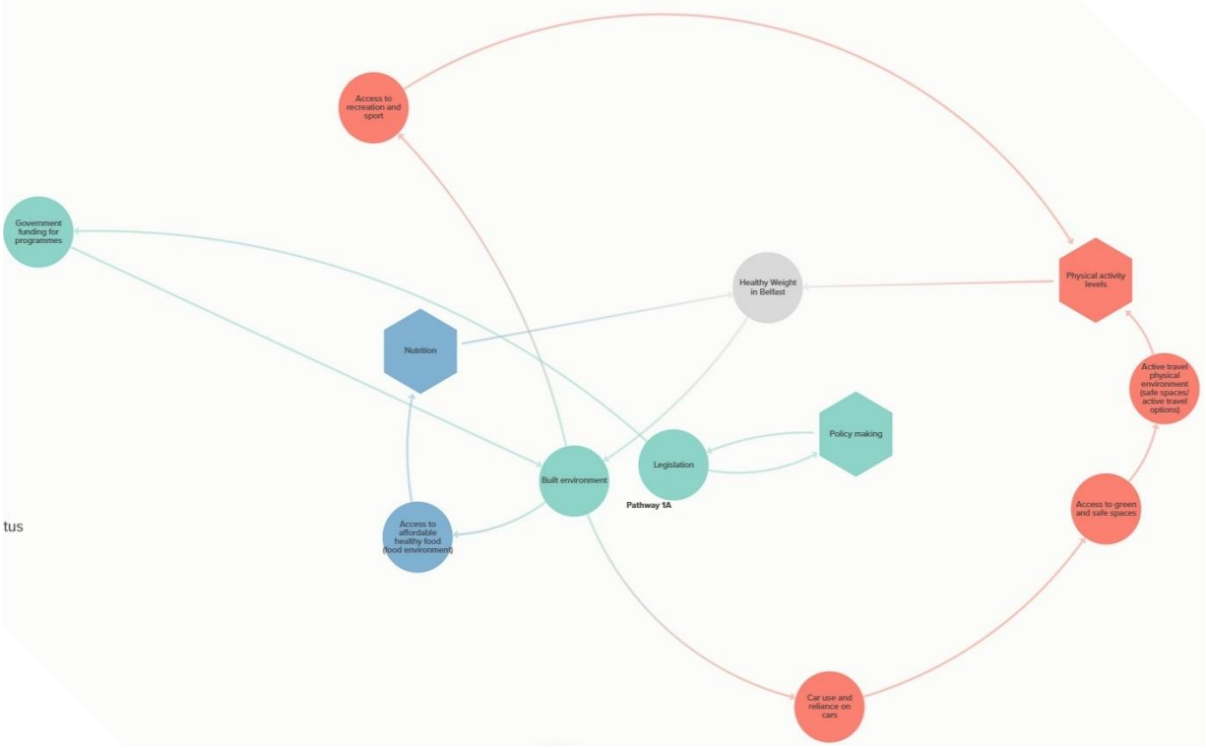

Figure 3.1: Pathway 1A: Creating enabling physical infrastructure

Description:
Policy making and legislation operate bidirectionally to shape the foundational infrastructure that enables physical activity. Through government funding for programmes, policy decisions influence the built environment, which in turn determines access to recreation and sport facilities. This access pathway creates opportunities for physical activity that directly contribute to healthy weight outcomes. The built environment also determines patterns of car use and reliance on cars. This transportation infrastructure directly affects access to green and safe spaces, which in turn influences the active travel physical environment including safe spaces and active travel options. These environmental conditions enable or constrain physical activity levels, ultimately affecting healthy weight outcomes. The built environment also has a direct influence on food environment which determines access to affordable and healthy food.

The food environment then affects nutrition ultimately affecting healthy weight in Belfast. This pathway uses loop 1,loop 2, loop 3 and loop 4 as system levers (Please refer to the integrated systems map to visualize the loops).

Key insight: Policy interventions at the upstream level through strategic funding allocation and legislative frameworks, can create lasting environmental changes that make physical activity more accessible and feasible for communities. By investing in recreational infrastructure and ensuring equitable distribution of facilities, policy makers establish the physical conditions necessary for sustained behaviour change, rather than relying solely on individual motivation or education-based interventions. Policy and legislation through built environment shapes transportation infrastructure that either reinforces car dependency, thereby reducing physical activity, or enables active travel as a pathway to increase physical activity and improved health.

3.2.Pathway 1B: Regulating Commercial Determinants to Shift Cultural Norms

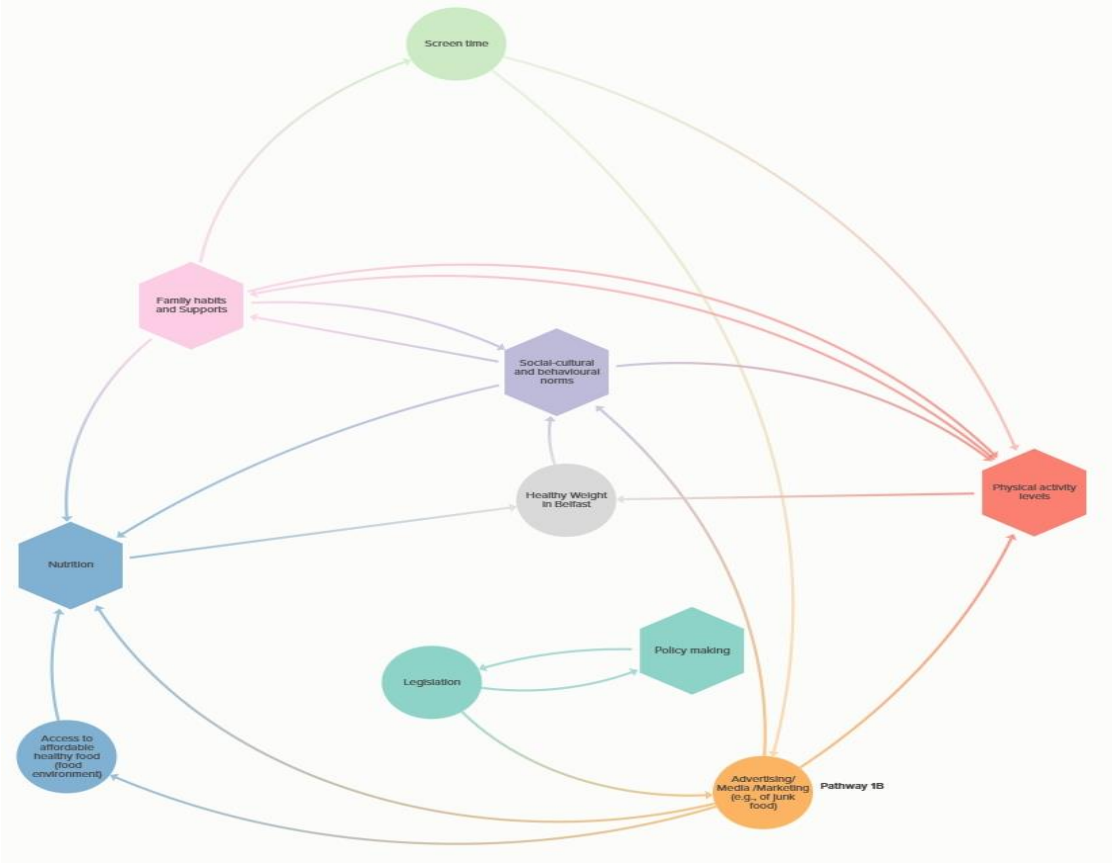

Figure 3.2: Pathway 1B: Regulating commercial determinants to shift cultural norms

Description:
Policy making and legislation, through their bidirectional relationship, regulate advertising/media and marketing practices, particularly junk food. This regulation influences social-cultural and behavioural norms, which exist in a feedback loop with family habits and supports. These norms and habits shape both physical activity levels and nutrition, directly affecting healthy weight outcomes.

Advertising/media/marketing (e.g. of junk food) is being shaped by the screen time which is influenced by family habits and supports. Advertising/media/marketing (e.g. of junk food) also influences nutrition through the food environment, which determines access to affordable healthy food. This pathway

includes loop 1 loop 5, loop 6, loop 7, loop 8, and loop 9 (Please refer to the integrated systems map to visualize the loops).

Key insight: Policy, through legislation, regulates commercial determinants of health, thereby shifting the cultural norms and family behaviors that drive dietary and activity patterns at the population level.

3.3.Pathway 1C: Education as a Driver of Normative Behaviours and Behavioural Change

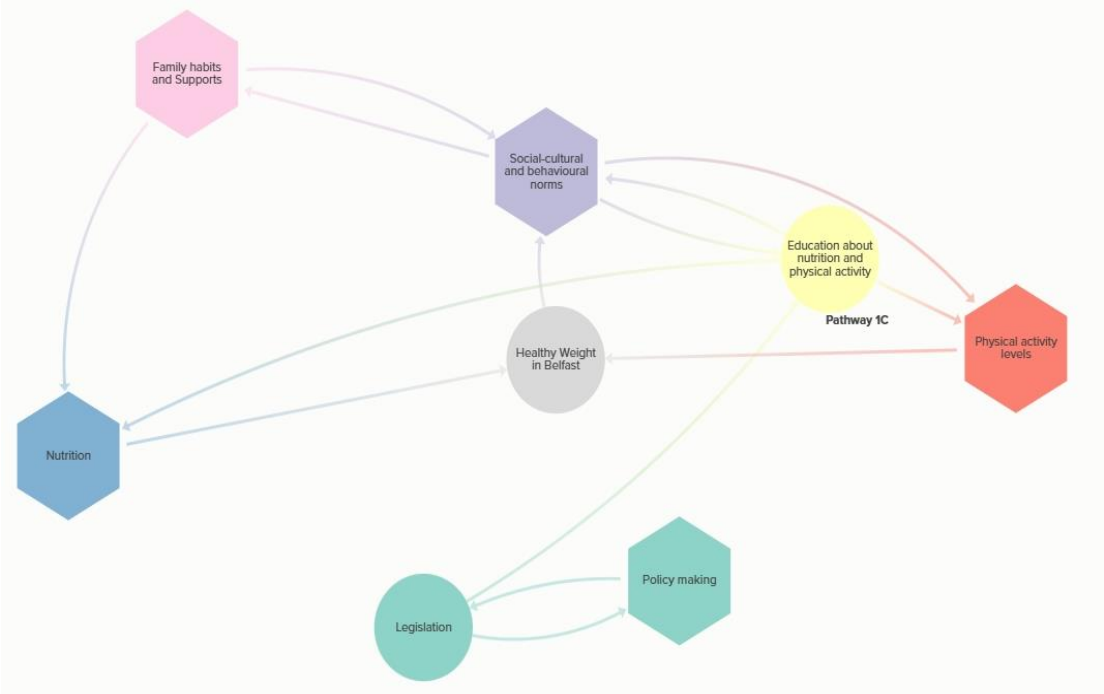

Figure 3.3: Pathway 1C: Education as a driver of normative behaviours and behavioural change

Description:
Policy making and legislation, through their bidirectional relationship, shape education about nutrition and physical activity. This education exists in a feedback loop with social-cultural norms, mutually reinforcing changes in what communities consider acceptable and desirable behaviors. These shifting norms influence family habits and supports, physical activity levels, and nutrition, which directly affect healthy weight outcomes. This pathway includes loop 1, loop 5, loop 8, loop 9 and loop 10. (Please refer to the integrated systems map to visualize the loops).

Key insight: Policy driven education initiatives shift social-cultural norms at the population level, empowering sustained behaviour change across multiple domains of health-related activity and dietary practices.

3.4. Pathway 1D: Addressing Socioeconomic Barriers to Unlock Multi-Domain Access

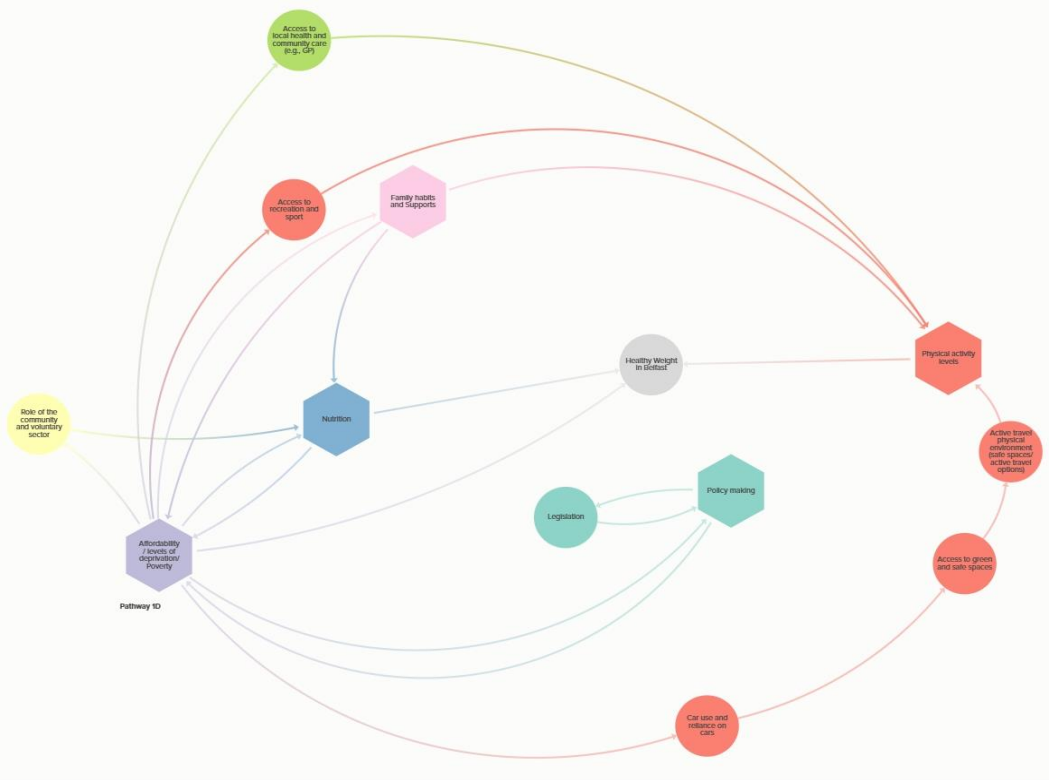

Figure 3.4: Pathway 1D: Addressing socioeconomic barriers to unlock multi-domain access

Description:
Policy making exists in a bidirectional relationship with affordability, levels of deprivation, and poverty, directly shaping the economic constraints that communities face. These socioeconomic conditions affect nutrition both directly and indirectly through the role of the community and the voluntary sector. Simultaneously, affordability/levels of deprivation/poverty affect access to recreation and sport facilities and access to health and community care (e.g. General Practitioner) directly. Affordability/levels and deprivation/poverty also influence access to green spaces and active travel physical environment through car use and reliance on cars. These access pathways converge to influence both physical activity levels and nutrition, which directly affect healthy weight outcomes. This pathway includes loop 1, loop 11, loop 12, loop 13, loop 14 and loop 15. (Please refer to the integrated systems map to visualise the loops.

Key insight: Policy interventions addressing socioeconomic barriers unlock multiple access pathways simultaneously, creating synergistic effects across both nutritional and physical activity domains rather than requiring separate interventions for each barrier.

Suggested Action Points

Based on the systems mapping workshops, stakeholders identified multiple action points for future interventions and policies addressing healthy weight challenges. These interventions are grouped into four action points corresponding to four sub-pathways of the main critical pathway. Each action point was systematically developed using the ASM/Iceberg Model framework[6], ensuring comprehensive coverage across all four intervention levels that strengthen overall system effectiveness.

The Action Points:

Action Point 1A

This action point addresses pathway 1A (Creating Enabling Infrastructure) through the following interventions:

i. ***Regional Legislation for Community Access to After School Hours Educational and Recreational Facilities***

Schools operating beyond traditional hours providing community access to educational and recreational facilities. This action requires legislative mandate, stakeholder coordination, facility adaptation, staffing allocation, and government funding for operational costs.

ii. ***Increase Green Space***

Transforming derelict urban spaces into play zones and community gardens near residential areas. This action involves Local Authority assessment, maintenance frameworks, stakeholder engagement, and anti-social use management.

iii. ***Open Parks for Active Travel Accessibility***

Developing park pathway infrastructure for walking, cycling, and active travel. This action integrates transport links, environmental protection, community consultation, and youth engagement. This proposed action is validated by Sustrans evidence showing 10% active travel increase across 500+ NI schools[8].

iv. ***Civic Dollars***

Digital incentive platform rewarding park usage with redeemable dollars. This digital incentive tool can also generate real-time usage data informing infrastructure investment. E.g. Belfast and Donegal 'Civic Dollars pilot projects' demonstrate 3,000+ hours park activity, 1,000+ users, approximately 40% community donations[9].

v. ***School Food Systems Transformation***

Developing legislative frameworks to establish nutritional standards in school meal procurement, reduction in ultra-processed food and to ensure healthy options. This proposed action aligns with Healthy Food for Healthy Outcomes framework[10] mandating cross-departmental coordination, supplier contract standards and compliance monitoring.

Action Point 1B

This action addresses pathway 1B (Regulating Commercial Determinants to Shift Cultural Norms) through the following proposed intervention:

Reducing Children's Exposure to Commercial Food Marketing

This action entails a three-pronged approach to establish coordination between family settings, school environments, and digital spaces:

1. Screen time management reducing food advertising exposure.
2. School policies restricting commercial vending machines and branded junk food.
3. Public awareness of commercial motivations in social media nutrition content.

Action Point 1C

This action point addresses pathway 1C (Education as Driver of Normative Behaviour and Behavioural Change) through the following proposed interventions:

i. ***Healthy Habits Initiative***

Holistic school-community programme integrating nutrition education, physical activity, accessible infrastructure, and family engagement. Child-to-family knowledge transfer creates normative behaviour shifts, while affordability awareness enables informed decision-making. This action aligns with HENRY programme in Northern Ireland[11] and Take 5 framework[12].

ii. ***Improving School Environment***

This action advocates for teacher training to promote nutrition and physical education delivery in schools, integration of school and health services (P1/Year 8 screening); parenting support for nutrition/sleep hygiene and school-family communication platforms. This action suggests prevention-focused resource allocation through cross-departmental funding pooling. Another important suggestion is to remove unhealthy reward systems which embeds the essence of Take 5 framework[12].

iii. ***Nutrition Literacy and Education***

Curriculum integration from primary through university. This action advocates for professional development of school/teaching staff; family engagement mechanisms; community nutrition education through workshops, cooking classes and budget-conscious meal planning. This action aligns with Healthy Food for Healthy Outcomes framework[10] and HENRY programme in Northern Ireland[11] which have demonstrated 93% healthier lifestyle adoption.

Action Point 1D

This action point addresses pathway 1D (Addressing Socio-Economic Barriers) through the following proposed intervention:

Addressing Food Affordability Barriers to unlock multi domain access

Financial support enabling vulnerable populations to access nutritious food through vouchers/cards redeemable at local shops, supermarkets, butchers. This action requires legislative frameworks, distribution infrastructure, vendor partnerships, fraud prevention mechanisms, and integrated nutrition education.

Evidence Base Supporting Participant-Suggested Interventions

The following section examines the evidence base supporting the participant-suggested interventions, assessing alignment with established programmes, impact data, and implementation feasibility.

Action Point 1A (PATHWAY 1A: Creating Enabling Infrastructure)

Pathway 1A interventions are strongly supported by three programmes operational in Northern Ireland demonstrating feasibility and impact.

School Food Systems Transformation aligns with the “Healthy Food for Healthy Outcomes” framework[10], a joint Department of Education and Department of Health initiative, establishing mandatory nutritional standards across Northern Ireland’s grant-aided schools. The policy mandates whole-school food provision approaches, curriculum integration from foundation stage through Key Stage 4 (KS4), and cross-departmental coordination, directly validating participants' structural reform suggestions. Furthermore, the nutritional standards requirements for procurement, vending machines, and school events support the specific mechanisms participants have identified.

Active Travel and Parks Infrastructure receives substantial validation from Sustrans' Active School Travel Programme[8], operational since 2013 with over 500 participating NI schools. Impact evidence validates participants' envisioned scale of change, that is, 10 percentage point increase in active travel (35%→45%), 9 percentage point decrease in car use (58%→49%), and daily 60-minute physical activity achievement rising from 25% to 35%. The programme's reach to 1,600+ activities engaging 57,000+ participants in 2024-25, demonstrates scalability supporting participants' infrastructure-focused approach.

Civic Dollars intervention is supported by Belfast, Donegal, and Derry/Strabane pilots[9]. For instance, Belfast registered 3,000+ hours of park activity; Donegal engaged 1,000+ users across 80+ earn zones. Critically, 40%+ of earned dollars are donated to community groups, validating participants' emphasis on both individual behaviour change and community infrastructure strengthening. Real-time usage data generation supports participants' vision of evidence-informed infrastructure planning.

These programmes share characteristics strengthening Pathway 1A's foundation: whole-systems coordination, established NI delivery infrastructure, demonstrated effectiveness in local contexts, and explicit equity focus. Evidence validates participants' emphasis on environmental conditions enabling healthy behaviours rather than individual motivation alone.

Action Point 1B (PATHWAY 1B: Regulating Commercial Determinants)

Pathway 1B represents a significant NI evidence gap. While international evidence supports commercial food regulation, for example, Chile's marketing restrictions, 'Food labelling and advertising law'[13], Northern Ireland lacks strict statutory restrictions/frameworks for commercial food marketing to children. Participants identified three commercial pathways: screen time exposure to food advertising, commercial school vendors (vending machines), and social media nutrition misinformation. These concerns lack NI-specific implementation models or impact data. This gap may reflect limited participant awareness of commercial regulation as intervention option or perceived difficult implementation of advertising restrictions at local versus national level. Therefore, this gap represents both limitation and opportunity. The limitation is reduced implementation confidence versus pathways with established NI programmes. The opportunity is highlighting commercial determinant regulation as underutilized systems leverage. Participant suggestions while modest compared to comprehensive advertising regulation represent important first steps toward managing commercial exposure. Future development should consider professional regulation for commercial nutrition advice; platform accountability for health and nutrition misinformation; advertising standards for influencer marketing; retail environment restrictions (checkout policies, promotional controls).

Action Point 1C (PATHWAY 1C: Education as Driver of Normative Change)

Pathway 1C has received a multi-programme validation during the workshops for education as a mechanism for normative behaviour and behavioural change.

Nutrition Literacy and Education aligns with two complementary programmes. Healthy Food For Health Outcomes[10] mandates nutrition education from foundation stage through KS4 with compulsory Home Economics at KS3, establishing curriculum frameworks participants identified as essential. HENRY programme[11] provides evidence for family engagement components, demonstrating achievable impact, for example, 93% of families adopted healthier lifestyles, 75% reported improved emotional wellbeing, 82% demonstrated better boundary-setting. HENRY programme also contributed to population-level obesity reduction in Leeds (9.4%→8.8% overall; 11.5%→10.5% in most deprived areas), validating participants' belief that education can achieve systems-level impact, particularly addressing inequalities.

Improving School Environment is supported by 'Sustrans Active School Travel'[8] and Take 5 framework[12]. Sustrans Active Travel School[8] provides national standard cycle training, walking bus coordination, and safety education, validating skill-building alongside infrastructure. Take 5 framework[12] supports holistic wellbeing integration (Be Active, Connect, Keep Learning) as interconnected determinants. Multi-sectoral uptake across community, voluntary, statutory, and business sectors demonstrates scalability beyond schools. Workplace accreditation provides implementation support adaptable to school environments.

Healthy Habits Initiative receives validation from HENRY's programme (whole-family approach)[11] and Take 5's framework[12]. HENRY[11] demonstrates that simultaneous addressing of nutrition, physical activity, and emotional

wellbeing produces superior outcomes compared to isolated interventions. Focus on building parental confidence and motivation rather than information provision alone aligns with participants' understanding that knowledge is insufficient for behaviour change.

Evidence validates key participant insights; education must be curriculum-embedded, not add-on programming; family engagement translates school learning to home practice; emotional wellbeing and physical health require holistic treatment; teacher training and leadership modelling are critical to achieve systems-level change[11].

Action Point 1D (PATHWAY 1D: Addressing Socio-Economic Barriers)

Pathway 1D addresses affordability and economic access with mixed evidence support requiring NI adaptation. Food Voucher Scheme partially aligns with the government of United Kingdom, 'Healthy Start programme'[14] (e.g. vouchers for fruit, vegetables, milk, infant formula to pregnant women and families on qualifying benefits).Healthy Start[14] validates financial mechanisms for food access, but the workshops participants identified NI-specific requirements: supporting local food economies; addressing food preparation barriers alongside affordability; recognizing limited major retailer access in some areas.

Civic Dollars[9] intervention (positioned in pathway1A with pathway 1D implications) demonstrates infrastructure addressing economic barriers through free access, rewards redeemable for recreation and food, and explicit disadvantaged population targeting (e.g. Derry/Strabane pre-diabetes cohort). This shows infrastructure activation incorporating equity with integrated economic interventions.

The Pathway 1D gap highlights need for NI-specific economic access mechanisms tailored to local food systems, community infrastructure, and population needs. UK-wide programmes provide principles and delivery mechanisms, but effective local implementation requires adaptation recognizing NI's specific economic, geographic, and community contexts.

Outcomes and Conclusion

Summary of workshop findings:

Policy making and legislation function as most critical leverage points which influence healthy weight through four distinct but interconnected mechanisms:

1. Physical infrastructure through built environment influences access to recreational and health facilities. Simultaneously built environment affects transportation systems which influences active travel through car dependency and access to green spaces.
2. Commercial regulation through advertising/marketing influences the social-cultural norms and family habits and supports.
3. Education systems through nutrition literacy and physical activity awareness transform social-cultural norms.
4. Economic interventions address affordability/level of deprivation to unlock multi domain access across the system.

The primary critical pathway 1 with four sub pathways converge on 'physical activity levels', 'nutrition', 'Social-cultural and behavioural norms' and 'family habits and supports' as critical mediators, which directly influence healthy weight. The bidirectional relationships between Policy and Legislation, Policy and affordability/levels of deprivation/poverty, family habits and supports and physical activity levels, affordability/levels of deprivation/poverty, highlight the feedback loops that can reorganise the system to achieve better outcomes.

Key Achievements

The workshop process achieved significant systems understanding through mapping complex relationships between individual, family, community, and institutional factors affecting healthy weight. Collaborative stakeholder engagement integrated diverse perspectives from health, education, community, policy, and business sectors, establishing shared ownership and collective commitment. The proposed interventions supported by evidence-based impact are organised into four interconnected action points to work synergistically across all ASM levels with clear implementation sequencing.

Lived Experience Considerations for System Interpretation and Implementation

While the integrated systems map reflects the collective outputs of the participatory workshops, additional considerations from a lived experience perspective are relevant to how the Whole Systems Approach is interpreted and taken forward in practice. Factors such as weight stigma, dominant framings of obesity, public understanding of obesity as a complex condition, and the language used in prevention efforts can influence trust in services, engagement with initiatives, and responses to education and community-based actions. Within Pathway 1B, commercial influences are primarily represented through advertising, marketing, and digital exposure, and the report highlights a corresponding evidence and implementation gap. In addition to the areas identified through the workshops, wider commercial determinants of health, including food production, processing, availability, pricing, distribution, and retail practices, may also shape everyday food environments beyond marketing exposure alone. To fully realise a Whole Systems Approach, an accompanying action plan that supports the operationalisation of the systems map could usefully consider stigma-informed communication, anti-stigma policy, education on the complexity of obesity, and broader commercial determinants alongside the existing pathways, supporting effective and inclusive implementation.

Conclusion

Through participatory systems mapping and collaborative intervention design, we have created a comprehensive, evidence-based, list of draft action points that transforms the challenge of healthy weight from an individual problem into a systems-level solution. With clear implementation pathways, robust evaluation frameworks, and broad stakeholder commitment, we are positioned to create change that will benefit current and future generations in Belfast.

The workshop demonstrated the power of systems thinking in addressing complex health challenges. Rather than designing isolated interventions, we created action points where each change strengthens and reinforces the others, creating sustainable system transformation. It is anticipated that the systems map, and the actions will be considered for incorporation into an action plan for Belfast City Council to target healthier weight, and to contribute to meeting the actions of the Healthy Futures Obesity Strategy for Northern Ireland[7]

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